

Reanalyzing Mandarin V₁-V₂ resultative constructions—A force-theoretic approach

PENG (BENJAMIN) HAN

University of Calgary, Calgary, Canada

peng.han@ucalgary.ca

Abstract

This study takes a force-theoretic approach to Mandarin V₁-V₂ resultative constructions. Unlike event-based analyses that hold a causing event accountable for a result state, this study attributes a result state to a specific entity involved in the relevant causing event. In this way, V₁-V₂ resultative construction (RC) sentences have the interpretation that through a causing action, one entity relevant to the action caused a change of state to another entity; this causal influence is reconceptualized as a force from the former entity, characterizing the situation change concerning the latter entity. Following Copley and Harley (2015), this conceptual reanalysis is represented structurally, successfully deriving V₁-V₂ RC sentences. V₂ and the internal argument DP specify the property of a resultant situation and its holder, defining the force; the external argument DP tells about this force's source; V₁ modifies this force, indicating the causing action through which this force is realized.

Keywords: Mandarin resultative constructions, force-theoretic framework, force structure

Résumé

La présente étude adopte une approche de la théorie de la force pour analyser les constructions résultatives V₁-V₂ en mandarin. Contrairement aux analyses événementielles qui affirment qu'un événement causal est responsable de l'état résultant, cette étude attribue l'état résultant à une entité spécifique (A) impliquée dans l'événement causal pertinent. Ainsi, des phrases contenant des constructions résultatives V₁-V₂ reçoivent l'interprétation suivante : par une action causale, une entité pertinente à l'action (A) a causé un changement d'état affectant une autre entité (B) ; cette influence causale est reconceptualisée ici comme une force allant de A vers B, caractérisant le changement de situation concernant cette dernière entité. D'après Copley et Harley (2015), cette réanalyse conceptuelle est représentée de façon structurelle, dérivant avec succès des phrases résultatives V₁-V₂. Le V₂ et le DP argument interne déterminent la situation résultante et l'entité qui a subi le changement, définissant ensemble

This paper has got tremendous help from Dr. Bridget Copley, Dr. Maria Cristina Cuervo, Dr. Elizabeth Ritter and Dr. Dennis Storoshenko (in alphabetic order). Thanks also go to those who have provided comments and advice, including the professors and graduate students at the University of Calgary. Despite this, only the author is held responsible for errors in this article.

la force; le DP argument externe détermine la source de cette force; V_1 modifie cette force, indiquant l'action causale à travers laquelle cette force s'exerce.

Mots-clés: constructions résultatives en mandarin, cadre théorique de la force, structure de la force

1. INTRODUCTION

Resultative constructions (hereafter RCs) are found in many languages.¹ In the English example (1a), *the waiter's wiping* serves as a cause for *the table's* becoming clean. To express the same meaning, Mandarin can use a complex predicate in the form of V_1 - V_2 , as demonstrated by *ca-ganjing* 'wipe-clean' in sentence (1b).²

- (1) a. The waiter wiped the table clean.
 b. fuwusheng **ca-ganjing**-le zhuozi.
 waiter wipe-clean-PERF table
 'The waiter wiped the table clean.'

In the complex predicate, V_1 seems to encode a causing action, while V_2 indicates a result state. Other examples of V_1 - V_2 resultative complexes include *da-shang* 'hit-injured', *ma-ku* 'scold-cry', etc.³

The V_1 - V_2 complex in (1b) represents a typical resultative construction, in which an entity (e.g., entity A) acts on another entity (e.g., entity B), causing a change of

¹Abbreviations: CL = classifier, DE = post-verbal resultative marker, EA = the entity represented by the external argument of a sentence, IA = the entity represented by the internal argument of a sentence, PASS = passive marker, PERF = perfective marker, PNMM = pre-nominal modification marker, PROG = progressive marker, SFP = sentence-final particle, RC = resultative construction.

²Despite the symbol V_1 - V_2 , components in a resultative predicate encompass action verbs, states of being, and adjectives used predicatively.

³ V_1 - V_2 complexes are not necessarily resultative constructions; for instance, *zhua-jin* 'hold-tight' in (i) is a V_1 - V_2 complex, but not a resultative one, as the gloss suggests that sentence (i) only embodies one action represented with V_1 'hold', with V_2 'tight' serving as a degree modifier of V_1 'hold'.

- (i) ni yinggai **zhua-jin** fushou.
 you should hold-tight rail
 'You should hold the rail tightly.'

In addition to V_1 - V_2 complex verbs, Mandarin RCs can also surface in the form of "V-*de* + clause", hence named clausal RCs. (ii) is a clausal counterpart of sentence (1b). The morpheme *de* can be used as a lexical verb meaning 'gain', but in clausal RCs, *de* is attached to the preceding verb and functions to introduce clauses detailing result states. Despite the two forms of Mandarin resultative constructions, this study only focuses on the analysis of V_1 - V_2 RCs, leaving that of clausal RCs for future research.

- (ii)
 fuwusheng **ca-de** zhuozi bian ganjing-le.
 waiter wipe-DE table become clean-PERF
 'The waiter wiped the table, so that the table became clean.'

state for the latter. In terms of thematic roles, entity A is the agent of the relevant action, while entity B is not only the patient/theme of the action, but serves as the holder of the new state. In (1b), *fuwusheng* ‘waiter’ is the agent of ‘wipe’, whereas *zhuozi* ‘table’ is the patient of ‘wipe’ and the holder of ‘clean’. Nevertheless, the resultant effect in a V_1 - V_2 RC sentence does not always apply to the patient/theme of an action. In (2), for instance, the drinker *Lisi* acts on ‘wine’, but this sentence encodes a result state concerning the drinker instead, making *Lisi* both the agent of ‘drink’ and the holder of ‘drunk’.⁴ Despite this, the resultant effect in (2) falls on an entity involved in the action of ‘drink’, that is to say, the agent. There are also RC sentences with the represented effects oriented outwards, that is, the resultant effect may happen to an entity that is not involved in the corresponding causing event. The sentence in (3) demonstrates an outward result, with *Zhangsan*’s crying getting the handkerchief wet. The handkerchief, to which the resultant effect applied, was not involved in *Zhangsan*’s crying and is external to this causing event.

- (2) na ping jiu **he-zui-le** Lisi.
 that bottle wine drink-drunk-PERF Lisi
 ‘Drinking that bottle of wine got Lisi drunk.’
- (3) Zhangsan **ku-shi-le** shoujuan.
 Zhangsan cry-wet-PERF handkerchief
 ‘Zhangsan’s crying got the handkerchief wet.’

As seen above, I distinguish three types of resultative constructions, based on distinctions in the affected entity (i.e., who/what a resultant effect happens to) and its relationship to the causing event. A resultative construction is typical if the resultant effect applies to the entity that the relevant causing event acts on (mostly patient/theme of the action); otherwise, it is atypical. Note that typical resultative constructions are found in quite a few languages (e.g., English, German, Japanese, etc.), but atypical ones are not common. Sentence (2) exhibits an atypical resultative construction that does not have an English resultative counterpart. Moreover, a resultative construction can be inward or outward; an inward resultative construction’s affected entity is obligatorily involved in the causing event, but an outward resultative’s affected entity lies outside the core actors in the causing action. In Table 1, I summarize the three types of Mandarin RCs and present their affected entities, properties and examples.

The distinction in RC types not only demonstrates the range of entities on which a causing event can exert its effect, but provides a glimpse of the complex theta-role assignment patterns involved in Mandarin RC sentences. Table 2 shows the theta-roles assigned to the subjects and the objects in sentence (1b), sentence (2) and sentence (3). It seems that some arguments take more than one theta-role, showing an apparent violation of the Theta Criterion (Chomsky 1981). Moreover, Type II RC sentences involve reversed theta-role assignments, with patients/themes placed in

⁴The two component verbs *he* ‘drink’ and *zui* ‘drunk’ are not derivationally related in Chinese.

RC types	Affected entities	Properties	Examples
Type I	patient/theme of a causing action	typical & inward	sentence (1b)
Type II	agent of a causing action	atypical & inward	sentence(2)
Type III	not agent/patient/theme	atypical & outward	sentence (3)

Table 1. Types and dimensions of Mandarin resultative constructions

subject position and agents in object position, violating the Thematic Hierarchy (Huang et al. 2009).

Some researchers (e.g., Li (1990)) have argued that ‘wine’ in (2) is not the theme of ‘drink’, but instead the causer for *Lisi*’s drunk state, to avoid the violation of the Thematic Hierarchy. However, this treatment is challenged by the fact that not all causers can appear in the subject position of RC sentences, for example, (4b). In sentence (4a) with the causative verb *shi* ‘make’, *yumen-de xinqing* ‘the depressed feeling’ is demonstrated to be a possible cause for *Lisi*’s intoxication as well; yet, ‘the depressed feeling’ is not a feasible subject like ‘wine’ in (2), as seen in (4b). There must be some constraints on external arguments in Mandarin RC sentences, other than merely requiring that they be a causer.

- (4) a. *yumen-de xinqing shi Lisi he-zui-le.*
depressed-PNMM mood make Lisi drink-drunk-PERF
‘The depressed feeling led to Lisi’s drinking himself drunk.’
- b. * *yumen-de xinqing he-zui-le Lisi.*
depressed-PNMM mood drink-drunk-PERF Lisi
Intended reading: ‘The depressed feeling led to Lisi’s drinking himself drunk.’

Recall the complexity in the theta-role assignments shown in Table 2, with multiple theta-roles assignable to a single argument in an RC sentence. Theta-role assignments in Mandarin RC sentences can be more complex, with a single sentence allowing multiple readings and each reading embodying distinct theta-role assignments. As indicated in Li (1998), sentence (5) with the complex *zhui-lei* ‘chase-tired’ is ambiguous, with three different readings. This leads us to ask the question of how the arguments with distinct theta-roles surface with the same word order. But since the various readings in (5) differ in which entity the resultant effect applies to, for

Sentences	RC types	Subject	Object
(1b)	Type I	agent of ‘wipe’	theme of ‘wipe’ & holder of ‘clean’
(2)	Type II	theme of ‘drink’	agent of ‘drink’ & holder of ‘drunk’
(3)	Type III	agent of ‘cry’	holder of ‘wet’

Table 2. Exemplifying theta-role assignments in different types of RC sentences

instance, whether it happens to the agent or theme of the causing action, these readings actually involve different types of resultative constructions. According to the tripartite distinction of RC types in Table 1, *zhui-lei* ‘chase-tired’ is a Type I resultative construction under Reading A, but it should be considered a Type II resultative construction under Readings B and C. As will be seen in this paper, this distinction is helpful in explaining the multiple interpretations of (5).

- (5) Zhangsan **zhui-lei-le** Lisi.
 Zhangsan chase-tired-PERF Lisi
 Reading A: ‘Zhangsan chased Lisi so that Lisi got tired.’
 Reading B: ‘Lisi chased Zhangsan so that Lisi got tired.’
 Reading C: ‘Zhangsan chased Lisi so that Zhangsan got tired.’

Adapted from Li (1998)

In this article, I will present a syntax-semantics analysis of Mandarin V_1 - V_2 resultative constructions by taking a force-theoretic approach (Copley and Harley 2015). This analysis not only successfully derives Mandarin V_1 - V_2 RC sentences, but provides answers to problems raised above concerning V_1 - V_2 RCs. The rest of this article is organized as follows. Section 2 introduces the search for a satisfactory account of Mandarin V_1 - V_2 RCs. It begins with the theoretical problems that a purely syntactic approach faces, followed by a discussion of Li’s (1990; 1998) lexical analysis and four event-based analyses: Sybesma (1999), Ramchand (2008), Lin (2004) and Liu (2019). I then present an overlooked phenomenon: Mandarin RC sentences can encode different effects following from a single causing event, whose effects can arise from multiple entities involved in the causing event and happen to different entities internal or external to the causing event. In order to characterize the multiple potential effects following from a causing event, the notion of “force” is introduced, along with an analysis mapping force structures to syntactic argument realizations, as in Copley and Harley’s (2015) force-theoretic approach. In section 3, I apply the force-theoretic approach to Mandarin V_1 - V_2 RC sentences, exemplifying how a V_1 - V_2 RC sentence is derived. I then demonstrate how pragmatic enrichment is involved in obtaining the common sense readings of V_1 - V_2 RC sentences. These readings incorporate both causing events and result states, which are not the focus of event-based analyses. This force-theoretic analysis allows the mapping of each conceptual primitive in a force structure to a linguistic element in a Mandarin RC sentence, in opposition to event-based analyses which tend to struggle to locate the entity that appears in the external argument position of a Mandarin RC sentence. I conclude in section 4.

2. THE JOURNEY TO FINDING A SATISFACTORY ACCOUNT OF MANDARIN RCs

In the search for a plausible account of Mandarin RCs, a purely syntactic approach is the first one excluded. A syntactic approach to Mandarin RCs usually attempts to derive the V_1 - V_2 predicates and arrange their arguments in a ‘correct’ word order. As demonstrated in the previous section, for a syntactic approach to work, it is necessary to avoid violations of the Theta Criterion and the Thematic Hierarchy. Moreover,

if the Uniformity of Theta Assignment Hypothesis (Baker 1988) is assumed, each distinctive theta-role should have a constant structural position, which makes it very challenging to derive the word order in Type II RC sentences, with patients/themes in external argument position and agents in internal argument position. Usually, movements are employed to derive the required word order, but these movements involve patients/themes moving over agents, which tends to result in a violation of Minimality (Rizzi 2001).

2.1 A lexicalist approach: Li (1990, 1998)

Li (1990, 1998) offers a lexicalist account of V₁-V₂ RCs. In this account, V₁-V₂ predicates are a combination of their component verbs. Li attributes the complex theta-role assignments in these constructions to rules that derive the V₁-V₂ predicates' theta-grids from the theta grids of the individual verbs. In the formation of a resultative complex V₁-V₂, shared theta-roles of V₁ and V₂ are first merged and assigned to a single argument. This reduces the number of arguments required by the V₁-V₂ to a maximum of two, and circumvents the violation of the Theta Criterion. Then, head-feature percolation ensures the theta-roles of a resultative complex follow the thematic hierarchy of the head verb of the complex, that is to say, V₁. In terms of *zhui-lei* in (5), its component verbs have the theta-grids in (6), with V₁ assigning two theta-roles and V₂ assigning one.

- (6) θ -grids for *zhui* and *lei*:
 - zhui* 'chase': < agent < patient >>
 - lei* 'tired': < holder >

In Li (1990), the three readings of sentence (5) are explained as different identification possibilities, as presented in Table 3, with “=” symbolizing identification of theta-roles.

Assuming that V₁ is the head, the theta-grid of *zhui-lei* 'chase-tired' needs to follow *zhui*'s thematic hierarchy. Li's analysis can easily accommodate Readings A and C but not Reading B, because, in Readings A and C, the agent of the head verb V₁ appears in the external argument position of sentence (5). As for Reading B, it involves reversed theta-role assignments, violating the thematic hierarchy percolated from V₁ *zhui* 'chase'. To solve this, Li introduces causative structures wherein the causer is held responsible for putting the causee in a specific state. It is stipulated that the causative hierarchy < Causer < Causee >> is able to override the thematic hierarchy percolated from a head verb. Following this, the patient of

	External argument	Internal argument
Reading A	agent of V ₁	patient of V ₁ = holder of V ₂
Reading B	patient of V ₁	agent of V ₁ = holder of V ₂
Reading C	agent of V ₁ = holder of V ₂	patient of V ₁

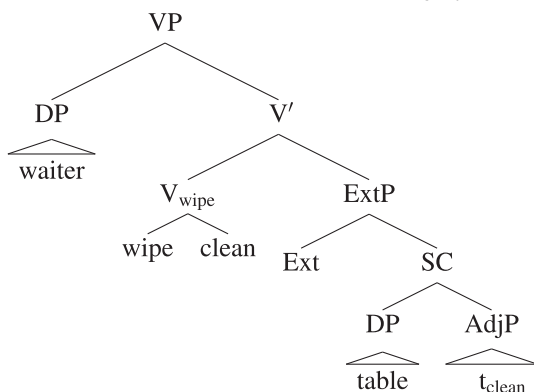
Table 3. Varied theta-identifications for different readings of sentence (5)

V_1 and the agent of V_1 under Reading B are assigned the new roles of causer and causee respectively, and are thus not subject to V_1 's (*zhui*) thematic hierarchy. The introduction of causative structures does provide an extended explanatory scope, but it also renders Li's analysis less integrated. A complex predicate's theta-grid is derived from several incongruent rules, and the analysis involves stipulations and lacks independent theoretical motivations. Also, Li's approach raises but does not answer the question of how patients can be understood to be causers.

2.2 Conceptualizing RC sentences as events

Hoekstra (1992: 160) proposes that an RC sentence encodes an event with a result state, and the predicate representing the result state functions to "turn a non-telic predication into a telic one, by specifying the state which terminates the event". Sybesma (1999) follows this conceptual basis and analyzes Mandarin RCs on a par with their English counterparts. In Sybesma's treatment of V_1 - V_2 RC sentences, V_2 and its argument (also the internal argument of the complex) are included in a small clause. For example, the underlying structure of (1b) contains a small clause [_{SC} table clean], as seen in (7), whose structure is based on Sybesma's analysis.

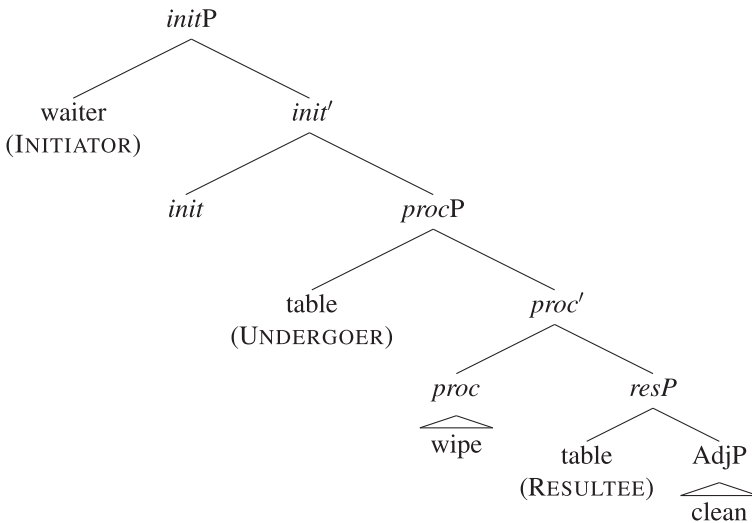
(7) Partial derivation of sentence (1b) following Sybesma (1999):



Immediately above the small clause is the projection of Extent Phrase, which serves as the complement of V_1 . V_2 within the small clause needs to undergo head movement and combine with V_1 to derive the surface form. Unfortunately, Sybesma's analysis can account for sentence (5) only under Reading A, which is, in essence, a Type I RC sentence; it fails to derive Type II RC sentences such as (2). In this sentence, a bottle of wine got the drinker drunk through the drinker's drinking; a drinking event is terminated by the drinker's insobriety. Following this reasoning, the result state (i.e., V_2 'drunk') and the result state's holder (i.e., the drinker *Lisi*) should originate in the small clause, and the event (i.e., V_1 'drink') should be merged as a V head above ExtP. A problem arises when V selects *Lisi* as its specifier, because then there are two copies of *Lisi* (the drinker); one in the small clause and the other in the specifier of VP. Meanwhile, the sentential subject 'wine' is not represented at all.

Lin (2004), Ramchand (2008) and Liu (2019) demonstrate approaches that appeal to interactions at the syntax-semantics interface. They agree that predicates should be analyzed semantically as events, but they go further and decompose predicates into semantic primitives of events. These semantic primitives are mapped to syntactic argument structures. In Ramchand (2008), predicates are decomposed temporally into the subevents of initiation, process and result. The three subevents are mapped onto syntactic structures as the functional phrases, *initP* (initiating/causing projection), *procP* (process projection) and *resP* (result projection). In terms of an RC sentence, there is an initiation phase with the necessary conditions leading to the result; after experiencing the process during which a certain action happens, the affected entity obtains a result state. Following this analysis, sentence (1b) should have the derivation as in (8). The external argument ‘waiter’ is introduced as an initiator and merged as the specifier of *initP*. The internal argument ‘table’ is not only the undergoer of change/process, but the resultee (i.e., entity holding the result state), so that ‘table’ is introduced twice as the arguments in both *procP* and *resP*. Though Ramchand does not go into the details of the derivation of RC sentences, it is conceivable that some mechanism could be adopted to reduce one copy of ‘table’ and ensure a surface form that does not crash.

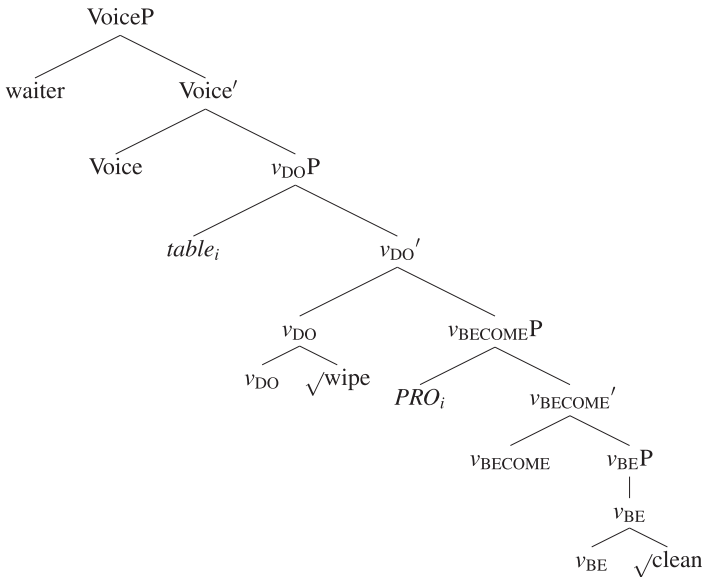
(8) Partial derivation of sentence (1b) following Ramchand (2008):



When it comes to deriving Type II RC sentences, it is unclear how roles are assigned, especially those of INITIATOR and UNDERGOER. In interpreting and deriving sentence (2), for instance, the undergoer can either be the drinker or alcohol, as both of these entities undergo a change or a process. The change involved in (2) is getting drunk, but the process involved is drinking, indicating inconsistent undergoers. Besides, the referent of INITIATOR changes depending on what is initiated, the process of drinking or the change. In short, Ramchand’s account with INITIATOR and UNDERGOER faces problems when an agent acts on a patient/theme but at the same time the agent undergoes a change.

Lin (2004) also analyzes predicates from the perspective of event structures, but unlike Ramchand (2008), Lin makes use of a different set of semantic primitives (including DO, BECOME and BE) to decompose a V_1 - V_2 resultative complex. These primitives are realized as verbalizing heads little v , which select for verbal roots and license the roots as verbs. Semantically, the three little v s represent three subevents; v_{DO} realizes the causing event and v_{BE} realizes the result state, while v_{BECOME} represents the cause-and-effect connection between the causing event and the result state. Structurally, a v_{DO} head takes a $v_{BECOME}P$ as complement, which in turn has $v_{BE}P$ as complement. In (9), I present how Lin would derive sentence (1b). V_2 combines with v_{BE} and V_1 combines with v_{DO} as modifiers to produce little v s with enriched meanings. Little v s at lower levels then undergo head movements to the highest little v and merge into the complex predicate surfacing as V_1 - V_2 (not pictured in (9)). As *zhuozi* ‘table’ is both the entity with a state of change and the entity subject to the action ‘wipe’, it is represented at two places in (9), with an overt form represented as v_{DO} ’s argument and an empty form *PRO* encoded as v_{BECOME} ’s argument. The introduction of *PRO* saves the Theta Criterion. As v_{DO} ’s argument is the closest c-commanding DP for *PRO*, *PRO* is necessarily controlled by v_{DO} ’s argument, ensuring the co-indexation between the two.

(9) Partial derivation of sentence (1b) following Lin (2004):



In line with Kratzer (1996) and Pylkkänen (2002), a Voice head is merged to introduce the external argument *waiter*. Lin recognizes that non-agentive entities can also trigger changes of states, for example, ‘wine’ in the Type II RC sentence (2). In this case, to use v_{DO} to represent the effect of ‘wine’ is inappropriate. It is then proposed that causers like *wine* have special properties/states capable of producing certain effects that require another projection of v_{BE} to be inserted between VoiceP and $v_{DO}P$. This signifies a specific property/state and mediates between the non-agentive

causer and its relevant result state. Despite Lin's efforts to accommodate Type II RC sentences, I believe it is counter-intuitive to claim that an activity-denoting v_{DO} is always included in the derivation, even when alcohol, which does not 'do' anything, has an effect on its drinker.

Concerning the syntactic structure in Lin (2004), Liu (2019) argues that v_{BE} should be removed, as its presence should allow adverbs that modify states to appear and modify V_1 - V_2 resultative predicates, which turns out to be false. Consider the contrast in (10).

- (10) a. a sentence with a stative predicate:
 na-kuai tie-pian hen bao.
 that-CL metal-plate very thin
 'That piece of metal plate is very thin.'
- b. a V_1 - V_2 RC sentence:
 John (*hen) **mo-bao**-le na-kuai tie-pian.
 John very rub-thin-PERF that-CL metal-plate
 Intended meaning: 'John rubbed that metal plate so that it was very thin.'
 Liu (2019)

Moreover, the contrast in (11) demonstrates that adverbs in V_1 - V_2 RC sentences modify the causing events but not the caused events (i.e., result states), as is the case in English direct causative sentences. For example, *grumpily* in the sentence "John awoke Bill grumpily" cannot be used to modify the state of *awake* and mean that John is/was awake grumpily.

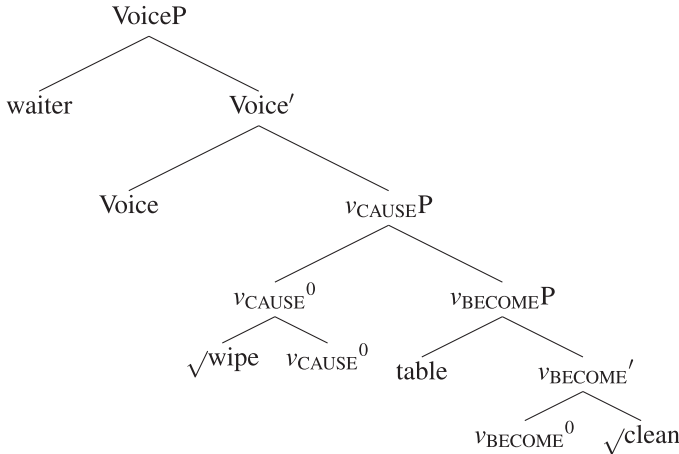
- (11) a. fuwusheng yonglide **ca-ganjing**-le zhuozi.
 waiter forcefully wipe-clean-PERF table
 'The waiter got the table clean by wiping it forcefully.'
- b. * zhuozi
 table yonglide **ganjing**-le.
 forcefully clean-PERF
 'The table has been forcefully cleaned.'

Following Pylkkänen's (2002) analysis of direct causatives like *awake*, Liu proposes that V_1 - V_2 resultative predicates involve v_{CAUSE} , rather than v_{DO} . The replacement of v_{DO} with v_{CAUSE} also helps account for why adverbs modifying activity predicates (i.e., those with v_{DO}) are not necessarily compatible with V_1 - V_2 resultative predicates, as seen in (12). Besides, v_{CAUSE} more appropriately represents the effect that alcohol has on its drinker than v_{DO} does.

- (12) a. a sentence with an activity verb:
 John zai dashengde ku.
 John PROG loudly cry
 'John is crying loudly.'
- b. a V_1 - V_2 RC sentence:
 John (*dashengde) **ku-shi**-le shoujuan.
 John loudly cry-wet-PERF handkerchief
 Intended meaning: 'John cried loudly so that his handkerchief got wet.'
 Liu (2019, 84)

Following the above amendments concerning little *vs*, Liu's analysis suggests a revised structure in (13) for sentence (1b). With v_{DO} 's replacement by v_{CAUSE} , 'table' is no longer subject to the action 'wipe', so it is represented only once as the entity with a change of state.

(13) Partial derivation of sentence (1b) following Liu (2019):



Note that the introduction of v_{CAUSE} is not without its problems. Recall that 'depressed feeling' is demonstrated to be a possible cause for one's getting drunk through drinking. If v_{CAUSE} does exist, there is no straightforward reason why the RC sentence in (4) is not acceptable with 'depressed feeling' as the external argument. In the analysis conducted in this paper, v_{CAUSE} is excluded from the derivation of Mandarin RC sentences and the roles played by v_{CAUSE} will be undertaken by other existing functional heads.

2.3 An overlooked phenomenon: multiple possible effects following from a single event

In an attempt to explain the fact that the same individual/entity can appear in different argument positions as in (14), Croft (2012: 233) points out that in mental events of emotion, cognition and perception, there can be two directions of transmission of force: "the experiencer directs their attention to the stimulus and the stimulus causes a change of (mental) state in the experiencer". The two sentences in (14) thus embody forces in different directions, though the force from the music to the listener caused a change, and the force from exerted from the listener to the music did not.

- (14) a. I listened to the loud music.
 b. The loud music frightened me.

The bidirectionality of force transmission is not unique to mental events. Returning to the sentences in (1), a waiter performed a "wiping" action, which made the wiped entity clean. For the event with the physical action "wiping", the waiter's force

directed toward the wiped entity (i.e., table) has an effect on it; it gets the wiped table clean. It is easily conceivable that the same event of “wiping” can also result in an effect on the wiping agent (i.e., waiter), for example, the waiter’s tiredness. The latter effect reflects the force transmission from the wiped entity to the wiping agent, and is characterizable by the V_1 - V_2 RC sentence in (15). Actually, the effects embodied in all Type II RC sentences apply to agents of the relevant causing actions, and do not apply to the patients/themes.

- (15) zhexie zhuozi **ca-lei-le** nage fuwusheng.
 these table wipe-tired-PERF that waiter
 ‘Wiping these tables tired the waiter.’

The effect of a causing event can apply to entities completely external to the causing event as well. RC sentences with this type of effect are represented by Type III. In the Type III sentence (16) (repeated from (3)), Zhangsan’s crying got a handkerchief wet; the handkerchief’s (the result state holder) presence is not a necessary condition for Zhangsan’s shedding tears. However, the handkerchief did get wet because of Zhangsan’s crying, demonstrating an outward effect from a causing event. Therefore, there are multiple potential effects arising from different entities involved in a causing event that can be directed toward different entities internal or external to the causing event.

- (16) Zhangsan **ku-shi-le** shoujuan.
 Zhangsan cry-wet-PERF handkerchief
 ‘Zhangsan’s crying got the handkerchief wet.’

Many studies of Mandarin RCs, especially those analyzing RCs from the perspective of event structures, generally overlook the multiple potential effects following from a single causing event. As seen in the previous section, those event-based analyses realize that a Mandarin RC sentence involves an event followed by a result state, with the former characterized as the causing event, and the latter as the caused event/effect. As causing events usually include sentences with of action verbs and their agents and patients/themes, it is easy to dwell on the potential effect that an agent has on a patient/theme and ignore other potential effects following from the same causing event, for instance, the effect a patient has on an agent. Therefore, previous event-based analyses fail to distinguish the possible different directions of effects within a causing event, which makes these analyses inaccurate with regards to what roles the external arguments and the component verbs (especially V_1) in a V_1 - V_2 RC sentence play, and how they are licensed.

For instance, the external arguments in Mandarin RC sentences are considered sometimes to be agents but sometimes to be causers; even when they are unified into initiator or causer roles, it is still unclear which individuals/entities can be licensed as such. A V_1 in a V_1 - V_2 RC is often characterized as the manner in which a result state is caused, for example, Liu (2019). While a waiter can make a table clean in the manner of wiping, it is inappropriate to make the claim for sentence (15) that the table got the waiter tired in a wiping manner. As will be seen in section 3, a recognition of the multiple effects following from a single causing event and a distinction between these effects are critical for both the interpretation and the

production of Mandarin RC sentences. To characterize the multiple potential effects, Croft has used the notion of force, which captures the causal power from any entity in an event, without necessarily entailing an actual effect.

The notion of force is not new; it has been adopted to characterize dynamic verbal meanings in the cognitive linguistic tradition in Talmy (1988, 2000), Croft (1991, 1998), Langacker (2003) and others. Formal literature (Asher 1992; Portner 1998) also mentions the notion of force in an intuitive sense in order to characterize some external or unexpected effects. Moreover, the notion of force is explicitly exploited in Shen and Sybesma's (2010) analysis of the Mandarin *ba*-construction, which is closely associated with Mandarin resultative constructions. Nearly all the Mandarin RC examples introduced in this paper can be easily rephrased with the addition of *ba*, forming *ba*-construction sentences. For example, the Mandarin RC sentence (1b) with 'wipe-clean' has been modified into a *ba*-construction sentence as in (17). According to Shen and Sybesma, object DPs in *ba*-construction sentences are affected by external forces, emanating from the subject DPs preceding *ba*. In terms of sentence (17), it should encode the meaning that the waiter exerts a force, causing the table to experience a change of state, that is, become clean. Mandarin RC sentences are almost semantically identical to their *ba*-construction counterparts (e.g., sentence (1b) and sentence (17)) and only differ in word orders. Therefore, the notion of force can possibly be extended to the interpretation of Mandarin RC sentences as well.

- (17) fuwusheng ba zhuozi **ca-ganjing**-le.
 waiter BA table wipe-clean-PERF
 'The waiter wiping the table clean.'

With the introduction of "force", the two different directions of the effects encoded respectively in sentences (1b) and sentence (15) actually reflect the bidirectionality of forces (or causal influences) between the two participating parties (i.e., agent and patient/theme) in the causing event "the waiter's wiping the table". Moreover, the handkerchief's getting wet in (3)/(16) should arise from the force directed from *Zhangsan* to the handkerchief. Following this line of thought, the result state encoded in an RC sentence can be attributed to a specific entity involved in the relevant causing event, rather than the event as a whole. This will allow conceptual structures of RC sentences to match their corresponding linguistic representations, in which the subject/object arguments refer to specific entities, rather than events. Therefore, this article undertakes a reconceptualization of Mandarin RC sentences using forces. It maps force structures to syntactic structures and argument realizations, leading to a more precise analysis of V_1 - V_2 RCs and more plausible answers to the problems concerning V_1 - V_2 RC sentences. To accomplish this, I will first show how force structures are represented linguistically.

2.4 Introducing the force-theoretic framework for event structure

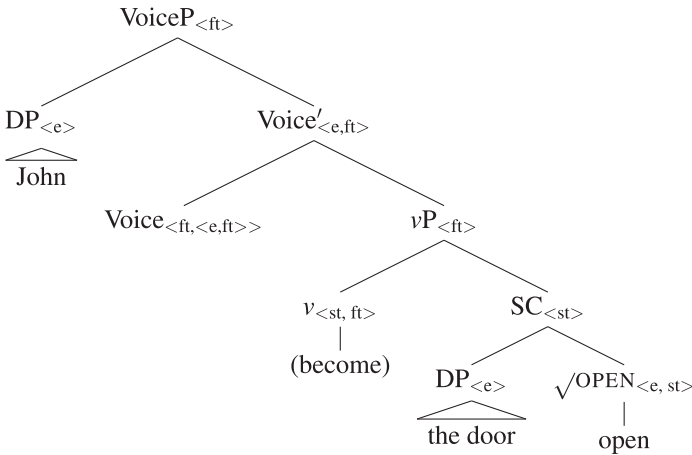
Copley and Harley's (2015) force-theoretic framework originates as an alternative account of accomplishment verbs, such as *open* in *John opened the door*. Traditional approaches consider accomplishment verbs to be composed of two sub-events chained together in a causal relationship, i.e. is to say the causing sub-

event e_1 “John’s opening” and the result sub-event e_2 “the door’s being open”. This chain is represented as $\exists e_1 \exists e_2: e_1 \text{ CAUSE } e_2$. When it comes to a sentence like (18), the two sub-event analysis runs into problems, as no result sub-event e_2 has occurred.

(18) Mary was painting the dresser black, but she didn’t finish.

In order to account for the non-culmination of the event in (18), Copley and Harley (2015) develop a syntax-semantics interface theory of accomplishment verbs which draws on the notion of force. According to these authors, an accomplishment verb encodes a force, which represents the causal influence from a specific source. This force is inherently defeasible and thus entails no necessary effect. Semantically, forces are realized as a new semantic type, $f(\text{orce}): \langle s, s \rangle$, denoting the function from an initial situation (s_0) to a final situation (s_1) that occurs if nothing external intervenes. In the sentence “John opened the door”, s_1 is encoded in the small clause [_{SC} the door open], and s_0 is the situation immediately before s_1 with the door closed. This sentence has the basic structure as in (19), with $v_{\text{BECOME}P}$ representing the force leading to the situation change from “door closed” to “door open”.

(19) Partial derivation of “John opened the door”:



The external argument *John* is “introduced by a Voice head, which takes a predicate of forces as its complement and returns a function from individuals to forces” (Copley and Harley 2015: 125).

The force-theoretic framework is also applied to compositions of other Vendlerian eventuality types, based on the underlying conception that dynamic predicates are forces while stative ones are situations. Note that ‘dynamic’ here is defined based on whether an input of energy is involved, rather than whether any motion or change occurs. Such a treatment successfully captures non-culminated cases of accomplishment verbs, and sheds light onto the question of why maintaining verbs (e.g., *keep* and *stay*) behave like change-indicating predicates (e.g., *become*, *cry*), but do not encode any kind of change. Imagine a door installed with a mechanism such that its resting state is to always be closed. A sentence like “The door stays open” does not encode any change of state, but it can take progressive aspect and

become “The door is staying open”, which demonstrates a dynamic quality. Following a force-theoretic treatment, the dynamic quality of maintaining verbs is ascribed to energy input rather than actual changes of state. Although no change of state happens to *the door*, an external force is needed to counteract *the door*’s desire to be closed. The intervention by external forces is more noticeable in the sentence “Mary is keeping the door open”, though including the force’s source *Mary* is not necessary to license the dynamic quality and the progressive *staying open*. Therefore, this force-theoretic framework not only accommodates sources and recipients of forces in syntactic representations, but tackles problems confronting event-based analyses, for example, non-culminating cases of accomplishment verbs.

3. A FORCE-THEORETIC APPROACH TO MANDARIN RCs

3.1 Adapting the force-theoretic approach to Mandarin V_1 - V_2 RCs

A force-theoretic approach to Mandarin V_1 - V_2 RCs begins with a conceptual reinterpretation of these RCs with forces and situations. Resultative constructions are traditionally characterized by causing events and result states. From the perspective of Copley and Harley (2015), the result states represent new situations; to bring in new situations, forces must be involved. In a V_1 - V_2 RC sentence, it is V_2 that encodes the resultant property in the new situation, while the internal argument of this sentence encodes the holder of the resultant property. This is demonstrated by the tests below, where sentence (20a) (replicated from (1b)) and sentence (20b) only differ in V_2 , and sentence (20a) and sentence (20c) only differ in their internal arguments. A change of V_2 results in a completely different resultant property for ‘table’; a replacement of the internal argument results in a different entity being subject to the resultant property.

- (20) a. fuwusheng **ca-ganjing-le** zhuozi.
waiter wipe-clean-PERF table
‘The waiter wiped the table clean.’
- b. fuwusheng **ca-liang-le** zhuozi.
waiter wipe-shiny-PERF table
‘The waiter wiped the table to a shine.’
- c. fuwusheng **ca-ganjing-le** yizi.
waiter wipe-clean-PERF chair
‘The waiter wiped the chair clean.’

Turning back to (1b)/(20a), the table in s_1 is clean, and in s_0 the table was not as clean. Forces are defined as the causal functions from initial situations to new situations; in (1b)/(20a), the force is what changes the table from “not being as clean” to “being clean”, and the table undergoing this change is the force recipient. The subject *waiter* is this force’s source, because it is the waiter that makes the change happen. In terms of V_1 ‘wipe’, it seems to represent the manner of the relevant force, as a replacement of V_1 in (1b)/(20a) with *shua* ‘scrub’ (cf. sentence (21)) only suggests a difference on how the change happening to ‘table’ is realized. Based on the

arguments above, a preliminary mapping between linguistic elements and conceptual interpretations are provided in (22). Each linguistic element corresponds to a conceptual primitive. A force structure involves four conceptual primitives, which are all relevant to and indispensable to the relevant force.

- (21) fuwusheng **shua-ganjing-le** zhuozi.
waiter scrub-clean-PERF table
'The waiter scrubbed the table clean.'
- (22) Linguistic elements \Leftrightarrow Conceptual interpretations/primitives (preliminary)
 V_2 : relevant property in the new situation s_1
 IA (internal argument): holder of the relevant property (force recipient)
 EA (external argument): source of the force that leads to the change from s_0 to s_1
 V_1 : manner in which the relevant situation change is realized

The mapping relations in (22) are derived based on Type I RC sentences. When similar reasoning is applied to Type II and Type III RC sentences, the mapping relations still hold except in the case of V_1 . For instance, the Type II RC sentence in (23a) (copied from (2)) involves the causal influence from 'wine' to the drinker *Lisi*, leading to the drinker's intoxication; however, it is less appropriate to claim that 'wine' got *Lisi* drunk in the manner of 'drinking' (the relevant V_1 here). Moreover, the Type III RC sentence in (23b) (copied from (3)) contains a new situation with "handkerchief being wet" resulting from a force directed from Zhangsan to the handkerchief, but it is far-fetched to make the interpretation that Zhangsan got the handkerchief wet in the manner of 'crying'.

- (23) a. na ping jiu **he-zui-le** Lisi
that bottle wine drink-drunk-PERF Lisi.
'Drinking that bottle of wine got Lisi drunk.'
- b. Zhangsan **ku-shi-le** shoujuan.
Zhangsan cry-wet-PERF handkerchief
'Zhangsan's crying got the handkerchief wet.'

In this article, I propose that V_1 represents a property of the relevant force, indicating the causing action's input of energy, which either directly or indirectly leads to the situation change.⁵ For instance, sentence (20a) and sentence (21) both encode the waiter's force (or causal influence) applied to the table, which made the table clean, but the two sentences differ in the use of V_1 , suggesting that different causing actions were responsible for the table's getting clean, that is to say, wiping and scrubbing. As for the Type II RC sentence in (23a), V_1 'drink' is a property denoting the relevant causing action, which serves as a prerequisite to the causal influence from 'wine' to *Lisi*. Though the influence from 'wine' to *Lisi* is passive, the presence of V_1 'drink' here still encodes the input of energy that makes wine's influence on a drinker possible. Similarly, 'cry' in (23b) encodes the causing action of 'crying' that helps realize Zhangsan's influence on the handkerchief. With this changed interpretation of V_1 , a revised mapping from linguistic elements to conceptual interpretations is presented in (24).

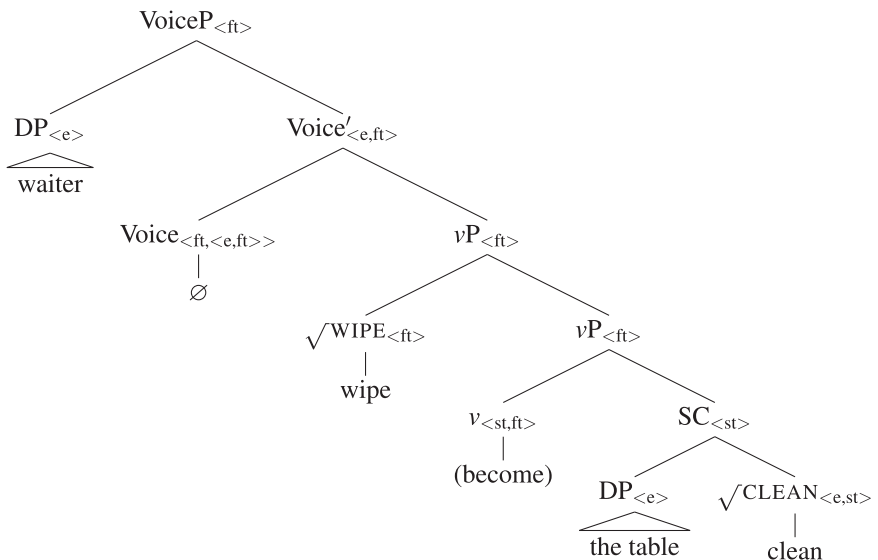
⁵As an action should always entail an input of energy, later sections simply describe V_1 as a property indicating the relevant causing action.

- (24) Linguistic elements \Leftrightarrow Conceptual interpretations/primitives (revised)
 V₂: relevant property in the new situation s₁
 IA (internal argument): holder of the relevant property (force recipient)
 EA (external argument): source of the force that leads to the change from s₀ to s₁
 V₁: property suggesting the causing action with an input of energy

In terms of the derivation of a V₁-V₂ RC sentence, Copley and Harley's treatment of "John opened the door" can be used for reference. The accomplishment verb *open* has a V₁-V₂ counterpart, *da-kai*, in Mandarin, and *da-kai* literally means 'hit-open'. The morpheme *da* 'hit' here has lost its semantic meaning and only functions to make the form disyllabic, which is much preferred over monosyllabic forms in modern Chinese (Duanmu, 2007). In the same way that *open* is decomposed in (19), complexes like *da-kai* 'hit-open' can be derived as well, with *da* represented as v_{become}. Here, however, I will not use 'open' and will instead use sentence (1b)/(20a) as an example derivation, so that comparisons can be easily made with previous analyses.

Integrating all the conceptual primitives, sentence (1b)/(20a) depicts a force that makes the table clean. The force is asserted from the waiter to the table, and is realized through the causing action of wiping. Following the example derivation of "John opened the door" in (19), I propose that sentence (1b)/(20a) is formally represented as in (25) with one more layer of intermediate projection, vP. The small clause in (25) represents the result situation of the table's being clean'; v_{BECOME}P represents the force that evokes the situation change.

- (25) Partial derivation of sentence (1b)/(20a) following Copley and Harley's (2015) analysis:



Note that V₁-V₂ resultative complexes are interpreted within a lexical-decomposition syntax, so that V₁ and V₂ are understood not as independent verbs, but as verb roots. Therefore, V₁'s root √WIPE denotes a property about the force (i.e., suggesting the

causing action), modifying the force that leads to the situation change denoted by $v_{\text{BECOME}}\text{P}$.⁶ Structurally, the property-denoting $\sqrt{\text{WIPE}}$ adjoins to the force predicate $v\text{P}$, while compositionally, $\sqrt{\text{WIPE}}$ and $v_{\text{BECOME}}\text{P}$ are combined by Predicate Modification. After that, an empty voice head is merged and introduces the force's source 'waiter'. Following Copley and Harley's denotations for v_{BECOME} and Voice, I provide the parallel semantics involved in the derivation of sentence (1b)/(20a) below.

- (26) [[the table clean]] = the table being clean[[v_{BECOME}]] = $\lambda p \lambda f. \text{fin}(f)$ is p presupposed: $\sim p(\text{init}(f))$
 $\text{fin}(f)$ = the final situation s_1
 $\text{init}(f)$ = the initial situation s_0
 $v_{\text{BECOME}}\text{P}$ = [[v_{BECOME}]] ([[the door open]]) = $\lambda f.$ the table is clean in $\text{fin}(f)$
[[wipe]] = $\lambda f.$ f realized through the causing action of wiping
 $v\text{P}_{\sqrt{\text{WIPE}}} = \lambda f.$ the table is clean in $\text{fin}(f)$ & [[wipe]] (f)
[[Voice_{ACTIVE}]] = $\lambda \pi \lambda x \lambda f. \pi(f)$ & source(x, f)
Note: π is the denotation of $v\text{P}$
[[Voice']] = [[Voice_{ACTIVE}]]($v\text{P}_{\sqrt{\text{WIPE}}}$) = $\lambda x \lambda f.$ the table is clean in $\text{fin}(f)$ & [[wipe]] (f) & source(x, f)
[[VoiceP]] = [[Voice']] (the waiter) = $\lambda f.$ the table is clean in $\text{fin}(f)$ & f realized through the causing action of wiping & the waiter being the source (f)

Copley and Harley (2015) also hint at the morphological derivation of complex predicates. In the case of *ca-ganjing* 'wipe-clean', V_2 's root $\sqrt{\text{CLEAN}}$ first undergoes head-movement to v_{BECOME} ; the intermediate outcome $[\sqrt{v^0}]_v^o$ then combines with $\sqrt{\text{WIPE}}$ via m-merger (Matushansky 2006), deriving the surface form *ca-ganjing*.

3.2 Pragmatic enrichment in comprehending Mandarin RC sentences

As seen in (24) and (26), the linguistic elements in a Mandarin V_1 - V_2 RC sentence can be mapped to their respective conceptual primitives, which are then integrated to derive this sentence's foundational interpretation: because of a causing action, represented with V_1 , EA has a causal influence on IA, leading to a change of state for IA. This foundational interpretation can be represented semantically, as in (27).

- (27) Foundational interpretation of a V_1 - V_2 RC sentence:
[[VoiceP]] = $\lambda f. \text{fin}(f) = V_2$ holds of IA in $\text{fin}(f)$ & $V_1(f)$ & source(f) = EA

For instance, sentence (1b) or (20a) has the foundational interpretation that because of the 'wiping' action, the waiter has a causal influence on the table, leading to the table's being clean. However, this foundational interpretation does

⁶Note that the same form of V_1 can appear as an independent verb, and V_1 as an independent verb encodes a force f' , which is different from the force encoded by V_1 - V_2 . For example, the force represented by *chang-ku* 'sing-cry' is defined by the situation change of turning into tears, but *chang* 'sing' as an independent verb involves a quite different force. See Copley and Harley (2015) for details on how activity predicates like *sing* are accommodated in a force-theoretic framework.

not specify the agent/theme of wiping, which is different from the common sense understanding that the waiter wiped the table, making the table clean. There is thus a gap between a sentence's foundational interpretation and its common sense understanding. As a matter of fact, previous event-based analyses differ from the current force-theoretic analysis in that they rely on the common sense understanding with two clear-cut sub-events, that is to say the causing event "the waiter's wiping the table" and the result state "the table's being clean".

This article acknowledges that people's common sense understanding of an RC sentence tends to come with a causing event and a result state, but the thematic relations indicated in a causing event (between external/internal arguments and V_1 in a V_1 - V_2 RC sentence) are proposed to be derived from pragmatic inference, rather than formal structures. In the following, I will first argue that there is no uniform pattern specifying how each argument is thematically related to V_1 , which suggests that it is implausible to encode these thematic relations in formal structures. Then I will demonstrate that the thematic relations manifested in causing events can be cancelled, confirming that pragmatic enrichment plays a role in building the thematic relations. Therefore, the current force-theoretic analysis allows flexibility in interpreting a Mandarin RC sentence, and this flexibility is not seen in previous event-based analyses. As will be shown, the flexibility based on various possibilities of pragmatic enrichment can account for why a Mandarin RC sentence may have multiple interpretations. Moreover, the interpretation with reversed theta-role assignments will no longer be problematic, because arguments in Mandarin RC sentences are interpreted in relation to the relevant forces, rather than relative to V_1 . The seemingly reversed theta-role assignments actually embody the causal influence from the patient/theme of a causing action to the agent of that action.

For the Type I RC sentence in (1b)/(20a), the external argument 'waiter' and the internal argument 'table' are associated with the property-denoting V_1 'wipe' as its agent and its theme respectively. However, there can be great variability concerning how arguments in Mandarin RC sentences are thematically related to V_1 . Sentence (28a) is copied from (2), which involves a reversed arrangement of theta-roles in relation to the property-denoting V_1 'drink', with the external argument serving as the theme of V_1 'drink' and the internal argument taking the role of agent.

- (28) a. na ping jiu he-zui-le Lisi
 that bottle wine drink-drunk-PERF Lisi.
 'Drinking that bottle of wine got Lisi drunk.'

Mapping relations:

Resultant property in the new situation s_1 : 'drunk' (V_2)

Holder of the resultant property: Lisi (IA)

The net force f : $\langle s_0, s_1 \rangle$

Recipient of the force f : Lisi (IA)

Source of the force f : 'that bottle of wine' (EA)

Property of the force f : 'drink' (V_1)

- b. Zhangsan ku-shi-le shoujuan.
 Zhangsan cry-wet-PERF handkerchief
 'Zhangsan's crying got the handkerchief wet.'

Mapping relations:Resultant property in the new situation s_1 : 'wet' (V_2)

Holder of the resultant property: 'handkerchief' (IA)

The net force f : $\langle s_0, s_1 \rangle$ Recipient of the force f : 'handkerchief' (IA)Source of the force f : Zhangsan (EA)Property of the force f : 'cry' (V_1)

There are also times when the internal argument of an RC sentence is irrelevant to V_1 in that sentence, that is, not a necessary part to make the causing event happen, as in Type III RC sentences. For instance, in sentence (28b) (copied from (3)), the internal argument 'handkerchief' does not receive any theta-role from its relevant V_1 'cry'. As the causing event involved in an RC sentence needs to be reconstructed by relating this sentence's arguments to V_1 thematically, the great uncertainty and variability in building the thematic relations makes it very difficult to propose a uniform pattern that maps each argument to a specific theta-role in relation to the property-denoting V_1 . Unfortunately, previous event-based analyses generally take it for granted that the interpretation that contains a causing event and a result state is readily available, and rarely address the issue how people, in the face of an RC sentence, come to derive this interpretation, especially the relevant causing event.

The gap between the foundational interpretation and the common sense understanding of an RC sentence must be bridged. Huang et al. (2009) propose that this can be done by inference based on common sense. This paper also holds pragmatic inference responsible for the uncertain and variable theta role assignments in relation to V_1 . For instance, common sense requires the external argument 'waiter' and the internal argument 'table' in (1b)/(20a) to be the agent and the theme of the causing action of 'wiping' so that 'waiter' can get 'table' clean. However, these thematic relations indicated in a common sense understanding can be cancelled in a hypothetical world where one can get a table clean by simply wiping something on a screen, and this action performed on the screen will trigger a mechanism that makes the table clean. So in this hypothetical world, the internal argument 'table' is not necessarily the theme of 'wipe', as evidenced in (29).

- (29) fuwusheng **ca-ganjing**-le zhuozi, erqie quan-cheng meiyou peng
 waiter wipe-clean-PERF table and whole-process not touch
 na-ge zhuozi.
 that-CL table
 'The waiter wiped the table clean, and he did so without touching the table in the whole process.'

As for sentence (28a) with the reversed theta-role assignments, the external argument 'wine' and the internal argument *Lisi* serve as the theme and the agent in relation to the causing action of 'drinking' because, based on common sense, only in this way can the wine get Lisi drunk. Therefore, when people perceive an RC sentence, the foundational interpretation tends to be enriched with pragmatic inference based on common sense. Pragmatic enrichment centers around how arguments are thematically related to the property-denoting V_1 , which helps reconstruct what happened

before the resultant situation s_1 , and provides a more concrete idea of the causing action.

Pragmatic enrichment can account for the existence of multiple readings of a single sentence. Recall sentence (5) (replicated as (30) below) with three possible readings. The foundational interpretation of sentence (5)/(30) only presents the idea that through the causing action of chasing, Zhangsan got Lisi tired.

- (30) Zhangsan **zhui-lei-le** Lisi
 Zhangsan chase-tired-PERF Lisi.
 Reading A: 'Zhangsan chased Lisi so that Lisi got tired.'
 Reading B: 'Lisi chased Zhangsan so that Lisi got tired.'
 Reading C: 'Zhangsan chased Lisi so that Zhangsan got tired.'
- (31) Mapping relations for Reading A and Reading B:
 Resultant property in the new situation s_1 : 'tired' (V_2)
 Holder of the resultant property: 'Lisi' (IA)
 The net force f : $\langle s_0, s_1 \rangle$
 Recipient of the force f : Lisi (IA)
 Source of the force f : Zhangsan (EA)
 Property of the force f : 'chase' (V_1)

Both Reading A and Reading B conform to the foundational interpretation, though they differ in the causing events reconstructed, specifically, how each argument is associated with V_1 *zhui* 'chase'. This is where pragmatic enrichment comes in. The differences between Reading A and Reading B should derive from different enrichment possibilities. According to common sense, *Zhangsan* can get *Lisi* tired either when *Zhangsan* chased *Lisi*, or when *Zhangsan* was chased by *Lisi*. In the former scenario, *Zhangsan's* chasing caused *Lisi* to run, which tired *Lisi*; in the latter scenario, *Zhangsan's* running required *Lisi* to chase hard, which got *Lisi* tired. The two scenarios involve quite different causing events, but both allow the causal influence from *Zhangsan* to *Lisi*, with *Lisi* becoming tired. The two enrichment possibilities then lead to two readings (i.e., A and B) with different causing events. As to Reading C, it is derived differently, and will be discussed in a later section.

Another instance involving multiple readings is provided in (32). Its foundational interpretation only suggests that through the action of singing, a song brought a large audience to tears. However, there is no definite answer to what happened before the audience's shedding of tears, and it is unclear who did the singing.

- (32) zhe-shou-ge **chang-ku-le** xuduo guanzhong.
 this-CL-song sing-cry-PERF many audience
 'Singing this song brought a large audience to tears.'

Mapping relations:

- Resultant property in the new situation s_1 : 'in tears' (V_2)
 Holder of the resultant property: 'a large audience' (IA)
 The net force f : $\langle s_0, s_1 \rangle$
 Recipient of the force f : 'a large audience' (IA)
 Source of the force f : 'this song' (EA)
 Property of the force f : 'sing' (V_1)

It is possible that the audience themselves sang and were moved to tears, or that some other person (e.g., a famous singer) sang and moved them to tears. In the second case, it is difficult to reconstruct the event of singing with a definite singer if no other contextual information is provided. This demonstrates that pragmatic enrichment is constrained and that it is not always possible to reconstruct a complete picture of a causing event, that is, with all necessary entities to realize the causing action. This poses a great problem for those analyses that take causing events for granted or assume a fixed pattern in reconstructing causing events from Mandarin RC sentences.

3.3 Settling force structures in the production of Mandarin RC sentences

The previous subsection has shown that in interpretation, people can reconstruct from a Mandarin RC sentence a scenario with a specific causing event and its result state by integrating the conceptual interpretation of each linguistic element in that sentence and then enriching the integrated foundational interpretation with pragmatic inference. When it comes to the production of a Mandarin RC sentence, the derivation in (25) illustrates how a V_1 - V_2 RC sentence can be derived step by step, with the necessary building blocks. But if one intends to frame RC sentences within a real-life scenario where an event causes multiple resultant situations, it is necessary to first settle the force structure to be represented, which includes four conceptual primitives: the source of the force, the recipient of the force, the property of the force (characterizing the causing action) and the resultant property in the new situation. As these conceptual primitives all have their corresponding linguistic elements, a Mandarin RC sentence cannot be derived without determining the relevant force structure. Specifically, the DP representing the source appears as an external argument; the DP encoding the recipient appears as an internal argument; the verb representing the causing action serves as V_1 in a V_1 - V_2 complex, and the verb representing the resultant property is V_2 . This ensures that only possible linguistic elements (external argument, internal argument, V_1 and V_2) are mapped to form RC sentences. In this way, a Mandarin RC sentence can be derived by mapping the conceptual primitives of a force structure to corresponding linguistic representations. Previous event-based analyses only distinguish causing events and result states, so result states are ascribed to causing events, without specifying the entity that causes a result state. It is therefore no wonder that they tend to face problems in deriving RC sentences, especially in determining their external arguments, whose referents are the specific entities to which result states should be ascribed.

For instance, the event “Zhangsan’s beating a big drum” can result in any of the three resultant situations in (33). These situations affect different entities, that is, the theme of beating, the agent of beating, and an entity irrelevant to the causing event. Therefore, if encoded by RC sentences, these situations will correspond to three different types. Since force is defined as the causal influence leading to a resultant situation (f : $\langle s_0, s_1 \rangle$), the three resultant situations (i.e., s_1^a , s_1^b and s_1^c) in (33) represent three different forces (i.e., f^a , f^b and f^c), though they share a common s_0 . Note that the three resultant situations can co-exist; if so, these situations should belong to one general situation. But since a Mandarin RC sentence only allows the expression

of one entity's resultant property at a time (i.e., only one force is encoded each time), it is necessary to first decide which resultant situation or which entity's resultant property is to be expressed. In the following, I will assume that (33) presents three separate resultative situations, and illustrate how the force structure relating to each situation is determined and mapped to linguistic elements to derive the corresponding RC sentences.

- (33) a. A resultant situation for Type I RC sentences (typical and inward)
 s_1^a : The drum was broken.
 f^a : $\langle s_0, s_1^a \rangle$
- b. A resultant situation for Type II RC sentences (atypical and inward)
 s_1^b : Zhangsan was tired.
 f^b : $\langle s_0, s_1^b \rangle$
- c. A resultant situation for Type III RC sentences (atypical and outward)
 s_1^c : The passers-by were impatient.
 f^c : $\langle s_0, s_1^c \rangle$

It is relatively straightforward to articulate the scenario in (33a) with the resultant situation s_1^a . For the scenario with a broken drum, the drum is the force recipient with the property 'broken'; the force that got the drum broken comes from the drummer *Zhangsan* through the causing action of beating. In this way, the four conceptual primitives of the involved force structure have the linguistic representations as seen in (34). An RC sentence corresponding to this scenario is then derived, as presented in (34a).

- (34) Resultant property in the new situation s_1^a : 'broken' (V₂)
 Holder of the resultant property: 'big-drum' (IA)
 The net force f^a : $\langle s_0, s_1^a \rangle$
 Recipient of the force f^a : 'big-drum' (IA)
 Source of the force f^a : Zhangsan (EA)
 Property of the force f^a : 'beat' (V₁)
- a. Type I RC sentence reflecting the situation s_1^a in (33a):
 Zhangsan **qiao-po**-le na-ge da-gu.
 Zhangsan beat-broken-PERF that-CL big-drum
 'Zhangsan beat the big drum and it broke.'

When it comes to the resultant situation s_1^b in (33b), the net force involved made the drummer *Zhangsan* tired. While s_1^b and its corresponding force f^b (including the force recipient and the property relating to this force) are determined immediately, this force's source requires further discussion. It seems that both Zhangsan and 'big-drum' can serve as the source in relation to f^b , because conceptually, Zhangsan and the drum jointly contributed to Zhangsan's tiredness. When a drummer beats a drum, the drum has a causal influence on the drummer, tiring the drummer; but since the drum's influence to the drummer requires the input of energy from the drummer (i.e., the drummer's beating), the drummer also has a causal influence on himself, though the influence from 'big-drum' is non-energetic whereas the influence from the drummer is energetic. Considering the two sources, two RC sentences

encoding different sources are derived, as presented in (35a) and (35b). Note that when the force's source coincides with its recipient, the reflexive *ziji* 'self' is used to encode the force recipient (cf. sentence (35b)), in contrast to the use of *Zhangsan* in (35a).

(35)

Resultant property in the new situation s_1^b : 'tired' (V_2)

Holder of the resultant property: Zhangsan (IA)

The net force f^b : $\langle s_0, s_1^b \rangle$

Recipient of the force f^b : Zhangsan (IA)

Source of the force f^b : Zhangsan or 'big-drum' (EA)

Property of the force f^b : 'beat' (V_1)

a. Type II RC sentence of s_1^b in (33b) with 'drum' as source of the force:

na-ge da-gu **qiao-lei-le** Zhangsan.
that-CL big-drum beat-tired-PERF Zhangsan
'Beating the big drum tired Zhangsan.'

b. Type II RC sentence of s_1^b in (33b) with Zhangsan as source of the force:

Zhangsan **qiao-lei-le** ziji.
Zhangsan beat-tired-PERF self
'Zhangsan got himself tired by beating (something).'

With regard to the resultant situation s_1^c in (33c), the resultant property holder "passers-by", though external to the causing event, can still be affected. As seen in (36), the passers-by received the causal influence and became impatient. Like in (35), both entities involved in the causing event, that is, 'big-drum' and 'Zhangsan', contributed to the impatience of the passers-by via the production of drumming sounds; correspondingly, two sentences encoding distinct sources of the relevant force, that is, (36a) and (36b), are presented for s_1^c .

(36) Resultant property in the new situation s_1^c : 'impatient' (V_2)

Holder of the resultant property: passer-by (IA)

The net force f^c : $\langle s_0, s_1^c \rangle$

Recipient of the force f^c : passers-by (IA)

Source of the force f^c : 'big-drum' or Zhangsan (EA)

Property of the force f^c : 'beat' (V_1)

a. Type III RC sentence of s_1^c in (33c) with 'drum' as source of the force:

na-ge da-gu **qiao-fan-le** luren.
that-CL big-drum beat-impatient-PERF passer-by
'Beating the big drum made the passers-by impatient.'

b. Type III RC sentence of s_1^c in (33c) with Zhangsan as source of the force:

Zhangsan **qiao-fan-le** luren.
Zhangsan beat-impatient-PERF passer-by
'Zhangsan's beating made the passers-by impatient.'

The RC sentences in (34), (35) and (36) all encompass different types of resultant situations following from a single causing event. The production of these sentences demonstrates that determining a force structure requires selecting the resultant property to be expressed and its holder, and identifying the underlying force and its

source. In actual usage, people are free to express any of the resultant properties and compatible holders that they intend to focus on, determining V_2 and IA. V_1 can be fixed via the causing event's action. When it comes to EA, previous event-based analyses are not clear on what is mapped to an EA. Following the force-theoretic framework and the mapping relations in (24), for a DP to appear in the EA position of an RC sentence, it needs to encode the source of the force encoded in the RC sentence. As forces in RC sentences are defined by the relevant situation changes and modified by properties characterizing the relevant causing actions, what appears in the EA position of an RC sentence should represent the entities that cause the relevant situation change through the relevant causing action. Consider a scenario where a singer sang a song so that a large audience were brought to tears; since both 'singer' and 'song' are responsible for the audience's shedding tears due to the causing action of 'singing', either can appear in EA position, as seen in (37).⁷ But when the scenario changes with a different causing event, such as a large audience listened to a song so they were in tears, it is no longer acceptable for 'singer' to appear in EA position, as demonstrated in (38a).⁸ This is because the causal influence from 'singer' is not realized through the causing action relevant in (38), that is to say, listening.

(37) Resultant property in the new situation s_1 : 'in tears' (V_2)

Holder of the resultant property: 'a large audience' (IA)

The net force f : $\langle s_0, s_1 \rangle$

Recipient of the force f : 'a large audience' (IA)

Source of the force f : 'that singer' or 'this song' (EA)

Property of the force f : 'sing' (V_1)

- a. na-ge-ge-shou **chang-ku-le** xuduo guanzhong.
 that-CL-singer sing-cry-PERF many audience
 'That singer brought a large audience to tears by singing.'

⁷When there are multiple sources, it is up to the speakers which source is to be represented. The speakers' choice may carry implications. For instance, sentence (38b) with "this song" as the EA suggests that the speaker attributes the audience's shedding tears to an external and more objective source, but sentence (38c) with 'a large audience' as the EA tends to focus on the effect from the audience themselves and imply the audience's willingness or volition in listening and being brought to tears.

⁸Sentence (38a) cannot be interpreted within a scenario with the causing event "a large audience's listening to that singer", because in Mandarin, *ting* 'listen' as an independent verb does not take animate themes that encode sound sources, as shown below.

- (i) a. wo ting na-ge geshou de ge.
 I listen that-cl singer poss song
 'I listen to that singer's song.'
- b. ?wo ting na-ge geshou.
 I listen that-cl singer
 'I listen to that singer.'
- c. *wo ting yi-ge luren.
 I listen one-cl passer-by
 'I listen to one passer-by.'

- b. zhe-shou-ge **chang-ku-le** xuduo guanzhong.
 this-CL-song sing-cry-PERF many audience
 ‘Singing this song brought a large audience to tears.’

(38) Resultant property in the new situation s_1 : ‘in tears’ (V_2)

Holder of the resultant property: ‘a large audience’ (IA)

The net force f : $\langle s_0, s_1 \rangle$

Recipient of the force f : ‘a large audience’ (IA)

Source of the force f : ‘this song’ or ‘a large audience’ (EA)

Property of the force f : ‘listen’ (V_1)

- a. * na-ge-geshou **ting-ku-le** xuduo guanzhong.
 that-CL-singer listen-cry-PERF many audience
 ‘Listening to that singer brought a large audience to tears.’

- b. zhe-shou-ge **ting-ku-le** xuduo guanzhong.
 this-CL-song listen-cry-PERF many audience
 ‘Listening to this song brought a large audience to tears.’

- c. xuduo guanzhong **ting-ku-le** ziji.
 many audience listen-cry-PERF self
 ‘A large audience’s listening (to something) brought themselves to tears.’

Turning back to the question why the causer “depression” cannot replace the external argument “wine” in (2) (reproduced below in (39)), there is a straightforward explanation: V_1 indicates a causing action of ‘drink’; the sources relevant to this causing action only include the drinker *Zhangsan* and ‘wine’; ‘depression’ is not a possible source.

- (39) na ping jiu **he-zui-le** Lisi.
 that bottle wine drink-drunk-PERF Lisi
 ‘Drinking that bottle of wine got Lisi drunk.’

This section has detailed the complexity in determining the relevant force and its structure in the production of a Mandarin RC sentence. The determination of a causing event and of a resultative property to be represented involves all four force primitives in a force structure. After these primitives are mapped to their respective linguistic representations, the linguistic building blocks can then be merged into the derivation of a Mandarin RC sentence, regardless of its RC type.

The current force-theoretic analysis has demonstrated success in the interpretation and production of Mandarin RC sentences, but it may not be readily applicable to resultative constructions in other languages. Cross-linguistically, resultative constructions share the conception that a causing event results in a state of change to an entity, but different linguistic means can be used to encode this conception. For instance, all three types of RC sentences in Mandarin are represented with V_1 - V_2 complexes, with sources of forces in EA position; however, a special sentence pattern (e.g., *wipe...clean*) is used for the English counterparts of Mandarin Type I RC sentences and event-denoting complex DPs are utilized for Type II and Type III RC sentences, as seen in the contrasts between each Mandarin sentence and its English gloss in (40).

- (40) a. Type I RC sentence:
 fuwusheng **ca-ganjing-le** zhuozi.
 waiter wipe-clean-PERF table
 ‘The waiter wiped the table clean.’
- b. Type II RC sentence:
 na ping jiu (*buduandi) **he-zui-le** Lisi.
 that bottle wine continuously drink-drunk-PERF Lisi
 ‘Drinking that bottle of wine continuously got Lisi drunk.’
- c. Type II RC sentence:
 Zhangsan (*dashengdi) **ku-shi-le** shoujuan.
 Zhangsan loudly cry-wet-PERF handkerchief
 ‘Zhangsan’s crying loudly got the handkerchief wet.’

In a strict sense, an English RC sentence with the pattern like *wipe...clean* does not correspond to a Mandarin RC sentence with a complex V_1 - V_2 (e.g., *ca-ganjing* ‘wipe-clean’). As demonstrated earlier, the thematic relation indicated in the common sense understanding of the relationship between an EA entity and V_1 (e.g., the relation between the table and the action of wiping in (40a)) is cancellable in a Mandarin RC sentence, but not so in its English gloss. It seems that English resultative constructions stress a complete representation of causing events so that all necessary theta-roles (mostly agent, patient/theme) of a causing action verb need to be assigned. But in Mandarin, V_1 simply modifies a relevant force by providing information about the causing action, without presenting a complete picture of the causing event. The stress on event representation in English is also manifested in the glosses of the other two types of Mandarin RC sentences. For instance, in (40b) and (40c), result states are directly attributed to events, that is, *drinking that bottle of wine* and *Zhangsan’s crying*. This event representation of causes in English allows adverbials to adjoin and modify the causing action verbs *drink* and *cry*, but modification intended for V_1 (in a V_1 - V_2 complex) is not always acceptable in Mandarin Type II and Type III RC sentences, for instance the use of *buduandi* ‘continuously’ in (40b). Therefore, Mandarin and English are different in how resultative constructions are represented; while English stresses representation of causing events, Mandarin focuses on representation of the exact source that brings about a result state. The difference between English and Mandarin RC sentences can help set up a typology of resultative constructions across languages, though a force-theoretic analysis of English-type resultative constructions requires further research.

3.4 Explaining Reading C of sentence (5)/(30)

In the exploration of the interpretation and production of Mandarin RC sentences, the current force-theoretic analysis has been able to address most of the problems put forward in the introduction, including the reversed theta-role assignments, the constraints on external argument (corresponding to source of the force) selections, and two of the readings of sentence (5)/(30). Despite this, Reading C of sentence (5)/(30), simplified as sentence (41a), is yet to be resolved, as it involves a resultant property for the subject *Zhangsan*. In other words, the entity in EA position seems to be

interpreted as a force recipient, contradicting the mapping relations in (22), which require external arguments in Mandarin RC sentences to be interpreted as sources of forces.

- (41) Resultant property in the new situation s_1 : ‘tired’ (V_2)
 Holder of the resultant property: Zhangsan (**apparent EA**)
 The net force f : $\langle s_0, s_1 \rangle$
 Recipient of the force f : Zhangsan (**apparent EA**)
 Source of the force f : **unspecified**
 Property of the force f : ‘chase’ (V_1)
- a. Zhangsan **zhui-lei-le** Lisi.
 Zhangsan chase-tired-PERF Lisi
 Reading C: ‘Zhangsan got tired because of his chasing Lisi.’
- b. Zhangsan **zhui-lei-le**.
 Zhangsan chase-tired-PERF
 ‘Zhangsan got tired because of his chasing or being chased.’

Before attempting to account for Reading C, it is necessary to discuss a different type of RC sentence where entities in subject position are force recipients (also resultant property holders). This type of RC sentence contains a V_1 - V_2 predicate, but only selects a subject argument, as exemplified in sentence (41b), which differs from (41a) only in the presence/absence of an apparent object. For a sentence of this type, it is the entity represented by the subject that undergoes a situation change, and serves as the rheme as defined in Ramchand (2008). Considering this, some previous studies (e.g., Lin (2004), Liu (2019)) have described this RC type as subject-affected, as opposed to object-affected RC sentences that select two arguments. Just as a causative sentence like “John opened the door” can be expressed with an inchoative counterpart “the door opened”, this study agrees with Lin and Liu regarding the proposal that object-affected RC sentences and subject-affected RC sentences represent the alternation between causative and inchoative uses of the same V_1 - V_2 resultative complexes. As seen in (42), sentence (41b) has a causative counterpart, with *Zhangsan* serving as an object. The addition of *Lisi* in subject position specifies the source of the force and all the other conceptual primitives in (41) still apply to (42).

- (42) Lisi **zhui-lei-le** Zhangsan.
 Lisi chase-tired-PERF Zhangsan
 ‘Lisi got Zhangsan tired by chasing Zhangsan or because of his being chased by Zhangsan.’

Following the current force-theoretic analysis, resultative complexes in inchoative RC sentences can be decomposed and interpreted in the same way as they are decomposed and interpreted in causative RC sentences. The subject arguments in inchoative RC sentences (e.g., (41b)) are resultant property holders and take the role of force recipient; there is no representation of the relevant force’s source. Every step in the derivation of a causative RC sentence (cf. (25)) is also involved in the derivation of an inchoative RC sentence, except that VoiceP is not projected, and therefore the force’s source is not introduced. Subsequently, the DP encoding

force recipient is raised to the subject position, explaining why subjects in inchoative sentences appear to represent force recipients with changes of states.

Turning back to Reading C presented in (41a), it involves a force that rendered Zhangsan tired, which is identical to the force encoded in the inchoative sentence (41b). Formally, sentence (41a) seems to have an extra object *Lisi* in comparison to sentence (41b). As claimed in Huang (2006) and Lin (2004), this apparent object is not a true argument, for the following reasons. First, *Lisi* in (41a) under Reading C does not allow passivization or topicalization, as evidenced in (43). Note that *Lisi* under Reading A or B can be passivized or topicalized, so sentence (43a) and sentence (43b) can be grammatical, but not with the intended readings.

- (43) a. * *Lisi bei Zhangsan zhui-lei-le.*
Lisi PASS Zhangsan chase-tired-perf
 Intended reading: ‘Lisi was chased by Zhangsan so that Zhangsan got tired.’
- b. * *Lisi, Zhangsan zhui-lei-le.*
Lisi, Zhangsan chase-tired-perf
 Intended reading: ‘As for Lisi, Zhangsan chased him and got tired.’

Second, only a limited number of V_1 - V_2 resultative complexes allow apparent objects, including *chi-bao* ‘eat-full’, *he-zui* ‘drink-drunk’, and those in the form of *V-lei* ‘tired’, etc. Even for these complexes, only bare nouns are allowed in the apparent object position, as seen in the contrast in (44).⁹ This strongly suggests the idiosyncrasy of these resultative complexes and the relevant sentences. According to Cheng (1997), these bare nouns are mostly non-referential, as is *advantage* in the idiom ‘take advantage of’. Following Cheng’s analysis, the apparent object *Lisi* in (41a) is originally selected as a patient of V_1 *zhui* ‘chase’, but later gets incorporated with V_2 and V_1 , forming the complex verb *zhui-lei-Lisi* ‘chase-tired-Lisi’.

- (44) a. *Lisi chi-bao fan-le.*
Lisi eat-full meal-SFP
 ‘Lisi was full because of meal-eating.’
- b. * *Lisi chi-bao liang-wan mi-fan-le.*
Lisi eat-full two-bowl rice-meal-SFP
 ‘Lisi was full because he ate two bowls of rice.’

This article agrees with Cheng’s analysis of sentences like (41a) under Reading C. That is, the apparent objects are incorporated to the resultative complexes to form even more complex predicates. This incorporation serves to provide supplementary information which constrains possible interpretations. For instance, the extra apparent object in (41a), in comparison to its inchoative counterpart in (41b), provides more information about who *Zhangsan* chases. Just like in the derivation of an inchoative RC sentence, the force recipient *Zhangsan* is then raised to subject position to derive sentence (41a), making this sentence subject-affected. Though the details of how a bare noun (e.g., *fan* ‘meal’ in (44a)) is incorporated still await further research, Cheng’s analysis successfully captures the fact that the apparent

⁹Proper names in Mandarin do not distinguish DP forms from bare noun forms.

objects cannot be interpreted as arguments, hence disallowing passivization and topicalization. Therefore, sentence (41a) under Reading C is explained as involving the incorporation of a bare noun (i.e., the apparent object) into an originally inchoative RC sentence. This study also successfully predicts the absence of a fourth reading of sentence (5)/(30). Consider the various readings in (5)/(30). It is easily seen that Reading A and Reading C involve the same causing event “Zhangsan’s chasing Lisi” but differ in the force recipient, that is, *Lisi* for Reading A and *Zhangsan* for Reading C. One may wonder whether there is Reading D, which shares the same causing event as Reading B, but has a different force recipient, that is to say, “Lisi’s chasing Zhangsan” → “Zhangsan’s tiredness”. No previous literature has reported Reading D. Informal consultation with native Mandarin speakers does not support Reading D, either. The unavailability of Reading D can be explained from two perspectives. First, Reading D would violate the mapping relation that requires that force recipients with changes of states should be the entities in IA position. Considering that *Lisi* appears in IA position, *Zhangsan* cannot be the one becoming tired. Second, Reading D cannot be derived in the same way that Reading C is derived. V_1 *zhui* ‘chase’ should first license the role of patient; thus, what is adjoined to V_1 ‘chase’ through nominal incorporation should be a nominal with the role of patient, that is, *Zhangsan* as the patient of ‘chase’. Consequently, Reading D does not allow *Lisi* to undergo nominal incorporation, making the sentence form in (5)/(30) incompatible with Reading D.

4. CONCLUSION

This article takes a force-theoretic approach to Mandarin V_1 - V_2 RC sentences. Resultative constructions are reconceptualized as forces from sources to recipients, which lead to changes of states of these recipients via certain causing actions. Following Copley and Harley’s (2015) force-theoretic approach to predicates, the conceptual primitives of force structures are mapped to syntactic structures and argument realizations, with V_1 - V_2 resultative complexes formed in the derivation of RC sentences. The use of force allows precise attribution of a result to the force’s source, rather than ascribing the result to the relevant causing event, which may involve multiple forces and their corresponding force structures (including the source of a force). Therefore, before producing an RC sentence, it is necessary to first determine the force structure to be expressed, especially with regards to its source. For instance, the patient/theme of an action may cause a change of state to the agent of the action; this causal influence is characterized as a force from the patient/theme to the agent. The linguistic representation of such a force will produce an RC sentence with reversed theta-role assignments. The current force-theoretic analysis also answers why it is not the case that all causes can serve as external arguments in V_1 - V_2 RC sentences. Entities in EA position should cause the relevant change of state via the relevant causing action. In terms of how the different readings of a single RC sentence are derived, they actually have a shared foundational interpretation, which involves the integration of the conceptual primitives represented in

that sentence. However, the foundational interpretation only specifies the causing action, without providing other details about the event. Thus, pragmatic inference is needed to reconstruct the causing event. Sometimes, there is more than one way of reconstructing a causing event; in this case, different readings emerge. Moreover, V_1 - V_2 resultative complexes have inchoative uses; RC sentences with inchoative uses of V_1 - V_2 have force recipients realized in subject position, leaving these sentences subject-affected. A few V_1 - V_2 resultative complexes are proposed to even allow the incorporation of bare nouns to form more complex predicates (i.e., “ V_1 - V_2 -N”); when these more complex predicates are used inchoatively, force recipients will then appear in subject position while the bare nouns incorporated will seem to be in object position.

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