

Participant Sharing in Chinese Resultatives

Mingming Liu (*Rutgers University*)

Introduction: Chinese resultatives take the form of verb compounds V_1 - V_2 , V_1 denoting an activity e_1 and V_2 its resultant state s_2 . An example is given in (1). Following the literature, I call these compounds Resultative Verb Compounds (RVCs) and I use $S+V_1-V_2+O$ as a general schema to represent sentences containing RVCs (S is RVC's subjects, while O is its object).

Thesis: This talk is mainly about the relations between O and the two verbs V_1 , V_2 . I will claim: although the direct object O is only an argument of V_2 , not V_1 , it has semantic relations both to V_1 and V_2 . I then use thematic relations to model this semantic relation and propose a semantic constraint—Participant Sharing—to ensure the required relations. Finally, I implement the participant-sharing idea by adding into the semantic rule of resultative formation a conjunct $[[O]] \in \Theta(e_1)$, which requires the argument of V_2 must also receive a thematic role from V_1 .

- (1) *Zhāngsān kǎn-diào le shùyè*
Zhangsan hack-fall PERF leaves

Zhangsan hacked the leaves and the leaves fell off.

Problem with Argument Sharing: Since there are two verbs but only two argument positions S and O , assuming both individual verbs have their own theta roles to assign, it is natural to ask: where does the additional theta role go if V_1 is transitive? It is easy to show an Argument Sharing idea (Li 1990) cannot be right. Look at (2): (2) is an example of unergative verbs being V_1 , in which case, the O is not an argument of V_1 and Argument Sharing cannot be satisfied.

- (2) *Zhāngsān kū-shī le shǒupà* (Unergative V_1)
Zhangsan cry-wet PERF handkerchief

Zhangsan was crying and his handkerchief got wet as a result.

Worse still, there are transitive V_1 but without argument sharing; following Lin (2004), I call these cases unselective transitive V_1 , see (3).

- (3) *Zhāngsān kǎn- dùn le fǔ-zi* (Unselective transitive V_1)
Zhangsan hack-blunt PERF axe

Zhangsan hacked something and the axe got blunt.

A comparison between (1) and (3) shows we will never know when Argument Sharing is to be applied. Thus, such a theory makes no prediction and is unattractive.

Problem with Pragmatic Association: Based on examples like (2) and (3), Williams (to appear) proposes another analysis, which I call Pragmatic Association. In this theory, a thematic relation between V_2 and O is always present, but there is no thematic relation between V_1 and O . Any understood relation of O to V_1 is pragmatically inferred or obtained by world knowledge. Take (3) as an example. In a Pragmatic Association analysis, it means ‘Zhangsan hacked something, and the axe got blunt as a result’ and pragmatics tells us that *the axe* is the instrument of *hacking*.

However, this analysis cannot be right either. It over-generates interpretations that are not possible. Again, take (1) as an example (this argument is adopted from Lin 2004), the pragmatic association will predict it can either have (4a) or (4b) as its interpretations. But (4b) is impossible, as can be shown by the contradiction in (5). In other words, the O in (1) has to be interpreted as the patient of *hacking*. Notice, this problem cannot be solved by Kratzer's (2005) (citing Bittner 1999) Direct Causation either, since Mandarin Chinese has many RVCs that do not involve Causation, e.g. *xie-cuo* (write-wrong), *shui-xing* (sleep-awake)

- (4) *Zhāngsān kǎn-diào le shùyè*
Zhangsan hack-fall PERF leaves

Zhangsan hacked the leaves and the leaves fell off.

- a. Meaning: Zhangsan hacked the leaves, and the leaves fell.
 b. **Impossible**: Zhangsan hacked the tree and the leaves fell.
- (5) #*Zhāngsān kǎn-diào le shùyè, dàn tā méi kǎn shùyè*
 Zhangsan hack-fall PERF leaves, but he not hack leaves
 a. #Zhangsan hacked the leaves and the leaves fell off, but Zhangsan did not hack the leaves.
 b. **Impossible**: Zhangsan hacked something and the leaves fell off, but Zhangsan did not hack the leaves.

Participant Sharing: In view of the above failures, a new constraint I call Participant Sharing is proposed. The Participant Sharing constraint says (6) and it actually treads a middle ground between the two earlier proposals—it enforces a grammatical relation between V_1 and O (unlike the Pragmatic Association approach), but it denies an Verb-Argument relation between V_1 and O (contra Argument Sharing) and by doing this it leaves open what the precise relation will be.

(6) Participant Sharing: To combine two verbs V_1, V_2 into an RVC V_1-V_2 , the event introduced by V_1 and the event introduced by V_2 have to share at least one participant.

(6), together with the common (Lin 2004, Kratzer 2005, Williams 2011) assumption as is in (7), gives the correct results to (1), (2) and (3). Notice (7) is at least motivated by (2) and (3).

(7) Antipassive Assumption: O is never an argument of V_1 ;

First, (7) solves the problem faced by Argument Sharing by directly denying the principle. But crucially, the effects of Argument Sharing are preserved by the new constraint. Specifically, in (1)-type cases, although the O *leaves* is interpreted as the patient of *hack*, it is not an argument of it; the patient relation between *leaves* and *hack* is instead enforced by the participant sharing constraint (6). Likewise, in (2) participant sharing is satisfied by letting O *the handkerchief* receive an locative role from the V_1 *cry*; in (3) the participant sharing condition is also met by allowing *the axe* to receive a instrument role from the V_1 *hack*. **Second**, (6) solves the over-generation problem faced by Pragmatic Association, by excluding any sentence/interpretation whose O does not receive a theta role from V_1 of the RVC. Specifically, in (4b), the *tree* received the patient role from the V_1 *hack*, putting *leaves* in a situation where it can receive no imaginable thematic role, violating the Participant Sharing constraint.

Implementation: Below, I try to formalize the ideas discussed above using Davidsonian event semantics (Davidson 1967). Two points need to be mentioned for this formalization. **First**, existentially binding of the internal argument of V_1 represents the idea that O is never an argument of V_1 ; **second**, the participant sharing idea is modeled by the conjunct in the semantic representation $x \in \Theta(e_1)$. While $[[\Theta]] = \lambda e \lambda x (x \text{ bears a theta role to } e)$.

(8) shows the relevant RVC-formation rule. Notice, e and s are eventuality variables, C might either be a Causal relation (Kratzer 2005) or Temporal relation (Rothstein 2004) between eventualities. Finally, $x \in \Theta(e_1)$ leaves room for pragmatics to play. Pragmatics will be the actual factor to determine which element from the set $\Theta(e_1)$ is to be selected by x .

- (8) a. Transitive V_1 : $\lambda x \lambda y \lambda e_i [P(x)(y)(e_i)] + \lambda x \lambda s_i [Q(x)(s_i)]$
 $= \lambda x \lambda y \lambda e_i \exists z \exists s_i [C(e_i)(s_i) \wedge P(z)(y)(e_i) \wedge Q(x)(s_i) \wedge x \in \Theta(e_i)]$
 b. Intransitive V_1 : $\lambda x \lambda e_i [P(x)(e_i)] + \lambda x \lambda s_i [Q(x)(s_i)]$
 $= \lambda x \lambda y \lambda e_i \exists s_i [C(e_i)(s_i) \wedge P(y)(e_i) \wedge Q(x)(s_i) \wedge x \in \Theta(e_i)]$

Selected References: Kratzer, A. 2005. Building resultatives. In *Event arguments: Functions and applications*, ed. C. Maienborn and Wollstein-Leisten, 177–212. Li, Y. 1990. On V-V compounds in Chinese. *NLLT* 9:177-207. Lin, J. 2004. *Event structure and the encoding of arguments*. Thesis, MIT. Rothstein, S. 2004. *Structuring Event*. Blackwell. Williams, A. (to appear). Objects in resultatives. Accepted with minor revisions to *NLLT*.