

RESULT IN MANDARIN VERB COMPOUNDS*

SHIAO WEI THAM
Wellesley College

1 Introduction

Resultative verb compounds (RVCs) in Mandarin (1) have been well-studied in terms of their argument realization properties, especially in relation to the notion of causativity (Li 1990, 1995, Gu 1992, Cheng and Huang 1996, Her 2007, Shibagaki 2010).

- (1) xiǎoháir yā-biǎn-le ní-tuán
child press-flat-PERF mud-ball
The child pressed the mudball flat.¹

Somewhat less studied is the event structural composition of Mandarin RVCs. In this vein, one question raised by (1) is how the change of state (COS) meaning of the RVC arises in such sentences. In (1), the first member of the compound (V1) *yā* ‘press’ is an activity verb and the second member (V2) *biǎn* ‘flat’ appears to be an adjective or stative verb. There is no apparent source for the change of state meaning of the entire compound. This question is analogous to how the accomplishment reading of English resultatives such as (2) comes about:

- (2) Pat hammered the metal flat.

Examples such as (2) have been proposed to involve a shift of the activity verb *hammer* to an accomplishment event structure, where the adjective *flat* specifies the result state of the accomplishment event (Rappaport Hovav and Levin 1998, Rothstein 2004:80).

This paper argues the COS meaning in (1) is contributed by the second member of the compound, henceforth V2. Support for this proposal is provided from motion verb compounds expressing spatial results such as (3).

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¹Abbreviations: ASSOC = associative marker, CL = classifier, NEG = negation, PERF = perfective, PL = plural, PROG = progressive, Q-PRT = question particle, SF-PRT = sentence-final particle, SG = singular

- (3) a. *lǎoshǔ pǎo-dào-le dòng-kǒu*
 mouse run-arrive/to-PERF hole-mouth
 The mouse ran to (the mouth of) the hole. Directional coverb
- b. *wūyā yòu jiào-le yì shēng, ... fēi-zài qiáng-shang*
 crow again call-PERF one sound ... fly-be.at wall-upon
 The crow cawed once more, and flew on the wall. (PKU)² Locative coverb

Such compounds consist of a manner of motion verb and a “coverb”, a morpheme with both preposition- and verb-like properties (Li and Thompson 1981:360). The coverb may encode a result e.g. *dào* ‘arrive/to’ (3a) or express stative location, e.g. *zài* ‘be at’ (3b).

I show first, that (non-spatial) RVCs are structurally analogous to Manner Verb+Directional Coverb compounds (henceforth *V-dào* compounds) such as that in (3a). I then show that in contrast to both *V-dào* and RVCs, the resultative interpretation of Manner Verb+Locational Coverb (henceforth *V-zài* compounds) (3b) is not lexically encoded but rather arises pragmatically. Since RVCs are parallel to *V-dào*, where change is encoded in V2, and both differ from *V-zài*, where V2 does not encode change, we may conclude that RVCs encode change in V2.

In section 2, I show that V2 in RVCs are indeed COS verbs, then in section 3, I demonstrate the parallel in aspectual properties between RVCs and *V-dào* compounds. Section 4 shows that *zài* ‘be at’ always describes stative location, and the resultative interpretation of *V-zài* arises pragmatically. Section 5 provides converging evidence from the POTENTIAL CONSTRUCTION for the COS status of V2 in RVCs. Section 6 concludes the paper.

2 V2 as a COS verb

This section argues for the plausibility that V2 in RVCs encodes COS, showing that in isolation (outside of RVCs), property concept words may be either stative or COS, but COS verbs with no stative counterpart also exist, and these may occur as V2 in RVCs.

2.1 Property concept state predicates show COS meanings

In simple predication contexts, the same form, e.g. *bái* ‘white’ in (4) may express either state (4a) or change of state meanings. The COS interpretation arises most notably in the presence of perfective marking (4b), but also in its absence, as Sybesma (1997) demonstrates with the examples in (5).

- (4) a. *Sānmáo tóufa hěn bái*
 Sanmao hair very white
 Sanmao’s hair is (very) white. (State)
- b. *Sānmáo tóufa bái le*
 Sanmao hair white PERF
 Sanmao’s hair turned white. (COS)
- (5) *tā néng gāo / tā huì pàng / tā yào hǎo*
 3SG can tall / 3SG will fat / 3SG will good
 He can become tall. / He may become fat. / He will get better.

²PKU indicates naturally-occurring data from the Peking University Center for Chinese Linguistics online corpus (URL: http://ccl.pku.edu.cn:8080/ccl_corpus/index.jsp?dir=xiandai).

This suggests Mandarin property-concept adjectives (or stative verbs)³ such as *bái* ‘white’ systematically alternate to a verb expressing change to the same state. I assume a semantics with ordinary (type *e*) individuals (variables *x, y*), events (variables *e, e'*), and locations (variables *x₁, y₁*) (see (29)). Employing the BECOME operator from Dowty (1979) to indicate COS, the semantic representations of *bái* ‘white’ are as follows:

- (6) a. *bái*_{Adj} ‘white’: $\lambda x \lambda e \text{white}'(x)(e)$
 b. *bái*_V ‘white’: $\lambda x \lambda e \text{BECOME}(\text{white}'(x))(e)$

2.2 COS verbs with no stative counterparts occur as V2

In contrast to words such as *bái* ‘white’ that alternate between state and COS interpretations, there is a class of intransitive verbs which encode only COS and have no stative counterpart (Tham 2010). These encode changes into states that arise as “the result of some action” (Dixon 1982:50), e.g. *zuì* ‘intoxicated’, *liè* ‘crack(ed)’. These verbs cannot occur with degree modifiers such as *hěn* ‘very’ (7b, 8b) but only with the post-verbal modifier *-de hěn lihai* ‘to a serious extent’ (7c, 8c).

- (7) a. *tā zuì le*
 3SG intoxicated PERF
 (S)he is drunk.
 b. **tā hěn zuì*
 3SG very intoxicated
 Intended: (S)he is very drunk.
 c. *tā zuì-de hěn lihai*
 3SG intoxicated-DE very serious
 (S)he is badly drunk.
- (8) a. *jìngzi liè le*
 mirror crack PERF
 The mirror (is) cracked.
 b. **jìngzi hěn liè*
 mirror very cracked
 Intended: The mirror is very cracked.
 c. *jìngzi liè-de hěn lihai*
 mirror cracked-DE very serious
 The mirror is badly cracked.

Adjectives such as *bái* ‘white’ may occur in both kinds of degree modification contexts, but crucially, modification with *-de hěn lihai* “to a serious extent” only allows a result state interpretation: (9b) only has the bizarre interpretation given in the translation.

³There is controversy over whether a class of adjectives should be assumed for Mandarin McCawley (1992). I assume the existence of such a class here, as do others in recent work (see e.g. Liu 2010, Grano 2010) but the issue is orthogonal to the current discussion.

- (9) a. Sānmáo yì shēng-xià-lai tóufa jiù hěn bái
 Sanmao once born-down-come hair JIU very white
 Sanmao's hair was very white from the moment he was born.
 b. Sānmáo yì shēng-xià-lai tóufa jiù bái-de hěn lìhai
 Sanmao once born-down-come hair JIU white-DE very serious
 Sanmao's hair turned very white from the moment he was born.

This indicates *zuì* 'become intoxicated' and *liè* 'become cracked' are both COS verbs with no stative counterpart:

- (10) a. *zuì*_V 'become intoxicated': $\lambda x \lambda e$ BECOME(intoxicated'(x))(e)
 b. *liè*_V 'become cracked': $\lambda x \lambda e$ BECOME(cracked'(x))(e)

Importantly, these verbs participate felicitously as V2 in RVCs, consistent with the assumption that V2 is a COS verb:

- (11) tā hē-zuì-le jiǔ (12) Sānmáo pèng-liè-le jìngzi
 3SG drink-intoxicated-PERF wine Sanmao knock-crack-PERF mirror
 (S)he got drunk from drinking wine. Sanmao knocked the mirror cracked.

3 RVCs and *V-dào* are aspectually parallel

This section shows that RVCs parallel *V-dào* compounds in their aspectual properties. Since in *V-dào*, V2 encodes change, its similarity with RVCs is again compatible with the assumption that V2 in RVCs encodes change.

3.1 Types of RVCs

Mandarin result-encoding verb compounds have been categorised into causative (13-14) and non-causative (15), based on their ability (or otherwise) to participate in the BA and passive BEI constructions (13b, c) and (14b, c), vs (15b, c) (Huang, 1988):

- (13) Causative
- a. xiǎoháir yā-biǎn-le ní-tuán
 child press-flat-PERF mud-ball
 The child pressed the mudball flat.
 b. xiǎoháir bǎ ní-tuán yā-biǎn le
 child BA mud-ball press-flat PERF
 The child pressed the mudball flat.
 c. ní-tuán bèi xiǎoháir yā-biǎn le
 mudball BEI child press-flat PERF
 The mudball was pressed flat by the child.

(14) Causative, “inverted”

- a. zhè dùn fàn zhēn chī-qióng-le wǒ
this CL meal really eat-poor-PERF 1sg
The eating of this meal has really made me poor.
- b. zhè dùn fàn zhēn bǎ wǒ chī-qióng-le
this CL meal really BA 1sg eat-poor-PERF
The eating of this meal has really made me poor.
- c. wǒ zhēn bèi zhè dùn fàn chī-qióng-le
1sg really BEI this CL meal eat-poor-PERF
I have really been made poor by the eating of this meal.

(15) Non-causative, subject-oriented

- a. Sānmáo chī-bǎo-le fàn
Sanmao eat-full-PERF rice
Sanmao became full from eating rice/a meal.
- b. *Sānmáo bǎ fàn chī-bǎo-le
Sanmao BA rice eat-full-PERF
- c. *fàn bèi Sānmáo chī-bǎo-le
rice BEI Sanmao eat-full-PERF

Manner of motion *V-dào* compounds are non-causative motion events with a spatial endpoint.

- (16) a. lǎoshǔ pǎo-dào-le dòng-kǒu
mouse run-arrive-PERF hole-mouth
The mouse ran to (the mouth of) the hole.
- b. *lǎoshǔ bǎ dòng-kǒu pǎo-dào-le
mouse BA hole-mouth run-arrive-PERF
- c. *dòng-kǒu bèi lǎoshǔ pǎo-dào-le
hole-mouth BEI mouse run-arrive-PERF

Despite the variety in argument realization patterns, the aspectual behaviour of Mandarin resultative compounds, including *V-dào*, is remarkably consistent.

3.2 RVCs and *V-dào* are “covert accomplishments”

Although RVCs contain an activity verb, they exhibit achievement-like behaviour. In general, RVCs cannot occur in the progressive aspect (17) (Tai 1984, Chief 2008:105-106).⁴ Tai (1984) also shows RVCs display achievement-like behaviour in negation contexts, in contrast to monomorphemic verbs in the same contexts which behave as activities.

⁴Although there are systematic exceptions, see Chief (2008:245-246).

- (17) a. wǒ zài xué(*-huì) zhōngwén
1sg PROG learn-know/master Chinese
I am learning Chinese
- b. wǒ zài shā(*-sǐ) Zhāngsān
1sg PROG kill-die Zhangsan
I am killing Zhangsan.
- c. *zhè dùn fàn zài chī-qióng wǒ
this CL rice PROG eat-poor 1sg
Intended: The eating of this meal is really making me poor.
- d. Sānmáo zài chī(*-bǎo) fàn
Sanmao PROG eat-full rice
Sanmao is eating rice/a meal.

Other kinds of aspectual modification can, however, indicate the RVC describes an event with duration. Modification with *sān fēnzhōng nèi* ‘within three minutes’ (18a), or *yòng-le sān fēnzhōng* ‘used three minutes’ (18b) can receive an interpretation of the activity event of pressing the mudball being performed during those three minutes.

- (18) a. xiǎoháir sān fēnzhōng-nèi yā-biǎn-le ní-tuán
child three minutes-within press-flat-PERF mudball
The child pressed the mudball flat in three minutes.
- b. xiǎoháir yòng-le sān fēnzhōng (cái) yā-biǎn ní-tuán
child use-PERF three minutes (then) press-flat mud-ball
The child took three minutes to press the mudball flat.

Similarly, *V-dào* compounds cannot occur in the progressive (19a), but contain a description of a subevent with duration: (19b, c) can mean the mouse was running within those three minutes.

- (19) a. *lǎoshǔ zài pǎo-dào dòng-kǒu
mouse PROG run-arrive hole-mouth
Intended: The mouse is running to (the mouth of) the hole.
- b. lǎoshǔ sān fēnzhōng-nèi pǎo-dào-le dòng-kǒu
mouse three minutes-within run-arrive-PERF hole-mouth
The mouse ran to the hole in three minutes.
- c. lǎoshǔ yòng-le sān fēnzhōng pǎo-dào-le dòng-kǒu
mouse use-PERF three minutes run-arrive-PERF hole-mouth
The mouse used three minutes to run to the hole.

3.3 An account

To account for these observations, I assume that the resultative clause denotes a set of achievement events related to an activity event. The relevant relationship may be one of causation, as in the case of causative resultatives (20), or of culmination (Parsons, 1990), in the case of non-causative resultatives (21)–(22).

- (20) a. xiǎoháir yā-biǎn-le ní-tuán
child press-flat-PERF mud-ball
The child pressed the mudball flat.
b. $\lambda e \exists e' [\text{BECOME}(\text{flat}'(\text{mb}))(e) \wedge \text{press}'(\text{mb})(c)(e') \wedge \text{CAUSE}(e)(e')]$
- (21) a. Sānmáo chī-bǎo-le fàn
Sanmao eat-full-PERF rice
Sanmao became full from eating rice/a meal.
b. $\lambda e \exists e' \exists y [\text{BECOME}(\text{full}'(s))(e) \wedge \text{eat}(y)(s)(e') \wedge \text{food}(y) \wedge \text{CUL}(e)(e')]$
- (22) a. lǎoshǔ pǎo-dào-le dòng-kǒu
mouse run-arrive-PERF hole-mouth
The mouse ran to (the mouth of) the hole.
b. $\lambda e \exists e' [\text{BECOME}(\text{be.at}'(h)(m))(e) \wedge \text{run}(m)(e') \wedge \text{CUL}(e)(e')]$

The distinction between causation and culmination discriminates between those compounds that occur felicitously in BA/BEI constructions and those that do not. In this approach, the “head” of the resultative compound, at least aspectually, is V2, which describes a change of state or location (23a, 24a) (see also Chief 2008). In RVC formation, V2 selects for an activity verb which describes an event that causes or culminates in the event of change described by V2 (23b, 24b).

- (23) a. *biǎn* ‘(become) flat’: $\lambda y \lambda e \text{BECOME}(\text{flat}'(y))(e)$
b. RVC formation
Resultative -*biǎn*: $\lambda P \lambda y \lambda x \lambda e \exists e' [\text{BECOME}(\text{flat}'(y))(e) \wedge P(y)(x)(e') \wedge \text{CAUSE}(e)(e')]$
- (24) a. *bǎo* ‘(become) full’: $\lambda y \lambda e \text{BECOME}(\text{full}'(y))(e)$
b. RVC formation
Resultative -*bǎo*: $\lambda P \lambda y \lambda x \lambda e \exists e' [\text{BECOME}(\text{full}'(y))(e) \wedge P(y)(x)(e') \wedge \text{CUL}(e)(e')]$

For current purposes, I assume the causative or culminative nature of the RVC is not determined by the COS verb, and thus COS verbs may in general form either kind of compound.

4 V-zài compounds: Inferred results

If resultative compounds are formed from a COS verb (or coverb encoding a spatial endpoint), this would predict the locational coverb *zài* ‘be at’ cannot form a spatial resultative.⁵ Thus examples such as (25), where a manner of motion verb with a locational coverb yields an interpretation of change of location, are unexpected under this view, and their availability requires an explanation.

- (25) a. wūyā yòu jiào-le yì shēng ... fēi-zài qiáng-shang
crow again call-PERF one sound ... fly-be.at wall-upon
The crow cawed once more, and flew onto the wall. (PKU)
b. xiǎo hóuzi tiào-zài mǎ-bèi-shang
small monkey jump-be.at horse-back-upon
The little monkey jumped onto the back of the horse. (Tai 1975:158, 9b)

⁵This applies only to the case where V1 itself does not encode change. Result-encoding compounds with COS V1 also occur (e.g. *dòng-liè* ‘freeze-cracked’). I do not discuss these in this paper.

This section shows that (i) *zài* ‘be at’ encodes stative location; (ii) the directional interpretation of *V-zài* arises from pragmatic factors and is not structurally encoded.

4.1 *zài* is always locational

The state/COS alternation found in adjectives, discussed above, is not available for locative predicates. That is, the event structure of individual coverbs does not vary. (26) shows that *zài* ‘be at’ is locative, whereas *dào* ‘arrive/to’ and some other coverbs, e.g. *jìn* ‘enter’ encode motion with a final destination.

- (26) *zài wū-li / dào wū-li / jìn wū-li*
 be.at house-within / arrive house-within / enter house-within
 be in the house / arrive in the house / enter the house

The examples in (27)-(28) show that, even in contexts such as co-occurrence with perfective *-le* or a future marker, where COS interpretations are found for adjectives/stative verbs, *zài* (unlike *dào* in (27)) does not encode change of location.⁶

- (27) *Sānmáo dào/*zài-le fáng-lǐ* (28) *tā huì zài fáng-lǐ*
 Sanmao arrive/be.at-PERF room-within 3SG will be.at room-within
 Sanmao got into the room. (S)he will be/*get in the room.

These data point to a stative, locative meaning for *zài* ‘be at’ (29a), in contrast to a change of location meaning for *dào* ‘arrive’ (29b).⁷

- (29) a. *zài* ‘be at’: $\lambda y_1 \lambda x \lambda e \text{ be.at}'(y_1)(x)(e)$
 b. *dào* ‘arrive’: $\lambda y_1 \lambda x \lambda e \text{ BECOME}(\text{be.at}'(y_1)(x))(e)$

4.2 A pragmatic account for directional *V-zài*

If *zài* ‘be at’ is always locative, how do the directional interpretations for *V-zài* in (25) above arise? This is related to an enduring question in the expression of directed motion events: How does an interpretation of directed motion arise in sentences such as those in (30) where there is no obvious directional morpheme?

- (30) The boat floated under the bridge. / Mary ran in the room.

Two alternatives have been proposed regarding this issue. Under the **lexical ambiguity** approach (Alonge 1997, Folli and Ramchand 2005, Fábregas 2007), these interpretations arise from lexical ambiguity, in particular, the ability of certain manner of motion verbs, and some prepositions, to take on a meaning of directed motion. The **pragmatic licensing** approach (Nikitina 2008, Tutton 2009, Levin et al. 2009) takes the directional interpretation to arise from contextual-pragmatic

⁶Henriette de Swart (p.c.) suggests the lack of a directional reading for *zài* sentences could reflect a blocking effect from the availability of more specific options such as the use of *dào* to encode directionality. While this could be correct for the cases in (27)-(28), it cannot be true across the board, given that manner of motion verbs with *zài* do allow directional interpretations even though *V-dào* is also available to express directionality. In light of blocking, then, the directional interpretation of *V-zài* is even more intriguing, and calls for an explanation.

⁷As noted above (section 2.1), y_1 represents individuals of type ‘location’.

factors such as aspectual properties of the manner verbs, and the nature of the ground described by the prepositional complement.

Below, I show that patterns in naturally-occurring data from the PKU corpus argue for a pragmatic interpretation of resultative *V-zài*. First of all, examples such as (31) show that directional readings of manner of motion verb with *zài* do not arise consistently.

- (31) yǒu shíhòu fēi-zài kōng-zhōng de wūyā huì diào xià-lai
 have time fly-be.at sky-within ASSOC crow will fall down-come
 Sometimes, crows flying in the air would fall down. (locational) (PKU)

Moreover, I showed in other work (Tham, to appear) that directional readings for *V-zài* are facilitated by contextual/pragmatic factors that include the following: First, the manner of motion verb describes short, punctual motion, e.g. almost all instances of *tiào-zài* ‘jump-be.at’ showed directional interpretations.

(32)	Verb	% result V-zài	Tokens/N
	<i>tiào</i> ‘jump’	98%	45/46
	<i>fēi</i> ‘fly’	27%	18/66
	<i>zǒu</i> ‘walk’	<0.1%	3/3832

Second, the sentence contains a less elaborated path description; e.g. no source location is described (33a). The coverb is more likely to be *dào* if a source location is mentioned (33b).

- (33) a. ...cā de yì shēng, nà guǐzi de nǎodai biàn fēi-zài yì biān le
 ...ONOM ASSOC one sound that devil ASSOC head then fly-be.at one side SF-PRT
 A sound of slicing, and the devil’s (Japanese soldier) head flew to one side.
 b. yǔhángyuán cóng dìqiú fēi-dào/*zài yuēqiú-shàng
 astronaut from earth fly-arrive/*be.at moon-upon
 The astronaut flew from the earth to the moon.

Third, the manner of motion can be inferred to be relatively “simple”, e.g. there is no adverbial modification indicating difficulty of the motion:

- (34) tā zhēngzhá-zhe pá-dào/*zài yí gè xiǎo shāndòng
 3SG struggle-DUR crawl-arrive/*be.at one CL small cave
 He crawled, struggling, to a small cave.

Following Cummins (1996, 1998), I propose that manner of motion verb with *zài* has a resultative interpretation when the motion event is interpreted as a single, short, unbroken movement. Thus manner verbs such as *tiào* ‘jump’, which easily describe a single, unbroken movement, are most natural in, and show the greatest proportion of, resultative *V-zài*. Some manners of motion such as flying, crawling or climbing, may consist of either a series of repetitive motion or a single motion, describable by the same verb. The second kind of interpretation is more likely to arise when the motion is interpreted as being over short, local distances and (described as) containing little to no “subordinate” movements, rather than when a longer path is understood, or when subordinate movements are highlighted by the description. Hence the correlation between the above conditions and resultative *V-zài*. This suggests the resultative interpretation of *V-zài*

compounds arises pragmatically, and should be distinguished from those resultative compounds where V2 structurally encodes change.

5 The potential construction

This section further distinguishes *V-dào* compounds and RVCs from *V-zài*, showing the former form a natural class in allowing the potential construction.

5.1 The potential construction targets compounds where V2 encodes change

RVCs can be modalized in the POTENTIAL CONSTRUCTION, expressing the (im)possibility of attaining the result by inserting a negation morpheme *-bu-* or the morpheme *-de-* between V1 and V2.

- (35) a. *tā de yáichǐ tài zāng le, tā zěnmeyě shuā-bu-bái*
 3SG ASSOC tooth too dirty SF-PRT, 3SG how also brush-NEG-white
 His/her teeth are too dirty, no matter what (s)he does (s)he can't brush them white.
- b. *yáyī yídìng shuā-de-bái*
 dentist definitely brush-POT-white
 The dentist will definitely be able to brush them white.

Among motion verb compounds, only *V-dào* compounds, i.e., those formed with a directional coverb including *dào* 'arrive/to', *jìn* 'enter/into', etc. may participate in the potential construction.

- (36) a. *xuéxiào tài yuǎn le, wǒmen kǒngpà zǒu-bu-dào*
 school too far SF-PRT 1PL afraid walk-NEG-arrive
 The school is too far, (I'm) afraid we can't get there by walking.
- b. *zhǐyǒu lǎoshǔ cái jǐ-de-jìn zhème xiǎo de dòng-kǒu*
 only mouse then squeeze-POT-enter so small ASSOC hole
 Only a mouse could squeeze into such a small hole.

Crucially, *V-zài* 'V-be.at' compounds with (or without) a directional interpretation cannot participate in the potential construction.

- (37) **wūyā fēi-bu-zài qiáng-shang*
 crow fly-NEG-AT wall-upon
 Intended: The crow was unable to fly on the wall.

The table below lays out the relationship between the event structure of V2 and corresponding compatibility with the potential construction:

(38)

VV compound	RVC	<i>V-dào</i>	<i>V-zài</i>
Examples	<i>shuā-bái</i> 'brush-white'	<i>zǒu-dào</i> 'walk-arrive'	<i>fēi-zài</i> 'fly-be.at'
Ok in potential construction?	yes	yes	no
V2 encodes change?	yes	yes	no

Result-encoding VV compounds may be formed with change encoded in V1. For instance, the verb *biàn* 'change' may combine with a COS V2 or a stative V2:

- (39) wūyā bián-**chéng**/**wéi** fènghuang le
 crow change-become phoenix SF-PRT
 The crow has changed into a phoenix.

But only if V2 is COS, such as *chéng* ‘become’ can the compound participate in the potential construction (40). If V2 is the stative *wéi* ‘as’, the potential construction is disallowed.

- (40) a. wūyā shì **biàn-bu-*chéng*/**wéi*** fènghuang de
 crow be change-NEG-become/as phoenix DE
 A crow can’t turn into a phoenix.
 b. wūyā zěnmē **biàn-de-*chéng*/**wéi*** fènghuang ne?
 crow how change-DE-become/as phoenix Q-PRT
 How can a crow turn into a phoenix?

The potential construction thus provides further support for treating V2 in RVCs such as *shuā-bái* ‘brush-white’ and *yā-biǎn* ‘press-flat’ as COS.

5.2 An analysis of the potential construction

I label the functions corresponding to the potential morphemes *-bu-* and *-de-* as NPOT (negative potential) and PPOT (positive potential) respectively. These combine with a predicate P over events of change to yield a predicate over worlds (namely, those worlds for which there is (or is not) an accessible world in which the event of change takes place).

- (41) a. *-bu-* “NPOT”: $[[-bu-]] = \lambda P \lambda w \neg \exists w' \exists e [R(w)(w') \wedge P(e) \text{ in } w']$
 b. *-de-* “PPOT”: $[[-de-]] = \lambda P \lambda w \exists w' \exists e [R(w)(w') \wedge P(e) \text{ in } w']$

- (42) xiǎoháir yā-bu-biǎn ní-tuán
 child press-NEG-flat mudball
 The child is unable to flatten the mudball by pressing it.

The meaning of (42) in (44) is obtained by applying NPOT to the predicate over events, i.e. the meaning of (43a), given in (43b).

- (43) a. xiǎoháir yā-biǎn ní-tuán
 child press-flat mudball
 “The child press the mudball flat.”
 b. $\lambda e \exists e' [BECOME(flat')(mb)(e) \wedge press'(mb)(c)(e') \wedge CAUSE(e)(e')]$

- (44) NPOT((43b)) =
 $\lambda w \neg \exists w' \exists e' [R(w)(w') \wedge BECOME(flat')(mb)(e) \wedge press'(mb)(c)(e') \wedge CAUSE(e)(e') \text{ in } w']$

I assume that culminative resultatives also participate in the potential construction in the same way, but do not show the derivation here for reasons of space.

6 Stepping back: conclusions and implications

Summing up, I have shown for resultative VV compounds in Mandarin with activity V1, whether causative, culminative, object- or subject-oriented, that change is encoded in V2. In many RVCs,

V2 appears to be an adjective, but property-concept adjectives systematically alternate to COS verbs. The assumption that apparent adjectives in V2 position of RVCs are COS verbs extends naturally to compounds where V2 is a COS verb with no stative counterpart. This case is clearly exemplified by *V-dào* compounds, aspectual properties of which are shared by RVCs. In further support of this conclusion, I showed the resultative interpretation of *V-zài*, where V2 is stative, arises pragmatically. Finally, RVCs may participate in the potential construction, which allows only compounds where V2 is COS, further affirming my proposal.

We may thus conclude that lexically-specified results in resultative compounds arise from a COS verb that, in many cases, alternates with an adjective, and not from an activity-to-accomplishment shift. This conclusion converges with the observation that accomplishment verbs are rare in Mandarin (Tai 2003, Chief and Koenig 2007) (45), and with the general lack of deadjectival caused COS verbs in the language (46).

- (45) Sūn Mázi bǎ Lǎo Luo shā-le, méi shā-sǐ
 Sun Mazi BA Lao Luo kill-PERF, NEG kill-die
 Sun Mazi killed Lao Luo but Lao Luo didn't die.
 (Chief and Koenig 2007: attested example)

- (46) *xiǎoháir biǎn-le ní-tuán
 child flat-PERF mud-ball
 Intended: The child flattened the mudball

Lexical accomplishments – although not deadjectival causatives – also seem to be rare in English (Rappaport Hovav (2008), see also Filip and Rothstein (2006) for proposals to the same effect for Germanic). This suggests the contrast between accomplishments and causatives could provide a fruitful avenue for exploring cross-linguistic differences in event structure operations.

This work also raises questions for the analogy, frequently made between spatial paths and property scales, that relative degree on a property scale is parallel to location on a path (Rappaport Hovav and Levin (2010), and change of state is analogous to change of location (Talmy 2000, Folli and Ramchand 2005). Although compatible with the assumption that change of state and change of location do indeed show parallels, the current work points to an important difference between property concept states and stative location. Specifically, while adjectives may show zero alternations with COS verbs, locative predicates do not seem to alternate freely with change of location meanings. This is presumably because a gradable property is necessarily a point (or interval) on a scale. But while paths constitute at least two connected locations, a location need not be a point on a path.

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