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博 士 論 文

從構式語法看漢語結果複合動詞

Resultative Verb Compounds in Mandarin Chinese: A Constructional Approach

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摘要

典型的漢語結果複合動詞 (resultative verb compound) 是由兩個動詞 Vc 與 Vr 結合而成的，用來表示一個致使事件以及一個結果事件。本論文討論漢語結果複合動詞，特別強調動詞論元結構與語法功能之間的複雜關係。

我們根據及物性、語意歸屬 (semantic host)、以及句法主語是否為 Vc 邏輯主語等標準，將結果複合動詞構式分成四種類型。這四種類型形成維根斯坦 (Wittgenstein 1953) 所提出的家族類似性 (family resemblance)：類型之間互有相同的性質，但所有類型合起來看很難找到共通性。

類型 I 包含了一般的賓語傾向 (object-oriented) 結果複合動詞構式。類型 II 包含了一般的主語傾向 (subject-oriented) 結果複合動詞構式。類型 III 包含了逆序致使 (inverted causative) 結果複合動詞構式，其主語總是具有起因者 (Causer) 的語意角色。類型 IV 包含了準被動 (pseudo-passive) 結果複合動詞構式，可視為類型 I 的不及物型。

在類型 I 與類型 III 中，致使關係直接反映在語法功能上：主語 (不一定為 Vc 的外部論元) 為起因者 (Causer)，賓語 (不一定為 Vc 的內部論元) 為受因者 (Causee)。相反地，在類型 II 與類型 IV 中，主語皆為受因者 (但在類型 II 中，Vc 的邏輯賓語可選擇性出現在句法賓語位置)。

我們採用構式語法 (Construction Grammar) 的理論，認為漢語結果複合動詞的論元是由結果複合動詞構式 [NP1 Vc-Vr (NP2)] 來得到認可 (license)，而非 Vc 或 Vr 當中之一，也非 Vc 與 Vr 合起來決定。

我們比較結果複合動詞與分析性致使詞 (analytic causative) 像是「讓」、「使」等，發現後者可以表達直接或間接致使 (causation)，但前者僅限於表達直接致使。

我們也討論漢語複合動詞的一些次構式 (sub-construction)，這些次構式無法化約為前述的一般結果複合動詞構式，而必須另外設定。這也支持了構式語法的觀點：構式與構式之間形成繼承關係。

為了忠實反映語言事實，在適當時機我們會採納 Chinese Gigaword 語料庫的語料。多樣的語料也能印證理論的適切性。

Abstract

Typically, a resultative verb compound (RVC) in Mandarin Chinese of the form Vc-Vr ("c" for cause; "r" for result) expresses a causing event and a result event. This dissertation discusses Mandarin RVCs with an emphasis on the complicated relations between verbal arguments and grammatical functions.

Based on structural transitivity, semantic host of Vr, and whether the grammatical subject is Vc's logical subject, four types of RVC constructions are distinguished, which form a case of Wittgenstein's (1953) *family resemblance*: properties are shared between the members, though nothing is common to all.

Type I includes normal *object-oriented* resultatives; Type II includes normal *subject-oriented* resultatives; Type III includes *inverted-causative* resultatives, whose subjects are invariably Causers; Type IV includes *pseudo-passive* resultatives, which are the intransitive counterparts of Type I resultatives.

In Type I and Type III, causal relations are directly reflected by grammatical functions. That is, the Causer (not necessarily the external argument of Vc) corresponds to the subject and the Causee (not necessarily the internal argument of Vc) corresponds to the object. On the contrary, in Type II and Type IV, the subjects are Causees (Vc's logical object can optionally appear in the object position in Type II).

We adopt the framework of Construction Grammar, arguing that arguments in RVCs are licensed by RVC constructions of the form [NP1 Vc-Vr (NP2)] rather than by Vc, or Vr, or Vc and Vr combined.

We contrast RVC constructions (synthetic causatives) with analytic causatives such as *rang* "to let" and *shi* "to cause", and find that while the former expresses direct or indirect causation, the latter expresses direct causation only.

Some sub-constructions of RVCs are discussed too, which are irreducible to general RVC constructions and must be specified independently. This supports the idea of Construction Grammar: inheritance relations exist among constructions.

To reflect language facts, data from the corpus *Chinese Gigaword* are used when appropriate. The results support the constructional perspective advocated here.

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Four years after graduating, I was admitted to the Ph.D. program. I took various seminars for the first two and half years, including Aspect by Prof. Kuang Mei, Formal Semantics by Prof. T.-H. Jonah Lin, Sociolinguistics by Prof. Feng-fu Tsao, and Construction Grammar by Prof. Chinfa Lien. These courses broadened my perspective and strengthened my linguistic skills.

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ANC	analytic causative *shi/rang/ling/jiao*
ASF	adjective suffix *de*
ASP	aspect marker
BA	disposal *ba/jiang*
BEI	passive marker *bei*
CL	classifier
POS	possessive *de*
PRO	pronoun
RES	resultative *de*

Chapter 1 Introduction

Resultative constructions have been a hotly-debated topic in Chinese linguistics. This chapter gives an overview of resultative constructions and their classification. The scope of this dissertation is then defined, and research questions are raised.

1.1 Resultative Verb Compounds vs. Resultative *De*

A resultative construction usually encodes a causing event (a process, or an activity) and a caused event (a result state) within a clause. Two related constructions exist in Mandarin Chinese which are not mutually reducible: the resultative verb compounds (henceforth RVCs) as in (1a) and the resultative-*de* constructions as in (1b):

(1) a. Ta pao-lei le.[1]

s/he run-tired ASP

"S/He ran her/himself tired."

b. Ta pao de hen lei.

s/he run RES very tired

"S/He ran her/himself tired."

RVCs attract more attention than resultative-*de* constructions, owing to their diverse behaviors in terms of argument linking, potential interpretations, and degree of analyticity and productivity. Thus we will focus on RVCs in this work. Before we provide a detailed classification of RVC constructions, we introduce the family of Verb-Complement Compounds, among which only RVCs proper are to be discussed in detail in this work.

[1] Throughout this dissertation, abbreviations of English glosses are used. See page xvii for a list of abbreviations. Glosses and translations of examples from other references are adapted here for reasons of consistency.

1.2 Resultative Verb Compounds in a Wider Context

The term Verb-Complement (V-R) Compound is used in Chao (1968) to refer to a class of related forms with different kinds of complements, roughly including ordinary resultative complements, phase complements, potential complements, intensifying complements, and directional complements. Here we briefly introduce the family of Verb-Complement Compounds with complements other than ordinary resultative complements.

1.2.1 Phase Complements

"There are a few complements which express the phase of an action in the first verb rather than some result in the action or goal" (Chao 1968: 446). Typical phase complements include *zhao* "to be on target", *dao* "to arrive", *jian* "to meet (a person)", *wan* "to finish", *hao* "to be good", *zhu* "to hold on" (Chao 1968: 446-50, Li and Thompson 1981: 65).

The phase complements differ from result complements in many ways. First, a phase complement indicates the completion of an activity instead of the result of some entity. It functions as a lexical aspect (*Aktionsart*) that changes the eventuality (situation type) of a verb: from activities to accomplishments or achievements. Examples are shown below (Li and Thompson 1981: 65-66):

Phase	Verb + Phase
wan "to finish"	*chang-wan* "sing-finish; finish singing" *nian-wan* "study-finish; finish studying"
dao "to arrive"	*kan-dao* "see-arrive; see" *zhao-dao* "search-arrive; find"

Table 1: Examples of Phase Complements

1.2.2 Potential Complements

Potential complements obligatorily take either of the potential infixes *de* and *bu* to express the positive and negative endpoints of the "capability" axis. Specifically, the complements can be dummy, minimal, or lexical (see Chao 1968: 452-58).

Dummy potential complements include *guo* "to surpass", *qi* "to rise", *liao* "to finish", and *lai* "to come"; their lexical meanings are weakened when they follow *de* or *bu*. For example, *da-*(de/bu)-guo* "can/can't outfight", *chi-*(de/bu)-qi* "can/can't afford to eat", and *cun-*(de/bu)-liao* "can/can't save (money, goods)" (examples adapted from Li and Thompson 1981: 67-68), *he-*(de/bu)-lai* "can/can't get along together" (Chao 1968: 454).

Minimal potential complements are themselves of the form *de*. The haplology of *de* results in the contrast below: *ren-(*de)-de* "can recognize" vs. *ren-bu-de* "can't recognize" (Chao 1968: 454-55).

Lexical potential complements still retain their lexical meanings, e.g. *lai-*(de/bu)-ji* "can/can't be in time for" (Chao 1968: 457).

Virtually all other types of Verb-Complement Compounds can have potential forms by optionally infixing *de/bu* in between. Examples of phase complements such as *kan-dao* "succeed in seeing" has the potential form *kan-[de/bu]-dao* "can/can't see". Another interesting example is *de-dao* "succeed in obtaining", which has the potential form *de-[de/bu]-dao* "can/can't obtain", without haplology of *de*.[2]

1.2.3 Intensifying complements

Intensifying complements function like degree modifiers. Chao (1968: 450-52) lists some intensifying complements such as *ji* "extremely", *tou* "thoroughly", and *si* "dead".

[2] The first *de* receives the second (rising) tone, while the second *de* is toneless, or receives the neutral tone.

Examples of *si* include *lei-si* “tire to death; very tired” and *qi-si* “anger to death; very angry” (Li and Thompson 1981: 66 group them with metaphorical RVCs).

1.2.4 Directional complements

Three types of directional complements are mentioned in Li and Thompson (1981: 58-65): (i) directional verbs *lai* “to come” and *qu* “to go”; (ii) directional verbs *shang* “to ascend; up”, *xia* “to descend; down”, *jin* “to enter; in”, *chu* “to exit; out”, *qi* “to rise; up”, *hui* “to return; back”, *guo* “to cross; over”, and *kai* “to open; apart, away”; (iii) a type (ii) directional verb followed by a type (i) directional verb.

Examples such as *song-lai* “send-come” and *na-qu* “bring-go” are of type (i); examples such as *dai-shang* “wear-ascend” and *fang-xia* “put-descend” are of type (ii); examples such as *zou-jin-lai* “walk-enter-come” are of type (iii).

1.3 Types of RVC Constructions

RVCs can be classified according to the nature of the complements, as shown previously. RVCs can as well be classified according to the nature of the first verbs, as in Cheng and Huang (1994), reviewed later in this work.

We believe that RVCs should be studied from a constructional perspective, and thus we distinguish among types of *RVC constructions*. An RVC construction is a *sentential template* with peculiarities in terms of syntactic distribution, semantic interpretations, and argument linking. A given RVC belongs to more than one RVC constructions. Based on the following two criteria, RVC constructions can be classified as four major types: (i) whether the grammatical subject of the construction is equal to the logical subject of the first verb (Vc); (ii) whether the construction is subject-oriented or object-oriented. The two criteria will be justified as we present the data in subsequent discussions. All RVC constructions can be

subsumed under the form below (NP1 is the subject; NP2 is the object when the construction is transitive; Vc and Vr stand for "cause" verb and "result" verb, respectively):

(2) NP1 Vc-Vr (NP2)

In this section, we present four types of RVC constructions following the criteria above. Each subtype is demonstrated by a representative example.

1.3.1 Type I Resultatives

The most common, "garden-variety" resultatives in Mandarin is Type I resultatives with the following properties: (i) the grammatical subject of the construction is equal to the logical subject of Vc; (ii) the construction is object-oriented.

In Type I resultatives of the form [NP1 Vc-Vr NP2], NP1 is also the logical subject of Vc, and NP2 is the semantic host of Vr, which is predicated of NP2. Examples of Type I resultatives are shown below (termed *Type Ia*, *Type Ib*, and *Type Ic*, respectively):[3]

(3) a. Ta ca-gan le zhuozi. ($S_{RVC}=S_{Vc}$, $O_{RVC}=O_{Vc}$, Vc=tr.)[4]

s/he wipe-dry ASP table

"S/He wiped the table dry."

b. Ta ti-po le qiuxie. ($S_{RVC}=S_{Vc}$, $O_{RVC}\neq O_{Vc}$, Vc=tr.)

s/he kick-worn ASP sneakers

"S/He kicked (something, e.g. a ball) and had the sneakers worn out."

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[3] In a Type I resultative, Vc cannot be unaccusative, as will be discussed in Section 5.3.1.

[4] S_{RVC} and O_{RVC} stands for the grammatical (constructional) subject and object, respectively. S_{Vc} and O_{Vc} stand for the logical subject and object of Vc (Cause), respectively. The symbol "∅" stands for an empty set, and means that something does not exist, used here to show that an intransitive verb does not have an object at all. The abbreviations "tr.", "unerg.", and "unacc." stands for transitive, unergative, and unaccusative, respectively.

c. Ta ku-shi le shoupa. ($S_{RVC}=S_{Vc}$, $O_{RVC}\neq O_{Vc}=\varnothing$, Vc=unerg.)

s/he cry-wet ASP hankie

"S/He cried (so much) that the hankie got wet."

The transitive verb *ca* "to wipe" in (3a) subcategorizes the object *zhuozi* "table", whereas the transitive verb *ti* "to kick" in (3b) does not subcategorize the object *qiuxie* "sneakers". The logical object of Vc *ti* "to kick" in (3b) is not expressed. Instead, the NP *qiuxie* "sneakers", the semantic host in the object position, has no logical relation with Vc *ti* "to kick".

In (3c), the unergative verb *ku* "to cry" cannot license the object *shoupa* "hankie". Despite this difference, all results are predicated of the objects, and thus the resultatives are said to be object-oriented.

1.3.2 Type II Resultatives

Type II resultatives have the following properties: (i) the grammatical subject of the construction is equal to the logical subject of Vc; (ii) the construction is subject-oriented. In Type II resultatives of the form [NP1 Vc-Vr (NP2)], the result Vr is the predicate of the subject NP1 instead of the object NP2 (if any). Examples are shown below (termed *Type IIa*, *Type IIb*, and *Type IIc*, respectively):

(4) a. Ta chi-ni le shuijiao. ($S_{RVC}=S_{Vc}$, $O_{RVC}=O_{Vc}$, Vc=tr.)

s/he eat-bored ASP steamed:dumpling

"S/He was fed up with steamed dumplings."

b. Ta pao-lei le. ($S_{RVC}=S_{Vc}$, Vc=unerg.)

s/he run-tired ASP

"S/He ran her/himself tired."

c. Zhangsan zui-dao le. (S_{RVC}=S_{Vc}, Vc=unacc.)

Zhangsan drunk-fallen ASP

"Zhangsan got drunk and fell."

Type IIa of (4a) resembles Type Ia of (3a), in having subcategorized objects. There are no counterparts of Types Ib and Ic (i.e. with nonsubcategorized objects) in subject-oriented transitive resultatives.

The two intransitive resultatives (4b) and (4c), Type IIb and Type IIc, differ only in that while Vc in the former is unergative, that in the latter is unaccusative. In both (4b) and (4c), the first verbs and the results are predicates of the grammatical subjects.

1.3.3 Type III Resultatives

The tale of Mandarin resultatives is incomplete without the inverted causative resultatives. They defy our understanding that subjects must be arguments of the verbs. Their existence challenges the view that the first verbs are heads of RVCs.

Type III resultatives have the following properties: (i) the grammatical subject of the construction is NOT equal to the logical subject of Vc; (ii) the construction is object-oriented. Examples are shown below (termed *Type IIIa*, *Type IIIb*, and *Type IIIc*, respectively):

(5) a. Zhe zhong yao hui chi-si ren.[5] (O_{RVC}=S_{Vc}, S_{RVC}=O_{Vc}, Vc=tr.)

this kind medicine may eat-dead person

"This kind of medicine kills."

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[5] Some may argue that the modal *hui* "may" imposes a potential reading on the sentence. The following example from *Chinese Gigaword* shows that episodic readings are also possible in Type IIIa resultatives:

(i) Weiergang chi-si le si ge ren.

Viagra eat-dead ASP four CL person

"Four people died from taking Viagra."

For consistency, we will use the original example throughout this dissertation.

b. Zhe duan lu pao-lei le Zhangsan. ($O_{RVC}=S_{Vc}$, $S_{RVC}\neq O_{Vc}=\varnothing$, Vc=unerg.)

this CL road run-tired ASP Zhangsan

"This road made Zhangsan tired from running."

c. Zhe ping jiu zui-dao le Zhangsan.[6] ($O_{RVC}=S_{Vc}$, $S_{RVC}\neq O_{Vc}=\varnothing$, Vc=unacc.)

this bottle wine drunk-fall ASP Zhangsan

"This bottle of wine got Zhangsan drunk and fall."

In (5a), the subject *zhe zhong yao* "this kind of medicine" is the logical object (internal argument) of *chi* "to eat", and the object *ren* "people" is the logical subject (external argument) of *chi* "to eat"; in (5b), the subject *zhe duan lu* "this road" is neither an argument of *pao* "to run" nor an argument of *lei* "tired";[7] in (5c), the subject *zhe ping jiu* "this bottle of wine" is neither an argument of *zui* "to be drunk" nor an argument of *dao* "to fall". Thus the three patterns are termed *inverted causatives* to reflect that the logical subjects of Vc's appear in the object positions, and the NPs in the subject positions are Causers (though not Agents).[8]

A classical example that is controversially three-way ambiguous is given in L. Cheng (1997: 178).[9]

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[6] For those who found this example not natural, the following sentence with an aspect marker of experience *guo* may sound better (provided by Prof. Feng-fu Tsao):

(ii) Zhe zhong jiu zui-dao guo san wei da yingxiong.

this kind wine drunk-fallen ASP three CL big hero

"This kind of wine once got three big heroes so drunk that they fell down."

[7] Although, as pointed out by Prof. Feng-fu Tsao, *zhe duan lu* "this (section of the) road" (with a Path or Location role) is indistinguishable from the object of a transitive verb, as shown below:

(iii) Zhangsan pao zhe duan lu.

Zhangsan run this CL road

"Zhangsan ran this road."

[8] This term is also used by Gu (2003: 39).

[9] Lisa Cheng herself only accepts readings (i) and (iii), while reading (ii) is reportedly acceptable by others as described in L. Cheng (1997: 178, note 7).

(6) Zhangsan zhui-lei le Lisi.

Zhangsan chase-tired ASP Lisi

(i) "Zhangsan chased Lisi and Lisi became tired."

(ii) "Zhangsan chased Lisi and Zhangsan became tired."

(iii) "Lisi chased Zhangsan and Lisi became tired."

(iv) *"Lisi chased Zhangsan and Zhangsan became tired."

(v) *"Zhangsan made Lisi tired by getting her/him involved in the act of chasing someone else."

The three readings correspond to Types Ia, IIa, and IIIa in our classification, respectively. The fourth and fifth readings are logically possible but must be ruled out in our analysis.

1.3.4 Type IV Resultatives

Type IV resultatives, or *pseudo-passive* resultatives as illustrated below, have the following properties: (i) the grammatical subject of the construction is NOT equal to the logical subject of Vc; (ii) the construction is subject-oriented.[10] Examples are shown below (termed *Type IVa*, *Type IVb*, and *Type IVc*, respectively):

(7) a. Zhuozi ca-gan le. (S_{RVC} unexpressed, $S_{RVC}=O_{Vc}$, Vc=tr.)

table wipe-dry ASP

"The table was wiped dry."

b. Qiuxie ti-po le. (S_{RVC} unexpressed, $S_{RVC}\neq O_{Vc}$, Vc=tr.)

sneakers kick-worn ASP

"The sneakers wore out from kicking."

[10] The term *pseudo-passive* resultative is from Cheng and Huang (1994).

c. Shoupa ku-shi le. (S_{RVC} unexpressed, $S_{RVC}\neq O_{Vc}=\varnothing$, Vc=unerg.)

hankie cry-wet ASP

"The hankie got wet from someone's crying."

Type IV resultatives are superficially like Types IIb and IIc, except that the grammatical subjects are not the logical subjects of Vc's: in (7a), *zhuozi* "table" is the logical object, rather than the logical subject, of *ca* "to wipe"; in (7b), *qiuxie* "sneakers" is not subcategorized by *ti* "to kick"; in (7c), *shoupa* "hankie" is by no means related to *ku* "to cry"; It is argued in Cheng and Huang (1994) that, like passivization, Type IV resultatives are derived from Type I via subject suppression and object raising.

We have discussed the four types of resultatives in Mandarin Chinese. Our observation can be summarized below:

Type	Subj.- or Obj.-Oriented?	Vc	Obj. Subcategorized by Vc?	Argument Structure
Ia	Obj.	Transitive	Yes	$S_{RVC}=S_{Vc}$, $O_{RVC}=O_{Vc}$
Ib	Obj.	Transitive	No	$S_{RVC}=S_{Vc}$, $O_{RVC}\neq O_{Vc}$.
Ic	Obj.	Unergative	(N/A)	$S_{RVC}=S_{Vc}$, $O_{RVC}\neq O_{Vc}=\varnothing$
IIa	Subj.	Transitive	Yes	$S_{RVC}=S_{Vc}$, $O_{RVC}=O_{Vc}$
IIb	Subj.	Unergative	(N/A)	$S_{RVC}=S_{Vc}$
IIc	Subj.	Unaccusative	(N/A)	$S_{RVC}=S_{Vc}$
IIIa	Obj.	Transitive	No	$O_{RVC}=S_{Vc}$, $S_{RVC}=O_{Vc}$
IIIb	Obj.	Unergative	(N/A)	$O_{RVC}=S_{Vc}$, $S_{RVC}\neq O_{Vc}=\varnothing$
IIIc	Obj.	Unaccusative	(N/A)	$O_{RVC}=S_{Vc}$, $S_{RVC}\neq O_{Vc}=\varnothing$
IVa	Subj.	Transitive	(N/A)	S_{RVC} unexpressed, $S_{RVC}=O_{Vc}$
IVb	Subj.	Transitive	(N/A)	S_{RVC} unexpressed, $S_{RVC}\neq O_{Vc}$
IVc	Subj.	Unergative	(N/A)	S_{RVC} unexpressed, $S_{RVC}\neq O_{Vc}=\varnothing$

Table 2: Four Types of Resultatives in Mandarin Chinese

None of the previous works classify Mandarin resultatives according to the criteria we propose here. This classification is construction-based and will be justified later in this work.

1.4 Aim and Scope

This dissertation aims to answer questions that have long been asked by the linguistic community concerning the behaviors of Mandarin resultatives.

1. Observing the mismatches between verbal arguments of Vc's and grammatical functions (subjects and objects) in RVC constructions, how can we account for their realization and licensing?
2. In what ways are RVC constructions constrained, in order to exclude logically possible scenarios that cannot be appropriately expressed by RVC constructions?
3. What restrictions do RVC constructions impose on the nature of causation, and how do they differ from expressions containing analytic causatives such as *shi* "to cause" and *rang* "to let"?
4. How are idiomatic resultative constructions incorporated under a constructional framework?

We aim to answer these questions from a constructional perspective. To have a better focus, we will not discuss resultative-*de* constructions and noncanonical RVCs such as phase, potential, intensifying (or metaphorical), and directional RVCs.

The normal syntactic realization of Mandarin RVCs is [NP1 Vc-Vr (NP2)]. Its passive counterparts with *bei* or *zao* and disposal counterparts with *ba* or *jiang* will not be discussed here.[11] Verb-copying will not be discussed either.[12] Furthermore, as we aim to provide a

[11] For general discussion of Mandarin *ba*, the readers are referred to Cheung (1973), Tsao (1987), Zou (1993), and F. Liu (1997); for the historical development of *ba*, Sun (1997) and L. Chang (2003); for interactions of *ba* with RVCs, Gao (1997), and J. Chang (2003). For Mandarin *bei*, see Huang (1999). Southern Min and Hakka also have disposal and passive equivalents. For *ka* in Southern Min, see Y. Cheng and Tsao (1995) and Tsao (2005); for *hoo* in Southern Min, see L. Cheng et al. (1999). For *lau* in Hakka, see Lai (2003a, 2003b); for *bun* in Hakka, see Lai (2001).

[12] See C. Chang (1991), Hsieh (1992), Tai (1999), and L. Cheng (2007), among others.

synchronic analysis of Mandarin RVCs, diachronic studies are beyond the scope of this dissertation.[13]

1.5 Organization of the Work

This dissertation is organized as follows: Chapter 2 reviews previous works on resultatives of English and Mandarin Chinese; Chapter 3 introduces theoretical frameworks of the constructional approach; Chapter 4 presents Resultative Templates for Mandarin RVCs and their roles in argument linking; Chapter 5 discusses alternations and operations of Mandarin RVCs; Chapter 6 discusses the nature of causation and how it is encoded in RVCs; Chapter 7 presents some sub-constructions of RVCs and how they are related to ordinary RVCs; Chapter 8 concludes this work.

[13] For the rise of RVCs, see C. Liu (2002), T.-H. Lin (2002), Shi (2002), and Gao (2003), to mention only a few.

Chapter 2 Literature Review

There are lots of previous works on Mandarin resultatives which we cannot go through in this dissertation.[14] There are approaches as diverse as lexical, complex predicate, verb class, aspectual, and constructional ones, among others.[15] It is our aim to have a deeper understanding of them before we proceed to our own analysis.

2.1 The Lexical Approach

This section discusses three papers on deriving resultatives by lexical means. Thompson (1973) discusses how Mandarin RVCs are formed by lexical rules; Simpson (1983) proposes a lexical rule to account for the valency-changing property of English resultatives; Li (1990, 1995, 1999) shows how argument structures of the two component verbs and that of the RVCs are related.

2.1.1 Thompson (1973)

Thompson (1973) suggests that resultative verb compounds in Mandarin are formed by a small set of lexical rules, rather than by syntactic transformations. The most general RV-creating rule looks like (pp. 368-369):

(8) $V_{(action)} + V_{(intransitive)} \rightarrow [V\text{-}V]_{RV(action)}$

[14] Dissertations or theses on Mandarin RVCs include, to name only a few, Chen (1990), F.-W. Lin (1990), Zhang (1991), Y. Cheng (1997), T.-H. Lin (2001), D. Li (2003), J. Lin (2004). The only thesis following a constructional approach as far as I know is S.-M. Lü (2002).

[15] For a cognitive approach on Mandarin RVCs, the reader is referred to M. Liu (1997). For a small clause approach, see Hoekstra (1988) (English) and Sybesma and Shen (2006) (Mandarin). For a hybrid (half lexical, half syntactic) approach, see L. Cheng (1997). Review of constructional approaches on resultatives will be deferred until Section 3.5.

This rule derives a resultative verb compound from an 'action' verb and an intransitive 'result' verb. The following examples illustrate this rule: *sha-si* 'kill-die', *ya-bian* 'press-be flat', *yong-lan* 'use-be falling apart', *chuan-lan* 'wear-be falling apart', *yun-zou* 'ship-go', *shuai-sui* 'throw-be in pieces', *si-sui* 'tear-be in pieces', *da-sui* 'strike-be in pieces', *tui-fan* 'push-turn over', *ku-hong* 'cry-be red (as of eyes)'.

Metaphorical uses include *–si* and *–huai*, among others: *ni-si* 'bore-die' N "bore N to death", *lei-huai* 'tire-be damaged' N "make N extremely tired" (p. 370).

Some other rules specify the result lexically; the meaning of the RV is not transparent and must be learned in each rule. These rules are illustrated by the following formula:

(9) V + -R → $[V\text{-}R]_{RV}$

For example, when the result is *xiaqu* 'go down', the RV means 'continue V-ing' as in *shuo-xiaqu* 'keep talking'; when the result is *qi* 'rise', the RV means 'can/can't afford V-ing' as in *chi-[de/bu]-qi xigua* 'can/can't afford eating watermelon'.

She also shows some RV's that are unpredictable and thus must be listed in the lexicon. These RV's are not derived from lexical rules. Examples followed by *–hao* "be good, ready" include *zuo-hao* "do-good; finish doing", *chuan-hao* "wear-good; put on (clothes)", and *xie-hao* "write-good; finish writing". Examples followed by *–kai* "open" include *fen-kai* "divide-open; separate", *xiang-kai* "think-open; remove a mental block", and *huan-kai* "change-open; change (a bill into small change)". Examples followed by *–zhu* "stop, stay" include *zhan-zhu* "stand-stop; stand still", *zhua-zhu* "grasp-stop; catch, grab and hold", and *guan-zhu* "manage-stop; control (someone)". Other endings include *–zou* "walk; away; off", *–zhao* "be on target", and *–dao* "arrive". There are also sporadic lexical items that must be learned individually, including *cai-chu* "guess-out; solve", *kan-chulai* "see-come out; tell what something is by seeing", *meng-jian* "dream-perceive; dream", and *tan-long* "talk-get close to; reach agreement by talking", among others.

Thus, Mandarin resultative verb compounds consist of an open subset (productive and derived by lexical rules) and a closed subset (nonproductive and listed in the lexicon). No transformational processes are needed here.

2.1.2 Simpson (1983)

Consider the following English resultatives (from Simpson 1983; parentheses mine):

(10) a. I painted the car yellow. (transitive active)

b. The car was painted red. (transitive passive)

c. The butter melted to a liquid. (unaccusative)

d. I danced myself tired. (unergative)

On the assumptions that unaccusative verbs are underlying objects and that the fake reflexives are coreferential with the subjects, Simpson (1983: 148) shows that "resultative attributes in English are subject to the SYNTACTIC constraint that they must be controlled by an OBJECT, whether underlying or surface". This constraint is later dubbed the *Direct Object Restriction* (DOR) in Levin and Rappaport Hovav (1995: 34).

Under the Lexical Functional Grammar framework, a verb such as *hammer* has the predicate-argument structure:

(11) *hammer*$_1$: hammerer, thing hammered

<SUBJECT OBJECT>

The two superficially similar verbs *persuade* and *believe* in (12) have the structure (13) (examples from p. 148):

(12) a. I persuaded John to be a scholar.

b. I believe John to be a scholar.

(13) a. *persuade* persuader, person persuaded, proposition

<SUBJ OBJ XCOMP >

(control equation) XCOMP SUBJ = Verb's OBJ

b. *believe* believer, proposition

<SUBJ XCOMP > OBJ

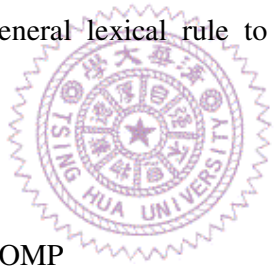
(control equation) XCOMP SUBJ = Verb's OBJ

She then proposes that "transitive verbs with resultative attributes, such as *flat* in *I hammered the metal flat*, have lexical entries similar to that of *persuade*" (p. 149).

(14) $hammer_2$: hammerer, thing hammered, result

<SUBJECT OBJECT XCOMP>

Therefore, she proposes a general lexical rule to account for the valency-changing behavior of English resultatives:



(15) XCOMP Addition Rule

Add a resultative attribute XCOMP

Add the control equation: XCOMP SUBJECT = Verb's OBJECT

Applying this rule to the intransitive verb *dance*, we have the lexical entry for the verb *dance* in *I danced myself tired* as in (16b), which parallels the lexical entry of the verb *believe* as in (13b):

(16) a. *dance* < (SUBJ) > (underlying form)

b. *dance* < (SUBJ) (XCOMP) > OBJ (addition of XCOMP)

XCOMP SUBJ = verb's OBJ

2.1.3 Li (1990, 1995, 1999)

Li's (1990) pivotal work on V-V compounds argues that the argument structure of the compound is determined compositionally from that of each component verb. Under the Generative Grammar framework he proposes the following requirements: i) Theta-identification; ii) Structured theta-grid; iii) Head-feature percolation.

Theta-identification is imperative in order to satisfy the Case theory, since the arguments of both component verbs must compete for the limited case-assigned position in syntax. Also, the theta-role prominency of the head must be strictly maintained in the theta-grid of the compound.

For example, if both the two component verbs have two arguments respectively, the theta-grid of the RVC will have four possibilities in (17). The only possible theta-grid (17a) is illustrated in (18) (from Li 1990: 184):

(17) a. <1-1', 2-2'> allowed.

b. <2-2', 1-1'> not allowed: violating theta-role prominency and head-feature requirement for Vc and Vr.

c. <1-2', 2-1'> not allowed: violating theta-role prominency for Vr.

d. <2-1', 1-2'> not allowed: violating theta-role prominency and head-feature requirement for Vc.

(18) Baoyu xia-shu le qi.

Baoyu play-lose ASP chess

"Baoyu played chess and as a result he lost it."

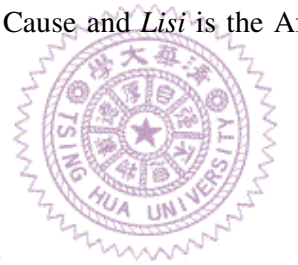
Based on Li (1990), Li (1995, 1999) incorporates inverted causatives (Type III resultatives in our classification) into his analysis. He first argues against movement analyses of Mandarin resultatives. To account for inverted causatives, he proposes the causative

hierarchy (in which Cause is more prominent than Affectee) on a par with the thematic hierarchy. The interaction of the causative hierarchy and the thematic hierarchy determines surface realizations of inverted causatives. The assignment of the causative roles (c-roles) in argument positions follows the criterion below (Li 1995: 267; V_{caus} and V_{res} are the main verb and the result, respectively):

(19) a. The argument in the subject position receives the c-role Cause from a resultative compound if it receives a theta role only from V_{caus}.

b. The argument in the object position receives the c-role Affectee from a resultative compound if it receives a theta role at least from V_{res}.

Following (19), only (i) and (iii) (Type I and Type III) in (6), repeated in (20), are assigned c-roles: *Zhangsan* is the Cause and *Lisi* is the Affectee, regardless of the thematic roles.



(20) Zhangsan zhui-lei le Lisi.

Zhangsan chase-tired ASP Lisi

(i) "Zhangsan chased Lisi and Lisi became tired."

(ii) "Zhangsan chased Lisi and Zhangsan became tired."

(iii) "Lisi chased Zhangsan and Lisi became tired."

(iv) *"Lisi chased Zhangsan and Zhangsan became tired."

(v) *"Zhangsan made Lisi tired by getting her/him involved in the act of chasing someone else."

Li (1995: 267) further claims that "[t]heta roles can be assigned contrary to the thematic hierarchy if the arguments receiving them are assigned c-roles in ways compatible with the causative hierarchy."

Thus (i) in (20) is grammatical since the thematic hierarchy is observed (*Zhangsan* the chaser; *Lisi* the chasee) despite the fact that causative hierarchy plays no role here. (ii) is grammatical because both the thematic hierarchy and the causative hierarchy are observed (*Zhangsan* the chaser and the Cause; *Lisi* the chasee and the Affectee). (iii) is grammatical since although the thematic hierarchy is violated (*Zhangsan* the chasee; *Lisi* the chaser), the causative hierarchy is observed (*Zhangsan* the Cause; *Lisi* the Affectee), which can override the thematic hierarchy.

2.1.4 Her (2004, 2007)

Under Lexical Functional Grammar, Her (2004, 2007) gives a lexical mapping account of Mandarin resultatives. The framework assumes an a-structure (argument structure) which mediates between the lexical semantic structure and the syntactic structure of a predicator. Three theoretical constructs are proposed (Her 2007: 228): (i) the thematic hierarchy must be observed in the a-structure as in (21a); (ii) the grammatical functions are also hierarchical, captured by (21b) ("r"=thematically restricted; "o"=objective); (iii) there is a universal classification of roles in the a-structure as in (21c).

(21) a. Thematic Hierarchy:

ag > *ben* > *go/exp* > *inst* > *pt/th* > *loc*

b. Markedness Hierarchy of Argument Functions:

SUBJ(-*r* -*o*) > OBJ(-*r* +*o*)/OBL$_\theta$ (+*r* -*o*) > OBJ$_\theta$ (+*r* +*o*)

c. Intrinsic Classification of Argument Roles for Functions (IC):

pt/th → [-*r*]

The theoretical constructs above work together with the following principle to generate correct surface realization (Her 2007: 229):

(22) The Unified Mapping Principle (UMP): Map each argument role, from the most prominent to the least, onto the highest compatible function available (i.e. not linked to a role).

In order to maintain strict one-to-one mapping, a mechanism called *suppression* must be employed. Resultative compounding in Mandarin can thus have four potential a-structures (suppression expressed by a cross-out) (Her 2007: 232):

(23) Resultative Compounding:

V_{caus}<*x y*> + V_{res}<*z*> → $V_{caus}V_{res}$<α β>, where <α β> =

(i) <*x y*-~~*z*~~>; (ii) <*x* ~~*y*~~-*z*>; (iii) <*x*-~~*z*~~ *y*>; (iv) <~~*x*~~-*z y*>

Concerning the causative distribution in Mandarin resultatives, Her (2007: 234) proposes the following generalization:

(24) Causativity Assignment in Resultative Compounding:

An unsuppressed role from V_{res} receives [af] iff an unsuppressed role from V_{caus} exists to receive [caus].

Incorporating this generalization, a final version of resultative compounding looks like (Her 2007: 237):

(25) Resultative Compounding (final formulation):

a. V_{caus}<*x y*> + V_{res}<*z*> → $V_{caus}V_{res}$<α β>, where <α β> =

(i) <*x y*-~~*z*~~>; (ii) <*x*[caus] ~~*y*~~-*z*[af]>; (iii) <*x*-~~*z*~~ *y*>; (iv) <~~*x*~~-*z*[af] *y*[caus]>

b. V_{caus}<*x*> + V_{res}<*z*> → $V_{caus}V_{res}$<α (β)>, where <α (β)> =

(i) <*x*-~~*z*~~>; (ii) <~~*x*~~-*z*>; (iii) <*x*[caus] *z*[af]>

The application of (25) to the three well-formed readings of (6) as repeated in (20) is illustrated in Her (2007: 233-235):

(26) Zhangsan zhui-lei le Lisi.

Zhangsan chase-tired ASP Lisi

(i) “Zhangsan chased Lisi and Lisi became tired.”

	< *x*	*y*-~~*z*~~	>	(*x*=*ag*; *y*=*pt/th*; non-causative)
IC		[-*r*]		
CF	S/O/…	S/O		
UMP	S	O		
	ZS	LS		
	< *x*[caus]	~~*y*~~-*z*[af]	>	(*x*=*ag*; *z*=*pt/th*; causative)
IC		[-*r*]		
CF	S/O/…	S/O		
UMP	S	O		
	ZS	LS		

(ii) *“Lisi chased Zhangsan and Zhangsan became tired.”

	< *x*	*y*-~~*z*~~	>	(non-existent)
	< *x*[caus]	~~*y*~~-*z*[af]	>	(non-existent)
	*O	*S		
	LS	ZS		

(iii) “Zhangsan chased Lisi and Zhangsan became tired.”

	< *x*-~~*z*~~	*y*	>	(*x*=*ag*; *y*=*pt/th*; non-causative)
IC		[-*r*]		
CF	S/O/…	S/O		
UMP	S	O		
	ZS	LS		

(iv) “Lisi chased Zhangsan and Lisi became tired.”

	< ~~*x*~~-*z*[af]	*y*[caus]	>	(*x*=*pt/th*; *y*=*pt/th*; causative)
IC	[-*r*]	[-*r*]		
CF	S/O	S/O		
UMP	O	S		
	LS	ZS		

The surface realization in (iv) of (26) can be resolved by resorting to Dowty (1991): “[caus] is a prototypical property associated with the AGENT role and [af] is associated with the prototypical PATIENT and that the former is more prominent than the latter.” (Her 2007: 235)

2.1.5 Critique on the Lexical Approach

Thompson's (1973) work achieves some descriptive adequacy in classifying RVCs according to their properties. Her claim that the most general form consists of an 'action' verb combined with an intransitive 'result' verb is basically correct, though some refinement is needed, as we will show that the first verb is not necessarily an 'action' verb (it can be a 'state', or an unaccusative verb as in Type IIc and Type IIIc), and even not necessarily a verb (it can be an adjective, see V-*si* construction in Section 7.2). Her observation of the metaphorical uses of *–si* and *–huai* is correct but not fine-grained. It is unclear how the metaphorical RVCs resemble and differ from ordinary ones in terms of syntactic and semantic behaviors.

Moreover, her observation of semantically opaque RVCs (e.g. *V-[de/bu]-qi* "can/can't afford V-ing) and closed-set RVCs implies that RVCs are at best semi-productive and cannot be handled across the board.

However, the closed-set RVCs are not entirely opaque in meaning, in my opinion. The opacity may be attributed to semantic weakening of the result parts, which are more precisely classified as phase complements as discussed in Subsection 1.2.1. For example, the endings *–hao* "be good, ready", *–zhu* "stop, stay", *–zhao* "be on target", and *–dao* "arrive" can be viewed as having the phase meaning of "successful in V-ing"; the endings *–zou* "walk; away; off" and *–kai* "open" can be viewed as having the phase meaning of "V away", at least for some lexical items.

Simpson (1983) handles the predicate-argument structures of verbs in resultatives across the board with a general lexical rule. However, it is not clear what kind of verbs can undergo this rule. Though she notes some semantic constraints on English resultatives in her article, which she considers language-particular, she did not discuss them in detail. Moreover, her article leaves unexplained the motivation of this lexical rule. It is not promising to keep the

result usage of a verb in the level of the lexical entries.

Li's (1990, 1995, 1999) analysis is unprecedented, though some problems exist. First, he does not observe RVCs with nonsubcategorized objects such as Type Ib resultatives (3b), repeated below:

(27) Ta ti-po le qiuxie.

s/he kick-worn ASP sneakers

"S/He kicked (something, e.g. a ball) and had the sneakers worn out."

The object *qiuxie* "sneakers" in (27) is neither the logical subject nor the logical object of the transitive verb *ti* "to kick"; and there is no way for it to be "identified" with the argument in the result *po* "worn out".

Moreover, Type III resultatives (inverted causatives) cannot be explained in Li (1990). A Type IIIa resultative (5a), repeated in (28a), has the theta-grid <2, 1-1'> , which is ruled out by Li's analysis since it violates both theta-role prominency and head-feature requirement. In (5b) and (5c), repeated respectively in (28b) and (28c), the grammatical subjects cannot even be derived in his analysis, since the theta-grid of the RVC is compositionally derived from the theta-grids of component verbs.

(28) a. Zhe zhong yao hui chi-si ren.

this kind medicine may eat-dead person

"This kind of medicine kills."

b. Zhe duan lu pao-lei le Zhangsan.

this CL road run-tired ASP Zhangsan

"This road made Zhangsan tired from running."

c. Zhe ping jiu zui-dao le Zhangsan.

this bottle wine drunk-fall ASP Zhangsan

"This bottle of wine got Zhangsan drunk and fall."

Li's (1995, 1999) proposal of the causative hierarchy, which can override the thematic hierarchy, explains argument realization in Type III resultatives. Despite the controversy that the addition of the causative hierarchy might be ad hoc, however, Type Ib resultatives in (27) (with nonsubcategorized objects) are still left unexplained.

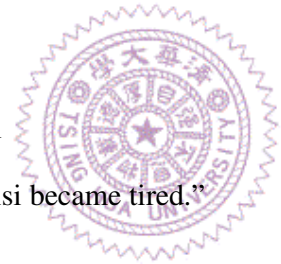
Her's (2004, 2007) account of Mandarin resultatives is insightful, though it has the following problems. First, in order to satisfy strict one-to-one mapping, the mechanism of suppression is proposed. Her (2007: 231) argues that suppression is "universally motivated and constrained." However, when we look closely at some examples, we find that suppression is implausible.

For example, consider reading (i) in (26), repeated below, which is classified as Type I resultatives in our work:

(29) Zhangsan zhui-lei le Lisi.

Zhangsan chase-tired ASP Lisi

"Zhangsan chased Lisi and Lisi became tired."



In Her's analysis, this reading is achieved by either suppressing *z*, resulting in a non-causative reading, or suppressing *y*, resulting in causative reading. A sentence is not likely to be non-causative and causative at the same time, a paradox. The solution lies in recognizing that a resultative construction is composed of a causing subevent and a caused subevent, neither of which may be suppressed if correct semantic interpretation is an issue.

Moreover, like Li (1990, 1995, 1999), Her's analysis does not mention resultatives with nonsubcategorized objects such as Type Ib as in (27). Since the rules of resultative compounding of (25) require that a-structure of the RVC be derived *solely* from a-structures of V_{caus} and V_{res}, Her's model fails to explain Type Ib resultatives. Furthermore, pseudo-passive resultatives (Type IV) are not accounted for in his analysis.

To summarize, the lexical approach of resultatives either employs lexical rules (Thompson 1973), or augments verbal arguments (Simpson 1983), or projects argument structures from those of component verbs (Li 1990, 1995, 1999; Her 2004, 2007). It either disregards Type III resultatives or explains these resultatives in a controversial way. None of them cover resultatives of Type Ib, which have nonsubcategorized objects. Thus the lexical approach is not tenable in accounting for Mandarin RVC constructions.

2.2 The Complex Predicate Approach

This section presents a view that the result part and the main verb in a resultative construction form a constituent, or a complex predicate, which licenses the grammatical object (if any) and the grammatical subject. Representative of this approach is Huang's (1988, 1992) proposal that RVCs must be handled on a par with resultative-*de* constructions and that the result verb (or result phrase in the case of resultative-*de*) form a complex predicate with the main verb (Vc). Rapoport's (1993) paper discusses four constructions: causatives, resultatives, argument small clauses, and adjunct-predicate constructions, the former three being analyzed as containing complex predicates.

2.2.1 Huang (1988, 1992)

Regarding Chinese resultative-*de* constructions, Huang (1988) argues for a Secondary Predication hypothesis in which the second verb is treated as a complement to the first. Examples below are from (53) and (55) of Huang (1988):

(30) a. Zhangsan$_i$ zui de [e$_i$ zhan-bu-qilai].

Zhangsan drunk RES cannot-stand-up

"Zhangsan was so drunk that s/he couldn't stand up."

b. Zhe ping jiu zui de [Zhangsan zhan-bu-qilai].

This bottle wine drunk RES Zhangsan cannot-stand-up

"This bottle of wine made Zhangsan drunk so that s/he couldn't stand up."

(30a) is an inchoative resultative construction, while (30b) is a causative resultative construction. The relevant syntactic structures are shown respectively in Fig. 1 and Fig. 2.

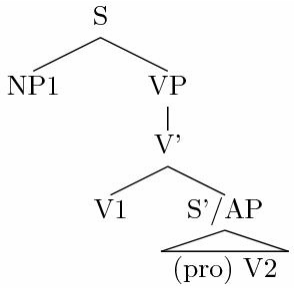


Fig. 1: Inchoative Resultative Construction (Huang 1988)

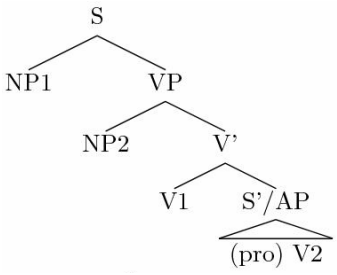


Fig. 2: Causative Resultative Construction (Huang 1988)

RVCs have the same structures as those of resultative-*de* constructions, except that, while resultative-*de* constructions are in V' (phrasal) level, RVCs are in V^0 (lexical) level. It is claimed that, since the first verb in the resultative-*de* construction is the main verb, RVCs are left-headed following the same reasoning. Furthermore, both constructions can have causative alternations via the addition of an external argument with verb-raising. The relevant RVCs are shown below (from (69) and (70) of Huang 1988):

(31) a. Ta xiao-si le.

s/he laugh-dead ASP

"S/He laughed (so much) that s/he died (metaphorically)."

b. Ni xiao-si ta le.

you laugh-dead s/he ASP

"You made her/him laugh (so much) that s/he died (metaphorically)."

Based on Huang (1988), Huang (1992) proposes a view that the resultative-*de* constructions involve control rather than raising. The distinction of control and raising in superficially similar constructions are shown below (examples from Huang 1992: 109):

(32) a. John$_i$ tried [PRO$_i$ to be honest].

b. John$_i$ seemed [t_i to be honest].

c. Bill$_i$ was persuaded t_i [PRO$_i$ to be honest].

d. Bill$_i$ was believed [t_i to be honest].

The embedded subject in (32a) is base-generated and controlled by a matrix subject, while that in (32b) is raised to the matrix subject position, leaving a trace. Likewise, the embedded subject in (32c) is based-generated and controlled by a matrix object (which is further raised to a subject position as a result of passivization), while that in (32d) is raised to the matrix subject position and leaves a trace.

Mandarin resultative *de*-constructions can be analyzed this way. The follow examples are said to have control relations (Huang 1992: 110-111):

(33) a. Zhangsan ku de hen shangxin.

Zhangsan cry RES very sad

"Zhangsan cried (so much) that s/he became sad."

b. Zhangsan ku de Lisi hen shangxin.

Zhangsan cry RES Lisi very sad

"Zhangsan cried (so much) that Lisi became sad."

c. Zhangsan ba Lisi ku de hen shangxin.

Zhangsan ba Lisi cry RES very sad

"Zhangsan cried (so much) that Lisi became sad."

d. Lisi bei Zhangsan ku de hen shangxin.

Lisi BEI Zhangsan cry RES very sad

"Lisi became sad, as a result of Zhangsan's crying."

Huang (1992) argues that the verb and the result form a complex predicate. (33a) and (33b) have the following D-Structures, respectively:

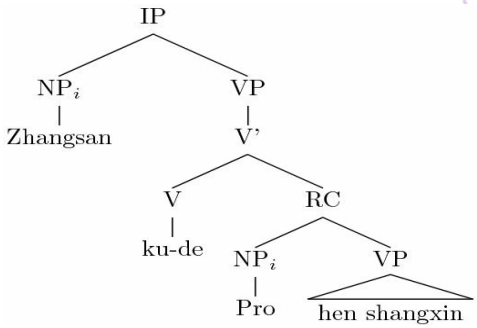


Fig. 3: Intransitive resultatives as control (Huang 1992)

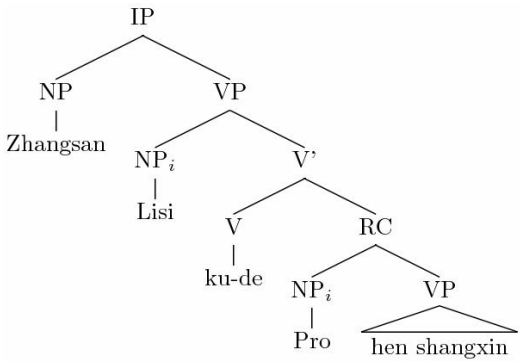


Fig. 4: Transitive resultatives as control (Huang 1992)

The complex predicate "*ku-de* Pro *hen shangxin*" takes no object in the subject-control Fig. 3, but takes one outer object (*Lisi*) in the object-control Fig. 4. The Minimal Distance Principle stipulates how the controller is determined (Huang 1992: 113):

(34) MDP: an infinitive complement of a predicate P selects as its controller the minimal c-commanding noun phrase in the functional complex of P.

There is no movement involved in deriving (33a) from the D-Structure of Fig. 3. On the contrary, the outer object (*Lisi*) of the D-Structure in Fig. 4 must: (i) have a head-to-head raised V^0 (*ku-de*) to assign it an accusative case, as in (33b); or (ii) have a *ba* inserted as a case assigner, as in (33c); or (iii) be raised to <Spec, IP> to be assigned a nominative case, as in (33d).

Huang (1992: 119) claims that "the lexical subject of the result clause is represented as the object, not of the matrix verb alone, but of a complex predicate containing the matrix verb and the predicate of the result clause." Thus, in Fig. 4, the verb *ku-de* takes the RC *Pro hen shangxin* as its complement and assigns it a Result role, and together they form a complex predicate *ku-de Pro hen shangxin* which takes *Lisi* as its object, assigning it a Patient role. The combined sequence then selects a subject *Zhangsan* and assigns it an Agent role.

RVCs are analyzed in the same way as resultative-*de* constructions. Unlike resultative-*de* constructions where only the verb head is raised, the derivation of (35a) from (35b) involves a re-analysis of V' to V^0 and a head-to-head movement upward so that *shoupa* can be case-assigned. Compare (35c) with (35d), the V' cannot be raised to an X^0 position. Thus the difference between an RVC and a resultative-*de* construction is whether a reanalysis (of V' to V^0) takes place.

(35) a. Zhangsan ku-shi le shoupa.

Zhangsan cry-wet ASP hankie

"Zhangsan cried (so much) that the hankie got wet."

b. Zhangsan [$_{VP}$ shoupa [$_{V'}$ ku [$_{RC}$ shi le]]].

c. Zhangsan ku de shoupa dou shi le.

Zhangsan cry RES hankie all wet ASP

"Zhangsan cried (so much) that the hankie got wet."

d. *Zhangsan ku de dou shi le shoupa.

Zhangsan cry RES all wet ASP hankie

Intended: "Zhangsan cried (so much) that the hankie got wet."

Huang (1992) also observes another distinction between RVCs and resultative-*de* constructions: while resultative phrases (resultative-*de* constructions) exhibit control properties in accordance with the MDP, resultative compounds (RVCs) need not to. He claims that "[t]his is because the internal structures of compounds are not accessible to rules or principles that apply in syntax, in particular the MDP" (p. 127). Examples below do not obey MDP:

(36) a. Ta chi-bao (fan) le.

s/he eat-full rice ASP

"S/He ate (meal) and got full."

b. Ta he-zui (jiu) le.

s/he drink-drunk wine ASP

"S/He drank (wine) and got drunk."

The complex predicate analysis not only accounts for the unergative/transitive alternation discussed above, but also explains the unaccusative/causative alternation below, where (37a) and (37c) are causative and (37b) and (37d) are unaccusative (examples from Huang 1992: 128-129):

(37) a. Ta qi de wo [Pro quanshen fadou].

s/he anger RES I all-body shiver

"S/He angered me (so much) that I shivered."

b. Wo qi de [Pro quanshen fadou].

I anger RES all-body shiver

"I was angry (so much) that I shivered."

c. Ta qi-si wo le.

s/he anger-dead I ASP

"S/He angered me very much."

d. Wo qi-si le.

I anger-dead ASP

"I was very angry."

The alternation in (37a) and (37b) is analyzed as the presence/absence of a Causer, as shown below (drawn by myself). The alternation in (37c) and (37d) is similar except for a V'-to-V^0 reanalysis.

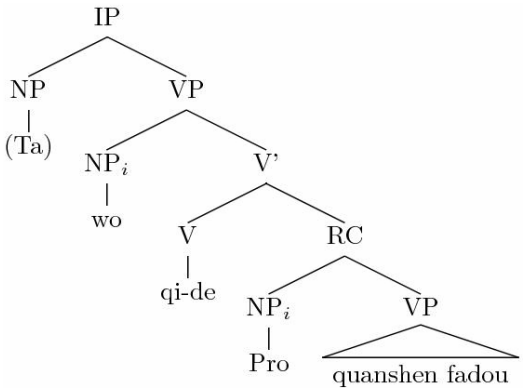


Fig. 5: Causative Alternation of Resultative-*De* Constructions (Huang 1992)

2.2.2 Rapoport (1993)

Rapoport (1993) discusses four superficially similar constructions in English as illustrated below:

(38) a. Miki made Riki angry. (causative)

b. Ya'el hammered the metal smooth. (resultative)

c. Riki finds all linguists incompetent. (argument small clause)

d. Noa ate the meat raw. (adjunct-predicate construction)

She argues that the first three constructions (38a-c) have identical syntactic structures. "In resultatives, the sentence-final adjective characterizes the state of the entity denoted by the lower NP, a state that results from the action or process described by the verb" (p. 164). She argues that the adjective is inevitable to the interpretation of the action, as seen in the follow comparison (from (8d) on page 163 and (9) on page 164 of Rapoport 1993, respectively):

(39) a. Merav nailed every window shut.

b. ?Merav nailed every window.

In order to satisfy licensing requirements, she proposes a syntactic structure in which the resultative phrase is sister to the main verb, and together they form a complex predicate that licenses the grammatical object and subject. A d-structure for *Ethan wiped the counter dry* looks like:

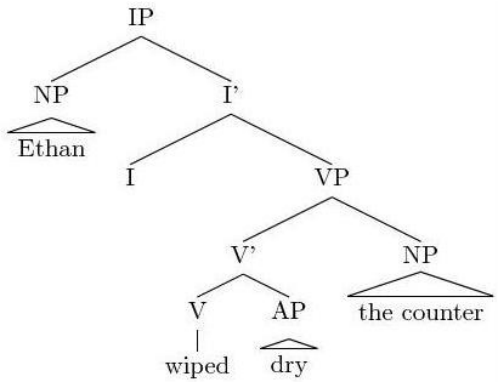


Fig. 6: D-structure for *Ethan wiped the counter dry*

The s-structure is derived from Fig. 6 via extraposition of *the counter* for reasons of case assignment. The argument here supports the complex predicate view in Huang (1988, 1992), although there is no control relation here.

2.2.3 Critique on the Complex Predicate Approach

Huang's (1988, 1992) account of the causative-inchoative alternations of RVCs and resultative *de*-constructions is appealing in terms of simplicity. It also has an important virtue of recognizing that "theta-roles are compositionally assigned" (Huang 1992: 130). That is, the verb and the result form a complex predicate, which licenses the grammatical object and the grammatical subject. To some extent, this view is like the constructional view we are going to advocate in this work, only that in the latter the "licenser" is the sentential construction itself instead of the complex predicate alone.

This analysis, however, fails to explain some cases where an added external argument is not allowed. For example, it is not clear why the causative counterpart (40b) is unacceptable:

(40) a. Zhangsan pao-lei le.

Zhangsan run-tired ASP

"Zhangsan ran her/himself tired."

b. *Lisi pao-lei le Zhangsan.

Lisi run-tired ASP Zhangsan

Intended: “Lisi made Zhangsan run (so much) that Zhangsan got tired.”

Rapoport (1993) argues that the verb and the result form a complex predicate in English resultative constructions. Evidence from syntax and semantic interpretation supports the idea of a complex predicate. Like Mandarin as discussed in Huang (1988, 1992), the grammatical subject and the grammatical object in English are licensed by the complex predicate as a whole, not by the verb or the result alone.

Thus, from Huang (1988, 1992) and Rapoport (1993), it is concluded that resultative constructions cannot be analyzed as projections of the verbs. Instead, both the verb and the result contribute to the argument realization of grammatical functions. Therefore, the complex predicate approach excels the lexical approach in that the licenser is not limited to the verb only, but to a larger language construct.

However, the complex predicate analysis still fails to explain the existence of nonsubcategorized objects in resultative constructions, e.g. Type Ib resultatives in Mandarin.

2.3 The Verb Class Approach

Cheng and Huang (1994) correlate event types with verb classes (unaccusativity of verbs) and discuss the possibility of causativization. This influential work raised some significant issues in Mandarin resultatives that concerned us in this dissertation. Thus we provide a detailed discussion of their work.

2.3.1 Cheng and Huang (1994)

Cheng and Huang (1994: 188) demonstrate the four basic predicate types: unergative, transitive, ergative, and causative with the examples below for monomorphemic verbs:[16]

(41) a. Zhangsan chang le hen jiu. (unergative)

Zhangsan sing ASP very long

"Zhangsan sang for a long time."

b. Zhangsan chang le san shou ge. (transitive)

Zhangsan sing ASP three CL song

"Zhangsan sang three songs."

c. Zhangsan xia le yi tiao. (ergative)

Zhangsan shock ASP one jump

"Zhangsan was taken by surprise."

d. Lisi xia le Zhangsan yi tiao. (causative)

Lisi shock ASP Zhangsan one jump

"Lisi surprised Zhangsan."

Likewise, they argue that Chinese RVCs can be classified accordingly.[17] From the point of view of verb classes, they argue that "the argument structure of a compound is essentially a composition of the event structure rather than the transitivity properties, of its component parts…" (p. 187). They claim that there are two paradigms: the *active paradigm* performs the unergative/transitive alternation, while the *non-active paradigm* performs the ergative/causative alternation. The unergative/transitive alternation involves the event type

[16] The term *ergative* is better known as *unaccusative*, which we adopt throughout. The role unaccusativity plays in English resultatives is discussed extensively in Levin and Rappaport Hovav (1995), particularly Chapters 2-4.

[17] The complementizer (resultative) *de* construction, according to the examples in Cheng and Huang (1994: 191), can also be classified this way.

"activity", while the ergative/causative alternation involves the event type "(change of) state" (pp. 188-189):

(42) a. Zhangsan qi-lei le. (unergative)

Zhangsan ride-tired ASP

"Zhangsan rode her/himself tired."

b. Zhangsan qi-lei le liang pi ma. (transitive)

Zhangsan ride-tired ASP two CL horse

"Zhangsan rode two horses tired."

c. Zhangsan qi-si le. (ergative)

Zhangsan anger-dead ASP

"Zhangsan got extremely angry."

(Lit., "Zhangsan was angered to death.")

d. Zhe jian shi zhen qi-si Zhangsan le. (causative)

this CL matter really anger-dead Zhangsan ASP

"This matter really angered Zhangsan."

(Lit., "This matter really angered Zhangsan to death.")

They further argue that Vc is the head of an RVC and propose the dichotomy of "Active RVCs" and "Non-Active RVCs" (pp. 198-199) according to the nature of Vc. Since Vr is always unaccusative (*ergative* in their term), they argue that Vc alone determines the behavior of the RVC. Depending on sentential transitivity, Active RVCs can be further classified as unergative RVCs, transitive RVCs, and mixed RVCs.

They also observe that the distinction of alternations based on verb classes is not always clear-cut. Some RVCs having unergative verbs as Vc's can occur in both unergative/transitive alternation as well as ergative/causative alternation ((43b) and (43c) are from p. 190):

(43) a. Ta ku-xing le. (unergative)

s/he cry-awake ASP

"S/He cried and awoke."

b. Ta ku-xing le xiaohai. (transitive)

s/he cry-awake ASP child

"S/He cried (and made) the child awake."

c. (Meng li de) nei jian shi ku-xing le ta. (causative)

dream in POS that CL matter cry-awake ASP s/he

"The episode (in the dream) made her/him cry (her/himself) awake."

They argue that (43b) and (43c) exhibit ergative/causative alternation (with Vc assigning a Causee/Experiencer role instead of an Agent role). Thus, the same verb *ku* "to cry" behaves differently in different circumstances: unergative/transitive alternation in (43a) and (43b) and ergative/causative alternation in (43a) and (43c).

In Section 3 of Cheng and Huang (1994), they suggest that the event structure for an RVC is composed of the event denoted by Vc which takes the event denoted by Vr as its complement. The event structure of an active Vc looks like (44). Three types (based on transitivity) of the Active paradigm are listed in (45).

(44) $[_{RV}\ Vc_{Active}\ [V2_{State/Change\text{-}of\text{-}State}]]$

(45) a. <Agent> (unergative RVC)

b. <Agent, Theme> (transitive RVC)

c. <Agent, (Theme)> (mixed)

The event structure of a stative Vc looks like (46). Two types (based on causativity) of the Non-active paradigm are listed in (47).

(46) [$_{RV}$ $Vc_{Non\text{-}active}$ [$V2_{State/Change\text{-}of\text{-}State}$]]

(47) a. <Theme/Experiencer/Causee> (ergative RVC)

b. <Causer, Theme/Experiencer/Causee> (causative RVC)

Unergative RVCs are like *xiao-lei* "laugh-tired", *pao-lei* "run-tired", *tiao-fan* "jump-annoyed"; transitive RVCs are like *ku-shi* "cry-wet", *ti-po* "kick-broken", *tui-kai* "push-open"; mixed RVCs are like *he-zui* "drink-drunk", *chi-bao* "eat-full", *ku-xing* "cry-awake". This classification is analogous to that of simplex active verbs: unergative like *sneeze*, *cry*, *laugh*, transitive like *kick*, *know*, *hit*, and mixed like *eat*, *read*, *write*, etc. (p. 198).

2.3.2 Critique on the Verb Class Approach

The main theme in Cheng and Huang (1994) is the four-way distinction of unergative, transitive, ergative (i.e. unaccusative), and causative, as illustrated in (41) and (42). In this subsection, we argue that this distinction is inappropriate as far as Mandarin RVCs are concerned.

Compare (41a) and (41b), the unergative-transitive minimal pair for monomorphemic verbs. They describe virtually the same scenario in which one sings. They differ only in the details of singing.

This is not the case in (42a) and (42b). While in (42a) it is Zhangsan who rode and got tired, in (42b) it is the horses that got tired. The two sentences describe different situations. The two sentences belong, respectively, to Type II and Type I resultatives in our analysis. The sentence pairs below are more ideal minimal pairs for unergative/transitive alternations: while (48a), (48c), and (48e) are Type IIb resultatives, (48b), (48d), and (48f) are Type IIa resultatives. A Type IIb resultative and its Type IIa counterpart express virtually the same scenario.

(48) a. Zhangsan qi-lei le.

Zhangsan ride-tired ASP

"Zhangsan rode and got tired."

b. Zhangsan qi-lei le ma (in its subject-oriented sense).

Zhangsan ride-tired ASP horse

"Zhangsan rode a horse and got tired."

c. Ta chi-bao le.

s/he eat-full ASP

"S/He ate and got full."

d. Ta chi-bao le fan.

s/he eat-full ASP rice

"S/He ate meal and got full."

e. Ta he-zui le.

s/he drink-drunk ASP

"S/He drank and got drunk."

f. Ta he-zui le jiu.

s/he drink-drunk ASP wine

"S/He drank wine and got drunk."

The transitive sentences (belong to Type IIa resultatives) above contain subject-oriented RVCs and are thus noncausative. On the other hand, the object-oriented RVC *qi-lei* "ride-tired" in (42b) is transitive and causative at the same time (belong to Type Ia resultatives). They are causative in the sense of S. Huang's (1974) *event causative*, where the grammatical subject is an Agent.[18]

[18] Cheng and Huang (1994: 191) also observe this: "…all resultatives are causatives by nature." This is correct for Type I (object-oriented) resultatives but controversial for Type II (subject-oriented) RVCs. As Type II

The confusion of Cheng and Huang's (1994) analysis comes from ignoring the differences between object-oriented RVCs (Type I resultatives such as (42b)) and subject-oriented RVCs (Type II resultatives such as (48b)) in transitive sentences, only the latter qualified for unergative-transitive alternations (since the grammatical subjects remain the "semantic hosts" of the result in both unergative and transitive constructions).

Following their reasoning, they are forced to claim that verbs participating in both (apparent but not true) unergative-transitive and ergative-causative alternations, as the RVC *ku-xing* "cry-awake" in the examples of (43) shows, are unergative and ergative at the same time, a contradiction.

Activity verbs such as *kan* "to read" occur in ergative-causative alternations as in (49a) and (49b), and Cheng and Huang (1994) argue, in a similar way, that the intransitive sentence (49a) is ergative (p. 190). However, this sentence occur in (again, apparent but not true) unergative-transitive alternations with (49c). Thus *kan-hua* "see-blurred" is ergative and unergative at the same time, again a contradiction.

(49) a. Ta de yanjing kan-hua le.

s/he POS eye see-blurred ASP

"Her/His eyes became blurred from seeing (e.g. a movie)."

b. Nei bu dianying kan-hua le ta de yanjing.

that CL movie see-blurred ASP s/he POS eye

"That movie made her/his eyes blurred (from seeing it)."

c. Ta kan-hua le yanjing.

s/he see-blurred ASP eye

"Her/His eyes became blurred from seeing (e.g. a movie)."

---

resultatives contain "reflexive" causal relations (i.e. the Causer and the Causee are co-referential), they are not causative in a strict sense.

Thus the four-distinction is problematic. First, as we have shown, unergative-transitive alternations of simplex active verbs can always be used to express the same situation, whereas in RVCs, only subject-oriented (Type II) resultatives such as *chi-bao-(fan)* "eat-full-rice" can occur in unergative-transitive alternations in the sense of simple verbs. For those active RVCs with object-oriented readings, the so called "unergative-transitive" alternations are actually "unergative vs. event causative" alternations. Therefore, the "mixed type" in Cheng and Huang (1994: 198) is not appropriate, as it contains two unrelated subgroups (one with real "unergative-transitive" alternation, i.e. Type IIb vs. Type IIa as in *chi-bao* "eat-full", and the other "unergative vs. event causative" alternation, i.e. Type IIb vs. Type Ic as in *ku-xing* "cry-awake").

Second, their examples are not all properly classified. For example, *tiao-fan* "jump-bored" (classified as unergative RVCs in their analysis) can be used either intransitively or transitively, and thus should be classified as mixed RVCs in their classification:

(50) a. Zhangsan tiao-fan le.

Zhangsan jump-bored ASP

"Zhangsan got her/himself bored from jumping."

b. Zhangsan tiao-fan le Lisi.

Zhangsan jump-bored ASP Lisi

"Zhangsan got Lisi bored from jumping."

We argue that transitivity and causativity are not properties of the RVC *per se*, but of the *construction*. We will present our constructional approach of resultatives later, but let us take a look at two more examples listed in Cheng and Huang (1994) to support our claim.

Ku-shi "cry-wet" is listed as a transitive type, whereas *ku-xing* "cry-awake" a mixed type. The fact that *ku-shi* "cry-wet" can only be transitive and *ku-xing* "cry-awake" can be

either intransitive ("got oneself awake by crying") or transitive ("got someone else awake by crying") shows that semantic compatibility of Vc and Vr with noun phrases in the subject and object positions is a determining factor.[19]

For *ku-shi* "cry-wet", it is common sense that one cannot cry until her/himself is wet, owing to the fact that the adjective *shi* "wet" can only be predicated of inanimate beings.[20] On the contrary, it is possible that one cries so much that something (say, *shoupa* "hankie" or an inalienable body part such as *yanjing* "eye") gets wet. And thus *ku-shi* "cry-wet" can only be transitive in ordinary resultatives (Type I and Type II).

For *ku-xing* "cry-awake", one can cry until her/himself is awake (forget the fact that this is itself somewhat anomalous), hence the intransitive use; one can also cry until someone else is awake, hence the transitive use. Both *ku* "to cry" and *xing* "awake" may be predicated of animate beings. And thus *ku-xing* "cry-awake" can be either transitive or intransitive, and belongs to "mixed RVCs" in their classification.

Therefore, the distinction of unergative/transitive/mixed RVCs is only an epiphenomenon, which is conditioned by semantic compatibility of Vc's and Vr's with subjects and objects (if any).

Let's turn to the non-active paradigm in (46), which has two types as in (47): ergative RVCs and causative RVCs. Both the active paradigm and the non-active paradigm can undergo causativization. It is not clear from Cheng and Huang (1994) what kind of verbs can be causativized, and if causativization is allowed, what the property of the causativization is. It seems that causativization can apply to all RVCs in the non-active paradigm, but not all in the active paradigm. Consider examples below:

---

[19] Obviously, the transitivity alternation here concerns ordinary (Type I and Type II) resultatives only, as *ku-shi* "cry-wet" can appear in Type IV resultatives as in (7c), which is intransitive.

[20] A modifier *quanshen* "whole body" is needed after the NP if *shi* "wet" is predicated of that NP.

(51) a. Ta de yanjing kan-hua le.

s/he POS eye see-blurred ASP

"Her/His eyes became blurred from seeing (e.g. a movie)."

b. Nei bu dianying kan-hua le ta de yanjing.

that CL movie see-blurred ASP s/he POS eye

"That movie made her/his eyes blurred (from seeing it)."

c. Lisi xie-lei le.

Lisi write-tired ASP

"Lisi wrote her/himself tired."

d. Nei feng xing xie-lei le Lisi.

that CL letter write-tired ASP Lisi

"That letter got Lisi to write her/himself tired."

There is a self-agentive relation in (51). It is possible that an action can ultimately affect the Agent of that action. Watching movies can eventually make one tired as in (51a) and (51b). The action of writing in (51c) and (51d) is similar. The grammatical subjects in (51b) and (51d) are in fact logical objects of the verbs *kan* "to watch" and *xie* "to write", respectively. They are Causers from Vr's point of view, not Vc's; they are not the external Causers of the actions. On the contrary, the grammatical subjects below are the external Causers of the actions:

(52) a. *Zhangsan kan-hua le Lisi de yanjing.

Zhangsan see-blurred ASP Lisi POS eye

Intended: "Zhangsan made Lisi see (e.g. a movie) so much that Lisi's eyes blurred."

b. *Zhangsan xie-lei le Lisi.

Zhangsan write-tired ASP Lisi

Intended: "Zhangsan made Lisi write (e.g. letters) so much that Lisi got tired."

c. *Zhangsan pao-lei le Lisi.

Zhangsan run-tired ASP Lisi

Intended: "Zhangsan made Lisi run so much that Lisi got tired."

In (52c), Zhangsan made Lisi run by whatever means, but the action of running is still carried out by Lisi. This is a kind of *indirect causation*. We will discuss the nature of causation in Chapter 6.

To summarize, we have shown that the four-way distinction above is not appropriate for Mandarin resultatives. We argue that the complexity results from the complexity in Vc's and Vr's event structures, both contributing to the behavior of the RVCs. The puzzling nature of the unergative verbs (having both transitive and causative alternations) is due to that they can be regarded as "unergative-unaccusative" complexes, the first giving rise to transitive alternation and the second causative alternation.

2.4 The Aspectual Approach

This section presents the aspectual approach of resultative constructions. Both Rappaport Hovav and Levin (2001) and J. Chang (2003) employ the concept of a causal chain, though they differ in some details.

2.4.1 Rappaport Hovav and Levin (2001)

The *Direct Object Restriction* (DOR) was first observed by Simpson (1983), based on the Unaccusative Hypothesis (Burzio 1986, Levin and Rappaport Hovav 1995, and Perlmutter 1978, among others) which distinguishes between unaccusative and unergative verbs by stipulating respectively internal arguments and external arguments for each type of intransitive verbs. This hypothesis proves successful in accounting for many linguistic data across languages.

Rappaport Hovav and Levin (2001) propose a semantic account of English resultatives from an event structure viewpoint and provide an argument against the DOR. The following counterexample from Wechsler (1997: 313) is one they list in their paper (p. 770):

(53) The wise men followed the star out of Bethlehem.

The verb *follow* with the "correlated motion" sense is unergative, yet the resultative is subject-oriented, an apparent violation of the DOR.

In additional to arguing against DOR, they provide contrasts between the *bare XP pattern*, as in (54a), and the *reflexive pattern*, as in (54b), claiming that "[r]esultatives with the mediating reflexive have a complex event structure, while those with bare XPs do not" (p. 775).

(54) a. The pond froze solid.

b. He ran himself tired.

In order to explain the difference in argument realization of the bare XP pattern and the reflexive pattern in English resultatives, they propose the Argument-per-Subevent Condition:

(55) Argument-per-Subevent Condition (Rappaport Hovav and Levin 2001: 779):

"There must be at least one argument XP in the syntax per subevent in the event structure."

In Rappaport Hovav and Levin (2001: 781), they argue that the difference in surface form reflects the difference in event structure. "The bare XP pattern, then, lacks a consistent association of notions of cause and result with verb and XP. In contrast, in the reflexive pattern the verb consistently represents the cause and the XP the result." Thus the bare XP pattern contains a simple event structure and is noncausative, while the reflexive pattern contains a complex event structure and is causative.

Since complex event structures are causative event structures, a complex event can be split into a *causing subevent* and a *result subevent* with the following properties (p. 783):

(56) a. The subevents need not be temporally dependent.

b. The result subevent cannot begin before the causing subevent.

c. Only the result subevent can bound the event as a whole.

d. There is no intervening event between the causing subevent and the result subevent; that is, causation is direct.[21]

They further argue that the grammaticality of resultatives lies in the well-formedness of event structures represented by *causal chains*. The essential properties of the causal chain are summarized below (Croft 1990: 53; Croft 1991: 173, 269; cited in Rappaport Hovav and Levin 2001: 787):

(57) a. a simple event is a (not necessarily atomic) segment of the causal network;

b. simple events are nonbranching causal chains;

c. a simple event involves transmission of force;

d. transmission of force is asymmetric, with distinct participants as initiator and endpoint.

We illustrate the causal chain with the example *Tracy wipes the table clean* which is object-oriented and has the causal chain in Fig. 7, which is nonbranching. It cannot have the subject-reading "Tracy becomes clean by wiping the table" since the causal chain in this reading is branching, as shown in Fig. 8.

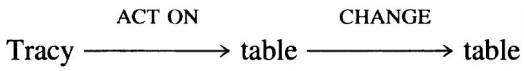


Fig. 7: Causal Chain for *Tracy wipes the table clean*

[21] Direct causation plays a role in inverted causative resultatives in Mandarin Chinese. We return to this topic in Chapter 6.

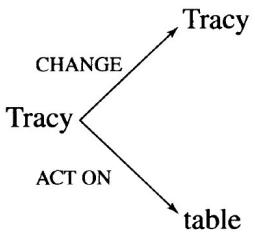


Fig. 8: Causal Chain for *Tracy becomes clean by wiping the table*

The well-formedness of events in terms of causal chains not only predicts the grammaticality of English resultatives, but also explains why DOR is valid in most cases of English resultatives. Thus an event structure account is preferred to a syntactic one.

2.4.2 J. Chang (2003)

J. Chang (2003: 317) argues that "it is the event role an argument plays in event structure, rather than the thematic role an argument plays, that determines how and where the argument is linked to the syntax." He proposes three *event roles* (i.e. *event participants*) involved in a causal chain (J. Chang 2003: 330): The *Initiator* is "an entity that is involved in the initiation or bringing about of an object." The *Target of activity* is "an entity that undergoes an action." The *Locus of affect* is "an entity that is involved in the endpoint or resulting state." These event participants are linked to syntactic positions via linking rules, which can be summarized as below (J. Chang 2003: 332-334):[22]

(58) a. The NP argument with the Initiator role is linked to the subject position.

b. The NP argument with the Locus of affect role is linked to the position immediately following the second verb or the word *ba*.

c. The NP argument with the Target of activity role is linked to the position immediately following a copied verb.

[22] J. Chang (2003: 334) suggests that "in the Verb-copying construction the first of the two identical verbs is a copied verb".

In case that syntactic positions are limited, the following hierarchy determines which event role takes higher priority. The role with lower priority can then be bound by the role with higher priority via indexing.

(59) Hierarchy of Event Roles: Initiator > Locus of affect > Target of activity

(J. Chang 2003: 335)

The rules reflect the temporal order of event participants in a causal relation. Temporally, "the Initiator role occurs before the Target of activity role, which occurs before the Locus of affect role, the linking of these event roles to syntax also follows the order of the event roles in the causal chain" (ibid.). "*Initiator* → *Target of activity* → *Locus of affect* in the syntactic structure is an iconic reflection of event structure in Chinese" (ibid.). For example, in (60a), *Zhangsan*, *yifu*, and *xiezi* are Initiator, Target of activity, and Locus of affect, respectively, following the linking rules in (58).

(60) a. Zhangsan xi yifu xi-shi le xiezi.

Zhangsan wash clothes wash-wet ASP shoes

"Zhangsan washed clothes and her/his own shoes got wet as a result."

b. *Zhangsan tui Lisi tui-dao le.

Zhangsan push Lisi push-fall ASP

Intended: "Zhangsan pushed Lisi and as a result Lisi fell."

c. *Zhangsan ba fan chi-bao le.

Zhangsan BA rice eat-full ASP

Intended: "Zhangsan was full from eating meal."

A consequence of this model is that when the Target of activity is co-indexed with the Locus of affect (an object-oriented reading), RVCs do not occur in the Verb-copying construction. In (60b), *Lisi* is the Target of activity according to (58c), and the syntactically

unexpressed Locus of affect role must be bound by the Target of activity role, a violation of Hierarchy of Event Roles (59).

Another consequence is that when the Locus of affect is co-indexed with the Initiator (a subject-oriented reading), RVCs do not occur in the *Ba*-construction. In (60c), *fan* is the Locus of affect according to (58b), but the real Locus of affect is the Initiator *Zhangsan* instead of *fan*. This conflict leads to the ungrammaticality of this example.

2.4.3 Critique on the Aspectual Approach

Rappaport Hovav and Levin's (2001) work faces at least two challenges if the same framework is applied to Mandarin.

The first challenge is the plausibility of the Argument-per-Subevent condition in (55), which explains the difference between the bare XP pattern (54a) and the reflexive pattern (54b) of English. It, if correct, is at best language-specific, as Mandarin does not require (and even exclude) the presence of an overt reflexive:

(61) Ta pao-lei le (*ziji).

s/he run-tired ASP self

"S/He ran her/himself tired."

There is no evidence that (61) and (54b) have different event structures. Thus the Argument-per-Subevent condition does not apply to Mandarin.

The second challenge is the prediction of the causal chains in Fig. 7 and Fig. 8, which predict that object-oriented readings (nonbranching causal chains) are accepted while subject-oriented readings (branching causal chains) must be excluded, a violation of the fact that in Mandarin subject-oriented (Type II) resultatives exist, if not so common.

J. Chang's (2003) analysis is promising in incorporating Verb-copying construction and *Ba*-construction. The isomorphism between the temporal order of event roles and the linear

order of syntactic constituents is also appealing. However, there are issues left unmentioned at all in his work. First, the inverted causative resultatives are not discussed. Second, the subject-oriented resultatives of the form [NP1 Vc-Vr NP2] are exemplified by only one example [*chi-bao fan*] "eat-full rice"; nothing is said about the restriction of their occurrence and their relation to other resultatives.

To summarize, the aspectual approach is superior to traditional approaches in recognizing the existence of nonsubcategorized objects. The causal chain functions like a "licenser" of these objects. As we have pointed out here, however, there is still weakness in this approach.

In this chapter, we have introduced different approaches to resultative constructions in English and Mandarin. The lexical approach is a bottom-up approach which is theoretically plausible, but it cannot generate resultatives with nonsubcategorized objects. The complex predicate approach recognizes the contribution of both component verbs in argument licensing, but it does not deal properly with the nature of causation in Mandarin resultatives. The verb class approach is insightful in its four-way distinction, but it cannot explain alternations in Mandarin resultatives property. The aspectual approach resembles our constructional approach (to be presented in the next chapter) in distinguishing between a verbal patient and an event affectee, but it fails to cover all the four types of resultatives in our classification. Thus we see that there are pros and cons for each approach. We will introduce the constructional approach in the next chapter.

Chapter 3 Theoretical Frameworks

This chapter introduces Construction Grammar and Jackendoff's semantic structures. Though differing in some technical details, both frameworks share basic assumptions and thus can be subsumed under a constructional approach. We incorporate Jackendoff's notation in our constructional approach since it handles causation and affectedness in a clear and neat way. The application of the theoretical frameworks to Mandarin resultatives will be presented in the next chapter.

3.1 Construction Grammar

The idea of a constructional approach is not new. Early construction-oriented papers include, among others, Fillmore et al. (1988), Michaelis and Lambrecht (1996), Jackendoff (1997b), and Kay and Fillmore (1999). Goldberg's (1995) influential work drew attention of linguists who were not satisfied with mainstream grammatical theories. The idea of a constructional argument (in contrast to a verbal argument) is employed in her book to account for argument mismatches in many argument structure constructions.

As summarized in Kay (1995: 171), "Construction grammar (CG) is a non-modular, generative, non-derivational, monostratal, unification-based grammatical approach, which aims at full coverage of the facts of any language under study without loss of linguistic generalizations within and across languages." Below we illustrate the special features of Construction Grammar, and compare it with other theories, particularly the mainstream generative grammar.

3.1.1 Non-modular

Traditionally, the study of natural languages holds a modular view: grammar and lexicon are distinct and has a clear-cut boundary. This dichotomy has been an underlying principle

imposed on most linguistic theories, particularly the mainstream generative grammar (MGG).[23]

While the grammar contains all the regularities that are predictable by "rules", the lexicon is a collection of idiosyncrasies to be listed as lexical items, which are often equaled to words.[24] In MGG, the lexical items (of the lexicon) are "inserted" into phrase structure rules (of the grammar).

The grammar can be further divided into independent but interacting modules (or components) such as syntax, phonology, and semantics. The MGG views syntax as central and the rest as interpretive, and thus is syntactocentric.

CG is a non-modular approach of grammar. CG blurs the distinction between grammar and lexicon. Modules in MGG such as syntax, semantics, and phonology do not exist in CG, despite the fact that a construction may contain information of syntax, semantics, and phonology.

The example below illustrates how CG explains argument "augmentation" in a more systematic way than traditional approaches (Robert Munsch, Andrew's Loose Tooth, cited in Goldberg 2003: 220):

(62) He sneezed his tooth right across town.

Since the surface form of a sentence is "projected" from the argument structure of the main verb in that sentence, we expect to find intransitive use in (62). The caused-motion sense here cannot be derived from the intransitive argument structure of verb *sneeze* alone, unless we stipulate an additional, ad hoc sense for the verb *sneeze*, making it polysemous. As many such examples are found, to avoid proliferating verbal senses, it is more reasonable and economical if we accept the idea that construction itself contributes to meaning and has its

[23] The term MGG is borrowed from Culicover and Jackendoff (2005: 3).

[24] As Bloomfield (1933: 274) put it, "[t]he lexicon is really an appendix of the grammar, a list of basic irregularities."

own argument structure. The surface form of (62) is the result of composition of verbal argument structure and constructional argument structure. This approach keeps simple the argument structure of a verb, and explains productivity found among similar patterns.[25]

Moreover, idiomatic expressions are a topic not taken seriously in MGG: they are viewed as "peripheral" and are not the concern of MGG, which studies the "core" only. The filtering-out of these "peripheral" data is theoretically-internal rather than theoretically-neutral. It is like a player who referees in a ball game.

CG aims to account for the syntactic behavior and interpretations of idiomatic expressions. By extending the definition of constructions to idiomatic expressions, we have a uniform analysis of idiomatic and non-idiomatic expressions alike.

A construction is a pairing of form (syntax and phonology) and meaning (semantics, pragmatics, etc.). Goldberg (1995) gives the following definition of a construction:

(63) C is a construction iff$_{def}$ C is a form-meaning pair <F_i, S_i> such that some aspect of F_i or some aspect of S_i is not strictly predictable from C's component parts or from other previously established constructions.

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[25] Note, however, that creative, or ad hoc, or "on-the-fly" usages may give rise to new lexical meanings in the long run. See Sweetser (1990). For example, in *Shi Jing* (Classic of Poetry; The Book of Odes), the verb *tou* means "to give", contrasting its modern meaning "to throw" as in *tou qiu* "throw the ball".

(iv) Tou wo yi tao, bao zhi yi li
give I with peach repay PRO with plum
"When one gives to me a peach, I return to her/him a plum."

Different as they might be, the sense extension of "giving" is not unconstrained. Another example provided by Prof. Chinfa Lien is the many senses of *song* (from "see off" to "deliver" to "give"). The semantic extension is also constrained somehow. Likewise, it may be argued that the verb *bake* in *John baked a cake* and that in *John baked Mary a cake* differ lexically, each having its own lexical entry. Despite this observation, the constructional approach is still indispensable in many other cases.

Thus a construction is nonredundant.[26] It can be of various scales: as short as words or phrases, e.g. *let alone* in Fillmore et al. (1988), or as long as sentences, e.g. ditransitive and resultative constructions in Goldberg (1995). Constructions may contain constants and variables alike. The elements in the *let alone* construction are solely constants (*substantive*); those in ditransitives and resultatives are solely variables (*schematic*). Some constructions are mixtures of both, e.g. the *V-ing NP away* construction (Jackendoff 1997b) and the *What's X doing Y?* construction (Kay and Fillmore 1999). A cline of constructions as summarized in Goldberg (2003: 220) is listed below:

Construction	Form/Example	Function
Morpheme	e.g. *anti-*, *pre-*, *-ing*	
Word	e.g. *Avocado*, *anaconda*, *and*	
Complex word	e.g. *Daredevil*, *shoo-in*	
Idiom (filled)	*Going great guns*	
Idiom (partially filled)	*Jog* <someone's> *memory*	
Covariational-Conditional construction	Form: The Xer the Yer (e.g. *The more you think about it, the less you understand*)	Meaning: linked independent and dependent variables
Ditransitive (double-object) construction	Form: Subj [V Obj1 Obj2] (e.g. *He gave her a Coke; He baked her a muffin*)	Meaning: transfer (intended or actual)
Passive	Form: Subj aux VPpp (PP_{by}) (e.g. *The armadillo was hit by a car*)	Discourse function: to make undergoer topical and/or actor non-topical

Table 3: Examples of constructions in Goldberg (2003)

[26] This definition of construction may be too strong, as Jackendoff (2002) distinguishes between lexical storage and online construction, arguing that some parts of grammar are stored in long-term memory while some are constructed online in working memory. He claims that "there is no reason to think that the brain stores information non-redundantly" (p. 153). In constructional terms, a nonidiomatic expression can still be a construction if it occurs frequently, even if its meaning is predictable (i.e. compositional) from its component parts.

3.1.2 Generative

The Generative Grammar have evolved through the years from Transformational Grammar (Chomsky 1957, 1965) to Government and Binding Theory (Chomsky 1981), and to Minimalist Program (Chomsky 1995). Basically, the spirit of the Generative Grammar is that a finite set of rules, when combined with lexical items from the lexicon, can generate all and only the grammatical sentences in a given language. The separation of linguistic competence from performance is significant in proposing a Universal Grammar which is part of the human biological endowment, that is, the language faculty. This view rejects the communicational or functional parts of language. Only the "core" of a language is worth studying.

The Generative Grammar regards the Principle of Compositionality (also called Frege's Principle) as an underlying assumption, which states that the meaning of a complex expression is determined by the meanings of its parts and *the ways* used to combine them.

Despite apparent discrepancies, Chomskyan Generative Grammar and Construction Grammar share the legacy of a generative view of language. In Construction Grammar *the ways* of combining linguistic constituents are not limited to phrase structure rules. Construction Grammar argues that *the ways* are part of more general form-meaning pairings, i.e. constructions. In this sense, Construction Grammar is generative, and the Principle of Compositionality can be maintained.

3.1.3 Non-derivational and Monostratal

The mainstream generative grammar (Chomsky 1957, 1965, 1981, 1986, 1995) is representative of the derivational approach. In Chomsky (1981), or *Lectures on Government and Binding*, the grammar is a "T-model" shown below:

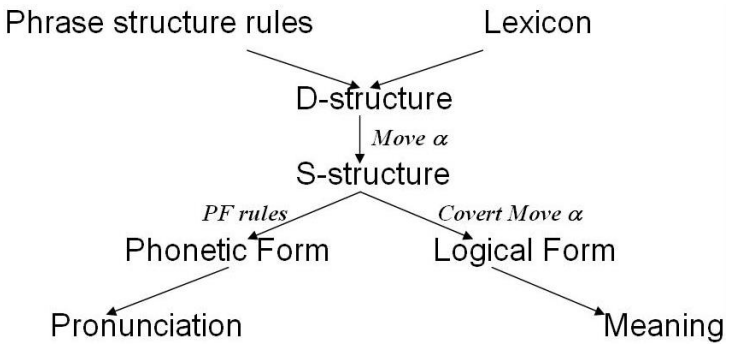

Fig. 9: The T-Model in Chomsky (1981)

Phrase structure rules generate an infinite set of D-structures after lexical insertion. Transformation rules (move α) operate between D-structures and S-structures. PF rules derive Phonetic Forms from S-structures, and covert move α derives Logical Forms from S-structures. Thus the mainstream generative grammar is basically derivational, and there are multiple of "strata" in the T-model

On the contrary, there are no derivations in Construction Grammar and thus it is monostratal. Each and every building block in Construction Grammar is a construction itself which interacts with other constructions.

3.1.4 Unification-based

In constraint-based grammars such as Lexical-Functional Grammar (LFG) (Bresnan 2001), Generalized Phrase Structure Grammar (GPSG) (Gazdar et al. 1985), Head-Driven Phrase Structure Grammar (HPSG) (Pollard and Sag 1994), and Construction Grammar (CG) (Goldberg 1995), the basic grammatical operation on "building blocks" (e.g. constructions in CG) is *unification*. In this subsection, we briefly introduce important concepts in unification-based approaches.

Though not all constraint-based grammars employ features, unification-based approaches can be best explained by the feature structures. "A feature structure is a partial

function from features to their values" (Shieber 1986: 12).[27] For example, a singular NP has the following feature structure D_{NPsg} where the feature *cat* has the value *NP*, and the feature *agreement* has another feature structure as its value, which has a feature *number* and a value *singular*.

$$\begin{bmatrix} cat\colon\ NP \\ agreement\colon \begin{bmatrix} number\colon\ singular \end{bmatrix} \end{bmatrix}$$

Fig. 10: The feature structure of D_{NPsg}

Relations among feature structures can be defined in terms of *subsumption*. "[A] feature structure D subsumes a feature structure D' (notated $D \subseteq D'$) if D contains a subset of the information in D'" (Shieber 1986: 15).[28] Thus the feature structure of D_{NP} shown below subsumes the feature structure of D_{NPsg}, notated $D_{NP} \subseteq D_{NPsg}$.

$$\begin{bmatrix} cat\colon\ NP \end{bmatrix}$$

Fig. 11: The feature structure of D_{NP}

A binary operation on feature structures is *unification*. According to Shieber (1986: 17-18), the unification of two feature structures D' and D'' is the most general feature structure D, such that $D' \subseteq D$ and $D'' \subseteq D$ (notated $D = D' \cup D''$).[29] For example, the feature structure of D_{NP3} in Fig. 12 can be unified with that of D_{NPsg} in Fig. 10 to yield the feature structure of D_{NP3sg} in Fig. 13.

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[27] In mathematics, a *partial function* is a binary relation R from A to B in which (i) each element in the domain is paired with just one element in the range; (ii) the domain of R is *not* equal to A (Partee et al. 1990: 30-31). Thus a feature structure may contain a feature whose value is unspecified.

[28] For typographic convenience, the notation here is slightly different from that used in the book cited.

[29] Again, for typographic convenience, the notation of unification is slightly different.

$$\begin{bmatrix} cat\colon\ NP \\ agreement\colon \begin{bmatrix} person\colon\ third \end{bmatrix} \end{bmatrix}$$

Fig. 12: The feature structure of D_{NP3}

$$\begin{bmatrix} cat\colon\ NP \\ agreement\colon \begin{bmatrix} number\colon\ singular \\ person\colon\ third \end{bmatrix} \end{bmatrix}$$

Fig. 13: The feature structure of D_{NP3sg}

We will demonstrate the unification process in Section 4.6, after the Resultative Templates of Mandarin RVC constructions are introduced.

3.1.5 Full Coverage

Chomsky (1986) distinguishes between I-language and E-language, a distinction similar to but not identical to the linguistic competence/performance dichotomy. I-language is the object of study in MGG. This mental abstraction leads to simplicity. A further simplification is the separation of core and peripherals. The core represents the "purest" mental constructs while the peripherals are subject to influences from pragmatics, discourse functions, etc.

The modular approach also resembles methodologies in natural sciences: a strict formalism and mechanical operations under various principles and/or laws in a given module.

In MGG, it is often the case that superficially different phenomena can be related by a unified operation. It seems that MGG is favored by *Occam's razor*, which requires that, all other things being equal, the simplest solution is the best.

The issue is that on its way to simplicity, MGG has been astray away from the language facts, most parts of which are regarded as peripheral.

CG aims to provide a holistic view of language, however "peripheral" the language data might be. If we reconsider Occam's razor, the conditional part "all other things being equal" may be controversial in that linguistic theories are not equal on the grounds of full coverage of language facts. Only when full coverage is achieved in a linguistic theory can we use Occam's razor to judge the succinctness of a theory.

3.2 Inheritance and Motivations

As Goldberg (1995: 67) puts it, "[t]he repertoire of constructions is not an unstructured set." She gives a brief summary of four psychological principles of language organization (pp. 67-68):

I. The Principle of Maximized Motivation: If construction A is related to construction B syntactically, then the system of construction A is motivated to the degree that it is related to construction B semantically. Such motivation is maximized.

II. The Principle of No Synonymy: If two constructions are syntactically distinct, they must be semantically or pragmatically distinct.

III. The Principle of Maximized Expressive Power: The inventory of constructions is maximized for communicative purposes.

IV. The Principle of Maximized Economy: The number of distinct constructions is minimized as much as possible, given Principle III.

Goldberg (1995) proposes inheritance links as relations among constructions. Four types of inheritance links are distinguished: *polysemy links*, *metaphorical extension links*, *subpart links*, and *instance links*.

These inheritance links are motivated as seen from the perspective of the four psychological principles above. Thus the constructions form a hierarchical network with inheritance links connecting the constructions.

3.3 Jackendoff's Semantic Structures

The mainstream Generative Grammar, as summarized in (Jackendoff 2007a: 4), has the following traits: (i) the grammar is syntactocentric; (ii) the grammar is derivation based; (iii) there is a strict formal distinction between the lexicon and the rules of grammar.

These traits are criticized by Jackendoff (2007a: 3), who claims that, "[a]ll linguistic theories that aspire to account for the full range of linguistic facts across the languages of the world find it indispensable to consider utterances as structured in several domains: at least phonological (sound) structure, syntactic (grammatical) structure, and semantic (meaning) structure." Apparently, the mainstream Generative Grammar does not meet this requirement, concerning the traits above.

To provide an alternative approach to linguistic theories, Jackendoff in a series of works (Jackendoff 1976, 1983, 1987, 1990, 1997a, 2002, 2007a, 2007b, Culicover and Jackendoff 2005) has been advocating the idea of a parallel, tripartite architecture of syntax, semantics, and phonology, arguing that each represents an autonomous, generative mechanism, linked to each other by interface rules. This *Parallel Architecture* is a response to current mainstream Generative Grammar, which he thinks has gone astray the road of linguistic researches proper.

The Parallel Architecture as shown in Fig. 14 (from Jackendoff 2007a: 8) is composed of three autonomous structures: Phonological Structure, Syntactic Structure, and Semantic Structure (which equals Conceptual Structure), linked to each other by interface rules (also known as *correspondence rules*). Each structure has its own formation rules. The Phonological Structure interacts with auditory input and motor output, while the Semantic Structure interacts with other cognitive systems.

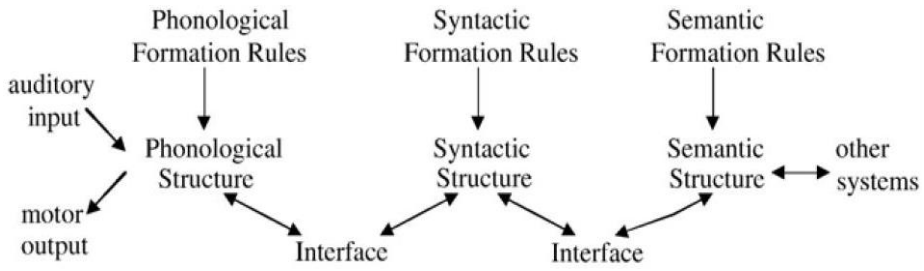

Fig. 14: The Parallel Architecture

The conceptual structure incorporates a repertoire of major conceptual categories, the "semantic parts of speech" including entities such as Thing (or Object), Event, State, Action, Place, Path, Property, and Amount (Jackendoff 1990: 43). Following Jackendoff (1976), any of the elements discovered in semantic decomposition is called a "semantic marker", without regard to its primitiveness. Semantic markers are conventionally capitalized. There are also some semantic markers which are "semantic functions" such as GO, BE, STAY, CAUSE, and LET.

For example (Jackendoff 1990: 45), the sentence (64a) has the Syntactic Structure (64b) and the Semantic Structure (64c).

(64) a. John ran into the room.

b. [$_{S}$ [$_{NP}$ John][$_{VP}$ ran [$_{PP}$ into [$_{NP}$ the room]]]]

c. [$_{Event}$ GO ([$_{Thing}$ JOHN], [$_{Path}$ TO ([$_{Place}$ IN ([$_{Thing}$ ROOM])])])]

The Semantic Structure here contains conceptual categories Event, Thing, Path, and Place. The semantic function GO takes two arguments, the first being a Thing and the second being a Path. For a Semantic Structure to be well-formed, the conceptual categories of the arguments must be compatible with those specified in a semantic function.

In an event of movement, thematic roles such as Theme, Source, and Goal are employed. In (64), *John* is the Theme while *the room* is the Goal. A Theme is a "thing in motion or being located" (Jackendoff 1990: 125). The following instances of the verb *hit* exhibit various

thematic relations (ibid.):

(65) a. Sue hit Fred.

b. The car hit the tree.

c. Pete hit the ball into the field.

In (65a), *Sue* is the Theme while *Fred* is the Goal; in (65b), *the car* is the Theme while *the tree* is the Goal. However, in (65c), *the ball* is in motion and thus is a Theme (rather than a Goal). A generalization must be made to account for the three uses of *hit*.

The inadequacy of thematic roles to account for the interaction of entities leads Jackendoff to propose *action tiers* as a semantic analogy of tier theory in recent phonology. The notions of action tiers is discussed in Jackendoff (1987) and elaborated in Jackendoff (1990, Chapter 7). The conceptual roles fall into two tiers: in addition to *thematic tier*, another layer called *action tier* is added to deal with Actor-Patient relations. Some two-tier analyses are shown below (Jackendoff: 1990: 126-127):

(66) a. Sue hit Fred.

Theme	Goal	(thematic tier)
Actor	Patient	(action tier)

b. Pete threw the ball.

Source	Theme	(thematic tier)
Actor	Patient	(action tier)

c. Bill entered the room.

Theme	Goal	(thematic tier)
Actor		(action tier)

d. Bill received a letter.

Goal	Theme	(thematic tier)
		(action tier)

The action tier is expressed by the two-argument function AFF, the first denoting the Actor and the second the Patient ("affected entity"). In cases where only one argument is present, Jackendoff (1990: 128) proposes some versions of notation, the first one being ruled out for ambiguity concerns (here with some modification for clarity):

(67) a. AFF ([X]) (X = Actor or Patient?)

b. AFF ([X],) (X = Actor only)

c. AFF (, [Y]) (X = Patient only)

d. AFF ([ ], [Y]) (implicit Actor)

e. AFF ([X], [ ]) (implicit Patient)

"The action tier enables us to dissect the traditional notion of Agent into a number of independent parts" (ibid.). There are at least two senses encapsulated in the notion of Agent. One sense is "extrinsic instigator of action", and another is "volitional actor". The former usually includes natural forces or events that are causative, while the latter usually includes animate beings that have the ability to perform some actions.

With the separation of action tier from thematic tier, it is now possible to attribute the "extrinsic instigator of action" sense to the thematic tier by putting it to the first argument of CAUSE and attribute the "volitional actor" sense to the action tier by putting it to the first argument of AFF. For example (Jackendoff 1990: 131):

(68) Harry forced Sam to go away.

$$\begin{bmatrix} \text{CAUSE ([HARRY], } \begin{bmatrix} \text{GO ([SAM], [AWAY])} \\ \text{AFF ([SAM],)} \end{bmatrix}\text{)} \\ \text{AFF ([HARRY], [SAM])} \end{bmatrix}$$

Fig. 15: Semantic Structure for *Harry forced Sam to go away*

Sentence (68) consists of two events. The first (outer) one is a causing event and the second (inner) one is a moving event. In the first event, *Harry* is a Causer and an Actor and *Sam* is a Causee and a Patient. In the second event, *Sam* is a Theme (the entity that moves) and an Actor.

In the next chapter we will present the advantages of the separation of thematic and action tiers. Various types of "resultative templates" are introduced with notations borrowed from Jackendoff's Semantic Structures. How they are linked to surface elements will also be discussed.

3.4 Processing in the Parallel Architecture

Though differing in some technical details, the Parallel Architecture and the Construction Grammar share a lot of basic assumptions. In this section, we introduce Jackendoff's (2007a) idea of how apparently different components of grammar (traditional lexical items, inflectional rules, idioms, and even phrase structure rules) can be subsumed under the phonology-syntax-semantics "triplets" (my term) which are equivalent to "constructions" in Construction Grammar.

The virtues of the Parallel Architecture are (Jackendoff 2007a: 5): (i) the grammar is made up of independent generative components for phonology, syntax, and semantics, linked by interfaces; (ii) the grammar is constraint based and inherently nondirectional; (iii) there is no strict lexicon-grammar distinction.

The following are some examples of triplets. (69a-c) are traditional lexical items. A triplet may contain *contextual restrictions* expressed by underlines. In (69c), for example, the triplet stipulates that the verb *devour* is transitive and takes two arguments, the external one (X) being animate and the internal one (Y) edible. These contextual restrictions are like features which are to be checked when appropriate during unification.

(69d) contains an inflectional rule (regular plural formation) for English, and (69e) is the triplet for the idiomatic expression *kick the bucket*. (69f), traditionally called a phrase structure rule, is now a "deficient" triplet with only the syntactic part.

(69) a. [kæt] – N – CAT

b. [ðə] – Det – DEF

c. [dəvawr$_1$] – V$_1$NP$_2$ – [X; ANIMATE] DEVOUR$_1$ [Y; EDIBLE]$_2$

d. [Wd$_1$ + z$_2$] – N$_1$ + aff$_2$ – PLUR$_2$ (X$_1$)

e. [kɪk ðə bʌkɪt] – [$_{VP4}$ V$_1$ [$_{NP}$ Det$_2$ N$_3$]] – [X; ANIMATE] DIE$_4$

f. [$_{VP}$ V + NP]

When a person hears a sequence of phonetic signals, the signals are compared with the triplets stored in her/his long-term memory. If a match is found, the relevant triplet is *activated* in the working memory. In the case of multiple matches, all the relevant triplets are activated, waiting for disambiguation at a later stage of language processing. Syntactic integration and semantic integration then check the well-formedness of the processed signals. This model is *parallel* in the sense that phonological, syntactic, and semantic contents are processed at the same time. An English example is given in Jackendoff (2007a, Section 7). In Section 4.6, we present the application of the Parallel Architecture to examples of Mandarin RVCs in terms of the Resultative Templates we are going to propose in Chapter 4.

3.5 The Constructional Approach to Resultatives

Influential works of English resultatives under the constructional framework include Goldberg (1995), Boas (2003), and Goldberg and Jackendoff (2004). This section presents how the constructional approach is applied to English resultatives.[30]

[30] Following Boas (2003) and Goldberg and Jackendoff (2004), there is a series of papers in *Language* that debate on English resultatives. See Boas (2005), Wechsler (2005), and Goldberg and Jackendoff (2005).

3.5.1 Goldberg (1995)

Goldberg (1995) proposes that not only verbal arguments, but also constructional arguments, are crucial in determining the well-formedness of resultatives. A construction may also inherit properties from another construction.

Goldberg (1995: 189) proposes a Resultative Construction with three constructional arguments: *agent*, *patient*, *result-goal*:

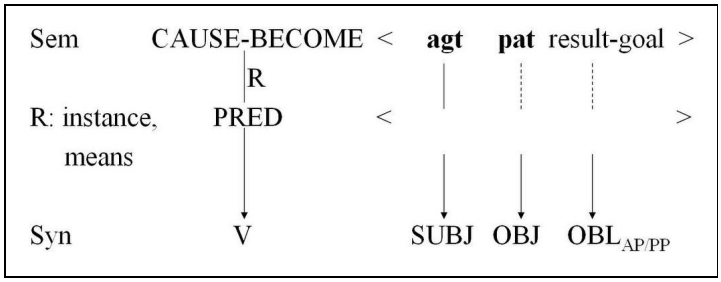

Fig. 16: Resultative Construction (Goldberg 1995)

The examples below illustrate how participant roles of verbs can be fused with constructional roles (ibid.). In (70a), the verb *wipe* is a transitive verb with two participant roles ("wiper" and "wiped") which are linked to constructional roles "agt" and "pat" and realized as the subject and the object, respectively; the constructional role "result-goal" is realized directly as the adjective phrase without linking to any verbal participant role. This is illustrated in Fig. 17 below. In (70b), the verb *talk* is an intransitive verb with only one participant role ("talker") which is linked to the constructional role "agt" and realized as the subject; the constructional role "pat" and "result-goal" are realized directly as the object and the adjective phrase, respectively, without linking to any verbal participant role. This is illustrated in Fig. 18 below.

(70) a. wipe **<wiper** wiped>

He wiped the table clean.

b. talk **<talker>**

He talked himself blue in the face.

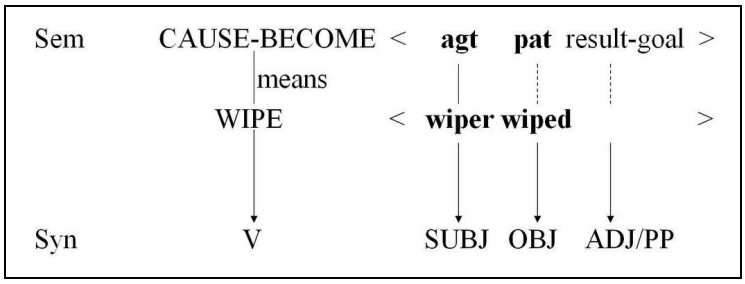

Fig. 17: Composite Structure: Resultative + *wipe*

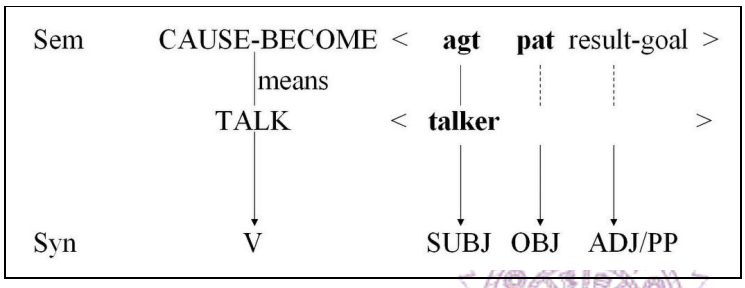

Fig. 18: Composite Structure: Resultative + *talk*

Semantic compatibility must be checked between constructional arguments and verbal arguments. "Resultatives can only be applied to arguments which potentially undergo a change of state as a result of the action denoted by the verb" (p. 188). The two traditional tests for patienthood are (p. 189):

(71) a. What X did to <patient> was, …

b. What happened to <patient> was, …

The fusion of arguments must observe semantic compatibility. Thus, in Fig. 17, *agt* is fused with *wiper*, and *pat* is fused with *wiped*; in Fig. 18, *agt* is fused with *talker*. The fusion here satisfies the requirement of semantic compatibility. Therefore, Goldberg's (1995) constructional approach not only explains the licensing of the augmented arguments, but also provides a systematic account of different resultative patterns.

3.5.2 Boas (2003)

Whether linguistic knowledge and encyclopedic (real world) knowledge are separable is a controversial topic in linguistics. We follow Boas (2003: 168-173) in assuming that both kinds of knowledge must be part of the lexical semantic information and thus are inseparable. Lexical information is enough for ordinary expressions such as *He ran*, yet resultative expressions such as *He ran his shoes threadbare* require world knowledge of running: the coordination of limbs, the wearing of shoes, and so on. Collocational restrictions can be accounted for if encyclopedic information is incorporated.

To express both on-stage and off-sage information, Boas (2003: 168) suggests using an event frame "to denote an abstract event or scene from the beginning to its end." Typical on-stage event participants are Agent (Ag) and Patient (Pt), and off-stage event participant is notated W (which stands for "world knowledge").

Temporal, spatial, and force-dynamic information are also included in an event-frame. Boas uses the labels SOURCE, PATH, and GOAL in a temporal rather than spatial sense to denote the beginning, the middle, and the end state of an event. Since the focus is on resultative constructions, throughout his work, only the GOAL frame is shown.

For example, the event-frame for the intransitive verb *run* and the transitive verb *paint* are shown below (Boas 2003: 190-191), where Ag, W, Pt, p1, p2, and p3 are called "event participants". The properties of Ag, W, and Pt are called p1, p2, and p3, respectively. Note that since the event-frame is a kind of construction, both the form (event participants) and the meaning (properties of the event participants) are specified.

The event participants of the event-frames are realized in syntax via the linking rules. Boas (2003: 190) proposes the following linking rules:

(72) a. Prototypical agents are mapped as NPs to the subject position.

b. Prototypical patients are mapped as NPs to the postverbal position.

c. Resultative phrases specifying the prototypical end result state of the prototypical agent are linked to immediate post-verbal position.

d. Resultative phrases specifying the prototypical end result state of the patient are linked to immediate post-patient position.

The following figure demonstrates the event-frame of *run*, and how the event participants are linked to the surface form:

GOAL
Ag (p1) (W p2)

Ag: animate object moving legs quickly
pl: directional PP

Fig. 19: Event-frame of *run*

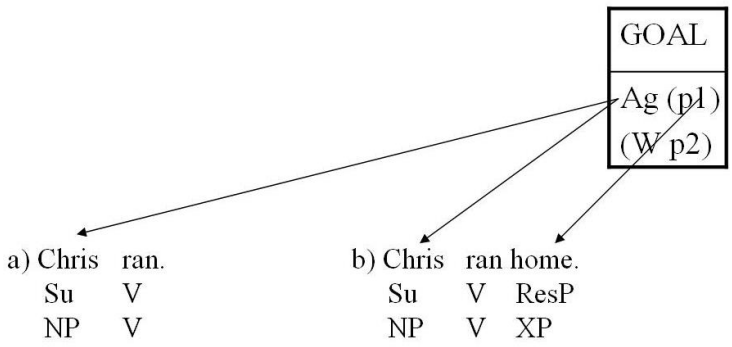

Fig. 20: Linking of *run*

The following figure demonstrates the event-frame of *paint*, and how the event participants are linked to the surface form:

GOAL
Ag (W p2) Pt (p3)

Ag: object covering a surface with paint

Pt: surface or object exhibiting a surface

p3: AP or NP denoting a color or a property associated with the prototypical intended end result of applying paint to a surface.

Fig. 21: Event-frame of *paint*

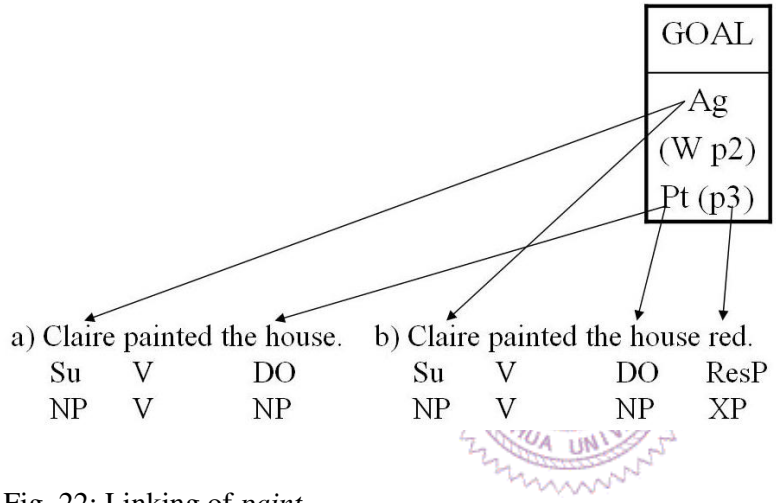

Fig. 22: Linking of *paint*

The event-frames in Boas (2003) are mini-constructions which function like licensers of arguments in resultative constructions. He particularly emphasizes the importance of collocational relations between the verb and the result phrase. "[P]articular types of verbs are conventionally associated with specific types of resultative phrases" (Boas 2003: 132). The results from his corpus-based research also support his argument.

3.5.3 Goldberg and Jackendoff (2004)

Goldberg and Jackendoff (2004) view resultative constructions as a family of constructions and discuss the relations between the two events involved. They distinguish between the "verbal subevent" and the "constructional subevent", arguing that the former is

the *means* of the latter, despite the fact that in some noncausative path resultatives, the verbal subevent denotes a *result*. The four major sub-constructions are (p. 563):

(73) a. Causative property resultative (e.g. *Bill watered the tulips flat*)

Syntax: NP_1 V NP_2 AP/PP_3

Semantics: X_1 CAUSE [Y_2 BECOME Z_3]

MEANS: [*VERBAL SUBEVENT*]

b. Noncausative property resultative (e.g. *The pond froze solid*)

Syntax: NP_1 V AP/PP_2

Semantics: X_1 BECOME Y_2

MEANS: [*VERBAL SUBEVENT*]

c. Noncausative path resultative (intransitive motion construction, e.g. *The ball rolled down the hill, The truck rumbled into the station*)

Syntax: NP_1 V PP_2

Semantics: X_1 GO $Path_2$

i. MEANS: [*VERBAL SUBEVENT*]

ii. RESULT: [*VERBAL SUBEVENT: X_1 EMIT SOUND*]

iii. RESULT: [*VERBAL SUBEVENT: X_1 DISAPPEAR*]

d. Causative path resultative (caused motion construction, e.g. *Bill rolled the ball down the hill*)

Syntax: NP_1 V NP_2 PP_3

Semantics: X_1 CAUSE [Y_2 GO $Path_3$]

MEANS: [*VERBAL SUBEVENT*]

The sharing of verbal arguments and constructional arguments must obey the Full Argument Realization (FAR) in Goldberg and Jackendoff (2004: 547):

(74) "All of the arguments obligatorily licensed by the verb and all of the syntactic arguments licensed by the construction must be simultaneously realized in the syntax, sharing syntactic positions if necessary in order to achieve well-formedness."

For example (Goldberg and Jackendoff 2004: 549, example (41a)):

(75) Willy watered the plants flat.

This sentence has two subevents. The constructional subevent has three arguments: *Willy* as Agent; *the plants* as Patient; *flat* as Predicate. The verbal subevent has two arguments: *Willy* as Agent; *the plants* as Patient. The arguments Agent and Patient are shared in the two subevents.

Goldberg and Jackendoff (2004) show that English resultative constructions form a case of family resemblance, and each sub-construction must be stipulated independently in terms of its syntax and semantics.

To summarize, the three papers discussed here all share the virtue of proposing some kind of form-meaning pairing for resultative constructions of English which licenses its arguments. We believe this reflects language facts in English and Mandarin as well.

In this chapter, we have presented the constructional approach and its application in resultative constructions of English. The arguments of English resultatives are licensed in a constructional way. In the next chapter, we will look at resultative adjunct rules in English and its adaptation in Mandarin. There are many differences between Mandarin and English resultatives, and we will show that the constructional approach is promising not only in English but also in Mandarin. Mandarin resultatives are more flexible than English resultatives in terms of mapping between verbal arguments and grammatical functions, which gives further supporting evidence for a constructional approach.

Chapter 4 Resultative Templates and Argument Linking

This chapter introduces resultative adjunct rules in English and their adaptation in Mandarin termed *Resultative Templates*. Resultative Templates are sentential constructions that interact with lexical constructions and together they determine syntactic behaviors and semantic interpretations of Mandarin RVC constructions.

4.1 Resultative Adjunct Rules

Jackendoff (1990: 225-241) discusses resultative adjunct rules in a spirit similar to that of Construction Grammar: the correspondence between the syntactic form and the semantic structure is systematic and thus can be characterized by a rule of mapping. In a constructional term, this rule is itself a construction that combines with lexical contents to generate the form and meaning of resultatives. The resultative adjunct rule is (p. 231):

(76) $[_{VP}\ V_h\ NP_j\ AP_k]$ may correspond to

$$\begin{bmatrix} \text{CAUSE}\ ([\alpha],\ [\text{INCH}\ [\text{BE}_{Ident}\ ([\beta],\ [\text{AT}\ [\ ]_k])]]) \\ \text{AFF}^-\ ([\ ]_i^{\alpha},\ [\{\alpha\}]_j^{\beta}) \\ \left[\text{BY}\ \left[\text{AFF}^-\ ([\alpha],\ \{[\beta]\})\right]_h\right] \end{bmatrix}$$

The rule above is disjunctive and can be split into two alternatives (p. 232):

(77) a. Resultative adjunct rule (default version):

$$\begin{bmatrix} \text{CAUSE}\ ([\alpha],\ [\text{INCH}\ [\text{BE}_{Ident}\ ([\beta],\ [\text{AT}\ [\ ]_k])]]) \\ \text{AFF}^-\ ([\ ]_i^{\alpha},\ [\ ]_j^{\beta}) \\ \left[\text{BY}\ \left[\text{AFF}^-\ ([\alpha],\ [\beta])\right]_h\right] \end{bmatrix}$$

b. Resultative adjunct rule (reflexive version):

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{INCH } [\text{BE}_{Ident} ([\beta], [\text{AT } [\ ]_k])]]) \\ \text{AFF}^- ([\ ]_i^{\alpha}, [\alpha]_j^{\beta}) \\ \left[\left[\text{BY } \left[\text{AFF}^- ([\alpha],)\right]_h\right]\right] \end{bmatrix}$$

These rules state that resultative constructions in English are causative inchoatives, with the objects of the constructions being either the Patients or reflexives. The verbs are subordinate means clauses specifying how the causing events are realized. The examples and their semantic structures are taken from Jackendoff (1990: 232-233), except for the semantic structure of (78a) which has been modified for consistency here.

(78) a. The gardener watered the tulips flat.

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{INCH } [\text{BE } ([\beta], [\text{AT } [\text{FLAT}]])]]) \\ \text{AFF}^- ([\text{GARDENER}]^{\alpha}, [\text{TULIPS}]^{\beta}) \\ \left[\left[\text{BY } \begin{bmatrix} \text{WATER } ([\gamma], [\delta]) \\ \text{AFF}^- ([\alpha]^{\gamma}, [\beta]^{\delta}) \end{bmatrix}\right]\right] \end{bmatrix}$$

b. The rooster crowed the children awake.

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{INCH } [\text{BE } ([\beta], [\text{AT } [\text{AWAKE}]])]]) \\ \text{AFF}^- ([\text{ROOSTER}]^{\alpha}, [\text{CHILDREN}]^{\beta}) \\ \left[\left[\text{BY } \begin{bmatrix} \text{CROW } ([\gamma]) \\ \text{AFF}^- ([\alpha]^{\gamma}, [\beta]) \end{bmatrix}\right]\right] \end{bmatrix}$$

c. Charlie laughed himself silly.

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{INCH } [\text{BE } ([\beta], [\text{AT } [\text{SILLY}]])]]) \\ \text{AFF}^- ([\text{CHARLIE}]^{\alpha}, [\alpha]^{\beta}) \\ \left[\left[\text{BY } \begin{bmatrix} \text{LAUGH } ([\gamma]) \\ \text{AFF}^- ([\alpha]^{\gamma},) \end{bmatrix}\right]\right] \end{bmatrix}$$

First, compare (78a) and (78b), which are derived by inserting lexical contents into the default rule (77a). They are exactly the same in the main part: both are causative inchoatives with the subjects as Actors and objects as Patients. They differ in the subordinate (verbal) part: (78a) contains a transitive verb whose verbal object is also the Patient (shown by the co-indexing of δ), while (78b) contains an intransitive verb whose argument structure is

unrelated to the Patient.

(78c) is derived by inserting lexical contents into the reflexive rule (77b). The Patient in the main part is co-indexed (via α) with the Actor. There is no Patient in the subordinate (verbal) part.

With the resultative adjunct rules here, there is no need to stipulate extra verbal argument structures for verbs in the resultative constructions. Moreover, the constructional meaning of causation is also encoded in the resultative adjunct rules, which give correct semantic interpretations of resultative constructions in English. In the next section, we present the Mandarin adaptation of English resultative adjunct rules.

4.2 Resultative Templates for Type I Resultatives

Based on the analysis of English resultatives, we propose semantic structures for Mandarin resultatives in this section. Mandarin resultatives differ from English ones not only in surface forms, but also in many other ways. To mention only a few, Mandarin allows subject-oriented resultatives while English does not (despite some controversial path resultatives); Mandarin allows causativization of a variety of resultatives not found in English; Mandarin also allows an unaccusative verb to be the Vc of a resultative construction.

This section presents some resultative templates similar to Jackendoff's (1990) resultative adjunct rules. They reflect the diversity of Mandarin resultatives.

A construction is a form-meaning pairing usually irreducible to other constructions. We believe the complexities and intricacies of Mandarin resultatives lie in the meaning part instead of the form part. Thus the details of the syntactic/phonological parts are not discussed, and we simply present the form in linear order. Inspired by Jackendoff (1990: 225-241), we propose the following templates for Mandarin resultatives. A template is by definition a sentential construction that interacts with other lexical constructions.

Note that a resultative template specifies not only the semantic structure and the syntactic structure, but also the *mapping* between them. The mapping is encoded by the co-indexation of the subscripts *i*, *j*, *k*, etc. which are shared in the syntactic part and the semantic part of a resultative template.

Type I resultatives (object-oriented) contain agents in subject positions which perform some actions that affect the patients in object positions. The notation in the following resultative template is borrowed from Jackendoff (1990), with some modifications.[31]

(79) Resultative Template I (object-oriented)

The form [NP_i V_k-V_l NP_j] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta]^j, [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]) \\ \left[\text{BY } \begin{bmatrix} V_k\ ([\gamma], \{[\delta]\}) \\ \text{AFF } ([\alpha]^\gamma, [\beta]) \end{bmatrix}\right] \end{bmatrix}$$

This Resultative Template I is a general form for the subtypes Ia, Ib, and Ic, which are more "substantial" forms that inherit properties from the Resultative Template I.

In (79), both the "main" part and the "subordinate" part have a thematic tier and an action tier, respectively. The thematic tier of the main part states that a causal relation exists between α (realized as the subject NP via co-indexing of *i*) and β (realized as the object NP via co-indexing of *j*) with the result state expressed by V_l. The action tier of the main part shows that α and β are Actor and Patient, respectively, i.e. α is an agent that performs some action whose affect is on β.

The thematic tier of the subordinate part specifies the relation between V_k's argument structure and the roles the argument play: the external argument of V_k, γ, is the Actor (through co-indexing) while the internal argument of V_k, δ (if any), is not necessarily the Patient (β), as

[31] The function complex INCH [BE ([α], [AT [β]])] is replaced by the compact form BECOME ([α], [β]). The co-indexing and the minus parameter of the AFF function are also simplified.

is clear from the absence of co-indexing in the superscript position of β in AFF function. The co-indexing of β and δ is a property of Type Ia resultatives, which is absent in Types Ib and Ic resultatives. In the next subsections the three subtypes of Type I resultatives are discussed separately.

4.2.1 Resultative Template Ia

Type Ia resultatives contain transitive verbs with subcategorized objects. In (80), the transitive verb *ca* "to wipe" subcategorizes the object *zhuozi* "table".

(80) Ta ca-gan le zhuozi. (=(3a))

s/he wipe-dry ASP table

"S/He wiped the table dry."

We propose the following resultative template for Type Ia resultatives. When compared with the general form (79), we see that the special form (81) contains a transitive V_k (shown by the two-argument function V_k ([γ], [δ])) and a co-indexing of β and δ:

(81) Resultative Template Ia

The form [NP_i V_k-V_l NP_j] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta]^j, [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]) \\ \left[\text{BY } \begin{bmatrix} V_k\ ([\gamma], [\delta]) \\ \text{AFF } ([\alpha]^\gamma, [\beta]^\delta) \end{bmatrix}\right] \end{bmatrix}$$

When this Resultative Template combines with lexical information in (80), we arrive at the following substantial semantic structure:

(82) Semantic structure for *Ta ca-gan le zhuozi*

$$\begin{bmatrix} \text{CAUSE ([S/HE], [BECOME ([TABLE], [DRY])])} \\ \text{AFF ([S/HE], [TABLE])} \\ \begin{bmatrix} \text{BY} \begin{bmatrix} \text{WIPE ([S/HE], [TABLE])} \\ \text{AFF ([S/HE], [TABLE])} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The structure above reads: "S/He caused the table to become dry by wiping it." The wiper *ta* "s/he" is an Actor whereas the wipee *zhuozi* "table" is a Patient. The parallel between verbal function (WIPE) and AFF function is guaranteed by the co-indexing of α and γ, and β and δ in the AFF function.

4.2.2 Resultative Template Ib

Type Ib resultatives contain transitive verbs with nonsubcategorized objects. In (83), the transitive verb *ti* "to kick" does not subcategorize the object *qiuxie* "sneakers".

(83) Ta ti-po le qiuxie. (=(3b))

s/he kick-worn ASP sneakers

"S/He kicked (something, e.g. a ball) and had the sneakers worn out."

We propose the following resultative template for Type Ib resultatives as in (84), which differs from Resultative Template Ia of (81) only in the co-indexing of β and δ: present in (81) but absent in (84). The absence of β-δ co-indexing reflects the nonsubcategorized objects.

(84) Resultative Template Ib

The form [NP$_i$ V$_k$-V$_l$ NP$_j$] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta]^j, [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]) \\ \begin{bmatrix} \text{BY} \begin{bmatrix} \text{V}_k\ ([\gamma], [\delta]) \\ \text{AFF } ([\alpha]^\gamma, [\beta]) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

When this Resultative Template combines with lexical information in (83), we arrive at the following substantial semantic structure:

(85) Semantic structure for *Ta ti-po le qiuxie*

$$\begin{bmatrix} \text{CAUSE ([S/HE], [BECOME ([SNEAKERS], [WORN])])} \\ \text{AFF ([S/HE], [SNEAKERS])} \\ \begin{bmatrix} \text{BY} \begin{bmatrix} \text{KICK ([S/HE], [}\delta\text{])} \\ \text{AFF ([S/HE], [SNEAKERS])} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The structure above reads: "S/He caused the sneakers to become worn out by kicking something (e.g. a football)." The kicker *ta* "s/he" is an Actor whereas the kickee is unsaturated and still represented by δ, which is something other than the Patient *qiuxie* "sneakers" that appears in the second argument of the lower AFF function.

4.2.3 Resultative Template Ic

Type Ic resultatives contain intransitive verbs with nonsubcategorized objects. In (86), the intransitive verb *ku* "to cry" is by no means related to the object *shoupa* "hankie".

(86) Ta ku-shi le shoupa. (=(3c))

s/he cry-wet ASP hankie

"S/He cried (so much) that the hankie got wet."

We propose the following resultative template for Type Ic resultatives as in (87), which differs from Resultative Template Ib of (84) only in the transitivity of V_k, which is transitive (expressed by the two arguments γ and δ) in (84) and intransitive (expressed by the argument γ) in (87).

(87) Resultative Template Ic

The form [NP$_i$ V$_k$-V$_l$ NP$_j$] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta]^j, [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]) \\ \left[\text{BY } \begin{bmatrix} \text{V}_k\ ([\gamma]) \\ \text{AFF } ([\alpha]^\gamma, [\beta]) \end{bmatrix}\right] \end{bmatrix}$$

When this Resultative Template combines with lexical information in (86), we arrive at the following substantial semantic structure:

(88) Semantic structure for *Ta ku-shi le shoupa*

$$\begin{bmatrix} \text{CAUSE } ([\text{S/HE}], [\text{BECOME } ([\text{HANKIE}], [\text{WET}])]) \\ \text{AFF } ([\text{S/HE}], [\text{HANKIE}]) \\ \left[\text{BY } \begin{bmatrix} \text{CRY } ([\text{S/HE}]) \\ \text{AFF } ([\text{S/HE}], [\text{HANKIE}]) \end{bmatrix}\right] \end{bmatrix}$$

The structure above reads: "S/He caused the hankie to become wet by crying." The crier *ta* "s/he" is an Actor and that is all for the intransitive verb *ku* "to cry". The Patient *shoupa* "hankie" that appears in the second argument of the lower AFF function is not related to the verb: it is affected by the crying event, but it is not part of it in terms of argument structure.

4.3 Resultative Templates for Type II Resultatives

Type II resultatives (subject-oriented) contain agents as the grammatical subjects, who perform some actions that eventually affect themselves. Optional grammatical objects subcategorized by Vc's may be appended to Type II resultatives.

(89) Resultative Template II (subject-oriented)

The form [NP$_i$ V$_k$-V$_l$ (NP$_j$)] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta], [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]^\alpha) \\ \begin{bmatrix} \text{BY } \begin{bmatrix} \text{V}_k\ ([\gamma], \{[\delta]^j\}) \\ \text{AFF } ([\alpha]^\gamma, \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

This Resultative Template II is a general form for subtypes IIa and IIb, which are more "substantial" forms that inherit properties from the Resultative Template II. The subtype IIc is slightly different with respect to the lower AFF function and will be discussed in the relevant subsection.

In (89), both the "main" part and the "subordinate" part have a thematic tier and an action tier, respectively. The thematic tier of the main part states that a causal relation exists between α (realized as the subject NP via co-indexing of *i*) and β (without co-indexing in the surface form) with the result state expressed by V$_l$. The action tier of the main part shows that α and β are Actor and Patient, respectively. The co-indexing of α and β denotes that NP$_i$ is both a Causer-Actor and a Causee-Patient, i.e. they are self-causative and self-agentive.[32]

The thematic tier of the subordinate part specifies the relation between V$_k$'s argument structure and the roles the argument play: the external argument of V$_k$, γ, is the Actor (through co-indexing) while the internal argument of V$_k$, δ (if any), is linked to the grammatical object

[32] This is in some way similar (in meaning but not in form) to the *reflexive* construction discussed in Lyons (1968: 361) which states that "[a] *reflexive* construction is one in which the subject and object refer to the same person (or thing)." (v) and (vi) are examples of reflexive constructions in English and French, respectively.

(v) He never shaves before lunch.

(vi) Je me lave.
I me wash
"I am washing myself."

NP_j. The action tier has an Actor role co-indexed with the external argument of V_k (via γ). There is no Patient role here. In the next subsections we present discussion on the three subtypes.

4.3.1 Resultative Template IIa

Type IIa resultatives contain transitive verbs with subcategorized objects. In (90), the transitive verb *chi* "to eat" subcategorizes the object *shuijiao* "steamed dumpling".

(90) Ta chi-ni le shuijiao. (=(4a))

s/he eat-bored ASP steamed:dumpling

"S/He was fed up with steamed dumplings."

We propose the following resultative template for Type IIa resultatives. When compared with the general form (89), we see that the more substantive form (91) contains a transitive V_k (shown by the two-argument function V_k ([γ], [δ])) and an optional surface object NP_j:

(91) Resultative Template IIa

The form [NP_i V_k-V_l (NP_j)] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta], [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]^\alpha) \\ \begin{bmatrix} \text{BY } \begin{bmatrix} V_k\ ([\gamma], [\delta]^j) \\ \text{AFF } ([\alpha]^\gamma, \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

When this Resultative Template combines with lexical information in (90), we arrive at the following substantial semantic structure:

(92) Semantic structure for *Ta chi-ni le shuijiao*

$$\begin{bmatrix} \text{CAUSE ([S/HE], [BECOME ([S/HE], [BORED])])} \\ \text{AFF ([S/HE], [S/HE])} \\ \begin{bmatrix} \text{BY} \begin{bmatrix} \text{EAT ([S/HE], [DUMPLINGS])} \\ \text{AFF ([S/HE],)} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The structure above reads: "S/He caused her/himself to become fed up with steamed dumplings (by overeating or eating too frequently)." The main part of (92) shows a self-causative/self-agentive relation: one becomes fed up with some kind of food by eating. The subordinate part shows that the internal argument *shuijiao* "steamed dumpling" in the thematic tier does not participate in the action tier: eating, like running, is an activity verb that involves an Actor only. Although some food is consumed during eating, it is not intuitively "affected". On the contrary, again like running, it is the Actor that is eventually affected by the eating event done by her/himself: one may become full or bored as a result of eating. This relation is expressed in the thematic tier and the action tier in the main part.

4.3.2 Resultative Template IIb

Type IIb resultatives contain unergative Vc's without surface objects. In (93), the intransitive verb *pao* "to run" is an unergative verb that denotes an activity.

(93) Ta pao-lei le. (=(4b))

s/he run-tired ASP

"S/He ran her/himself tired."

We propose the following resultative template for Type IIb resultatives as in (94), which differs from Resultative Template IIa of (91) only in the transitivity of V_k, which is transitive in (91) and intransitive in (94), and the presence of a surface object NP_j, which is optionally present in (91) but absent in (94).

(94) Resultative Template IIb

The form [NP$_i$ V$_k$-V$_l$] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta], [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]^\alpha) \\ \begin{bmatrix} \text{BY } \begin{bmatrix} \text{V}_k\ ([\gamma]) \\ \text{AFF } ([\alpha]^\gamma, \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

When this Resultative Template combines with lexical information in (93), we arrive at the following substantial semantic structure:

(95) Semantic structure for *Ta pao-lei le*

$$\begin{bmatrix} \text{CAUSE } ([\text{S/HE}], [\text{BECOME } ([\text{S/HE}], [\text{TIRED}])]) \\ \text{AFF } ([\text{S/HE}], [\text{S/HE}]) \\ \begin{bmatrix} \text{BY } \begin{bmatrix} \text{RUN } ([\text{S/HE}]) \\ \text{AFF } ([\text{S/HE}], \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The structure above reads: "S/He caused her/himself to become tired by running." The runner *ta* "s/he" is an Actor in the subordinate part of (95), and is an Actor and a Patient in the main part, since the runner got tired eventually as a result of her/his own running.

4.3.3 Resultative Template IIc

Type IIc resultatives contain unaccusative Vc's without surface objects. In (96), the intransitive verb *zui* "to be drunk" is an unaccusative verb that denotes a state.

(96) Zhangsan zui-dao le. (=(4c))

Zhangsan drunk-fallen ASP

"Zhangsan got drunk and fell."

We propose the following resultative template for Type IIc resultatives as in (97), which differs from Resultative Template IIb of (94) only in the AFF function of the subordinate part,

the argument in (97) being a Patient while that in (94) being an Actor.

(97) Resultative Template IIc

The form [NP$_i$ V$_k$-V$_l$] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta], [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]^\alpha) \\ \begin{bmatrix} \text{BY } \begin{bmatrix} \text{V}_k\ ([\gamma]) \\ \text{AFF } (\ , [\alpha]^\gamma) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

When this Resultative Template combines with lexical information in (96), we arrive at the following substantial semantic structure:

(98) Semantic structure for *Zhangsan zui-dao le*

$$\begin{bmatrix} \text{CAUSE } ([\text{ZHANGSAN}], [\text{BECOME } ([\text{ZHANGSAN}], [\text{FALLEN}])]) \\ \text{AFF } ([\text{ZHANGSAN}], [\text{ZHANGSAN}]) \\ \begin{bmatrix} \text{BY } \begin{bmatrix} \text{DRUNK } ([\text{ZHANGSAN}]) \\ \text{AFF } (\ , [\text{ZHANGSAN}]) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The structure above reads: "S/He caused her/himself to become fallen by being drunk." The one who got drunk (*Zhangsan*) is a Patient in the subordinate part of (98), and is an Actor and a Patient in the main part, since Zhangsan got fallen eventually as a result of her/his own being drunk.

4.4 Resultative Templates for Type III Resultatives

Type III resultatives (inverted-causative) contains causers (but not agents) in subject positions, which affect some entities (usually human beings) in object positions that perform some actions which eventually affect themselves. In this sense, Type III resultatives are another means to describe self-causative/self-agentive scenarios expressed by Type II resultatives: only that in Type III resultatives, the causers are now "profiled" in the subject

positions. The Resultative Template III is shown below:

(99) Resultative Template III (inverted-causative)

The form [NP$_i$ V$_k$-V$_l$ NP$_j$] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta]^j, [\ ]^l)]) \\ \text{AFF } (\ , [\beta]) \\ \left[\text{BY } \begin{bmatrix} \text{V}_k\ ([\gamma], \{[\delta]^\alpha\}) \\ \text{AFF } ([\beta]^\gamma, \ ) \end{bmatrix}\right] \end{bmatrix}$$

This Resultative Template III is a general form for subtypes IIIa and IIIb, which are more "substantial" forms that inherit properties from the Resultative Template III. The subtype IIIc is slightly different with respect to the lower AFF function and will be discussed in the relevant subsection.

In (99), both the "main" part and the "subordinate" part have a thematic tier and an action tier, respectively. The thematic tier of the main part states that a causal relation exists between α (realized as subject NP via co-indexing of *i*) and β (realized as object NP via co-indexing of *j*) with the result state expressed by V$_l$. The action tier of the main part shows that β is a Patient, although α is NOT an Actor, as shown by the absence of the first argument in the AFF function.

In the subordinate part, the external argument γ of V$_k$ in the thematic tier is the Actor in the action tier (through β-γ co-indexing). An optional internal argument δ in the thematic tier can be linked to the subject NP$_i$ (through i-α-δ co-indexing), as is the case in Type IIIa resultatives. If this internal argument is absent, something unrelated to V$_k$ appears in the subject position of NP$_i$, as is the case in Type IIIb and Type IIIc resultatives. In all subtypes of Type III resultatives, the subject position NP$_i$ invariably expresses the causer of the whole event. The following subsections present the Resultative Templates of the subtypes.

4.4.1 Resultative Template IIIa

Type IIIa resultatives contain transitive verbs with subcategorized logical "objects" in the subject positions. In (100), the transitive verb *chi* "to eat" subcategorizes the "object" *zhe zhong yao* "this kind of medicine", which appears in the grammatical subject position.

(100) Zhe zhong yao hui chi-si ren. (=(5a))

this kind medicine may eat-dead person

"This kind of medicine kills."

We propose the following resultative template for Type IIIa resultatives. When compared with the general form (99), we see that the more substantive form (101) contains a transitive V_k (shown by the two-argument function V_k ([γ], [δ])):

(101) Resultative Template IIIa

The form [NP_i V_k-V_l NP_j] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta]^j, [\ ]^l)]) \\ \text{AFF } (\ , [\beta]) \\ \begin{bmatrix} \text{BY} \begin{bmatrix} V_k\ ([\gamma], [\delta]^\alpha) \\ \text{AFF } ([\beta]^\gamma, \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

When this Resultative Template combines with lexical information in (100), we arrive at the following substantial semantic structure:

(102) Semantic structure for *Zhe zhong yao hui chi-si ren*

$$\begin{bmatrix} \text{CAUSE } ([\text{MEDICINE}], [\text{BECOME } ([\text{PEOPLE}], [\text{DEAD}])) \\ \text{AFF } (\ , [\text{PEOPLE}]) \\ \begin{bmatrix} \text{BY} \begin{bmatrix} \text{EAT } ([\text{PEOPLE}], [\text{MEDICINE}]) \\ \text{AFF } ([\text{PEOPLE}], \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The structure above reads: "Some kind of medicine caused people to become dead by their taking the medicine." The main part of (102) shows a causal relation between *zhe zhong*

yao “this kind of medicine” and *ren* “people”. The AFF function indicates that whereas *ren* “people” is a Patient, *zhe zhong yao* “this kind of medicine” is NOT an Actor, since it is not the entity that perform the action of taking medicine. The subordinate part shows that the external argument *ren* “people” is an Actor in the AFF function, which lacks a Patient role. Similarly, although some kind of medicine was taken, it is not intuitively “affected”. On the contrary, it is the Actor that it is eventually affected (and that is what medicine is for). Unfortunately, in our example above, a fatal side effect causes the patient to die.

4.4.2 Resultative Template IIIb

Type IIIb resultatives contain intransitive verbs. In (103), the intransitive verb *pao* “to run” is an unergative verb that denotes an activity.

(103) Zhe duan lu pao-lei le Zhangsan. (=(5b))

this CL road run-tired ASP Zhangsan

“This road made Zhangsan tired from running.”

We propose the following resultative template for Type IIIb resultatives as in (104), which differs from Resultative Template IIIa of (101) only in the transitivity of V_k, which is transitive in (101) and intransitive in (104).

(104) Resultative Template IIIb

The form [NP_i V_k-V_l NP_j] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta]^j, [\ ]^l)]) \\ \text{AFF } (\ , [\beta]) \\ \begin{bmatrix} \text{BY} \begin{bmatrix} V_k\ ([\gamma]) \\ \text{AFF } ([\beta]^\gamma, \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

When this Resultative Template combines with lexical information in (103), we arrive at the following substantial semantic structure:

(105) Semantic structure for *Zhe duan lu pao-lei le Zhangsan*

$$\begin{bmatrix} \text{CAUSE ([ROAD], [BECOME ([ZHANGSAN], [TIRED])])} \\ \text{AFF (, [ZHANGSAN])} \\ \begin{bmatrix} \text{BY} \begin{bmatrix} \text{RUN ([ZHANGSAN])} \\ \text{AFF ([ZHANGSAN],)} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The structure above reads: "This road caused Zhangsan to become tired by Zhangsan's running (on it)." The runner *ta* "s/he" is an Actor in the subordinate part of (105), but a Patient in the main part, since the runner got tired eventually as a result of running.

4.4.3 Resultative Template IIIc

Type IIIc resultatives contain intransitive verbs. In (106), the intransitive verb *zui* "to be drunk" is an unaccusative verb that denotes a state.

(106) Zhe ping jiu zui-dao le Zhangsan. (=(5c))

this bottle wine drunk-fall ASP Zhangsan

"This bottle of wine got Zhangsan drunk and fall."

We propose the following resultative template for Type IIIc resultatives as in (107), which differs from Resultative Template IIIb of (104) only in the AFF function of the subordinate part, the argument in (107) being a Patient while that in (104) being an Actor.

(107) Resultative Template IIIc

The form [NP_i V_k-V_l NP_j] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha]^i, [\text{BECOME } ([\beta]^j, [\ ]^l)]) \\ \text{AFF (, } [\beta]) \\ \begin{bmatrix} \text{BY} \begin{bmatrix} V_k\ ([\gamma]) \\ \text{AFF (, } [\beta]^\gamma) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

When this Resultative Template combines with lexical information in (106), we arrive at the following substantial semantic structure:

(108) Semantic structure for *Zhe ping jiu zui-dao le Zhangsan*

$$\begin{bmatrix} \text{CAUSE } ([\text{WINE}], [\text{BECOME } ([\text{ZHANGSAN}], [\text{FALLEN}])]) \\ \text{AFF } (\ , [\text{ZHANGSAN}]) \\ \begin{bmatrix} \text{BY } \begin{bmatrix} \text{DRUNK } ([\text{ZHANGSAN}]) \\ \text{AFF } (\ , [\text{ZHANGSAN}]) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The structure above reads: "This wine caused Zhangsan to become fallen by Zhangsan's being drunk." The one who got drunk (*Zhangsan*) is a Patient in the subordinate part of (108), and is also a Patient in the main part, since Zhangsan got fallen eventually as a result of being drunk.

4.5 Resultative Templates for Type IV Resultatives

Type IV resultatives (subject-oriented) contains patients as the grammatical subjects that undergo actions performed by unexpressed agents. Its Resultative Template is exactly the same as that of Type I resultatives, except for the co-indexing of surface NPs.

(109) Resultative Template IV (subject-oriented)

The form [NP_i V_k-V_l] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{BECOME } ([\beta]^i, [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]) \\ \begin{bmatrix} \text{BY } \begin{bmatrix} \text{V}_k \ ([\gamma], \{[\delta]\}) \\ \text{AFF } ([\alpha]^\gamma, [\beta]) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

This Resultative Template IV is a general form for the subtypes IVa, IVb, and IVc, which are more "substantial" forms that inherit properties from it. In the next subsections we present discussion on the three subtypes.

4.5.1 Resultative Template IVa

Type IVa resultatives contain transitive verbs with subcategorized "objects" in subject positions. In (110), the transitive verb *ca* "to wipe" subcategorizes the "object" *zhuozi* "table".

(110) Zhuozi ca-gan le. (=(7a))

table wipe-dry ASP

"The table was wiped dry."

We propose the following Resultative Template for Type IVa resultatives as in (111), which differs from Resultative Template Ia of (81) only in the way the semantic arguments are co-indexed with surface NPs.

(111) Resultative Template IVa

The form [NP$_i$ V$_k$-V$_l$] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{BECOME } ([\beta]^i, [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]) \\ \left[\text{BY } \begin{bmatrix} \text{V}_k \ ([\gamma], [\delta]) \\ \text{AFF } ([\alpha]^\gamma, [\beta]^\delta) \end{bmatrix}\right] \end{bmatrix}$$

When this Resultative Template combines with lexical information in (110), we arrive at the following substantial semantic structure:

(112) Semantic structure for *Zhuozi ca-gan le*

$$\begin{bmatrix} \text{CAUSE } ([\ ], [\text{BECOME } ([\text{TABLE}], [\text{DRY}])]) \\ \text{AFF } ([\ ], [\text{TABLE}]) \\ \left[\text{BY } \begin{bmatrix} \text{WIPE } ([\ ], [\text{TABLE}]) \\ \text{AFF } ([\ ], [\text{TABLE}]) \end{bmatrix}\right] \end{bmatrix}$$

The structure above reads: “The table became dry by someone’s wiping it.” The wiper, which is also a Causer and an Actor, is not expressed, as shown by the blanks above.

4.5.2 Resultative Template IVb

Type IVb resultatives contain transitive verbs with nonsubcategorized “objects” in subject positions. In (113), the transitive verb *ti* “to kick” does not subcategorize the “object” *qiuxie* “sneakers”.

(113) Qiuxie ti-po le. (=(7b))

sneakers kick-worn ASP

“The sneakers wore out from kicking.”

We propose the following Resultative Template for Type IVb resultatives as in (114), which differs from Resultative Template Ib of (84) only in the way the semantic arguments are co-indexed with surface NPs.

(114) Resultative Template IVb

The form [NP$_i$ V$_k$-V$_l$] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{BECOME } ([\beta]^i, [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]) \\ \left[\text{BY } \begin{bmatrix} \text{V}_k\ ([\gamma], [\delta]) \\ \text{AFF } ([\alpha]^\gamma, [\beta]) \end{bmatrix}\right] \end{bmatrix}$$

When this Resultative Template combines with lexical information in (113), we arrive at the following substantial semantic structure:

(115) Semantic structure for *Qiuxie ti-po le*

$$\begin{bmatrix} \text{CAUSE } ([\ ], [\text{BECOME } ([\text{SNEAKERS}], [\text{WORN}])]) \\ \text{AFF } ([\ ], [\text{SNEAKERS}]) \\ \left[\text{BY } \begin{bmatrix} \text{KICK } ([\ ], [\delta]) \\ \text{AFF } ([\ ], [\text{SNEAKERS}]) \end{bmatrix}\right] \end{bmatrix}$$

The structure above reads: “The sneakers became worn out by someone’s kicking something (e.g. a football).” The kicker, which is also a Causer and an Actor, is not expressed, as shown by the blanks above. Moreover, the kickee is left unsaturated and still represented by δ, which is something other than the Patient *qiuxie* “sneakers” that appears in the second argument of the lower AFF function.

4.5.3 Resultative Template IVc

Type IVc resultatives contain intransitive verbs. In (116), the intransitive verb *ku* “to cry” is by no means related to the grammatical subject *shoupa* “hankie”.

(116) Shoupa ku-shi le. (=(7c)

hankie cry-wet ASP

“The hankie got wet from someone’s crying.”

We propose the following Resultative Template for Type IVc resultatives as in(117), which differs from Resultative Template Ic of (87) only in the way the semantic arguments are co-indexed with surface NPs.

(117) Resultative Template IVc

The form [NP$_i$ V$_k$-V$_l$] corresponds to:

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{BECOME } ([\beta]^i, [\ ]^l)]) \\ \text{AFF } ([\alpha], [\beta]) \\ \left[\text{BY } \begin{bmatrix} \text{V}_k\ ([\gamma]) \\ \text{AFF } ([\alpha]^\gamma, [\beta]) \end{bmatrix}\right] \end{bmatrix}$$

When this Resultative Template combines with lexical information in (116), we arrive at the following substantial semantic structure:

(118) Semantic structure for *Shoupa ku-shi le*

$$\begin{bmatrix} \text{CAUSE}\ ([\ ], [\text{BECOME}\ ([\text{HANKIE}], [\text{WET}])]) \\ \text{AFF}\ ([\ ], [\text{HANKIE}]) \\ \left[\text{BY}\ \begin{bmatrix} \text{CRY}\ ([\ ]) \\ \text{AFF}\ ([\ ], [\text{HANKIE}]) \end{bmatrix}\right] \end{bmatrix}$$

The structure above reads: "The hankie got wet from someone's crying." The crier, which is a Causer and an Actor, is not expressed, as shown by the blanks above. The Patient *shoupa* "hankie" that appears in the second argument of the lower AFF function is not related to the verb: it is affected by the crying event, but it is not an essential part of it.

4.6 How Lexical Items and Resultative Templates Are Unified

Given the Resultative Templates presented in the previous sections, we are now ready to demonstrate how lexical items and the Resultative Templates are unified to arrive at correct semantic interpretations. Following Jackendoff's idea of a Parallel Architecture, the basic building blocks in the grammar are phonological-syntactic-semantic triplets. Following the English examples listed in (69), we list some triplets in Mandarin Chinese below:

(119) a. *Zhangsan* – N – ZHANGSAN[PROPER, ANIMATE]

b. *Lisi* – N – LISI[PROPER, ANIMATE]

c. *yao* – N – MEDICINE[EDIBLE, INANIMATE]

d. *ren* – N – PEOPLE[ANIMATE]

e. *tiao* – V – [X; ANIMATE] JUMP

f. *fan* – V – [X; ANIMATE] BORED

g. *chi* – VNP – [X; ANIMATE] EAT [Y; EDIBLE]

h. *si* – V – [X; ANIMATE] DEAD

Below we present the processing of the two similar sentences in (50), repeated below. (120a) and (120b) are Type IIb and Type Ic resultatives, respectively. They are not distinguishable until the last stage of processing.

(120) a. Zhangsan tiao-fan le.

Zhangsan jump-bored ASP

"Zhangsan got her/himself bored from jumping."

b. Zhangsan tiao-fan le Lisi.

Zhangsan jump-bored ASP Lisi

"Zhangsan got Lisi bored from jumping."

On hearing the first element *Zhangsan* in the linear sequence, the following four possibilities are activated: each is a unification (i.e. combination) of respective Resultative Template with lexical information of *Zhangsan*. Note that semantic attributes of *Zhangsan*, i.e. [PROPER, ANIMATE], are present but not expressed in the intermediate representations below:

Type I: $\begin{bmatrix} \text{CAUSE}\ ([\text{ZS}], [\text{BECOME}\ ([\beta]^j, [\ ]^l)]) \\ \text{AFF}\ ([\text{ZS}], [\beta]) \\ \begin{bmatrix} \text{BY} & \begin{bmatrix} \text{V}_k\ ([\text{ZS}], \{[\delta]\}) \\ \text{AFF}\ ([\text{ZS}], [\beta]) \end{bmatrix} \end{bmatrix} \end{bmatrix}$	Type II: $\begin{bmatrix} \text{CAUSE}\ ([\text{ZS}], [\text{BECOME}\ ([\text{ZS}], [\ ]^l)]) \\ \text{AFF}\ ([\text{ZS}], [\text{ZS}]) \\ \begin{bmatrix} \text{BY} & \begin{bmatrix} \text{V}_k\ ([\text{ZS}], \{[\delta]^j\}) \\ \text{AFF}\ ([\text{ZS}], \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$
Type III: $\begin{bmatrix} \text{CAUSE}\ ([\text{ZS}], [\text{BECOME}\ ([\beta]^j, [\ ]^l)]) \\ \text{AFF}\ (\ , [\beta]) \\ \begin{bmatrix} \text{BY} & \begin{bmatrix} \text{V}_k\ ([\gamma], \{[\text{ZS}]\}) \\ \text{AFF}\ ([\beta]^\gamma, \ ) \end{bmatrix} \end{bmatrix} \end{bmatrix}$	Type IV: $\begin{bmatrix} \text{CAUSE}\ ([\alpha], [\text{BECOME}\ ([\text{ZS}], [\ ]^l)]) \\ \text{AFF}\ ([\alpha], [\text{ZS}]) \\ \begin{bmatrix} \text{BY} & \begin{bmatrix} \text{V}_k\ ([\gamma], \{[\delta]\}) \\ \text{AFF}\ ([\alpha]^\gamma, [\text{ZS}]) \end{bmatrix} \end{bmatrix} \end{bmatrix}$

Fig. 23: Processed: *Zhangsan*

During unification, semantic attributes must be checked for compatibility. At this stage, no checking is needed since Resultative Templates contains no attributes. Observe how indexing helps us in tracking: In all the four cases, the noun phrase *Zhangsan* is unified with NP_i in [NP_i V_k-V_l NP_j], thus the semantic information ZHANGSAN (short form ZS) replaces all arguments linked to index *i*, either directly or indirectly. Accordingly, in Type I, ZS replaces all arguments with indices *i*, α, and γ; in Type II, ZS replaces all arguments with indices *i*, α, β, and γ; in Type III, ZS replaces all arguments with indices *i*, α, and δ; in Type IV, ZS replaces all arguments with indices *i* and β.

Now it is the turn of the next two elements, Vc and Vr, whose unification with the intermediate representations are shown below:

Type I: $\begin{bmatrix}\text{CAUSE}([\text{ZS}], [\text{BECOME}([\beta]^j, [\text{BORED}])])\\ \text{AFF}([\text{ZS}], [\beta])\\ \begin{bmatrix}\text{BY}\begin{bmatrix}\text{JUMP}([\text{ZS}], \{[\delta]\})\\ \text{AFF}([\text{ZS}], [\beta])\end{bmatrix}\end{bmatrix}\end{bmatrix}$	Type II: $\begin{bmatrix}\text{CAUSE}([\text{ZS}], [\text{BECOME}([\text{ZS}], [\text{BORED}])])\\ \text{AFF}([\text{ZS}], [\text{ZS}])\\ \begin{bmatrix}\text{BY}\begin{bmatrix}\text{JUMP}([\text{ZS}], \{[\delta]^j\})\\ \text{AFF}([\text{ZS}],)\end{bmatrix}\end{bmatrix}\end{bmatrix}$
Type III: $\begin{bmatrix}\text{CAUSE}([\text{ZS}], [\text{BECOME}([\beta]^j, [\text{BORED}])])\\ \text{AFF}(, [\beta])\\ \begin{bmatrix}\text{BY}\begin{bmatrix}\text{JUMP}([\gamma], \{[\text{ZS}]\})\\ \text{AFF}([\beta]^\gamma,)\end{bmatrix}\end{bmatrix}\end{bmatrix}$	Type IV: $\begin{bmatrix}\text{CAUSE}([\alpha], [\text{BECOME}([\text{ZS}], [\text{BORED}])])\\ \text{AFF}([\alpha], [\text{ZS}])\\ \begin{bmatrix}\text{BY}\begin{bmatrix}\text{JUMP}([\gamma], \{[\delta]\})\\ \text{AFF}([\alpha]^\gamma, [\text{ZS}])\end{bmatrix}\end{bmatrix}\end{bmatrix}$

Fig. 24: Processed: *Zhangsan tiao-fan*

Unification in this stage replaces arguments or functions subscripted with *k* or *l* with respective semantic information: here the brackets subscripted with *l* are replaced by BORED, and V_k by JUMP. Furthermore, since the verb *tiao* "to jump" is an intransitive verb, the second argument in the JUMP function should not be present. This is fine since the curly brackets "{" and "}" means that the element inside is optional. Thus the representations further reduce to:

Type I: $\begin{bmatrix}\text{CAUSE ([ZS], [BECOME ([}\beta\text{]}^{j}\text{, [BORED])])}\\ \text{AFF ([ZS], [}\beta\text{])}\\ \begin{bmatrix}\text{BY}\begin{bmatrix}\text{JUMP ([ZS])}\\ \text{AFF ([ZS], [}\beta\text{])}\end{bmatrix}\end{bmatrix}\end{bmatrix}$	Type II: $\begin{bmatrix}\text{CAUSE ([ZS], [BECOME ([ZS], [BORED])])}\\ \text{AFF ([ZS], [ZS])}\\ \begin{bmatrix}\text{BY}\begin{bmatrix}\text{JUMP ([ZS])}\\ \text{AFF ([ZS],)}\end{bmatrix}\end{bmatrix}\end{bmatrix}$
Type III: $\begin{bmatrix}\text{CAUSE ([ZS], [BECOME ([}\beta\text{]}^{j}\text{, [BORED])])}\\ \text{AFF (, [}\beta\text{])}\\ \begin{bmatrix}\text{BY}\begin{bmatrix}\text{JUMP ([}\gamma\text{])}\\ \text{AFF ([}\beta\text{]}^{\gamma}\text{,)}\end{bmatrix}\end{bmatrix}\end{bmatrix}$	Type IV: $\begin{bmatrix}\text{CAUSE ([}\alpha\text{], [BECOME ([ZS], [BORED])])}\\ \text{AFF ([}\alpha\text{], [ZS])}\\ \begin{bmatrix}\text{BY}\begin{bmatrix}\text{JUMP ([}\gamma\text{])}\\ \text{AFF ([}\alpha\text{]}^{\gamma}\text{, [ZS])}\end{bmatrix}\end{bmatrix}\end{bmatrix}$

Fig. 25: Processed: *Zhangsan tiao-fan* (Version 2)

At this stage, semantic attributes of the verbs must be checked. The verb *tiao* "to jump" requires that its sole argument be animate. Fortunately, the NP *Zhangsan* is animate, and thus this requirement is met in Type I and Type II. No such semantic checking is necessary in Type III and Type IV, since the sole argument of *tiao* "to jump" is still unsaturated. Moreover, the verb *fan* "to be bored" also requires animacy, and this requirement is met in Type II and Type IV. Again, no such semantic checking is necessary in Type I and Type III, since the first argument of the BECOME function is still unsaturated.

For (120a), this is the end of unification (the unification of the aspect marker *le* is not significant in our study here). Type I and Type III are ruled out since the argument with index *j* is not realized in surface NPs. All arguments in Type II are saturated, and thus it is the optimal choice. Type IV is logically possible, but is blocked by Type II to avoid ambiguity (see discussion in Subsection 5.3.3). Therefore, as expected, Type II (or more precisely, Type IIb) wins out in this example.

For (120b), further unification is needed. The noun phrase *Lisi* must be incorporated in the representations, replacing arguments with subscripts related to *j*. This leads to unification failure in Type II and Type IV as they do not have any arguments with subscripts *j*. The result of unification in Type I and Type III are shown below:

Type I:	Type III:
[CAUSE ([ZS], [BECOME ([LISI], [BORED])]) AFF ([ZS], [LISI]) [BY [JUMP ([ZS]) AFF ([ZS], [LISI])]]	[CAUSE ([ZS], [BECOME ([LISI], [BORED])]) AFF (, [LISI]) [BY [JUMP ([LISI]) AFF ([LISI],)]]

Fig. 26: Processed: *Zhangsan tiao-fan le Lisi*

Semantic compatibility requires that animacy be shared between LISI and BORED in Types I and III. Additionally, animacy must be shared between ZS and JUMP in Type I, and LISI and JUMP in Type III. Both representations above meet this requirement. However, Type III is ruled out by the Direct Causation Constraint of (162) to be discussed later. Thus Type I is the only choice.

To further illustrate how unification works, let's take a look at the Type IIIa resultative in (5a), repeated below:

(121) Zhe zhong yao hui chi-si ren.

this kind medicine may eat-dead person

"This kind of medicine kills."

After the input *zhe zhong yao* "this kind of medicine" (with semantic content abbreviated as MED) is unified with the four Resultative Templates, we have:[33]

[33] For brevity we ignore the details of unification of the constituents inside the noun phrase *zhe zhong yao* "this kind of medicine".

Type I: $\begin{bmatrix}\text{CAUSE}\ ([\text{MED}],\ [\text{BECOME}\ ([\beta]^j,\ [\ ]^l)]) \\ \text{AFF}\ ([\text{MED}],\ [\beta]) \\ \begin{bmatrix}\text{BY} & \begin{bmatrix}\text{V}_k\ ([\text{MED}],\ \{[\delta]\}) \\ \text{AFF}\ ([\text{MED}],\ [\beta])\end{bmatrix}\end{bmatrix}\end{bmatrix}$	Type II: $\begin{bmatrix}\text{CAUSE}\ ([\text{MED}],\ [\text{BECOME}\ ([\text{MED}],\ [\ ]^l)]) \\ \text{AFF}\ ([\text{MED}],\ [\text{MED}]) \\ \begin{bmatrix}\text{BY} & \begin{bmatrix}\text{V}_k\ ([\text{MED}],\ \{[\delta]^j\}) \\ \text{AFF}\ ([\text{MED}],\ )\end{bmatrix}\end{bmatrix}\end{bmatrix}$
Type III: $\begin{bmatrix}\text{CAUSE}\ ([\text{MED}],\ [\text{BECOME}\ ([\beta]^j,\ [\ ]^l)]) \\ \text{AFF}\ (\ ,\ [\beta]) \\ \begin{bmatrix}\text{BY} & \begin{bmatrix}\text{V}_k\ ([\gamma],\ \{[\text{MED}]\}) \\ \text{AFF}\ ([\beta]^\gamma,\ )\end{bmatrix}\end{bmatrix}\end{bmatrix}$	Type IV: $\begin{bmatrix}\text{CAUSE}\ ([\alpha],\ [\text{BECOME}\ ([\text{MED}],\ [\ ]^l)]) \\ \text{AFF}\ ([\alpha],\ [\text{MED}]) \\ \begin{bmatrix}\text{BY} & \begin{bmatrix}\text{V}_k\ ([\gamma],\ \{[\delta]\}) \\ \text{AFF}\ ([\alpha]^\gamma,\ [\text{MED}])\end{bmatrix}\end{bmatrix}\end{bmatrix}$

Fig. 27: Processed: *Zhe zhong yao*

At this stage, no semantic checking is needed. Then the verbal parts *hui chi-si* "may eat-dead" are unified with the representation above. Ignoring the modal *hui* "may", we have the following representation:

Type I: $\begin{bmatrix}\text{CAUSE}\ ([\text{MED}],\ [\text{BECOME}\ ([\beta]^j,\ [\text{DEAD}])]) \\ \text{AFF}\ ([\text{MED}],\ [\beta]) \\ \begin{bmatrix}\text{BY} & \begin{bmatrix}\text{EAT}\ ([\text{MED}],\ \{[\delta]\}) \\ \text{AFF}\ ([\text{MED}],\ [\beta])\end{bmatrix}\end{bmatrix}\end{bmatrix}$	Type II: $\begin{bmatrix}\text{CAUSE}\ ([\text{MED}],\ [\text{BECOME}\ ([\text{MED}],\ [\text{DEAD}])]) \\ \text{AFF}\ ([\text{MED}],\ [\text{MED}]) \\ \begin{bmatrix}\text{BY} & \begin{bmatrix}\text{EAT}\ ([\text{MED}],\ \{[\delta]^j\}) \\ \text{AFF}\ ([\text{MED}],\ )\end{bmatrix}\end{bmatrix}\end{bmatrix}$
Type III: $\begin{bmatrix}\text{CAUSE}\ ([\text{MED}],\ [\text{BECOME}\ ([\beta]^j,\ [\text{DEAD}])]) \\ \text{AFF}\ (\ ,\ [\beta]) \\ \begin{bmatrix}\text{BY} & \begin{bmatrix}\text{EAT}\ ([\gamma],\ \{[\text{MED}]\}) \\ \text{AFF}\ ([\beta]^\gamma,\ )\end{bmatrix}\end{bmatrix}\end{bmatrix}$	Type IV: $\begin{bmatrix}\text{CAUSE}\ ([\alpha],\ [\text{BECOME}\ ([\text{MED}],\ [\text{DEAD}])]) \\ \text{AFF}\ ([\alpha],\ [\text{MED}]) \\ \begin{bmatrix}\text{BY} & \begin{bmatrix}\text{EAT}\ ([\gamma],\ \{[\delta]\}) \\ \text{AFF}\ ([\alpha]^\gamma,\ [\text{MED}])\end{bmatrix}\end{bmatrix}\end{bmatrix}$

Fig. 28: Processed: *Zhe zhong yao hui chi-si*

Since the external argument of *chi* "to eat" is animate and *zhe zhong yao* "this kind of medicine" is inanimate, Type I and Type II are ruled out owing to semantic incompatibility.

Type IV is also ruled out because DEAD cannot be predicated of MED, which is inanimate. The only choice is Type III resultative, which is illustrated below, after the grammatical object *ren* "people" is unified with the previous structure via the index *j*.

$$\begin{bmatrix} \text{CAUSE ([MED], [BECOME ([PEOPLE], [DEAD])])} \\ \text{AFF (, [PEOPLE])} \\ \begin{bmatrix} \text{BY} \begin{bmatrix} \text{EAT ([PEOPLE], [MED])} \\ \text{AFF ([PEOPLE],)} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Fig. 29: Processed: *Zhe zhong yao hui chi-si ren*

Therefore, from the demonstration in this section, we see that a Parallel Architecture model of language processing is promising on both theoretical grounds and language facts.

4.7 The General Resultative Template

The Resultative Templates of the four types of Mandarin RVC constructions can be merged into a general Resultative Template shown below:

$$\begin{bmatrix} \text{CAUSE } ([\alpha], [\text{BECOME } ([\beta], [\ ]^{l})]) \\ \text{AFF } (\{[\alpha]\}, [\beta]) \\ \begin{bmatrix} \text{BY} \begin{bmatrix} \text{V}_k\ ([\gamma], \{[\delta]\}) \\ \text{AFF } (\{[\ ]\}, \{[\ ]\}) \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Fig. 30: The General Resultative Template

This Resultative Template can be paraphrased as: "A causal relation exists between α (which is invariably a Causer and optionally an Actor) and β (which is invariably a Causee and a Patient) with a means denoted by the verb V_k whose arguments are linked to α and β in whatever way semantic compatibility allows."

Below we present more schematic representations of Mandarin Resultative Templates discussed in the previous sections. In the schematic representations, the upper half of the figure shows the *constructional* part with two constructional arguments: *Causer* and *Causee*. The lower half shows the *verbal* part with verbal arguments denoted by Ag (the external one) and Pt (the internal one). Ag and Pt stand for *Agent* and *Patient* in the sense of Dowty's (1991) Proto-Agent and Proto-Patient with contributing properties of Agent Proto-Role and Patient Proto-Role listed below (p. 572):

(122) Contributing properties for the Agent Proto-Role:

a. volitional involvement in the event or state

b. sentience (and/or) perception

c. causing an event or change of state in another participant

d. movement (relative to the position of another participant)

(e. exists independently of the event named by the verb)

(123) Contributing properties for the Patient Proto-Role:

a. undergoes change of state

b. incremental theme

c. causally affected by another participant

d. stationary relative to movement of another participant

(e. does not exist independently of the event, or not at all)

Thus, for transitive verbs we have two arguments: Ag and Pt, and for intransitive verbs we have one argument: Ag for unergatives, or Pt for unaccusatives. The arrows from Causer to Causee or from Ag to Pt can be regarded as "transmission of forces", though they actually have different senses. The three schematic representations for Type I Resultative Templates are shown below:

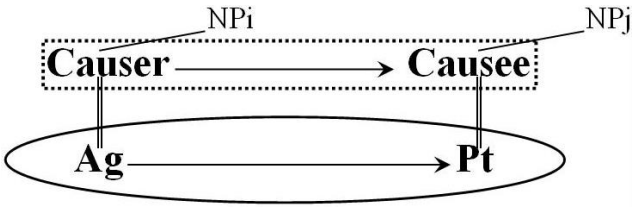

Fig. 31: Schematic Type Ia

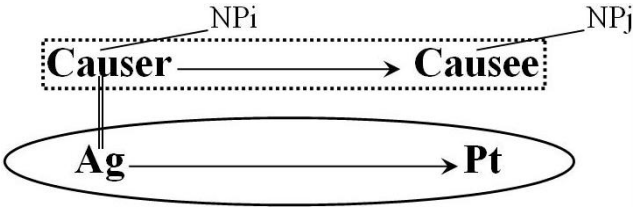

Fig. 32: Schematic Type Ib

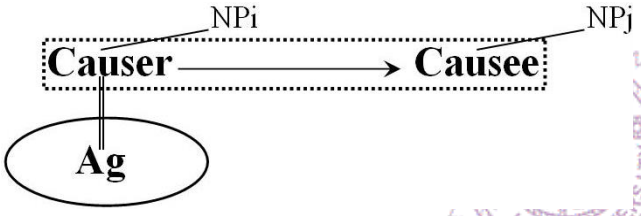

Fig. 33: Schematic Type Ic

The dotted rectangle defines the realm of the Resultative Template. The mapping principles are shown directly by straight lines connecting constructional arguments to noun phrases: the Causer is mapped to NP_i, while the Causee is mapped to NP_j. The scope of the verb is expressed by an oval shape. The double line indicates the co-indexation of a constructional argument with a verbal argument. Likewise, the schematic representations for Type II are shown below:

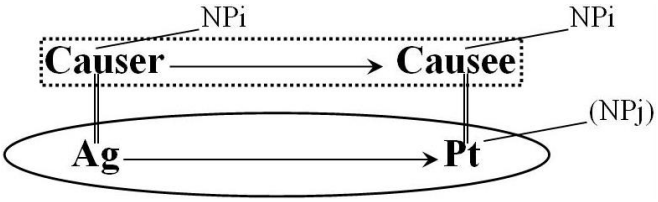

Fig. 34: Schematic Type IIa

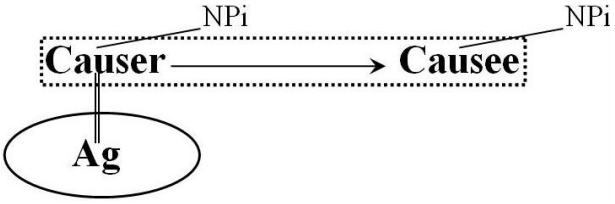

Fig. 35: Schematic Type IIb

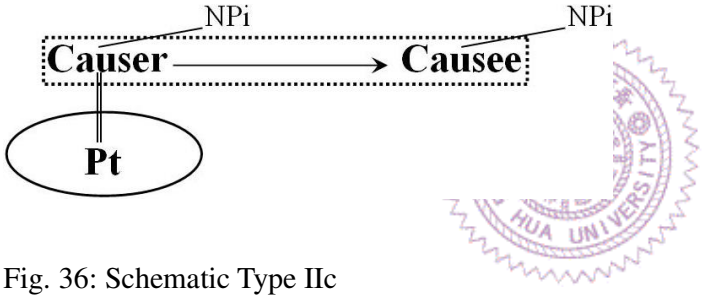

Fig. 36: Schematic Type IIc

Mapping in Type II is different from that in Type I: in Type II, both the Causer and the Causee are mapped to NP_i. Additionally, Pt (in Type IIa only) is mapped to the optional NP_j. Similarly, we have the following schematic representations for Type III resultatives:

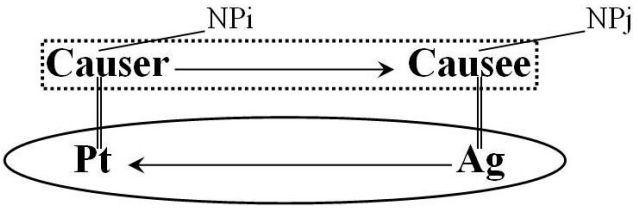

Fig. 37: Schematic Type IIIa

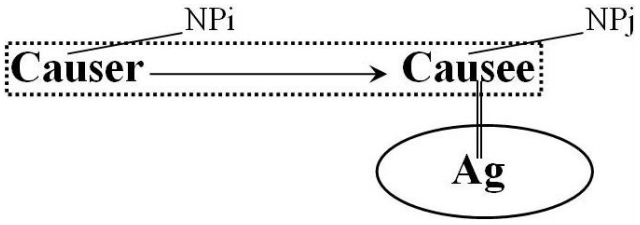

Fig. 38: Schematic Type IIIb

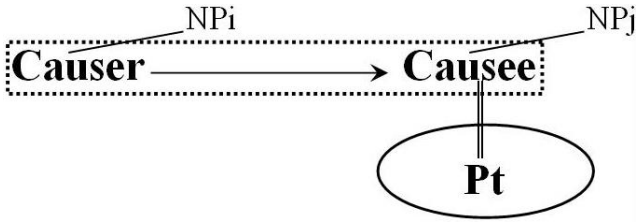

Fig. 39: Schematic Type IIIc

In Type III resultatives, the mapping is the same as that in Type I resultatives: the Causer is mapped to NP_i and the Causee NP_j. They differ in the connection between constructional arguments and verbal arguments: the Agent and the Patient are connected with the Causee and the Causer respectively in Type IIIa, inverse to the connection in Type Ia. In Type IIIb and Type IIIc, the only argument (Ag or Pt) is connected to the Causee (instead of the Causer as in Type I resultatives).

Type IV resultatives are derivative of Type I ones, and thus they only differ in the mapping: the Causee is mapped to the subject position NP_i, and the Causer is unexpressed.

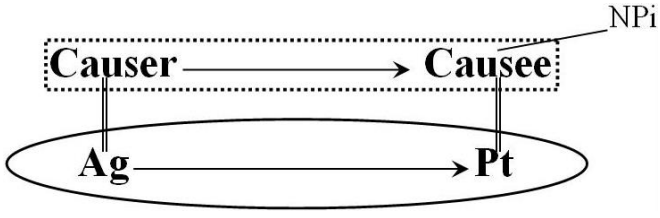

Fig. 40: Schematic Type IVa

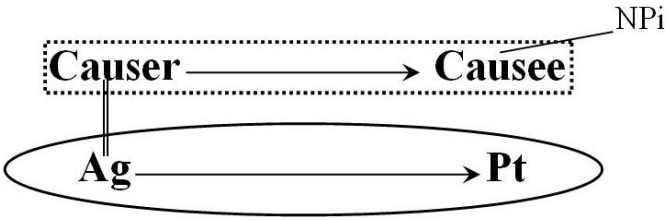

Fig. 41: Schematic Type IVb

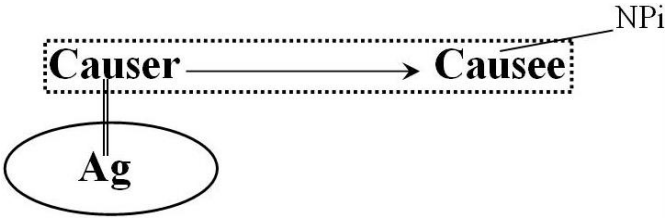

Fig. 42: Schematic Type IVc

Based on the way constructional arguments are mapped, we list the three different kinds of Resultative Templates below.

Fig. 43: Schematic Resultative Templates in Type I and Type III

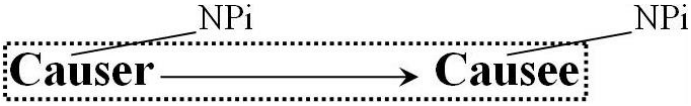

Fig. 44: Schematic Resultative Templates in Type II

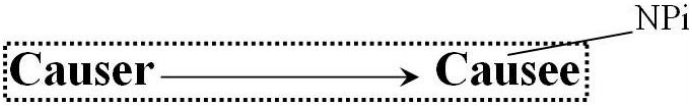

Fig. 45: Schematic Resultative Templates in Type IV

And thus the most general form of a Mandarin RVC construction contains two constructional arguments, the Causer and the Causee. The causal relation is essential in all kinds of RVC constructions in Mandarin.[34]

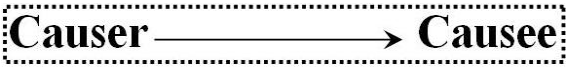

Fig. 46: The General Resultative Template

[34] Prof. Mei-chun Liu suggests that only two constructions are needed to account for the data in Mandarin RVCs. The first, a transitive construction, has an Affecter in the subject position and an Affectee in the object position (optionally); the second, an intransitive one, has an Affectee in the subject position.

(vii) NP1 Vc-Vr (NP2)
Affecter (Affectee)
(viii) NP1 Vc-Vr
Affectee

I appreciate her suggestion and agree with her observation, which is a good generalization of our data. However, in order to clarify the predication relations and intricate semantics involved, the models proposed in this chapter are still indispensable.

Chapter 5 Alternations and Operations

The four types of Mandarin RVC constructions discussed in the previous chapter are related by alternations and operations, which will be discussed in this chapter. We will also discuss constraints on verb classes and referentiality for the different types of resultative constructions.

5.1 Alternations in Mandarin RVCs

There are two superficially similar alternations: *unspecified object alternations* and *transitive-causative alternations*, both of which have intransitive and transitive uses of the forms below:

(124) a. NP1 Vc-Vr

b. NP1 Vc-Vr NP2

They must be distinguished according to predication relation of each component verb with surface arguments (grammatical subject and object). The two alternations are not fully productive, and their restrictions will be discussed too.

5.1.1 Unspecified Object Alternations

Levin (1993) discusses unexpressed object alternations which are a type of transitivity alternations "where the subject of the transitive use of the verb bears the same semantic relation to the verb as the subject of the intransitive use does" (p. 33). "The intransitive variant in each of these alternations involves an unexpressed but understood object" (ibid.). One subtype of unexpressed object alternations is "unspecified object alternations". Instances of this alternation usually involve activity verbs such as *eat*, as shown in the example below (ibid.):

(125) a. Mike ate the cake.

b. Mike ate. (→Mike ate a meal or something one typically eats.)

Rappaport Hovav and Levin (1998) propose that the possibility of object omission is conditioned by event structures of verbs: while manner verbs may omit their objects, result verbs cannot. Goldberg (2001) argues that even causative (resultative) verbs may have their objects omitted under certain circumstances. She summarizes the constraints on patient omission in terms of a principle of Omission under Low Discourse Prominence (Goldberg 2001: 514):[35]

(126) Omission of the patient argument is possible when the patient argument is construed to be deemphasized in the discourse vis-à-vis the action. That is, omission is possible when the patient argument is not topical (or focal) in the discourse, and the action is particularly emphasized (via repetition, strong affective stance, discourse topicality, contrastive focus, etc.).

Usually, objects of causative verbs cannot be omitted. However, the principle explains the omission of objects of some causative verbs under some circumstances illustrated below. The objects in the examples are nonspecific, and the sentences have a repetitive/generic/habitual sense (p. 506):

(127) a. The chef-in-training chopped and diced all afternoon.

b. Tigers only kill at night.

c. The singer always aimed to dazzle/please/disappoint/impress/charm.

Many subject-oriented resultatives (Type II) in Mandarin also exhibit this alternation, while object-oriented resultatives (Type I) do not:

[35] Onozuka (2007) further argues that object omission is not so much sensitive to the distinction of causative and noncausative verbs and therefore it fails to be a good diagnostic tool for their differentiation.

(128) a. Ta chi-bao (fan) le.[36]

s/he eat-full (rice) ASP

"S/He ate (meal) and got full."

b. Ta he-zui (jiu) le.

s/he drink-drunk (wine) ASP

"S/He drank (wine) and got drunk."

c. Zhangsan xie-lei (lunwen) le.

Zhangsan write-tried thesis ASP

"Zhangsan wrote (a thesis) and got tired."

(129) a. Ta ku-shi le *(shoupa).

s/he cry-wet ASP hankie

Intended: "S/He cried so much that something (e.g. the hankie) got wet."

b. Ta ca-gan le *(zhuozi).

s/he wipe-dry ASP table

Intended: "S/He wiped something (e.g. the table) dry."

c. Ta ti-po le *(qiuxie).

s/he kick-worn ASP sneakers

Intended: "S/He kicked (e.g. a ball) and something (e.g. the sneakers) wore out."

[36] Prof. Mei-chun Liu pointed out the similarity between cognate objects and objects in *chi-bao (fan)* "eat-full rice" and *he-zui (jiu)* "drink-drunk wine". Although in both cases the object is optional, they still have the following differences: (i) a cognate object as in *He laughed a bitter laugh* have the same form as the verb, while *chi* "to eat" and *fan* "rice" on the one hand, and *he* "to drink" and *jiu* "wine" on the other hand, are not of the same form; (ii) the verb of a cognate object is usually intransitive, while the verbs *chi* "to eat" and *he* "to drink" are optionally transitive; (iii) a cognate object can (and sometimes must) be preceded by an adjective and together them function like an adverbial modifier, while the objects *fan* "rice" and *jiu* "wine" are generic in meaning and cannot be modified.

We argue that the host of the result in an RVC is the focus in the discourse and thus the objects in Type II resultatives can be omitted, while those in Type I cannot, under the principle of Omission under Low Discourse Prominence in (126).

The following alternation shows that while (130a) is ambiguous in having both subject-oriented and object-oriented readings, (130b) can only have the subject-oriented reading. This further supports our idea of the requirement of a subject-oriented reading.

(130) a. Ta qi-lei le ma.

s/he ride-tired ASP horse

(i) "S/He rode the horse and got tired." (subject-oriented)

(ii) "S/He rode the horse and it got tired." (object-oriented)

b. Ta qi-lei le.

s/he ride-tired ASP

"S/He rode her/himself tired." (subject-oriented)

However, there are sentences with subject-oriented readings that cannot undergo unspecified object alternation:

(131) a. Ta chi-ni le hanbao.

s/he eat-bored ASP hamburger

"S/He was fed up with hamburgers."

b. *Ta chi-ni le.

s/he eat-bored ASP

Intended: "S/He was fed up with some kind of food."

Therefore, semantic recoverability is also a factor in this alternation: While in (128a) and (128b), the objects are generic (*fan* here means meal, not limited to rice; *jiu* here means anything that can make people drunk, not limited to wine) and can be implied by the verbs

(*chi* "to eat" and *he* "to drink"), in (131) the object cannot be recovered from the verb alone.

5.1.2 Transitive-Causative Alternations

In Mandarin, transitive-causative alternations (which have no English equivalents) must be distinguished from unspecified object alternations, though they are superficially similar. In transitive-causative alternations, the subject-oriented reading in the intransitive version does not express the same scenario as the object-oriented reading in the transitive version. This is in contrast with the unspecified object alternation such as (128), where the intransitive use and its transitive counterpart can be used to express the same scenario. A typical example of the transitive-causative alternation is shown below:

(132) a. Zhangsan ku-fan le.

Zhangsan cry-annoyed ASP

"Zhangsan cried (so much) that s/he her/himself got annoyed."

b. Zhangsan ku-fan le Lisi.

Zhangsan cry-annoyed ASP Lisi

"Zhangsan cried (so much) that Lisi got annoyed."

Here there are two distinct scenarios: in (132a), it is Zhangsan who cried and got annoyed; in (132b), it is Zhangsan who cried and it is Lisi who got annoyed. Hence the transitive-causative alternations must be distinguished from unspecified object alternations.

In Cheng and Huang (1994: 198), active RVCs receive the following trichotomy: unergative RVCs (e.g. *xiao-lei* "laugh-tired"), transitive RVCs (e.g. *ku-shi* "cry-wet"), and mixed RVCs (e.g. *ku-fan* "cry-annoyed").[37]

[37] In Cheng and Huang (1994: 198), *he-zui* "drink-drunk" and *chi-bao* "eat-full" are classified as mixed RVCs, despite the fact that they involve unspecified object alternations instead of transitive-causative alternations.

I argue that this trichotomy is nothing more than an epiphenomenon, and thus is untenable. Instead, I propose that semantic restrictions on predication and pragmatic considerations play a role in determining the transitivity of RVCs. First, consider the unergative RVC in (133) and the mixed RVC in (132), repeated in (134):

(133) a. Zhangsan xiao-lei le.

Zhangsan laugh-tired ASP

"Zhangsan laughed (so much) that s/he her/himself got tired."

b. *Zhangsan xiao-lei le Lisi.

Zhangsan laugh-tired ASP Lisi

Intended: "Zhangsan laughed (so much) that Lisi got tired."

(134) a. Zhangsan ku-fan le.

Zhangsan cry-annoyed ASP

"Zhangsan cried (so much) that s/he her/himself got annoyed."

b. Zhangsan ku-fan le Lisi.

Zhangsan cry-annoyed ASP Lisi

Zhangsan cried (so much) that Lisi got annoyed."

In terms of predication relation, both *xiao* "to laugh" and *lei* "tired" can be predicated of human beings, so there is no reason that (133b) is unacceptable. It is pragmatic considerations that exclude this sentence: it is unlikely that one's laughing (so much) can make someone else tired.

On the contrary, both *ku* "to cry" and *fan* "annoyed" can be predicated of human beings, and both sentences in (134) are acceptable. Pragmatic inferencing here allows such a scenario: one cried so much that someone else got annoyed. Now consider the transitive RVC below:

(135) a. *Zhangsan ku-shi le.

Zhangsan cry-wet ASP

Intended: "Zhangsan cried (so much) that s/he her/himself got wet."

b. *Zhangsan ku-shi le Lisi.

Zhangsan cry-wet ASP Lisi

Intended: "Zhangsan cried (so much) that Lisi got wet."

c. Zhangsan ku-shi le shoupa.

Zhangsan cry-wet ASP hankie

"Zhangsan cried (so much) that the hankie got wet."

The result *shi* "wet" can be predicated of inanimate beings only, thus no NPs can be the semantic host of the result *shi* "wet" in (135a) and (135b).[38] On the contrary, (135c) is acceptable because the grammatical object *shoupa* "hankie" is inanimate and thus semantically compatible with *shi* "wet".

Thus semantic compatibility and pragmatic inferencing play an important role in determining the acceptability of Mandarin RVC constructions, as shown in the transitive-causative alternations here. To sum up, we have argued for the distinction between unspecified object alternations and transitive-causative alternations in this section. Their difference can be schematized by the predication relations below:[39]

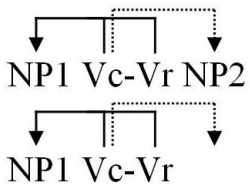

Fig. 47: Predication Relations: Unspecified Object Alternations

[38] In the case of animate beings, an adverbial *quanshen* "of the whole body" or some body part must follow the NP denoting that animate being. E.g. *Ta [quanshen/jiao] shi le* "S/He got wet (on the feet)."

[39] The dotted line represents the logical object relation between Vc and the NP it is predicated of.

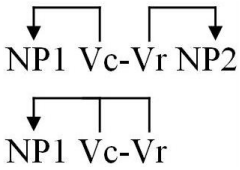

Fig. 48: Predication Relations: Transitive-Causative Alternations

In unspecified object alternations, Vc must be transitive, and both the transitive and the intransitive versions belong to Type IIa resultatives. In transitive-causative alternations, Vc must be unergative, and the transitive and the intransitive versions belong to Type Ic and Type IIb, respectively.

5.2 Operations in Mandarin RVCs

In Mandarin RVCs, there are two superficially reverse operations: *causativization* and *deagentivization*.[40] Causativization operates between Type II and Type III resultatives, while deagentivization operates between Type I and Type IV resultatives.

5.2.1 Causativization

Causativization involves 'verbs with transitive and intransitive uses, where the transitive use of a verb V can be paraphrased as roughly "cause to V-intransitive"' (Levin 1993: 26-27). One subtype of causativization is the causative/inchoative alternation illustrated below (p. 29):[41]

[40] The term *operation* does not presuppose a derivational approach; it only means that a relation (adding a cause, or removing an agent) exists between more unmarked domains (Type II and Type I) and less unmarked ones (Type III and Type IV). On the contrary, the term *alternation* means that a relation exists within more unmarked domains (Type I and Type II).

[41] For causative/inchoative alternations in Mandarin, see Tang (2002). For their behaviors in Mandarin and Japanese, see Mochizuki (2004).

(136) a. The cup broke.

b. Janet broke the cup.

Many resultatives with unaccusative verbs (denoting states or change of states) as Vc's undergo this alternation, as in (137) and (138):

(137) a. Ta zui-dao le.

s/he drunk-fallen ASP

"S/He got so drunk that s/he fell down."

b. Zhe ping jiu zui-dao le ta.

this bottle wine drunk-fallen ASP s/he

"This bottle of wine caused her/him to get so drunk that s/he fell down."

(138) a. Ta lei-huai le.

s/he tired-bad ASP

"S/He was exhausted."

b. Zhe zhong cuzhong de gongzuo lei-huai le ta.

this kind heavy ASF work tired-bad ASP s/he

"This kind of heavy work made her/him exhausted."

However, those with transitive or unergative verbs (denoting activities) as Vc's can also undergo this alternation, as illustrated in (139) and (140):

(139) a. Ta he-zui le.

s/he drink-drunk ASP

"S/He got drunk from drinking."

b. Zhe ping jiu he-zui le ta.

this bottle wine drink-drunk ASP s/he

"This bottle of wine made her/him drunk from drinking."

(140) a. Ta pao-lei le.

s/he run-tired ASP

"S/He ran her/himself tired."

b. Zhe duan lu pao-lei le ta.

this CL road run-tired ASP s/he

"This road made her/him tired from running."

In Cheng and Huang's (1994) terms, both active RVCs and non-active RVCs can undergo causativization. Therefore, it seems that the possibility of adding an external Causer in Mandarin resultatives is not conditioned by the properties of Vc's (such as event type or unaccusativity) but by some other factor(s) instead. In previous works of Mandarin resultatives, restrictions on causative/inchoative alternations are left unmentioned. Obviously, this alternation is not fully productive:

(141) a. Nei bei jiu zui-dao le Zhangsan.

that cup wine drunk-fallen ASP Zhangsan

"That cup of wine made Zhangsan so drunk that s/he fell."

b. *Lisi zui-dao le Zhangsan.

Lisi drunk-fallen ASP Zhangsan

Intended: "Lisi made Zhangsan so drunk that s/he fell."

c. Nei duan lu pao-lei le Zhangsan.

that CL road run-tired ASP Zhangsan

"That road made Zhangsan run her/himself tired."

d. *Lisi pao-lei le Zhangsan.

Lisi run-tired ASP Zhangsan

Intended: "Lisi made Zhangsan run her/himself tired."

We propose that the possibility of causativization is determined by the nature of causation involved. We return to this issue in Chapter 6.

5.2.2 Deagentivization

Deagentivization involves the suppression of an agent. It is neither passivization (since there is no passive marker such as *bei* or *zao*) nor middle constructions (since episodic readings are possible, as opposed to ordinary middle constructions). Type I resultatives in (3) and Type IV resultatives in (7) are in a relation of deagentivization, repeated below:

(142) a. Ta ca-gan le zhuozi.

s/he wipe-dry ASP table

"S/He wiped the table dry."

b. Ta ti-po le qiuxie.

s/he kick-worn ASP sneakers

"S/He kicked (something, e.g. a ball) and had the sneakers worn out."

c. Ta ku-shi le shoupa.

s/he cry-wet ASP hankie

"S/He cried (so much) that the hankie got wet."

(143) a. Zhuozi ca-gan le.

table wipe-dry ASP

"The table was wiped dry."

b. Qiuxie ti-po le.

sneakers kick-worn ASP

"The sneakers wore out from kicking."

c. Shoupa ku-shi le.

hankie cry-wet ASP

"The hankie got wet from someone's crying."

Deagentivization is unique in Mandarin as we found no such counterparts in English. Even though the agent is suppressed in Type IV resultatives, the agentive sense still exists, since the agentive Vc can tell us how the result is brought about.

To sum up, the two operations in Mandarin RVC constructions, causativization and deagentivization, can be schematized by the predication relations below:[42]

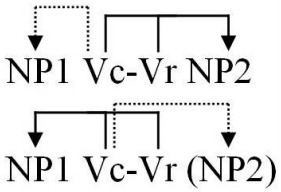

Fig. 49: Predication Relations: Causativization

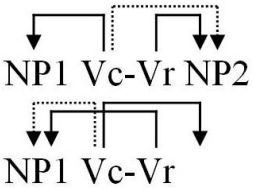

Fig. 50: Predication Relations: Deagentivization

5.3 Constraints on Verb Classes

Not all verbs can enter a given type of RVC constructions. Each type of RVC constructions has its own constraints on what kind of verbs can fit into it. In this section we

[42] Again, the dotted line represents the logical object relation between Vc and the NP it is predicated of. In Causativization and Deagentivization, the Vc may be either transitive or intransitive, and thus the dotted lines can be either present or absent.

discuss the constraints concerning verb classes.

5.3.1 Type I Resultatives

A Type I resultative, by definition, requires that the subject of an RVC construction be the logical subject of Vc. Thus, the subject can be the agent of the causing event (for transitive or unergative verbs) or the patient (or experiencer or undergoer) of the causing event (for unaccusative verbs). As we have shown, a transitive verb or an unergative verb can occur in Type I resultatives. We now check whether unaccusative verbs can occur in Type I resultatives. Compare the following examples:

(144) a. Dashu ya-si le xuduo ren.

big:tree press-dead ASP many people

"The big tree's pressing caused many deaths."

b. *Dashu dao-si le xuduo ren.

big:tree fall-dead ASP many people

Intended: "The big tree's falling caused many deaths."

c. Lisi lei-si le Zhangsan.

Lisi tired-dead ASP Zhangsan

"Lisi made Zhangsan tired to death." (Not: "Lisi's being tired killed Zhangsan.")

(144a) and (144b) differ in Vc's only (*ya* "to press" is transitive and *dao* "to fall" is unaccusative), but they are different in acceptability. It is logically possible that the tree's falling causes people to die, yet this sentence is ungrammatical.

The verb *lei* "to be tired" in (144c) is also unaccusative. This example is grammatical in the sense that it is the object *Zhangsan*, rather than the subject *Lisi*, that got tired. Thus (144c) belongs to Type III resultatives rather than Type I resultatives. The sense "Lisi's being tired killed Zhangsan" is by no means an option, though it is logically possible.

From the observation above, we conclude that in a Type I resultative, Vc must be either transitive or unergative.[43]

5.3.2 Type II and Type III Resultatives

The Vc's in the three subtypes of Type II resultatives, Type IIa, Type IIb, and Type IIc, are transitive, unergative, and unaccusative, respectively. Thus Type II resultatives allow all kinds of verbs.

Likewise, the Vc's in the three subtypes of Type III resultatives, Type IIIa, Type IIIb, and Type IIIc, are transitive, unergative, and unaccusative, respectively. Thus Type III resultatives allow all kinds of verbs.

5.3.3 Type IV Resultatives

In principle, those verbs allowed in Type I resultatives should be able to occur in Type IV resultatives. However, there are cases where a Type I resultative is allowed while its Type IV equivalent is unacceptable. The rescue is to insert a passive marker *bei*:

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[43] There is, however, an example of Type I resultatives with an accusative Vc mentioned in Huang (2006: 39):

(ix) Zhangsan bing-ji le ta-de jiaren.
Zhangsan sick-anxious ASP his family
"Zhangsan got so sick that his family became anxious."

This sentence is not acceptable at least for some native speakers of Mandarin in Taiwan. A possible reason is that Type I resultatives are *event causatives* in the sense of S. Huang (1974) which requires an agentive (usually transitive or unergative) verb as Vc. The example here is a *factive causative* rather than an event causative as it can be paraphrased as:

(x) Zhangsan de bing ji-si le ta-de jiaren.
Zhangsan POS sickness anxious-dead ASP his family
"Zhangsan's sickness made his family very anxious."

(145) a. Dashu ya-si le xuduo ren. (=(144a))

big:tree press-dead ASP many people

"The big tree's pressing caused many deaths."

b. *Xuduo ren ya-si le.

many people press-dead ASP

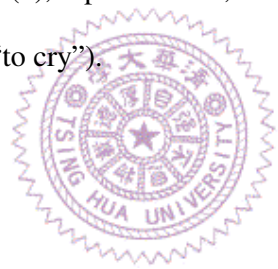
Intended: "Many people died of being pressed."

c. Xuduo ren bei ya-si le.[44]

many people BEI press-dead ASP

"Many people died of being pressed."

It seems that highly transitive verbs like *ya* "to press" cannot occur in Type IV resultatives. However, the verbs in (7), repeated here, are mostly highly transitive too: *ca* "to wipe" and *ti* "to kick" (but not *ku* "to cry").



(146) a. Zhuozi ca-gan le.

table wipe-dry ASP

"The table was wiped dry."

b. Qiuxie ti-po le.

sneakers kick-worn ASP

"The sneakers wore out from kicking."

c. Shoupa ku-shi le.

hankie cry-wet ASP

"The hankie got wet from someone's crying."

We propose that highly transitive verbs can occur in Type IV resultatives, as long as the grammatical subject cannot be construed as the logical subject of Vc. In (146a), *zhuozi*

[44] This example expresses a highly adverse scenario, which might be the reason that omission of the passive marker *bei* is not preferred.

"table" is the logical object, not the logical subject, of *ca* "to wipe". In (146b), *qiuxie* "sneakers" is not related to the verb *ti* "to kick", let alone being its logical subject. This constraint is to avoid ambiguity. In (145b), *xuduo ren* "many people" has the potential of being the logical subject of *ya* "to press". Since speakers of a language tend to avoid ambiguity, this sentence in (145b) is cleverly excluded.

More examples that support our proposal are shown below. The following are intended to be Type IV resultatives, but are unacceptable. The grammatical subject and Vc are semantically compatible. In (147a), *daitu* "bandit" is animate and thus can be the logical subject of *sha* "to kill". A possible interpretation of this sentence is "the bandit killed (someone)", though it might sound incomplete. The same reasoning applies to (147b).

(147) a. *Daitu sha-si le.

bandit kill-dead ASP

Intended: "The bandit was killed."

b. *Yi ge xingren zhuang-si le.

one CL pedestrian hit-dead ASP

Intended: "A pedestrian was hit and killed."

The following example supports our idea of the constraint on avoiding ambiguity. The subject *laoshu* "rat" cannot be construed as the logical subject of *yan* "to drown", and thus this sentence is grammatical.

(148) Laoshu yan-si le.

rat drown-dead ASP

"The rats were drowned."

Therefore, although Type IV resultatives allow both transitive and unergative verbs as Type I resultatives do, a further constraint is imposed on Type IV resultatives in order to avoid ambiguity.

5.3.4 Verbs That Cross Four Types

Unlike English, Mandarin rarely has monomorphemic verbs that dually express a result and the causation of that result:

(149) a. The enemy sank the boat.

b. The boat sank.

c. John broke the vase.

d. The vase broke.

(149a) and (149b) are in causative/inchoative alternations and so are (149c) and (149d). In Mandarin, such causative/inchoative alternations are usually expressed by RVCs. There are, however, two monomorphemic (and at the same time monosyllabic) verbs that parallels the English verbs *sink* and *break*:

(150) a. Wo hen lei.

I very tired

"I am tired."

b. Zhe jian gongzuo hen lei ren.

this CL task very tire people

"This task is tiring."

c. Ta hen qi.

s/he very angry

"S/He is angry"

d. Ta guyi qi mama.

s/he on:purpose anger mom

"S/He annoyed her/his mom on purpose."

The two causative verbs *lei* "to tire" and *qi* "to anger" can as well be viewed as adjectives *lei* "tired" and *qi* "angry", making it difficult to classify them when they occur in RVCs. A pair of sentences with the inchoative/causative alternations is shown below:

(151) a. Kai le zhengtian de hui zhenshi lei huai dajia le.

open ASP all:day POS meeting really tire-bad everyone ASP

"Having meetings all day made everyone extremely tired."

b. Dajia dou lei-huai le.

Everyone all tire-bad ASP

"Everyone is extremely tired."

If the causative sense is basic, then we have a Type I-Type IV alternation. If the inchoative sense is basic, then we have a Type II-Type III alternation. It is insignificant which sense is basic.[45] The four-way distinction proposed here becomes a two-way distinction, though such verbs are lexically limited. An important virtue of Mandarin is that the subject of an RVC is not necessarily the subject of Vc (as in the case of Type III and Type IV resultatives). And it is this property (together with, perhaps, the subject-oriented reading not readily available in English) that makes Mandarin resultatives so diverse.

[45] However, Levin and Rappaport Hovav (1995) argue that such verbs should be dyadic (i.e. the causative sense is basic) rather than monodic (i.e. the inchoative sense is basic).

5.4 Constraints on Referentiality

When compared with Type I and Type IV resultatives, Type II and Type III resultatives are more restricted in terms of referentiality. In Type II resultatives, the NP in the object position must be nondefinite or nonreferential. The following sentence, if restricted to subject-oriented reading, must have a nondefinite or nonreferential object.

(152) Zhangsan qi-lei le [∅ / *zhe pi / *yi pi / *san pi / *xuduo pi] ma.

Zhangsan ride-tired ASP [∅ / this CL / one CL / three CL / many CL] horse

"Zhangsan rode [∅ / *this / *one / *three / *many] horse(s) and got tired."

On the contrary, in Type III resultatives, the NP in the subject position must be definite or referential, as shown below:

(153) [Zhe ping / *yi ping / *san ping / *xuduo ping / *∅] jiu he-zui le Zhangsan.

[this CL / one CL / three CL / many CL / ∅] wine drink-drunk ASP Zhangsan

"[This bottle of / *One bottle of / *Three bottles of / *Many bottles of / *∅] wine made Zhangsan drunk from drinking."

Thus it seems that while Type II resultatives require the objects be nonreferential or nondefinite, Type III resultatives require the subjects be referential or definite.[46]

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[46] Prof. Feng-fu Tsao suggests that this is a more general constraint of subjects. I agree with him, observing the following examples:

(xi) *(You) yi ge ren qiao-po le huaping.

have one CL person knock-broken ASP vase

"One person broke the vase by knocking."

(xii) ?(Zhe) san ping jiu zui-dao le suoyou keren.

this three bottle wine drunk-fallen ASP all guest

"Three bottles of wine got all the guests so drunk that they fell down."

Type I and Type IV resultatives are not subject to this constraint. Thus the question is: Why Type II and Type III resultatives are subject to this constraint on referentiality?

From the perspective of markedness, Type I resultatives are more unmarked since the subjects and objects are Actors and Patients on the action tier. There is an isomorphic relation between the action tier (the AFF function) and the thematic tier (the CAUSE function). On the other hand, only the subject-Actor relation holds in Type II resultatives, and only the object-Patient relation holds in Type III resultatives. Thus Type II and Type III resultatives are more marked. Type IV resultatives are derivative of Type I resultatives and thus are free from these constraints as well.

Now the question can be paraphrased: why marked resultatives in Mandarin are subject to the constraint on referentiality, while unmarked ones are not? So far we do not have a satisfactory account and we leave it for further study.

In this chapter, we have shown that Mandarin RVC constructions are constrained in many ways. Resultatives are closely related to the concept of causation, which is the topic in the next chapter. We will discuss the nature of causation and see how Mandarin RVCs impose constraints on the properties of causation.

(xi) is unacceptable without the verb *you* "to have", which shows that Type I resultatives are not totally immune from the referentiality/definiteness constraint. (xii) is at worst marginally acceptable without *zhe* "this", showing that there are other factors involved, which we will not discuss here.

Chapter 6 Resultatives and Causation

Causation is essential to Mandarin RVC constructions, as we have shown in Chapter 4. It is a cover term for many different but related concepts. In this chapter, we discuss exactly what kind of causation plays a role in RVCs.

6.1 Formal and Semantic Properties of Causation

Causation can be tackled in terms of formal markings and semantic parameters. An earlier work of significance is Shibatani (1976), who distinguishes between *lexical causatives* and *productive causatives*.

He provides evidence against a generative semantic view which claims that the apparent synonymy of a lexical causative *kill* and a productive causative *cause to die* can be treated alike as their entailments and truth conditions are the same.[47]

He argues that the distinction should be made between the one-event causative situation and the two-event causative situation, the former expressed by lexical causatives while the latter by productive causatives (p. 15).

Two causative types exist: *manipulative* causation and *directive* causation (pp. 31-32). In English, the two kinds of causation are expressed by lexical and productive causatives, respectively. They are not synonymous as demonstrated below (p. 29, example (47)):

(154) a. I didn't stand the child up, but I caused him to stand up.

b. *I didn't cause the child to stand up, but I stood him up.

The verb *cause* allows both manipulative causation and directive causation, while *have/make/get* allow only directive causation. The observation is summarized below, along with a comparison with Japanese:

[47] Also see Fodor (1970) and Shibatani (1972).

		Causation Type	
		manipulative	directive
English	lexical	√	×
	cause	√	√
	have/make/get	×	√
Japanese	lexical	√	×
	-saseru	×	√

Table 4: Form-meaning Correlation of English and Japanese Causatives

It seems that the manipulative-directive distinction is isomorphic to the lexical vs. productive causatives. This is not always the case. Lexical causatives are by nature nonproductive, and where there are lexical gaps, productive causatives are used for manipulative causation. On the contrary, it is not uncommon that nonmanipulative causation involving conventionalized purposes associated with the causative situation can be expressed by lexical causatives.

Comrie (1989: 165-184) discusses causation based on formal and semantic parameters. Formally, there is a continuum from analytic causatives (e.g. *cause* and *have* in English) through morphological causatives (e.g. *–dir* in Turkish as in *öl* "die" vs. *öl-dür* "kill" with vowel harmony) to lexical causatives (e.g. intransitive *sink* vs. transitive *sink* in English). Semantically, a distinction is on direct and indirect causation. Another distinction is on the degree of control. Yet another distinction is on true causatives vs. permissives. It is easy to find correlation between formal and semantic parameters, as Comrie (1989: 172) puts it, "the continuum from analytic via morphological to lexical causative correlates with the continuum from less direct to more direct causation."

Dixon (2000: 33-41) provides a detailed discussion on formal markings of causatives. They can be (i) morphological processes; (ii) two verbs in one predicate; (iii) periphrastic causatives; (iv) lexical causatives; (v) exchanging auxiliaries. In terms of semantic distinctions, Dixon (2000: 62) provides nine parameters of causation: (i) relating to the verb:

state/action and transitivity; (ii) relating to the cause: control, volition, and affectedness; (iii) relating to causer: directness, intention, naturalness, and involvement.

Talmy's (2000) model of Force Dynamics provides a significant perspective on how entities interact under the cover term *causation*. The two entities are called the *Agonist* (the focal force entity) and the *Antagonist* (the force element that opposes it). Each entity has intrinsic force tendency of being toward action or being toward rest. The resultant of the force interaction is either *action* or *rest*, based on which entity is stronger. The Agonist interacts with Antagonist according to parametric variations. This model explains causation subtypes such as helping, letting, preventing, and overcoming.

Two temporally-dependent events are not necessary causally linked, yet temporal dependency is a necessary condition of causation. Causation involves two events: the *causing event* and the *caused* (or *resulting*) *event*, following Talmy (2000: 482).

S. Huang (1974) distinguishes between *event causatives* and *factive causatives*, exemplified below by (155a) and (155b), respectively:

(155) a. Zhangsan ba ta ti-si le.

Zhangsan BA s/he kick-dead ASP

"Zhangsan kicked him/her dead."

b. Zhaopian ba wo xia le yitiao.

picture BA I scare ASP one:jump

"The picture scared me so I jumped up."

While an event causative contains a causal link between an event and a state, the cause in a factive causative must be interpretable as a fact or fact-like entity, e.g. idea, notion, thought, motion, or proposal, etc. (S. Huang 1974: 360).

Another distinction is between *causative* constructions and *indirect imperative* sentences, the latter being exemplified by Mandarin examples below (Teng 1989: 229):[48]

(156) a. Wo cui ta gankuai jiao suode shui

I urge s/he quickly pay income tax

"I urged her/him to pay the income tax as soon as possible."

b. Women dou quan ta duo he yidiar jiu.

we all persuade s/he more drink a:little wine

"We all urged her/him to drink more wine."

c. Xuesheng qing ta qianming.

student ask s/he sign

"Those students asked her/him to sign her/his name."

In her diachronic study of causativization of verbs such as *shi*, *ling*, *jiao*, and *rang*, L. Chang (2005) uses the term *shi-yi* without English translation. The notion of *shi-yi* is roughly equivalent to indirect imperatives. A minimal pair of causative and *shi-yi* in terms of *jiao* "to call" is shown below:

(157) a. Jinbihuihuang de dating zhen jiao women kan-sha le yan.

splendid ASF lobby really ANC we look-dumbfounded ASP eye

"The splendid lobby really made us dumbfounded (when we saw it)."

b. Laoshi jiao xuesheng huida wenti.

teacher demand student answer question

"The teacher asked the student to answer the question."

[48] For causatives in Taiwanese Southern Min, see R. Cheng (1974) and Lien (1999). For diachronic studies of Chinese causatives, see Li and Thompson (1976) and L. Chang (2005), among others.

In this section, we have shown distinctions of causation based on different perspectives. The causative type in which someone asks someone else to do something receives different names: *directive* in Shibatani (1976); *indirect* causation in Comrie (1989); *indirect imperative* in Teng (1989); and *shi-yi* in L. Chang (2005). From now on, this causative type is termed *indirect causation* throughout. We will find this notion useful when we discuss the nature of causation in Mandarin RVC constructions in the next section.

6.2 Direct Causation in Type III Resultatives

In Type III resultatives (which are all causatives), Vc's can be transitive (Type IIIa), unergative (Type IIIb), or unaccusative (Type IIIc). The three subtypes, IIIa, IIIb, and IIIc, correspond to the three subtypes IIa, IIb, and IIc in terms of verb classes.

Since the intransitive Type IIc resultatives are related to Type IIIc resultatives, is it possible that Type IV resultatives, which are also intransitive, are related to Type IIIc resultatives?

In Cheng and Huang (1994: 215), *deep ergatives* (Type IIc in our classification) and *surface ergatives* (Type IV in our classification) are differentiated.

(158) a. Shoupa ku-shi le.

hankie cry-wet ASP

"The hankie got wet from someone's crying."

b. Qiqiu chui-po le.

balloon blow-broken ASP

"The balloon was popped."

c. Zhangsan lei-si le.

Zhangsan tired-dead ASP

"Zhangsan was exhausted."

d. Zhangsan zui-dao le.

Zhangsan drunk-fallen ASP

"Zhangsan was so drunk that s/he fell down."

They argue that, while deep ergatives such as (158c) and (158d) may undergo pure causativization, surface ergatives (158a) and (158b) may not. They claim that this difference on the possibility of causativization lies in that "once an argument has been dethematized, it cannot be thematized again" (ibid.). The following examples are supporting evidence:

(159) a. *Zhangsan ku-shi le shoupa.

Zhangsan cry-wet ASP hankie

Intended: "Zhangsan caused the hankie to be cried-wet."

b. *Zhe jian shi ku-shi le shoupa.

this CL matter cry-wet ASP hankie

Intended: "This matter caused the hankie to be cried-wet."

We agree with their observation. However, not all deep ergatives can be causativized. We argue that the nature of causation dominates the acceptability of causativization. To justify our claim, we demonstrate below that not all deep ergatives (Type IIc) and unergatives (Type IIb) can undergo causativization. First we look at examples of deep ergatives:

(160) a. Nei bei jiu zui-dao le Zhangsan.

that CL wine drunk-fallen ASP Zhangsan

"That glass of wine got Zhangsan so drunk that s/he fell down."

b. *Lisi zui-dao le Zhangsan.

Lisi drunk-fallen ASP Zhangsan

Intended: "Lisi got Zhangsan so drunk that s/he fell down."

The condition on causativization lies in the nature of causation, rather than verb classes. (160a) describes a situation of direct causation, while (160b) describes a situation of indirect causation. The instigator, Lisi, is not directly related to the becoming-drunk event. S/He only gives a verbal command, or forces Zhangsan to drink.[49]

This claim is further supported by causativization of Mandarin RVC constructions with unergative Vc's (the verb *pao* "to run" is unergative) below:

(161) a. Nei duan lu pao-lei le Zhangsan.

that CL road run-tired ASP Zhangsan

"That road made Zhangsan tired from running."

b. *Lisi pao-lei le Zhangsan.

Lisi run-tired ASP Zhangsan

"Lisi made Zhangsan tired from running."

Likewise, in (161a), *nei duan lu* "that road" is the location or path of the running event.[50] In (161b), *Lisi* is the instigator, external to the running event.[51] Thus both Type IIb

[49] The fact that one forces someone else to drink may seem to be manipulative in the sense of Shibatani (1976), but it is manipulative with respect to the action for forcing, not the state of being drunk, and thus the causation here is still indirect. On the contrary, the sentence below involves direct causation and belongs to Type Ia:

(xiii) Lisi guan-zui le Zhangsan.

Lisi pour-drunk ASP Zhangsan

"Lisi forced Zhangsan to drink so that s/he got drunk."

(Lit., "Lisi poured (wine) on Zhangsan so that s/he got drunk.")

[50] Prof. Feng-fu Tsao suggests that *nei duan lu* "that road" can be regarded as an *event* nominal (as opposed to ordinary *referential*, or *entity*, nominals), as replacing it with *nei tiao lu* "that road" (which is referential) leads to marginal acceptability. Prof. Cheng-hui Liu also indicates that *nei duan lu* "that road" is similar to the nominalization of [zhe yi V] "the V-ing event" (Lit., "this one V") which expresses an event, e.g. *zhe yi tiao* "the jumping" (Lit., "this one jump") and *zhe yi tuo* "the delay" (Lit., "this one delay").

[51] Prof. Mei-chun Liu comments that this sentence is not totally unacceptable if the wording is adjusted and the scenario provided. An athlete, after running (as demanded by the track and field coach), may tell the coach that *Ni zhenshi pao-si wo le* "You really made me tired from running". A web search by the author also yields an

resultatives (with unergative Vc's) and Type IIc resultatives (with unaccusative Vc's) are subject to some constraint concerning the nature of causation. Based on the definition of *indirect causation* in the previous section, the Direct Causation Constraint on Type III resultatives can be stated like this:

(162) Direct Causation Constraint: The causal relations involved in Type III resultatives must be *direct*. That is, the Causer cannot be a human instigator that gives verbal commands or forces someone else to do something, nor can it be an indirect cause of the event in question.

6.3 Semantic Structures of Causation

Jackendoff (1990: 43-44) lists some basic function-argument structures where the CAUSE function has two arguments: the first is either an Agent (if it is a "Thing") or a Cause (if it is an "Event"); the second is an Effect (an "Event"). The output of the CAUSE function has the semantic category "Event".

Jackendoff (2002: 363-64) revises the CAUSE function and proposes an additional three-argument version with semantic roles Agent, Patient, and Effect. (163a) has the two-argument version (163b); (163c) has the three-argument version (163d).

(163) a. The wind made it rain.

b. CAUSE (WIND, [$_{\text{Event}}$ IT-RAIN])

c. The wind made me fall down.

d. CAUSE (WIND, ME, [$_{\text{Event}}$ I FALL DOWN])

---

interesting sentence: *Hua hang ya! Ni pao-si wo le* "Oh China Airlines! You really made me tired from running", with a scenario in which a photographer ran after a jet plane in order to take pictures of it. Both examples above, however, are frowned at by at least some native speakers.

We will stick to the two-argument version since we found the role Patient to be not only inappropriate but also unnecessary. It is inappropriate when the "Patient" *him* is also an Agent in a situation like *I made him run*. It is unnecessary since the two-argument version and the three-argument version are mutually reducible to each other, as (163b) can also be expressed as the three-argument version (164a), and (163d) as the two-argument version (164b):

(164) a. CAUSE (WIND, RAIN, [$_{\text{Event}}$ IT-RAIN])

b. CAUSE (WIND, [$_{\text{Event}}$ I FALL DOWN])

Therefore, we adopt the two-argument version of CAUSE as in Jackendoff (2002: 364), which takes an Object or an Event as its first argument, and an Event as its second argument. The output of this CAUSE function is an Event, as shown in (165a). This is also compatible with Talmy (2000: 482).

The caused event can be either an activity or some change of state. Jackendoff (1990: 75, 2002: 364) proposes an inchoative function INCH that takes a State as its sole input and outputs an Event, as shown in (165b). The inchoation of a state is a kind of event, whereas an event is not necessarily the inchoation of some state.

(165) a. CAUSE: < (Object/Event, Event), Event>

b. INCH: <State, Event>

Levin (1993: 26-32) distinguishes among three types of causative alternations: (i) causative / inchoative alternation as in (166a) and (166b); (ii) induced action alternation as in (166c) and (166d); (iii) other instances as in (166e) and (166f):

(166) a. Janet broke the cup.

b. The cup broke.

c. Sylvia jumped the horse over the fence.

d. The horse jumped over the fence.

e. I burped the baby.

f. The baby burped.

All the transitive verbs above can be paraphrased as "cause to V-intransitive".[52] In all the intransitive examples (166b), (166d), and (166f), only (166b) contains the INCH function and denotes the beginning of a new state; other intransitive sentences simply express events.

To summarize so far, we found that causative alternations do not always imply inchoatives. Also, while the presence of the INCH function is necessary for an expression to qualify as "resultative", it is not sufficient. Consider sentences below:

(167) a. John killed Mary.

b. John stabbed Mary.

c. John stabbed Mary to death.

d. John stabbed Mary and as a result Mary died.

Of the sentences above, only (167c) qualifies as a resultative. (167a) and (167b) do not express the result of being dead explicitly, though such an entailment exists in (167a) (but not in (167b)); both (167c) and (167d) express the activity and the result explicitly, yet (167d) expresses them in a biclausal structure instead of a simple clause.

Therefore, a resultative construction expresses explicitly both an activity and the inchoation of a state brought about by that activity within a mono-clausal structure. The resultative construction has the following semantic structure:

(168) CAUSE ([$_{\text{Event}}$ Some activity], [$_{\text{Event}}$ INCH ([$_{\text{State}}$ Some result])])

[52] Also see Tang's (2002) discussion on the causative/inchoative alternation of Mandarin RVCs.

This criterion works well for most cases, but not for the following:

(169) a. John broke the vase.

b. John broke the vase to pieces.

According to Boas (2003), (169b), but not (169a), is a resultative construction since (169b) gives the details of the result state of the vase, while (169a) only vaguely points out the state of the vase's being broken. I do not object this distinction, but it seems that semantic considerations are not enough to define resultative constructions, and thus syntactic ones must be resorted to.

6.4 The Headedness of Mandarin RVCs

In linguistics, the head is the word that determines the syntactic type of the phrase of which it is a member, or analogously the stem that determines the semantic category of a compound of which it is a component.

Regarding the issue of determining the head of an RVC, Cheng and Huang (1994: 191) argue that "…the notion of a head is a structural and not a conceptual notion." They reviews Li's (1990) work which claims that Vc's are the heads of RVCs. Li proposes that "the external argument of Vc must be expressed as the external argument of the whole compound" and "the argument structure (treated as a feature) of the head Vc is obligatorily percolated to the whole compound". Cheng and Huang (1994) criticize Li (1990) for being not able to explain the causative patterns such as our Type III resultatives.[53]

Cheng and Huang (1994) agree with Li (1990) on the Vc-as-head view. However, they disagree with Li and propose that "the transitivity of an RVC does not follow from the transitivity properties of either of its components" (p. 193) and "it is the aspectual property of

[53] Li (1995) observes the causative patterns and proposes a "causative tier" which can override thematic hierarchy in determining surface realizations.

an argument structure that plays a crucial role in the making of a resultative compound" (p. 194).

Cheng and Huang (1994: 194) argue that, when Vc is active, the entire RVC is either unergative or transitive, and when Vc is stative (non-active), the entire RVC is either ergative or causative. This leads to the conclusion that Vc is the head of the RVC. However, since the distinction based on unergative/transitive and ergative/causative alternations cannot hold (as we have shown in Section 2.3), their argument that Vc is the head becomes untenable even from a pure syntactic (structural) point of view.

They also review Shen (1992) and Gu (1992) who both claim that Vr is the head in RVCs and C.-R. Huang and Lin (1992) who claim that RVCs are headless.[54]

They criticize C.-R. Huang and Lin's (1992) headless claim by saying that the inability to determine the transitivity of RVCs (based on Vc's and Vr's transitivity) may lead to the conclusion that English resultatives are also headless, according to C.-R. Huang and Lin's (1992) reasoning.

I think Cheng and Huang (1994) misinterpret C.-R. Huang and Lin's (1992) argument. English resultatives differ from Mandarin resultatives in many ways. English resultative constructions are purely syntactic (or, to be specific, phrasal) rather than morphological. In English, verbs and adjectives can be distinguished by inflectional suffixes and derivational morphemes. On the contrary, there is no clear-cut distinction between verbs and adjectives in Mandarin. Moreover, verbs and adjectives alike can be the main predicates in Mandarin, but in English, adjectives must be preceded by something like *be* verbs in order to become the main predicates. All these differences suggest that the transitivity of English resultatives can be determined on independent grounds (while Mandarin resultatives cannot). Therefore, their criticism on C.-R. Huang and Lin (1992) is based on partial evidence and cannot be justified.

[54] Shen (1992), a manuscript listed in Cheng and Huang (1994), is more accessible in Shen (1993).

To give further support of the Vc-as-head view, they cite Huang (1988) which claims that in order to make sense of the causative sentences (170a), it is necessary to assume a derivation from a Deep Structure (170b):

(170) a. Nei jian shi jidong-de Zhangsan liu-chu-le-yanlei.

that CL matter excite RES Zhangsan come:to:tears

"That matter excited Zhangsan to the extent that s/he came to tears."

b. Nei jian shi [CAUSE] Zhangsan jidong-de liu-chu-le-yanlei.

Cheng and Huang (1994: 196) propose that "…it is well known that in Chinese, resultative compounds mirror resultative phrases in word order, and in the absence of evidence to the contrary (and we claim there isn't any), the most reasonable assumption to make is that the RVC's have essentially the same headed structure as phrasal resultative constructions do."

Thus they arrive at the Vc-as-head conclusion based on two controversial claims: (i) a resultative-*de* construction with a Deep Structure having a covert CAUSE can have the main verb incorporated with the CAUSE; (ii) RVCs are treated the same way as resultative-*de* constructions in terms of headedness.

The first claim is questioned by the following examples containing an active (unergative) Vc *pao* "to run": The underlying forms of the resultative-*de* construction in (171a) and the RVC in (172a) must be realized as the analytic causative forms in (171b) and (172b) (overt causative verbs *rang* or *shi*). Raising the main verbs and incorporating them with CAUSE positions is illegitimate, as shown in (171c) and (172c):

(171) a. Zhangsan [CAUSE] Lisi pao de hen lei.

b. Zhangsan [rang/shi] Lisi pao de hen lei.

Zhangsan ANC/ANC Lisi run RES very tired

"Zhangsan made Lisi run and Lisi got tired."

c. *Zhangsan pao de Lisi hen lei.

Zhangsan run RES Lisi very tired

Intended: “Zhangsan made Lisi run and Lisi got tired.”

(172) a. Zhangsan [CAUSE] Lisi pao-lei le.

b. Zhangsan [rang/shi] Lisi pao-lei le.

Zhangsan ANC/ANC Lisi run-tired ASP

“Zhangsan made Lisi run and Lisi got tired.”

c. *Zhangsan pao-lei le Lisi.

Zhangsan run-tired ASP Lisi

Intended: “Zhangsan made Lisi run and Lisi got tired.”

As to the second claim, they provide no evidence, and base it on the absence of negative evidence. This claim is thus weak and needs yet to be verified. Moreover, as Huang (1992) shows, RVCs differ from resultative-*de* constructions not only in that one is morphological and the other phrasal, but also in the applicability of the Minimal Distance Principle. These differences further weakened the claim that both types are treated the same way across the board.

To argue against a Vr-as-head view such as Shen (1992), Cheng and Huang (1994) claim, regarding sentences below, that (i) a transitivity analysis is not tenable; (ii) Agent-suppression takes place here.

(173) a. Shoupa ku-shi le.

hankie cry-wet ASP

“The hankie got wet from someone’s crying.”

b. Zuichun shuo-gan le.

lip talk-dry ASP

“The lips got dry from too much talking.”

c. Pen xi-lou le.

basin wash-leaky asp

"The basin became leaky from too much washing."

In my opinion, Shen's (1992) analysis is problematic. He bases his Vr-as-head analysis on examples in (173) where the logical subject of Vc is absent and the logical subject of Vr appears as the grammatical subject. However, there are examples where the grammatical subject is neither the logical subject of Vc nor that of Vr, but is the logical object of Vc:

(174) a. Fan chi-bao le.[55]

rice eat-full ASP

"(Someone) ate meal and got full."

b. Niupai chi-ni le.

beefsteak eat-bored ASP

"(Someone) was fed up with beefsteaks."

On the other hand, Cheng and Huang's (1994) proposal of the so-called Agent-suppression can explain the data in (174). Therefore, Shen's (1992) Vr-as-head view is not tenable.

From a constructional perspective, neither Vc or Vr alone determines the syntactic behavior (e.g. transitivity) or semantic interpretation (e.g. causativity) of an RVC. Which one is the head of an RVC is still controversial.

As we have shown, the properties (transitivity and causativity) of a Mandarin RVC must be determined in the sentential level. Thus any judgment of RVC headedness based on only some type(s) of RVC constructions is doomed to be partial and thus cannot hold.

[55] A similar expression *Jiu he-zui le* is not acceptable for at least some speakers. Maybe the difference in frequency of use plays some part.

What we are sure is that causation is the main theme in Mandarin RVCs, as the CAUSE function in the Resultative Template shows. Moreover, the interpretation of a Mandarin RVC must be determined by the properties of Vc, Vr, the subject NP (and the object NP too, if any), and the Resultative Template altogether. Thus a constructional approach is more convincing then the approaches we have presented in Chapter 2.

In the next chapter, we present some sub-constructions of Mandarin RVCs based on data from a corpus named *Chinese Gigaword*. The idiosyncrasies of the sub-constructions are supporting evidence for our constructional approach of Mandarin RVC constructions.

Chapter 7 Sub-Constructions of RVCs

This chapter provides a quantitative study of some sub-constructions in Mandarin RVCs based on corpus data. These sub-constructions are related to the general RVC constructions discussed in the previous chapters via inheritance links. They can be incorporated into our theoretical framework and support our constructional view of Mandarin RVCs.

7.1 Chinese Gigaword

For large-scale Chinese corpora, we are left with few options. The *Academia Sinica Balanced Corpus of Modern Chinese* (henceforth the *Sinica Corpus*) is well-known in Chinese linguistic community and marks an unprecedented achievement. It is well segmented; each segmented word is tagged with its part of speech. As of 1997, version 3.0 of the Sinica Corpus contains about 5 million words.

The number of search results in the web-based version of the Sinica Corpus is limited to 2,000 lines. This imposes a severe restriction on further processing. Although manual examination of data is time consuming, the number of lines to be examined can be significantly reduced when further condition of searching is set. However, limiting search results *in the first place* simultaneously excludes the possibility of occurrence of some potential search targets.

We thus resort to another Chinese corpus, *Chinese Gigaword*. This corpus contains newswire text data from Central News Agency (Taiwan) (735,499 K-characters, about 735 million characters) and Xinhua News Agency (China) (382,881 K-characters, about 383 million characters) collected and compiled by Linguistic Data Consortium. In this dissertation, we focus only on data from Central News Agency (totally 12 years of data, from 1991 to 2002), based on the following reasons: i) Mandarin spoken in Taiwan and China are different in many ways, and the current study aims to reflect Taiwan Mandarin usage and to get more

homogeneous results; ii) The Central News Agency data constitute about 66% of Chinese Gigaword and thus are representative.

Chinese Gigaword is stored in a DVD-ROM which contains lots of plain text files (with some HTML-like tags) which are not annotated. The lack of parts of speech makes it difficult to search Chinese Gigaword based on syntactic categories. However, Chinese Gigaword has the following advantages: i) the plain texts can be processed easily; ii) Chinese Gigaword (counting only the Central News Agency parts) outnumbers the Sinica Corpus by a factor of approximately 70 (assuming one word equals two characters in Chinese yields 10 million characters for the Sinica Corpus).

The author wrote a searching program using Perl, a programming language suitable for natural language processing. The search results are examined manually (observing the fact that this corpus is unannotated, and thus any sequence matching our search conditions will be listed).

7.2 The V-*si* Construction

This section presents corpus data of the V-*si* construction from the Chinese Gigaword. The result *si* "dead" occurs in various types of resultative constructions in Mandarin. Type I resultatives are like (175a) and (175b), though they differ in that the Vc in (175a) is a transitive verb whereas that in (175b) is in fact a gradable adjective.

(175) a. Zhe qun baotu ceng yi duandao kan-si le yi ming jingcha.

the CL bandit once with dagger slash-dead ASP one CL police

"The bandits once slashed a police officer to death with daggers."

b. Relang zhishao re-si le sishiwang zhi ji.

heat:wave at:least hot-dead ASP 400,000 CL chicken

"The heat wave caused at least 400,000 chickens to die."

Type I V-*si* constructions as in (175a) allow verbs of contact by impact (*qiao* "to knock", *zhuang* "to hit", *ti* "to kick", *ci* "to stab", *yao* "to bite", *she* "to shoot"), verbs of cutting (*kan* "to hew", **ge* "to cut", **qie* "to slice", **duo* "to chop"), verbs of exerting force (*ya* "to press", *ji* "to push; to squeeze", **la* "to pull", **tui* "to pull"), and verbs of killing (*sha* "to kill", *du* "to poison", *lei* "to strangle", *diao* "to hang", *yan* "to drown", *men* "to suffocate").[56]

Type I V-*si* constructions as in (175b) are gradable property adjectives rather than verbs. These adjectives are noncausative and behave like intransitive verbs in valency. Since the result *si* "dead" is also noncausative and intransitive, neither Vc nor Vr contributes to the causativity and transitivity of the sentence, which we argue come from the whole resultative construction. This supports our constructional view of Mandarin resultatives. Adjectives of this kind includes *leng* "cold", *re* "hot", *la* "spicy", and *xian* "salty".

Type III resultatives are like (176a) and (176b), which belong to Type IIIa and Type IIIc resultatives, respectively.

(176) a. Weiergang chi-si le si ge ren.

Viagra eat-dead ASP four CL person

"Four people died from taking Viagra."

b. Meiguo zhikong shadan husheng e-si renmin

U.S. accuse Saddam Hussein hungry-dead people

"The U.S. accused Saddam Hussein of starving the people to death."

Type III V-*si* constructions as in (176a) allow verbs of ingesting such as *chi* "to eat" and *he* "to drink". Type III V-*si* constructions as in (176b) allow gradable sensory or psych adjectives that take human (or at least animate) beings as their sole arguments. Examples include *e* "hungry", *qi* "angry", *lei* "tired", *fan* "annoyed", **ke* "thirsty".

[56] Verb classification follows Levin (1993). An asterisk before the verb means that it belongs to the verb class in question but does not appear in the V-*si* construction.

Type II resultatives, which are noncausative, are exemplified in (177a) and (177b).

(177) a. Waizi zhende ai-si yazhou xinxing shichang.

foreign:investment really love-dead Asia emerging:market

"Foreign investment really loves Asian emerging markets very much."

b. Ta gaoxing-si le.

s/he happy-dead ASP

"S/He is very happy; S/He couldn't be happier."

Type II V-*si* constructions as in (177a) allow psych-verbs (*admire* type, or subject-experiencer type), including *ai* "to love" and *hen* "to hate". These verbs take the targets of emotion as their grammatical objects. Type II V-*si* constructions as in (177b) allow gradable psych adjectives such as *gaoxing* "happy" and *nanguo* "sad". All these sentences express states rather than events. The result *si* "dead" functions like a degree modifier and does not contribute to argument realizations (both *ai* "love" and *ai-si* "love-dead" are transitive; both *gaoxing* "happy" and *gaoxing-si* "happy-dead" are intransitive).

Below is a summary of our classification of the V-*si* construction and verbs/adjectives allowed in each resultative type:

Verb class	Examples	Resultative Type	Alternations / Operations
Verbs of contact by impact	*qiao* "to knock"	Type I	No
Verbs of cutting	*kan* "to hew"	Type I	No
Verbs of exerting force	*ya* "to press"	Type I	No
Verbs of killing	*sha* "to kill"	Type I	Type IV, but only *yan* "to drown" and *men* "to suffocate"
Gradable property adjectives	*leng* "cold", *la* "spicy"	Type I	Type IV, but only *leng* "cold" and *re* "hot"[57]
Verbs of ingesting	*chi* "to eat"	Type III	No
Gradable sensory and psych adjectives	*e* "hungry", *qi* "angry"	Type III	Type II
Psych verbs (*admire* type)	*ai* "to love"	Type II	No
Gradable psych adjectives	*gaoxing* "happy"	Type II	No

Table 5: Summary of the V-*si* construction

7.3 The Body-Part Construction

Huang (2007: 8) treats the body-part construction on a par with other "adverse" constructions as listed below:[58]

(178) a. Wangmian qi sui si le fuqin.

Wangmian seven age die ASP father

"Wangmian suffered from his father's death at the age of seven."

b. Zhangsan you xia le yi zhi yanjing.

Zhangsan again blind ASP one CL eye

"Again, Zhangsan got blind in the other eye."

[57] They are Type IV instead of Type II because the adjectives *leng* "cold" and *re* "hot" are not directly predicated of the subjects. An utterance *Wo hen leng* "I (feel) cold" should be regarded as a compact form of *Wo juede hen leng* "I feel cold".

[58] Also see the discussion on direct and indirect passives of Japanese in Shibatani (1990: 317-333).

c. Kanshou you tao le san ge fanren.

guard again escape ASP three CL prisoner

"The guard was adversely affected by three prisoners' escape."

d. Zuotian tamen fasheng le yi jian chehuo.

yesterday they happen ASP one CL car:accident

"Yesterday, they had a car accident."

e. Tamen gongsi you chen le yi sao chuan, …

they company again sink ASP one CL boat

"Again, their company was adversely affected by the sinking of another boat."

He argues that examples above contain internal arguments (Patient) such as *fuqin* "father" and *yanjing* "eye" and middle arguments (Experiencer) such as *Wangmian* and *Zhangsan*.

Although examples above are not RVC constructions, the same reasoning can be applied to Mandarin RVCs. In Mandarin RVCs, there is a body-part construction, illustrated below, which belongs to Type I resultatives with object-oriented reading:

(179) a. Ta kan-hua le yanjing.

s/he see-blurred ASP eye

"Her/His eyes became blurred from seeing (e.g. a movie)."

b. Ta chi-huai le duzi.

s/he eat-bad ASP belly

"S/He had a diarrhea."

c. Ta die-duan le tui.

s/he stumble-broken ASP leg

"S/He stumbled and had her/his leg broken."

In (179), the grammatical objects are inalienable body parts of the grammatical subjects. Thus although it is the object that is affected, there is a strong sense that the subject is the one that is ultimately affected.

The body-part relation between the subject and the object is self-explanatory. The Direct Causation Constraint requires that the causing event be related to the caused event directly. Thus in (179a), two potential interpretations are blocked, where the subject and the object are by no means related. One is the ordinary Type I reading: "She saw (a movie) and someone else's eyes got blurred as a result." The other is the Type III reading: "She caused someone else to see (a movie) and that person's eyes got blurred as a result". The two interpretations involve implausible world knowledge or complicated indirect causation and thus are ruled out. The only way for (179a) to satisfy the Direct Causation Constraint is to employ the body-part relation, which in some way "transfers" the affectedness from the grammatical object to the grammatical subject.

In English, there are adnominal elements that can be promoted. The proper name *John* below appears either as part of a larger NP *John's nose* as in (180a), or as a promoted NP which is sister to the verb as in (180b).[59]

(180) a. Mary pinched John's nose.

b. Mary pinched John on the nose.

Likewise, Type I body-part resultatives can be paraphrased by Type IIb resultatives with the use of the possessive *de*, which "demotes" the subjects in Type I body-part resultatives.

(181) a. Ta de yanjing kan-hua le.

s/he POS eye see-blurred ASP

"Her/His eyes became blurred from seeing (e.g. a movie)."

[59] See Fillmore (1968) for details of adnominal promotion.

b. Ta de duzi chi-huai le.

s/he POS belly eat-bad ASP

"S/He had a diarrhea."

c. Ta de tui die-duan le.

s/he POS leg stumble-broken ASP

"S/He stumbled and had her/his leg broken."

The body-part constructions are not necessarily idiomatic, as illustrated above. Below are examples that are emphatic and more idiomatic. The grammatical objects are lexically restricted and cannot be arbitrarily replaced by (near-)synonyms:

(182) a. Ta xiao-po le dupi.

s/he laugh-torn ASP belly:skin

"S/He laughed so much that her/his belly tore out."

b. Ta xiao-diao le daya.

s/he laugh-dropped ASP front:tooth

"S/He laughed so much that her/his front teeth dropped."

Type I body-part constructions (both idiomatic and non-idiomatic) can have Type III and Type IV equivalents, by connecting the subject and the object via a possessive marker *de*.

(183) a. Nei bu dianying kan-hua le ta de yanjing.

that CL movie see-blurred ASP s/he POS eye

"That movie made her/his eyes blurred (from seeing it)."

b. Ta de yanjing kan-hua le.

s/he POS eye see-blurred ASP

"Her/His eyes became blurred from seeing (e.g. a movie)."

(184) a. Zhe jian shi xiao-po le ta de dupi.

this CL matter laugh-torn ASP s/he POS belly:skin

"This matter caused her/him to laugh so much that her/his belly tore out."

b. Ta de dupi xiao-po le.

s/he POS belly:skin laugh-torn ASP

"Her/His belly tore out from laughing too much."

Therefore, they have properties unique (and irreducible) to those of ordinary Type I resultatives. The body-part constructions are sub-constructions of ordinary Type I resultatives and share properties with them.

In the following subsections, we use corpus data from Chinese Gigaword to illustrate the body-part constructions. Besides ordinary body-part constructions such as *die-duan* "stumble-broken", idiomatic constructions such as *die-po yanjing* "stumble-broken glasses", *xiao-diao daya* "laugh-dropped front teeth", and *xiao-po dupi* "laugh-popped belly skin" will also be discussed.[60]

7.3.1 *Die-duan*

There are different surface realizations for the RVC *die-duan* "stumble-broken". After searching Chinese Gigaword for *die-duan* "stumble-broken", we find out the form [NP1 *die-duan* NP2] is the most productive of all.

[60] Note that *die-po yanjing* "stumble-broken glasses" is not a body-part construction in a strict sense. It is regarded as one because its behaviors are like other idiomatic body-part constructions such as *xiao-diao daya* "laugh-dropped front teeth" and *xiao-po dupi* "laugh-popped belly skin".

Form	Instances
NP1 *die-duan* NP2	52
NP1 *de* NP2 *die-duan*	6
NP1 *ba/jiang* NP2 *die-duan*	3
Total	61

Table 6: Statistics for Different Surface Realizations of *die-duan*

This RVC imposes semantic constraints on NP2, as the following table shows. Noun phrases allowed in *die-duan* "stumble-broken" must be body parts that have bones or bone-like materials. It is unlikely that *toufa* "hair" or *wei* "stomach" can be NP2 of *die-duan* "stumble-broken".

NP2	Instances
yachi "tooth"	9
tui "leg"	7
tui-gu "leg bone", *gu-tou* "bone"	5
shuang-tui "two legs"	4
suo-gu "clavicle; collar bone"	3
rengong yinjing "artificial penis", *zuo-jiao* "left foot", *yi-tiao-tui* "one leg", *you-tui* "right leg", *zuo-tui* "left leg", *jiao-gu* "foot bone", *kuan-gu* "pelvic bone"	2
(others)	14
Total	61

Table 7: Statistics for NP2 of *die-duan*

7.3.2 *Die-po yanjing*

The phrase *die-po yanjing* "stumble-broken glasses" means roughly "to surprise (someone)". It is idiomatic in that (i) none of the lexical items may be substituted by (near-)synonyms (e.g. *die* "to stumble" by *shuai* "to stumble", *po* "broken" by *sui* "shattered",

or *yanjing* "glasses" by *jingpian* "lens"); (ii) the meaning is non-literal;[61] (iii) Type III resultatives based on Type IV are possible.

Statistics from the Chinese Gigaword shows that this phrase can occur in a variety of constructions, the majority of the data being causative forms with the external causer in the subject position: [NP2 *die-po* NP1 *de yanjing*] (Type III) and [NP2 *rang/ling/shi/jiao* NP1 *die-po yanjing*] (analytic causative).

Form	Instances	Type
NP2 *die-po* NP1 *de yanjing*	289	Type III
NP1 *die-po yanjing*	26	Type I
NP1 *de yanjing die-po*	3	Type IV
NP2 *rang/ling/shi/jiao* NP1 *die-po yanjing*	191/177/26/3	analytic causative
NP2 *rang/ling* NP1 *de yanjing die-po*	1/3	analytic causative

Table 8: Statistics of *Die-po yanjing*

The following exemplify the first three constructions: [NP2 *die-po* NP1 *de yanjing*], [NP1 *die-po yanjing*], and [NP1 *de yanjing die-po*].

(185) a. "Sha-weng qing shi" de chu xian die-po zhuanjia yanjing.

Shakespeare love history POS exit line stumble-broken expert glasses

"It surprised the experts that 'Shakespeare in love' was short listed."

b. Xinpusen an peishentuan xunsu zuochu panjue gefang die-po yanjing.

Simpson case jury prompt make verdict everyone stumble-broken glasses

"It surprised everyone that the jury announced a verdict on the Simpson case promptly."

[61] The literal meaning and the non-literal meaning are somehow related. The literal one "A causes B's glasses to become broken" can be translated to the non-literal one "A causes B to become surprised". There is a *metonymic* relation between B and B's glasses.

c. Meiguo zhi-lan zhuanjia yanjing jintian wanshang die-po yi di.

U.S. prof:basketball expert glasses today evening stumble-broken one ground

"NBA experts were surprised this evening."

The use of analytic causatives such as *rang/ling/shi/jiao* is not uncommon, as illustrated below:

(186) a. Dan yili guo-ren de nikesen rang suoyouren dou die-po yanjing.

but perseverance excel ASF Nixon ANC everyone all stumble-broken glasses

"But Nixon, who has perseverance, surprised everyone."

b. Buguanruhe, cunshan neige weichi dao xianzai, yi ling henduo riben guanchajia nevertheless Murayama cabinet hold to now already ANC many Japan observer die-po yanjing.

stumble-broken glasses

"Nevertheless, it has surprised many Japanese observers that the Murayama cabinet survived until now."

c. Yidali pushuomili de zhengqing jingchang shi zhuanjia die-po yanjing.

Italy bewildering ASF politics often ANC expert stumble-broken glasses

"The bewildering Italian politics often surprises experts."

d. Jintian fangbang de zhengda que jiao ren die-po yanjing.

today public:roll ASF NCCU however ANC person stumble-broken glasses

"The public roll of successful examinees of National Chengchi University is surprising."

There are even creative uses of *die-po yanjing* "stumble-broken glasses" which observe how glasses may be manipulated literally, according to world knowledge:

(187) a. …yindi'an'na daxue… ye ling zhuanjia de yanjing die-po yi di.

Indiana university also ANC expert POS glasses stumble-broken one ground

"The (defeat of) Indiana University team also made the experts surprised."

(Lit., "The Indiana University team made the experts stumble so that their glasses became broken, scattered all over the ground.")

b. …yalisangna daxue dui…jinru guanjunsai rang lanqiu zhuanjia de yanjing yi lu die-po dao di.

Arizona university team enter finals ANC basketball expert POS glasses one way stumble-broken to bottom

"The Arizona University team's entering finals surprised the basketball experts."

(Lit., "The Arizona University team's entering finals made the basketball experts stumble so that their glasses became broken, scattered all the way through.")

Concerning the third property in the beginning of this subsection, we first observe Cheng and Huang's (1994: 215) claim that "once an argument has been dethematized, it cannot be thematized again." See examples below (ibid.):

(188) a. Shoupa ku-shi le.

hankie cry-wet ASP

"The hankie got wet from someone's crying."

b. *Zhe jian shi ku-shi le shoupa.

this CL matter cry-wet ASP hankie

Intended: "This matter caused the hankie to be cried-wet."

(188a) is a Type IV resultative, as the verb *ku* "to cry" is not the logical subject of *shoupa* "hankie". This sentence is "dethematized" since the person who cries is unexpressed. The causativized (Type III) version, (188b), with an external causer as its subject, is not allowed. Thus Cheng and Huang's (1994) observation is basically correct. Generally

speaking, causativization is an operation from Type II resultatives to Type III resultatives. It is unlikely that Type IV resultatives can be causativized, as (188) shows. However, Type III resultatives based on Type IV are possible for the phrase *die-po yanjing* "stumble-broken glasses", as the alternation below shows:

(189) a. NP1 *de yanjing die-po*

b. NP2 *die-po* NP1 *de yanjing*

Though (189a) is outnumbered by (189b) (3 versus 289 in our corpus), the two patterns are nonetheless an inchoative-causative pair (though it is Type IV vs. Type III instead of Type II vs. Type III). (189) is analogous to (188), only that (189b) is grammatical whereas (188b) is not. This is peculiar with respect to general RVC constructions in Mandarin. Thus the idiomatic *die-po yanjing* "stumble-broken glasses" not only has an opaque meaning but also has slightly different syntactic behaviors.

We stipulate the following tripartite structure following Jackendoff's Parallel Architecture in Section 3.4:

(190) [die-po [[ ]$_2$ de yanjing]$_3$]$_4$ – [$_{VP4}$ Vc-Vr [$_{NP3}$]] – CAUSE ([ ]$_1$, BECOME ([ ]$_2$, SURPRISED))

The absence of the disposal constructions *ba* and *jiang* suggests that *yanjing* "glasses" is semantically empty (and thus cannot receive focus), as the absence of index 3 in the semantic part of (190) shows. This is supported by Tsao's (1987) analysis: "the word *ba* is a secondary topic marker whose presence is analogous to a stress signifying that the following NP is in focus or for contrast."

The discussion of *die-po yanjing* "stumble-broken glasses" shows that even an idiomatic expression must respect garden-variety syntax for the most parts. That is, idiomatic expressions do not occur out of thin air. Old components are often "recycled".

7.3.3 *Xiao-diao daya* and *Xiao-po dupi*

Two other idiomatic phrases like *die-po yanjing* "stumble-broken glasses" are *xiao-diao daya* "laugh-dropped front teeth" and *xiao-po dupi* "laugh-popped belly skin" as shown below, though with much less productivity:

Form	Instances	Type
NP2 *xiao-diao* NP1 *de daya*	4	Type III
NP1 *xiao-diao daya*	3	Type I
NP2 *rang/ling/jiao* NP1 *xiao-diao daya*	6/1/1	analytic causative
NP2 *xiao-po* NP1 *de dupi*	1	Type III
NP2 *rang/ling/jiao* NP1 *xiao-po dupi*	4/1/1	analytic causative

Table 9: *Xiao-diao daya* and *Xiao-po dupi*

The two expressions have similar meaning: roughly, "to amuse (someone)". Like *die-po yanjing* "stumble-broken glasses", the lexical items within *xiao-diao daya* "laugh-dropped front teeth" and *xiao-po dupi* "laugh-popped belly skin" cannot be replaced by (near-)synonyms (e.g. *daya* "front tooth" by *yachi* "tooth", *dupi* "belly skin" by *duzi* "belly"). Likewise, the two expressions have opaque, non-literal meanings. Also, they have a tendency toward using Type III resultatives and analytic causatives.

To summarize, the three idiomatic RVCs discussed above prefer the following constructions, with the meaning "NP2 surprises/amuses NP1".

(191) a. NP2 Vc-Vr NP1 *de* [body_part][62]

b. NP2 *rang/ling/shi/jiao* NP1 Vc-Vr [body_part]

[62] Since *yanjing* "glasses" is an accessory rather than a body part, the notation [body_part] is meant to be convenient only.

7.3.4 Causativization of Type IV Resultatives

In the previous subsections, we have shown that causativization of some idiomatic Type IV resultatives are possible. This subsection extends such a claim to general RVCs.

Surface ergatives (Type IV) are derived from normal object-oriented resultatives (Type I) via deagentivization. In Section 6.2, it is claimed that surface causatives cannot be causativized. Here we argue that such possibility exists, but only when body-part relation holds between the grammatical subject and the grammatical object. First take a look at the examples below:

(192) a. Ta (kan dianying) kan-hua le yanjing.

s/he see movie see-blurred ASP eye

"Her/His eyes became blurred from seeing a movie."

b. Ta de yanjing kan-hua le.

s/he POS eye see-blurred ASP

"Her/His eyes became blurred from seeing (e.g. a movie)."

c. Nei bu dianying kan-hua le ta de yanjing.

that CL movie see-blurred ASP s/he POS eye

"That movie caused her/his eyes blurred from seeing it."

The examples above belong to Type I, Type IV, and Type III, respectively. In (192a), the subject *ta* "s/he" is the agent of watching movies and also the causer of her/his eyes' getting blurred. To be more precise, it is the activity of her/his watching movies, rather than her/himself, that is to be blamed for the eyes' getting blurred. (192b) focuses on the result of getting-blurred with the causer left unmentioned. (192c) expresses the causer from a different perspective: it is the movie that is responsible. (192a) and (192c) parallel each other in containing subjects that are participants (either an agent or a theme) of the causing event.

Some might object that in (192b), *ta de yanjing* "her/his eyes", the subject of the *kan-hua* "see-blurred", is also the subject of *kan* "see" (despite the fact that the subject of *kan* "see" should be *ta* "s/he"), and thus this sentence belongs to Type II, rather than Type IV.

To give further supporting evidence, we turn back to the idiomatic [*xiao-po dupi*] "laugh-popped belly skin" construction discussed in the previous subsection. (193a-c) are various realizations of this construction: Type I, Type IV, and Type III, respectively.

(193) a. Ta xiao-po le dupi.

s/he laugh-torn ASP belly:skin

"S/He laughed so much that her/his belly tore out."

b. Ta de dupi xiao-po le.

s/he POS belly:skin laugh-torn ASP

"Her/His belly tore out from laughing too much."

c. Zhe jian shi xiao-po le ta de dupi.

this CL matter laugh-torn ASP s/he POS belly:skin

"This matter caused her/him laugh so much that her/his belly tore out."

In (193b), *xiao* "to laugh" cannot be predicated of *dupi* "belly skin", thus (193b) is Type IV instead of Type II. (193c) is the causativization of (193b), suggesting that Type IV resultatives can be causativized, though in a somewhat limited way (involving body-parts, and/or idiomatic).

7.4 Subject-oriented RVCs Revisited

Subject-oriented RVCs differ from other RVCs in that the grammatical objects are not Affectees (or Patients/Undergoers), as their semantic structures show. This section presents discussion of some sub-constructions of Type II (subject-oriented) RVC constructions, along with their peculiarities.

7.4.1 On V-*ni*

The result *ni* "bored" describes the feeling of a human being (or at least an animate being) when something is overdone. RVCs of the form *V-ni* are all subject-oriented. Searching Chinese Gigaword yields the following statistics:

RVC	Instances
chi-ni "eat-bored"	27
kan-ni "look-bored"	21
wan-ni "play-bored"	12
ting-ni "listen-bored"	4
yan-ni "act-bored"	3
huo-ni "live-bored"	2
zhu-ni "live-bored", *jiao-ni* "chew-bored", *guo-ni* "live-bored", *tan-ni* "talk-bored"	1

Table 10: Statistics of V-*ni*

These RVCs are all subject-oriented and can be either intransitive or transitive. In the case of *chi-ni* "eat bored", 6 examples are intransitive and 21 transitive. Among the transitive examples, *da-yu-da-rou* "rich food" appears 7 times. Other examples contain objects such as: *chuantong de yuebing* "traditional mooncake", *guantou shiping* "canned food", *junyong guantou* "can for military use", *xie-shi-yan de da-yu-da-rou* "rich food in teacher-thanksgiving banquet", *yi-cheng-bu-bian de niancai* "never-changing New Year's meal", *malingshu, fanqie, xiaohuanggua, mianbao, kaobing ji kaoyangroupian* "potato, tomato, cucumber, bread, roasted cake, and roasted mutton slice", *yiban canguan* "ordinary restaurant", *maidanglao* "McDonald's", *zhong-kouwei niuroumian* "heavily-flavored beef noodles", *biandang huo jiachangcai* "meal box or ordinary dish", *niancai* 'New Year's meal", *zhongguo can* "Chinese food", *ji-ya-yu-rou* "chicken, duck, fish, and meat", *zhongcan* "Chinese food".

It seems that *chi-ni* "eat-bored" (as well as the general form V-*ni*) allows a variety of objects. However, the objects must be kind-denoting entities and thus cannot be preceded by numerals, classifiers, or demonstratives.

As Chierchia (1998: 348) puts it, "[w]hat counts as kind is not set by grammar, but by the shared knowledge of a community of speakers. It thus varies, to a certain degree, with the context, and remains somewhat vague. Lexical nouns identify kinds. Complex nouns may or may not." From a semantic point of view, it is reasonable to conclude that objects of *chi-ni* "eat-bored" are kind-denoting: *chi-ni* "eat-bored" expresses how one feels (say disgusted, sick) about some kind of food one overeats. Extending this reasoning to the form V-*ni*, it follows that the objects must be some kind-denoting entities that cause people feel bored by overdoing.

There is an aspectual difference with respect to the event type of Vc: When Vc denotes an activity such as *chi* "to eat (something)", the RVC V-*ni* presupposes that the activity takes place many times. When Vc denotes a state such as *huo* "to live", there is no such presupposition.

7.4.2 On *Chi-bao Fan*

This subsection discusses the famous (and a bit enigmatic) subject-oriented RVC *chi-bao fan* "eat-full rice".

A corpus search on RVCs with *bao* "full" as the result within Chinese Gigaword yields the following verbs, classified roughly according to Levin's (1993) classification of English verbs. Each type is illustrated below.

(194) a. EAT type: *chi* "to eat", *jia* "eat", *shi* "eat", *xi* "to suck"[63]

b. FEED type: *wei* "to feed", *si* "to feed", *yang* "to raise"[64]

c. PUT type: *tian* "to fill", *chong* "to charge", *guan* "to fill", *sai* "to stuff", *jin* "to immerse"

d. Miscellaneous: *zhuan* "to earn", *shui* "to sleep", *kun* "to sleep", *qi* "to anger"[65]

Below we take a closer look at objects that follows *chi-bao* "eat-full". Grammatical objects that follow *chi-bao* includes:

(195) a. Subject-oriented: *fan* "rice", *wancan* "dinner", *jiaxiang kouwei* "hometown flavor"

b. Object-oriented: *duzi* "belly", *dupi* "belly skin"

The objects in the subject-oriented reading are limited to *fan* "rice". The others (*wancan* "dinner" and *jiaxiang kouwei* "home flavor") occur only once respectively and are outnumbered by fan "rice". *Fan* "rice" here receives a generic interpretation and denotes meals in general.

(196a) can be used to describe scenarios in which the meals do not contain rice at all. (196b) and (196c) show that the word *fan* "rice" cannot be replaced by semantically similar terms such as *mian* "noodle" and neither can it be modified by numerals and modifiers.

(196) a. Ta chi-bao (fan) le.

s/he eat-full (rice) ASP

"S/He ate (meal) and got full."

---

[63] *Jia* "to eat" is a verb borrowed from Taiwanese *chiah*^{8} "to eat"; *shi* "to eat" is literary and occurs only in compounds or written forms.

[64] Likewise, *si* "to feed" is also literary.

[65] *Kun* "to sleep" is obviously a form borrowed from Taiwanese *khun*^{3} "to sleep".

b. *Ta chi-bao mian le.

s/he eat-full noodle ASP

Intended: “S/He ate noodles and got full.”

c. *Ta chi-bao liang wan fan le.

s/he eat-full two bowl rice ASP

Intended: “S/He ate two bowls of rice and got full.”

It seems that, in normal order, the sequence *chi-bao* “eat-full” is objectless, unless followed by the “dummy”, generic word *fan* “rice” for meal. This is supported by the ungrammaticality of Type II resultatives (197a) and (197b) (created examples). On the contrary, their Type III equivalents in (197c) and (197d) (also created examples) are both grammatical.

(197) a. *Xuduo ren chi-bao le zhe guo fan.

many person eat-full ASP this pot rice

Intended: “Many people ate from this pot of rice and got full.”

b. *Wuqian ren chi-bao le wu bing er yu.

5000 person eat-full ASP five bread two fish

Intended: “5000 people ate from five loaves of bread and two fish and got full.”

c. Zhe guo fan chi-bao le xuduo ren.

this pot rice eat-full ASP many person

“This pot of rice fed many people.”

d. Wu bing er yu chi-bao le wuqian ren.

five bread two fish eat-full ASP 5000 person

“Five loaves of bread and two fish fed 5000 people.”

The corpus-based study in this chapter supports our claim that there are idiosyncrasies within the RVC constructions which must be learned independently. They are unpredictable

from general RVC constructions and form sub-constructions in their own right. These sub-constructions are related to general ones via inheritance links. Their existence further justifies the necessity of a constructional approach.

Chapter 8 Conclusion

The final chapter summarizes our classification of Mandarin RVCs, provides a brief comparison with English resultatives, and recapitulates our claims on the nature of agency and causation and world knowledge in the previous chapters.

8.1 A Summary of Mandarin RVC Types

As we have shown in Section 4.7, the four types of Mandarin resultative constructions can be subsumed under a general Resultative Template, with Causer and Causee as its constructional arguments. Type I and Type III resultatives share the same mapping principle (Causer to NP_i and Causee to NP_j), while differing in the nature of Causer, the former being agentive and the latter nonagentive. In Type II resultatives, both the Causer and the Causee are co-referential (mapped to NP_i), and the subcategorized object of a transitive Vc can optionally surfaces as NP_j. In Type IV resultatives, the Causer is unexpressed while the Causee is mapped to NP_i. Below is a summary of the mapping principles of the four types of Mandarin resultatives.

Type	Causer	Causee	Note
Type I	NP_i	NP_j	Agentive causer
Type II	NP_i	NP_i	Subcategorized Vc object as optional NP_j
Type III	NP_i	NP_j	Nonagentive causer
Type IV	N/A	NP_i	Agentive causer not expressed

Table 11: Mapping from Causer/Causee to Syntax

The alternations discussed previously can be regarded as operating between different RVC types: The *unspecified object alternation* operates within Type IIa resultatives; the *transitive-causative alternation* operates between Type Ic (transitive) and Type IIb (intransitive). The two alternations are both transitivity alternations but involve different

predication relations. We have shown that this distinction must be made.

Causativization is an operation from Type II resultatives to Type III resultatives, which adds an external cause or "promotes" an internal argument (e.g. a patient) or an adjunct (e.g. location) to the status of an external cause.

Deagentivization, which is a more precise term than *decausativization*, is an operation from Type I resultatives to Type IV resultatives. The subject in a Type I resultative is more agent-like than causer-like, and thus its suppression in Type IV resultatives justifies the term "deagentivization".

Following Dixon and Aikhenvald (2000), causativization is an operation of valency increase. This is true only for Types IIb and IIc (which are intransitive). Type IIa is transitive, whose valency does not change after causativization: its internal argument is "promoted" to the subject position and external argument "demoted" to the object position.

Likewise, deagentivization from Type I resultatives to Type IV resultatives is like passivization, an operation of valency reduction. This is true for all subtypes of Type I. Fig. 51 shows four types of RVCs and alternations/operations involved.

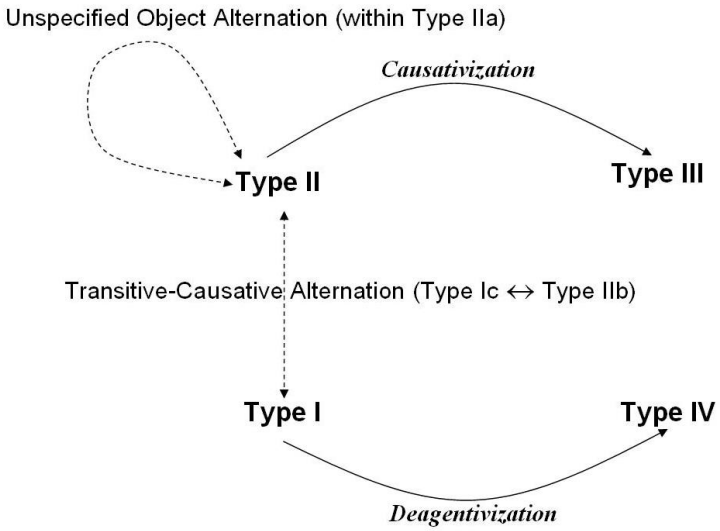

Fig. 51: Four RVC Types and their Alternations/Operations

There are two alternations and two operations here. The dotted lines show the two alternations, with types involved in the alternations expressed in the parentheses. The dotted lines also suggest that the alternations are not fully productive. Factors such as semantic recoverability and predicate compatibility are at play. The solid lines show the two operations. Causativization of Type IIa does not change the valency, since the object in Type IIa becomes the subject in Type III. Causativization of Type IIb and Type IIc adds a Causer and increments the valency by one, like the traditional notion of causativization. Deagentivization is a valency-decreasing operation that decrements the valency by one. The valency-changing properties are summarized in Table 12:

Operation	From	To	Degree of valency changing
Causativization	Type IIa	Type IIIa	0
	Type IIb	Type IIIb	+1
	Type IIc	Type IIIc	+1
Deagentivization	Type I	Type IV	-1

Table 12: Valency-changing Properties of RVCs

8.2 A Comparison with English Resultatives

This section compares Mandarin and English resultatives. We follow Rappaport Hovav and Levin's (2001) analysis which lists five patterns of English resultatives:[66]

(198) a. He wiped the table clean. (object-oriented transitive-based pattern)

b. Jody sang herself hoarse. (reflexive intransitive-based pattern)

c. The pond froze solid. (bare XP intransitive-based pattern)

d. The dog barked him awake. (nonsubcategorized NP intransitive-based pattern)

[66] The fifth pattern (nonsubcategorized NP transitive-based pattern) is not discussed in Rappaport Hovav and Levin (2001) until page 788. We include it here along with the rest four patterns discussed in the beginning of their paper.

e. They drank the pub dry. (nonsubcategorized NP transitive-based pattern)

Examples in (198a-e) correspond to Type Ia, Type IIb (without the reflexive), Type IIc, Type Ic, and Type Ib of our classification, respectively. This leaves us with Type IIa and all Type III and Type IV unverified. We now give counterexamples of their existence:

(199) a. *John ate a hamburger full. (Type IIa)[67]

Intended: "John ate a hamburger and got full as a result."

b. *This kind of medicine may eat people dead. (Type IIIa)

Intended: "This kind of medicine may cause people to die by eating."

c. *This road ran Mary tired. (Type IIIb)

Intended: "This road made Mary tired from running (on it)."

d. *The wine (is) drunk him fallen. (Type IIIc)

Intended: "The wine made him so drunk that he fell."

e. *The table wiped clean. (Type IVa)

Intended: "The table was wiped clean."

f. *The pub drank dry. (Type IVb)

Intended: "The pub was drank dry."

g. *He barked awake. (Type IVc)

Intended: "(Some dog) barked him awake."

Passives below show some degree of freedom. Passives with transitive verbs as in (200a) and (200b) are allowed, whereas passives with intransitive verbs as in (200c) are not.

(200) a. The table was wiped clean.

b. The pub was drunk dry.

c. *He was barked awake.

[67] This example is grammatical if a *depictive* meaning "John ate a hamburger while he was full" is intended.

Middle constructions as shown below allow only subcategorized "objects" (of the main verbs) to surface in the subject positions, as the grammaticality of (201a) shows:

(201) a. The table wipes clean very easily.

b. *The pub drinks dry very easily.

c. *He barks awake very easily.

The table below summarizes Mandarin and English equivalents of resultative constructions in terms of the four types proposed in this dissertation:

Mandarin	English
Type Ia	Object-oriented transitive-based pattern
Type Ib	Nonsubcategorized NP transitive-based pattern
Type Ic	Nonsubcategorized NP intransitive-based pattern
Type IIa	N/A[68]
Type IIb	Reflexive intransitive-based pattern[69]
Type IIc	Bare XP intransitive-based pattern
Type III, Type IV	N/A

Table 13: Comparison of Mandarin and English Resultatives

From Table 13 we see that Mandarin allows a much wider range of variations in resultative constructions. Type I resultatives have a full set of counterparts in English, while Type II resultatives do not. The lack of Type IIa equivalents in English indicates that English rejects subject-oriented readings in transitive resultative constructions (NP1 V NP2 XP), since Type IIb equivalents in English is a reflexive pattern which can be argued to be object-oriented and Type IIc equivalents in English contain unaccusative verbs whose surface

[68] There is a "subject-oriented transitive-based pattern" exemplified by *The wise men followed the star out of Bethlehem* (Rappaport Hovav and Levin 2001: 770) which expresses correlated motion and is not a resultative in a strict sense. English equivalents of Mandarin Type IIa resultatives often express the activity parts with adjuncts or simply leave them unmentioned, as the ungrammatical sentence **John ate a hamburger full* may be paraphrased as *John got full (from eating a hamburger)*.

[69] Whereas English requires a reflexive NP in the object position, Mandarin does not.

subjects are underlyingly internal arguments following the Unaccusative Hypothesis (Burzio 1986, Levin and Rappaport Hovav 1995, Perlmutter 1978). Type III and Type IV equivalents in English are totally absent, indicating the preference of some agent-like entity to occur in the subject position of an English resultative.

Goldberg (1995: 193) proposes the (Animate) Instigator Constraint which states that "[t]he two-argument resultative construction must have an (animate) instigator argument." Examples below contain subjects that are not agents, or Actors in the sense of Jackendoff's (1990) action tier.

(202) a. *The feather tickled her silly.

b. *The hammer pounded the metal flat.

This constraint echoes the comparison of Mandarin and English resultatives, which shows that Mandarin resultatives allow a much wider range of entities to surface as grammatical subjects. The contrast below shows that a lexical causative verb such as *sink* requires that the subject not only be causative, but also be agentive:

(203) a. The enemy sank the boat.

b. *The crack sank the boat.

c. The crack caused the boat to sink.

A more general claim of English is that "[t]he realization of arguments as subject or object in English is largely determined by the roles assigned to arguments on the action tier" (Levin and Rappaport Hovav 2005: 120).

To summarize, English resultatives require that arguments on the action tier be realized in syntax as evident from the resultative adjunct rules of (76): the first argument of AFF, the Actor, is realized in the subject position and the second argument of AFF, the Patient, is realized in the object position (at least for transitive resultatives). On the contrary, Mandarin

resultatives do not always require the subjects be Actors (as demonstrated by Type III resultatives), although the causal relations are maintained throughout.

8.3 Agency and Causation

Agency and causation are closely related but mutually irreducible.[70] As the comparison in the previous section shows, causation is the main theme in both Mandarin and English resultative constructions. They differ in that while English requires the subjects be Actors (or Agents), Mandarin does not. The subject can be either an Actor (or an Agent) or a Causer, as prototypical of Type I and Type III resultatives.

As Vendler (1984: 375) points out, "[a]s the sentence forms become more and more explicitly causal, they become less and less suitable for expressing what agents do." He provides a series of examples showing how agency and causation are distinguished as in (204a) and (204b), and how the "full-blown" (204c) fails (ibid).

(204) a. John raised his arm. (agency)

b. John caused his arm to rise. (causation)

c. *John was the cause of the rising of his arm.

Using analytic causatives such as *shi*, *ling*, *jiao*, and *rang*, and disposal words such as *ba* and *jiang* as testing criteria, we can analyze transitive resultatives (Type I, Type IIa, and Type III) and see whether agency and/or causation are involved.

(205) a. Ta ca-gan le zhuozi.

s/he wipe-dry ASP table

"S/He wiped the table dry."

[70] See, for example, Cruse (1973) and Vendler (1984).

b. Ta [ba/jiang] zhuozi ca-gan le.

s/he [BA/BA] table wipe-dry ASP

"S/He wiped the table dry."

c. *Ta [shi/ling/jiao/rang] zhuozi ca-gan le.

s/he [ANC/ANC/ANC/ANC] table wipe-dry ASP

Intended: "S/He wiped the table dry."

Type I resultatives allow disposal constructions while prohibiting analytic causatives, which suggests that Type I resultatives are highly agentive.

(206) a. Ta chi-ni le shuijiao.

s/he eat-bored ASP steamed:dumpling

"S/He was fed up with steamed dumplings."

b. *Ta [ba/jiang] shuijiao chi-ni le.

s/he [BA/BA] steamed:dumpling eat-bored ASP

Intended: "S/He was fed up with steamed dumplings."

c. *Ta [shi/ling/jiao/rang] shuijiao chi-ni le.

s/he [ANC/ANC/ANC/ANC] steamed:dumpling eat-bored ASP

Intended: "S/He was fed up with steamed dumplings."

Type II resultatives reject both disposal constructions and analytic causatives, which suggests that Type II resultatives are low in agentivity and causativity.

(207) a. Zhe ping jiu zui-dao le Zhangsan.

this bottle wine drunk-fall ASP Zhangsan

"This bottle of wine got Zhangsan drunk and fall."

b. Zhe ping jiu [ba/jiang] Zhangsan zui-dao le.

this bottle wine [BA/BA] Zhangsan drunk-fall ASP

"This bottle of wine got Zhangsan drunk and fall."

c. Zhe ping jiu [shi/ling/jiao/rang] Zhangsan zui-dao le.

this bottle wine [ANC/ANC/ANC/ANC] Zhangsan drunk-fall ASP

"This bottle of wine got Zhangsan drunk and fall."

Type III resultatives embrace both disposal constructions and analytic causatives, which suggests that Type III resultatives are highly causative.[71]

As Vendler (1984: 375) suggests that "the most one should admit concerning the relation of agency and causation is a weak family resemblance", we can say that Type I resultatives (highly agentive) and Type III resultatives (highly causative), together with Type II and Type IV resultatives, form a case of weak family resemblance.

Moreover, comparison with analytic causatives *shi/ling/jiao/rang* shows that the correlation between the form (from lexical to analytic) and the meaning (from direct to indirect) is a kind of iconicity relation in language: RVCs are more *compact* than analytic causatives, thus they express more *direct* causation than analytic causatives do.

To recapitulate, the subject in a Type I resultative is a causer (in a wider sense) and an agent, while that in a Type III resultative is a causer (in a narrower sense) and not an agent. Type II resultatives are noncausative, while Type IV resultatives are causative in the sense of Type I resultatives.

[71] Prof. Feng-fu Tsao suggests that the causative sense of *ba* here is an extended use rather than its basic disposal meaning.

8.4 The Role of World Knowledge

The sentences below are similar in that they contain intransitive Vc's (*ku* "to cry", *xiao* "to laugh", and *pao* "to run") predicated of the subjects and intransitive Vr's (*fan* "annoyed" and *lei* "tired") predicated of the objects. They are all Type Ic resultatives:

(208) a. Zhangsan ku-fan le Lisi.

Zhangsan cry-annoyed ASP Lisi

"Zhangsan cried (so much) that Lisi got annoyed."

b. ?Zhangsan xiao-lei le Lisi.

Zhangsan laugh-tired ASP Lisi

Intended: "Zhangsan laughed (so much) that Lisi got tired."

c. ?Zhangsan pao-lei le Lisi.

Zhangsan run-tired ASP Lisi

Intended: "Zhangsan ran (so much) that Lisi got tired."

The difference in grammaticality deserves some discussion. It seems that difference in acceptability of (208a) and (208b-c) is not of lexical semantics of Vc's and Vr's. These sentences are best explained if world knowledge is taken into account: while it is possible that one cried so much that another person got annoyed, it is unlikely that one laughed (or ran) so much that another person got tired. They differ only in how the causing events (crying, laughing, and running, respectively) affect the objects in question. If sufficient contextual information is provided, all sentences become acceptable.

While Type Ic resultatives in (208) can be rescued by contextual information, the same examples, if interpreted as Type IIIb resultatives, are doomed to fail in acceptability. Replacing the subjects by *zhe jian shi* "this matter" saves (209a) and (209b), but not (209c). This may contribute to the difference in lexical semantics between verbs such as *ku* "to cry" and *xiao* "to laugh" on the one hand, and verbs such as *pao* "to run" on the other hand.

(209) a. [*Zhangsan / Zhe jian shi] ku-fan le Lisi.

[Zhangsan / this CL matter] cry-annoyed ASP Lisi

"[*Zhangsan / This matter] made Lisi cry (so much) that Lisi got annoyed."

b. [*Zhangsan / Zhe jian shi] xiao-lei le Lisi.

[Zhangsan / this CL matter] laugh-tired ASP Lisi

"[*Zhangsan / This matter] made Lisi laugh (so much) that Lisi got tired."

c. [*Zhangsan / *Zhe jian shi] pao-lei le Lisi.

[Zhangsan / this CL matter] run-tired ASP Lisi

"[*Zhangsan / *This matter] made Lisi run (so much) that Lisi got tired."

The subjects in the Type III resultatives above must be construed as *facts*, i.e. they are *factive causatives* in the sense of S. Huang (1974). The two verbs *ku* "to cry" and *xiao* "to laugh" denote emotions that can be brought about by facts. The verb *pao* "to run" denote activities that can only be done by the runner.

The potentially ambiguous example of (210a) shows how world knowledge helps exclude the implausible reading (ii):

(210) a. Zhangsan xiao-si le Lisi.

Zhangsan laugh-dead ASP Lisi

(i) "Zhangsan made Lisi laugh."

(ii) Intended: "Zhangsan laughed (so much) that Lisi died."

b. Zhe duan lu pao-lei le Zhangsan.

this CL road run-tired ASP Zhangsan

"This road made Zhangsan tired from running."

c. Zhangsan ku-shi le shoupa.

Zhangsan cry-wet ASP hankie

"Zhangsan cried (so much) that the hankie got wet."

Reading (i) of (210a) patterns with (210b), both being Type III resultatives. Reading (ii) of (210a) patterns with (210c), both being Type I resultatives. Reading (ii), however, is unlikely a real-world scenario: the action of laughing does not have any physical (though maybe some psychological) impact on someone, and thus cannot be the cause of death. On the contrary, in (210c), the action of crying does affect the hankie substantively, and it is this world knowledge that justifies the reading there.

The following example shows that world knowledge is flexible. Common sense tells us that it is unlikely that someone's crying should cause a wall (let alone the Great Wall, which is supposed to be much more robust than ordinary walls) to collapse:[72]

(211) Mengjiangnü ku-dao wanlichangcheng.[73]

Mengjiangnü cry-fallen The:Great:Wall

"Mengjiangnü cried (so much) that the Great Wall fell."

However, in story telling, created, imaginary worlds are a bit (or totally) different from the world we live in. And thus "world" knowledge differs from one world to another. Following the same reasoning, (210a) can be said to allow Type I reading as in (ii) if this sentence is uttered in a world where laughing may cause deaths.

Therefore, from this section, world knowledge provides flexible constraints on Mandarin resultative constructions, but these constraints may be overridden should sufficient contextual information is provided. There are, however, situations of Type III resultatives that are excluded in the lexical semantic level, as (209c) shows. This example cannot be saved

[72] Prof. Huei-ling Lai points out that this sentence denotes a (pseudo-)historical event with a somewhat idiomatic (fossilized) reading.

[73] Mengjiangnü is a legendary figure in the Qin Dynasty of China. Her husband was captured in the evening of their wedding day and escorted to build the Great Wall. She then traveled a long distance to look for her husband, and only found him dead and buried underneath the Great Wall. So she cried. She cried so much that the Great Wall fell. She dropped her blood onto piles of bones and eventually found his corpse.

anyway, and echoes our claim of the Direct Causation Constraint in (162).

8.5 Concluding Remarks

In this dissertation, we present four types of RVC constructions in Mandarin. The constructional approach not only predicts argument realization for the various types of resultatives, but also solves issues raised by sub-constructions, which the traditional approaches fail to explain. The four types of resultatives form a case of family resemblance in the sense of Wittgenstein (1953). Part of this family share features, but the family as a whole share few (if not none) features.

We have shown that transitivity and causativity are not inherent properties of RVCs, but instead properties of the RVC constructions. Only when the RVC constructions interact with lexical constructions can we determine the transitivity and the causativity after semantic compatibilities are checked. The chapter on sub-constructions also revealed that idiomatic RVC constructions are irreducible to general constructions: they do not observe the constraints of general RVC constructions, and their meanings are non-compositional.

Mandarin RVCs exhibit a much wider range of flexibility than English resultatives, as also demonstrated in Lü (1986). The four types of resultatives shown in this work show the various possibilities. The Resultative Template of each type licenses arguments in the subject and object positions. The semantics of direct causation is also encoded in the Resultative Template as part of its constructional meaning.

8.6 Further Study

In this dissertation, we have shown that a constructional approach is favorable from both theoretical backgrounds and language facts. Many issues not discussed in this work worth further study.

First, the similarity and difference between RVC constructions and resultative-*de* constructions are not discussed. Resultative-*de* constructions are more analytic (in form) and more transparent (in meaning) than RVC constructions. Their comparison is a topic worthy of exploring.

Second, verb-copying constructions may impose constraints on Mandarin resultatives. Their functions need further clarification (though see J. Chang's (2003) aspectual account reviewed in Subsection 2.4.2).

Third, the roles of disposal *ba* and passive *bei* are not discussed in detail. They also contribute to the grammaticality of Mandarin resultatives.

The properties of Vr's in resultative constructions are also constrained with respect to Vc's. Washio (1997) compares English and Japanese/French resultatives and distinguishes between *strong* and *weak* resultatives for transitive resultatives. Boas (2003) lists many mini-constructions of verbs and compatible result phrases in English. The same can be done to Mandarin in the future.

Finally, comparison of Mandarin with Taiwanese Southern Min or Hakka may shed light on the complexities of resultative constructions in general.

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