

Resultatives as Causal Relations between Events*

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Abstract. This paper investigates some resultative constructions in English, Korean, Chinese, and Japanese. It will be argued that the Direct Object Restriction (DOR) used in previous syntactic accounts is not correct. This paper examines the typical resultative constructions in English and Korean and, within the framework of event semantics, offers a proper semantic account of the relevant data on the basis of the semantic relationships of the lexical items. The analysis makes use of the notions such as ‘event,’ ‘appropriate result,’ etc. In addition, it will be shown that the proposed account is also useful for explaining the so-called resultative Verb-Verb Compounds (VVCs) in Korean, Chinese, and Japanese.

Keywords: complex predicate, verb-verb compound (VVC), causal, appropriate, affected

1 Resultative vs. Depictive Sentences

Jespersen (1909-49, Part V: 23-28) discusses the type of sentence in (1) under the term ‘object of result’. Later Halliday (1967:63-65) discusses a similar type of sentence in (2a) using the term ‘resultative,’ which he compares with another sentence pattern ‘depictive’ in (2b).

- (1) He pushed the gate open.
- (2) a. She washes them clean. (resultative)
= She washes them and, because she washes them, they become clean.
b. She sells them cheap. (depictive)
= She sells them and, when she sells them, they are cheap.

Simpson (1983:143) recognizes four types of resultatives, and she claims that the matrix verb and the resultative phrase form a complex verb. The resultative phrases are diverse and they are collectively termed result ‘XPs’ (Hovav and Levin, 2001:766) or ‘RPs’ (Goldberg and Jackendoff, 2004:536). I will use the abbreviation RP in this paper.

Recent researchers on English resultatives (Wechsler, 1997; Kaufmann and Wunderlich, 1998; Hovav and Levin, 2001; Goldberg and Jackendoff, 2004) have collected data of various resultative constructions and focused on the typical sentences listed in (3). Following the general convention (in particular, Wechsler, 1997), the result phrase (RP) is italicized and the NP of which the RP is predicated is underlined.

- (3) a. He hammered the metal *flat*. (RP=Adjective Phrase) [Object-predicated]
b. He painted the car *a pale shade of red*. (RP=Noun Phrase) [Object-predicated]
c. The brook froze *solid*. (RP=Adjective Phrase) [Subject-predicated]
d. He yelled himself *hoarse*. (RP=Adjective Phrase)
[Object-predicated, but actually Subject-predicated]

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In this paper the following abbreviations are used: Acc=Accusative particle, Asp=Aspect marker, Comp=Complementizer, Dat=Dative, Dec=Declarative particle, De=Resultative marker, Loc=Locative, Ni=Directional postposition, Nom=Nominative particle, Past=Past tense marker, Perf=Perfective marker, Poss=Possessive marker, Pres=Present tense marker, Top=Topic particle, Vi=Intransitive verb, Tv=Transitive verb.

- e. They drank the pub *dry*. (RP=Adjective Phrase) [Object-predicated]
 f. Mary danced out of the room. (RP=Preposition Phrase) [Subject-predicated]

In (3a) the result phrase(RP), an adjective, *flat* is predicated of the direct object NP *the metal*, and in (3b) the RP, an NP, *a pale shade of red*, is predicated of the direct object NP *the car*. In (3c) the RP *solid* is predicated of the surface matrix subject *the brook* of the intransitive unaccusative construction. In (3d) the RP *hoarse* is predicated of the matrix subject *he* through the postverbal reflexive *himself*. In this case, however, we may say that the RP syntactically is predicated of the reflexive object *himself*. In (3e) the RP *dry* is predicated of the direct object *the pub*. Finally, in (3f) the RP, *out of the room*, is predicated of the matrix subject *Mary*.

2 Syntactic Account and Its Problems

As noted by Hovav and Levin (2001:766), the success of syntactic accounts is mainly due to the Unaccusative Hypothesis (Perlmutter, 1978, UH henceforth). Intransitive verbs in English has two subclasses: unaccusative verbs and unergative verbs. The unaccusative hypothesis claims that the argument of an unaccusative verb is an internal direct argument, while the only argument of an unergative verb is an external argument. It has been argued that the internal or external status of the arguments of unaccusative and unergative verbs is a syntactic fact. It has also been argued that result phrases (RPs) in English are predicated of NPs in object position (Simpson 1983). This is the so-called Direct Object Restriction (DOR, henceforth).

The DOR accounts for the transitive resultative in (3a), the unaccusative resultative in (3c), and the so-called ‘fake reflexive’ resultative in (3d). The UH posits an underlying object for the subject of an unaccusative verb in (3c). In (3c) the surface subject *the brook* is actually represented as an underlying object. The DOR is assumed to apply on the underlying level and explain the construction. Thus, the DOR accounts for the transitive resultative in (3a) and the unaccusative construction in (3c) as well.

In addition, the DOR may account for the fake reflexive construction in (3d). The reflexive pronoun is in the object position, and it satisfies the DOR because the RP *hoarse* seems to be predicated of the reflexive object. However, the reflexive may not appear alone as the ungrammaticality of the sentences in (4) shows. This fact indicates that the RP in (3d) is actually predicated of the subject *John*, indirectly through the anaphoric reflexive pronoun.

- (4) a. *John yelled himself.
 b. *John cried himself.

However, the DOR used in previous syntactic accounts has some problems. In English there are sentences with transitive verbs, in which the RP is predicated of the subjects, not objects. In these constructions the DOR is violated. The examples in (5) are taken from Hovav and Levin (2001:770). The original source of each sentence is given in parentheses.

- (5) a. The wise men followed the star out of Bethlehem. (Wechsler, 1997:313)
 b. John danced mazurkas across the room. (Verspoor, 1997:151)
 c. Fly American Airlines to Hawaii for your vacation! (Hovav & Levin, 2001:770)

In these examples, the RPs are predicated of the subjects; hence, they belong to the subject-oriented transitive-based pattern in Hovav and Levin’s term (2001:770).

In other languages such as Chinese, Japanese, and Korean, there are examples in which the RP is predicated of the subject, not the direct object. Let us examine the examples in (6).

- (6) a. Chinese (J. Hung, 2006:4)
Lisi tiao-*lei*-le.
 Lisi dance-tired-Perf
 ‘Lisi danced [himself] tired.’
 b. Korean
Mica-nun phikonha-key *chwumcwu*-ess-ta. (with a resultative reading)
 Mica-TOP tired-Comp dance-Past-Dec
 ‘Mica danced [herself] tired.’

- c. Japanese (Gameschlag, 2002:534).
 Isi-ga takaku tumi-agat-ta.
 stone-NOM high pile-rise-PAST
 ‘The stones were piled up high.’

In all the examples in (6), the result is subject-oriented, so they are counterexamples to the DOR. Accordingly, we conclude that the DOR is not fully effective either in English or in other languages such as Korean, Chinese, and Japanese.

3 Semantic Account

Starting with Bolinger (1971), many works on resultatives (e.g. Dowty, 1979:219,302; Simpson, 1983:143; Kaufmann, 1995:417; Kaufmann & Wunderlich, 1998:23; Wechsler, 1997:309; Hovav and Levin, 2001:774-775; Goldberg and Jackendoff, 2004:538), have accepted the idea that the ‘Main Verb + RP’ combination, e.g. *hammer-flat*, forms a kind of semantic ‘complex predicate.’ It is true that this idea has been expressed by a variety of slightly different terms.

Wechsler (1997:309) notes that the relation between the matrix Verb and the RP must be ‘canonical’ or ‘normal’ to make up an acceptable combination. Following this idea, Hovav and Levin (2001:774-775) explain the resultative patterns in terms of the semantic relation between the event denoted by the verb and the event represented by the result RP. Accordingly, it has usually been assumed that the Verb-RP combination represents a complex event consisting of two subevents.

A typical transitive example, ‘*John hammered the metal flat*’ can be analyzed as in (7).

- (7) a. Syntactic Argument Structure: HAMMER(JOHN, THE METAL)
 b. Semantic Representation:

$$[\text{COMPLEX EVENT}[\text{VERBAL SUBEVENT } \textit{HAMMER}'(\textit{JOHN}, \textit{THE METAL}')] +$$

$$[\text{RESULT SUBEVENT } \textit{FLAT}'(\textit{THE METAL}')]]$$

A formal rule of resultative formation is found in Kaufmann and Wunderlich (1998:6), which gives a similar final representation.

In a previous collaborative paper, Lee, Kim, and Lee (2004:139-140) formally represent the semantic structure of a typical transitive resultative in (8a) as in (8b), within the framework of event semantics introduced in works such as Parsons (1990).

- (8) a. Mary wiped the table clean.
 b. $\exists e[\textit{Wipe-cleaning}'(e) \ \& \ \exists e_1[\textit{Cause}(e_1, e) \ \& \ \textit{Wiping}'(e_1) \ \& \ \textit{Actor}(\textit{Mary}', e_1) \ \& \ \textit{Theme}(\textit{the table}', e_1)]] \ \& \ \exists e_2[\textit{Result}(e_2, e) \ \& \ \textit{Clean}'(e_2) \ \& \ \textit{Theme}(\textit{the table}', e_2)]] \ \& \ \textit{Appropriate-Result}(e_2, e_1) \ \& \ [e_1 < e_2]]$

In (8a), *Wipe-cleaning'*(e) is a complex event denoted by the semantic complex predicate *wipe-clean*. This wipe-clean event consists of two subevents, the first of which, *Wiping'*(e₁), is the causing event of the complex event(e), while the second one, *Clean'*(e₂) is a result event. *Cause*(e₁,e) means that the e₁ is the causing event of the complex event e, while *Result*(e₂,e) shows that e₂ is a result state of e. *Wiping'*(e₁) is an activity event, while *Clean'*(e₂) is a state event. The last part ‘*Appropriate-Result*(e₂,e₁)’, which is a new addition in the present paper, means that e₂ is an appropriate result of e₁. This part ensures the acceptable combination of the verbal and result phrases. I stipulate this as a semantic/pragmatic constrain.

The basic ideas of (7) and (8) are similar. Both assume two subevents denoted by the matrix verb and the result phrase, but they are different in the detailed representations.

4 Semantic/Pragmatic Constranits

Wechsler (1997:311) notes that, in resultatives, the normal result state of a main verb can be decided on the basis of the semantic properties of adjectives, as depicted in (9).

- (9) a. John hammered the metal flat/ smooth/ (?shiny)/ into the ground/ *beautiful/ *safe.
 b. Sally painted the door red/ a pale shade of red/ ?sticky/ *beautiful/ *noticeable.

In (9a), the complex lexical predicate *hammer-flat* is a ‘normal’ relation, while the RPs *beautiful* or *noticeable* are not inherent consequences of the hammering activities. A similar observation can be made about the examples in (9b). I take this restriction as the appropriate result constraint. The examples in (9) may be represented in terms of the appropriate relations as in (10). The starred one illustrates a relation which is not inherent.

- (10) a. *paint-red, paint-a pale shade of red, *paint-beautiful, *paint-noticeable*
 b. *hammer-flat, hammer-smooth, *hammer-beautiful, *hammer-safe*

I will stipulate this relation as a constraint, namely an Appropriate Result Constraint (ARC) as in (15c) below. The constraint will have a similar effect as Wechsler’s (1997:311) Canonical Result Restriction (CRR), which says that “a control resultative must represent a ‘canonical’ or ‘normal’ result state of an action denoted by the verb.” My ARC, however, is more comprehensive in that it applies to all the resultative constructions including Verb-Verb compounds (VVC) in languages such as Korean, Japanese, and Chinese, while Wechsler’s CRR is limited to the control resultatives mainly in English.

In addition, I will generalize Wechsler’s (1997:308) Affected Theme Restriction (ATR) as in (15d) below, using the word ‘argument’ instead of ‘theme’ (Lee, Kim, and Lee, 2004).

Now look at the examples in (11)-(12).

- (11) *John hammered the metal *exhausted*.
 (12) a. John hammered the metal *flat*.
 b. The water froze *solid*.

In (11) the subject *John* is not affected by the matrix verb *hammer*, so it cannot be the predication subject of the RP *exhausted*. In (12a), the direct object *the metal* is affected by the matrix verb *hammer*, so it is the predication subject. In (12b), the subject *the water* is affected by the matrix verb *freeze*, thus it is the predication subject of the RP *solid*.

Wechsler’s ATR works fine for the counterexamples to the DOR, given in (13).

- (13) a. Mary danced *out of the room*.
 b. The wise men followed the star *out of Bethlehem*.

The examples in (13a,b) are counterexamples to the DOR because the RPs are predicated of the subjects, not direct objects. According to Wechsler’s ATR, however, the subjects can be treated as affected themes. Thus, the semantic ATR is proved to be more effective than the syntactic DOR. However, the ATR is not quite useful in Korean, as shown in (14).

- (14) a. ku-nun [os- eyse kim-i na-key] ttwi-ess-ta.
 he-Top clothes-Loc steam-Nom come out-Comp] run-Past-Dec
 ‘He ran (his) shirts steaming.’
 b. ku-nun [pal-ey mulcip-i sayngki-key] kel-ess-ta.
 he-Top feet-Loc blister-Nom come out-Comp walk-Past-Dec
 ‘He walked his foot blistered.’

It is claimed that in the examples in (14a) the RP *kim-i na* ‘steam’ is predicated of the locative arguments (Loc) *os-eyse* ‘clothes-Loc’. Similarly, also in (14b), the RP is predicated of the locative argument (J. Kim, 1997). Accordingly, in our previous paper (Lee, Kim, and Lee, 2004:135), we noted that the ATR should not adhere to the ‘themehood’ but to the ‘affectedness’ only. This fact is incorporated in the revised restriction AAC given in (15d).¹

Taking these observations into consideration, I formulate the semantic/pragmatic conditions on the relationship between a verbal event and a result event as in (15).

¹ In English the notion of ‘affectedness’ was discussed by Croft (1991:170) in terms of ‘force transmission’ and later Hovav and Levin (2001:786) note that “in subcategorized NP resultatives the result XP must be predicated of the argument of the verb that is the force recipient, if there is one.” They also say that force recipients sometimes may not be patients, which include themes. This means that non-themes may be force recipients, which are arguments that the result RP may be predicated of.

- (15) Restrictions on resultatives
- Shared Argument Constraint (SAC): At least one of the arguments of the event denoted by the main verb (verbal event) must be directly or indirectly shared with one argument of the result event.
 - Causal Relation Constraint (CRC): The two subevents of a resultative are causally related.
 - Appropriate Result Constraint (ARC): The result subevent denoted by the V2 of a resultative is a semantically and/or pragmatically appropriate result of the subevent denoted by the V1.
 - Affected Argument Constraint (AAC): The RP is predicated of an affected argument.

According to Lee, Kim, and Lee (2004), an ECM resultative in German like (16a) has the semantic form given in (16b).

- (16) a. Die Jogger liefen den Rasen platt.
 ‘The joggers ran the lawn flat.’
- b. $\exists e[\text{Run-flat}'(e) \ \& \ \exists e_1[\text{Cause}(e_1,e) \ \& \ \text{Running}'(e_1) \ \& \ \text{Actor}(\text{Jogger}',e_1) \ \& \ \text{Locative}(\text{the lawn}',e_1)] \ \& \ \exists e_2[\text{Result}(e_2,e) \ \& \ \text{Clean}'(e_2) \ \& \ \text{Locative}(\text{the lawn}',e_2)] \ \& \ \text{Appropriate-Result}(e_2,e_1) \ \& \ [e_1 < e_2]]$

In (8b), Section 3, the affected argument is a theme as the expression ‘Theme(the table’, e_1)’ shows, while in (16b) it is a locative argument as the expression ‘Locative(the lawn’, e_1)’ indicates. This is allowed by the constraint (15d), namely AAC. According to Washio’s (1997:438-440) classification, (8a) is an example of ‘weak resultative’, while (16a) is a ‘strong resultative.’ The semantic representations (8b) and (16b) show that, once the affected argument is defined by the lexical semantics of the matrix verb, and the complex predicate V+RP is licensed, we do not need to have a distinction between the strong and weak resultatives in providing the semantic forms. Other ECM examples can also be properly treated.

5 Resultative VVCs

Languages such as Korean, Chinese, and Japanese, have the so-called Verb-Verb Compounds (VVCs). The V2 in the V1-V2 compound can often be realized as an expression of adjectival or prepositional property. The typical examples are given in (17).

- (17) a. Korean (*Standard Dictionary of the Korean Language*)
ku-nun madang-ey kkwul-*anc*-a calmos-ul pil-ess-ta. [Vi+Vi]
 Top field-on kneel.down-sit -Con mistake-Acc beg.pardon-Past-Dec
 ‘He begged pardon on his knees.’
- b. Chinese (Y. Li 1990: 182)
Lisi pao-*lei*-le. [Vi + Vi]
Lisi run-*tired*-Asp
 ‘Lisi got tired because of running.’
- c. Japanese (Naumann and Gameschlag 2003:277)
 kazi-de neko-ga yake-*sin*-ta. [Vi + Vi]
 fire-in cat-Nom burn-die-Past
 ‘The cat died in the flame.’

As I observed in Section 3, in many works on resultatives (Bolinger, 1971; Dowty, 1979; Simpson, 1983; Kaufmann, 1995; Kaufmann and Wunderlich, 1998; Wechsler, 1997; Hovav and Levin, 2001; Müller, 2002; Goldberg and Jackendoff, 2004), it has been persuasively argued that the ‘Main Verb + RP’ combination, e.g. *hammer-flat*, forms a kind of semantic ‘complex predicate’. This semantic complex predicate is actually syntactically realized in Korean, Chinese, and Japanese. That is, the Korean expression *kkwul-anc* ‘kneel.down-sit’ in (17a), *pao-lei* ‘run-tired’ in the Chinese example in (17b) and the Japanese *yake-sin* ‘burn-die’ in (17c) are complex predicates. For example, the Korean VVC *kkwul-anc* ‘kneel.down-sit’ is taken to consist of two verbs *kkwul* ‘kneel.down’ and *anc* ‘sit.’ It is important to note that in the

example in (17a), no adverb can intervene between *kkwul* ‘kneel.down’ and *anc* ‘sit’. The examples of Chinese and Japanese can be analyzed in the same way.

Some claims that the Korean example *kkwul-anc* ‘kneel.down’ is the contracted form of *kkwul-e-anc* ‘kneel.down.’ S. Lee (2006:136-143)², however, convincingly argues against this claim. Without repeating Lee’s argument here I assume that *kkwul-anc* ‘kneel.down-sit’ is a pure VVC in Korean. Lee provides similar examples as in (18). I take more examples from *Standard Dictionary of the Korean Language* compiled by the National Institute of the Korean Language.

- (18) a. ku-nun tol-ul kal-*puswu*-ess-ta. (Vt + Vt)
 he-Top crystal-Acc grind-smash-Past-Dec
 ‘He crushed the stone by grinding.=He ground up the stone’
 b. ku-nun swujeong-ul kal-*takk*-ess-ta. [Vt + Vt]
 he-Top crystal-Acc rub-polish-Past-Dec
 ‘He polished the crystal by rubbing.’

In Chinese the combination of VVCs is very productive. This may be due to the fact that in some English unergative resultatives the fake reflexive is required, while it is not the case in Chinese. Many examples are discussed in relevant works on resultatives such as Y. Li(1990), Chung (1997), Kaufmann and Wunderlich(1998), Gamerschlag (2002), J. Huang (2006), etc.

- (19) Chinese Examples (Y. Li, 1990: 177; J. Huang, 2006:15)

Ta-pao-*lei*-le
 he ran-tired-Asp
 The verb *pao* ‘run’ may be replaced by verbs such as *qi* ‘ride’, *ku* ‘cry’, *xiao* ‘laugh’, *chang* ‘sing’, *shuo* ‘say, speak’, *ti* ‘kick’, *he* ‘drink’, *chi* ‘eat’, etc.

More Korean resultative VVCs are given in (20).

- (20) More Korean Examples (S. Lee, 2006)
 a. kam-ssa ‘roll-wrap’
 b. tul-anc ‘come.into-sit’
 c. nac-bo ‘low-see = despise’
 d. kam-ttwi ‘walk.around-jump’

With these examples in (20) we can argue against the claim that the serial verb constructions in Korean are not verb compounds (Zubizaretta and Oh, 2007). Moreover, I take the examples in (17a), (18) and (20) as resultative constructions, so I claim that Korean has resultative VVCs. Notice that these examples have the properties of the Korean serial verb constructions (Zubizaretta and Oh, 2007:57) and do not violate Y. Li’s (1993:499) Temporal Iconicity Condition (TIC). Also notice that, as the sentence in (21b) shows, there are no fake reflexive constructions in Korean. Instead, the V-e-V constructin in Korean can be interpreted as a kind of fake reflexive resultative, as shown in (21a).

- (21) a. ku-nun ttwi-e *phikonha*-ess-ta.
 He-Top run-Asp tired-Past-Dec
 ‘He ran [himself] tired.’
 b. *ku-nun susulo talli-e *phikonha*-ess-ta.
 he-Top self run-Asp tired-Past-Dec
 ‘*He ran himself tired.’

The verb *talli* ‘run’ may be replaced by *malha* ‘say, speak’, *nolayha* ‘sing’, etc.

Although there are several types of serial verb constructions in Korean, I will not discuss them in detail here.

² S. Lee (2006), first, classifies words into simple words and complex words. He then divides the latter into compound words and derived words. Many examples of Korean compounds may be found in S. Kim (2003) and C. Kim (2008).

6 Semantic Analysis of Resultative VVCs

Some researchers have tried to provide a syntactic account of the VVCs in languages such as Chinese, Japanese, and Korean. Among them, Y. Li (1990) presents a syntactic explanation of the Chinese VVCs in terms of the θ -grids of the participating Vs, i.e. V1 and V2, the head-feature percolation, and the θ -identification under the Government-Binding theory. In Y. Li (1993), he extends his theory to the explanation of the difference between Chinese, a head-initial language, and Japanese, a head-final language. Chung (1997) notes that Korean VVCs are similar to Japanese. I agree with him.

Here, I would not like to go into details of their syntactic analyses. One thing I want to note is the fact that both of Y. Li (1990, 1993) and Chung (1997) clearly mention the limits of syntactic explanation. In a rather simple resultative VVC, one of the possible argument combination types is illustrated as in (22) (=Y. Li, 1990:183, (12d)).

- (22) V1 V2
<1> <1'>

This is a possible combination when both component Vs take a single argument. <1> of V1 is the most prominent θ -role of the compound. The VVC in (22) may offer two possible θ -role identification patterns as in (23). Here, the hyphen(-) is used to mean that the two roles are identified, while the comma(,) means that two roles are not identified.

- (23) a. <1-1'> b. <1,1'>

The patterns are realized in the sentences as in (24).

- (24) a. xiaochou tiao-*fan*-le (Y. Li, 1990:189, (24b)) [Pattern of (22a)]
clown jump-bored-Asp
'The clown jumped (so long that he got) bored.'
b. xiaochou tiao-*fan*-le wo le (Y. Li, 1990:189, (25c)) [Pattern of (22b)]
clown jump-bored-Asp I asp
'The clown jumped (so long that) I became bored.'

In both sentences the VVC is the same *tiao-fan* 'jump-bored'. Nonetheless, the V2 *fan* in (24b) assigns its single θ -role to the object *wo* 'I', while in (24a) this θ -role is identified with that of V1. Thus, the two θ -role identification patterns in (23) are equally possible. The problem here is how we can explain the actual two realizations in (23a) and (23b) of the one pattern in (22). Li (1990:189) concludes that "the actual realization of them is subject to further semantic, pragmatic, or even idiomatic restrictions." By this Li actually seems to recognize the explanatory limits of the syntactic theory. Here, I claim that the natural selection of the appropriate patterns will be subject to the semantic-pragmatic restrictions given in (15) in Section 4, particularly (15c). I mean that the decision of the patterns is made by the knowledge provided by the semantic properties of the matrix verb and the contextual consideration.

Y. Li (1993) and later Chung (1997) discuss the 'hit-die' VVC, which consists of a Tv and a Ti. Originally Y. Li (1993) compares the Chinese and Japanese sentences and Chung (1997:209-210) compares and discusses the examples of Chinese, Korean, and Japanese, as shown in (25).

- (25) a. Chinese
Youyou da-*si*-le Taotao.
Youyou hit-die-Asp
'Youyou beat Taotao and as a result Taotao died.' (Y. Li, 1993:492)
b. Korean
*John-i Bill-ul ttayli-e *cwuk*-ess-ta.
John-Nom Bill-Acc hit-Asp die-Past-Dec
'John hit Bill and thus Bill died.'

c. Japanese

*John-ga Mary-o naguri-sinu-ta.

John-Nom Mary-Acc hit-die-Past-Dec

‘John hit Mary and as a result Mary died.’

Chung (1997) treats the marker *-e* in the Korean example as “a kind of serial verb linker.” I, however, take this as an Aspect marker in Korean VVCs. As shown in (25), in Chinese, a head-initial language, the *hit-die* VVC is acceptable, while the same VVC is ungrammatical in Korean and Japanese, both head-final languages. In the *hit-die* VVC, the two verbs have the θ -grids given in (26), which may be combined as in (27) by the θ -identification rule, and each thematic structure offers a possible reading.

(26) a. V1 ‘hit’: $\langle \theta_1, \theta_2 \rangle$ b. V2 ‘die’: $\langle \theta_a \rangle$

(27) a. $\langle \theta_1 - \theta_a, \langle \theta_2 \rangle \rangle$ b. $\langle \theta_1, \langle \theta_2, \theta_a \rangle \rangle$

In the Chinese example in (25a), a typical Vt-Vi compound, only the reading triggered by (27b), meaning ‘Youyou hit Taotao and Taotao died’ is correctly obtained by Y. Li’s θ -identification rule. The first reading triggered by (27a), meaning ‘Youyou hit Taotao and Youyou died’, should be ruled out. However, the reason for this ill-formedness is not clearly mentioned. Y. Li (1993: 493, fn. 9) relates this unacceptability to “pragmatic reasons” or “a poorly understood property” of resultative VVCs, which, I think, can be easily conjectured.

It is claimed that the Japanese example in (25c) allows neither (27a) nor (27b) as its reading. The same is true for the Korean example in (25b). The Korean example, however, seems to me to be acceptable with an addition of an adverb like *mucapiha-key* ‘mercilessly’ in front of the matrix verb. Then, the degree of appropriateness seems to increase. Discussing the Japanese example, Y. Li claims that the first reading triggered by (27a) is ruled out by the pragmatic reason as in Chinese. Chung (1997:217-221) proposes an alternative approach, which, however, necessitates some “semantic/pragmatic” conditions to provide a proper treatment of the examples.

Here I would like to note that, in the syntactic explanation, both Y. Li and Chung face difficulties. They try to avoid the problems in the syntactic account by simply suggesting that the problems be solved by some “semantic/pragmatic” conditions. They, however, do not provide any specific stipulation of the semantic/pragmatic conditions. I think it will be nice if we can account for the resultative VVCs in a semantic framework, without the difficulties in the syntactic explanation. The semantic approach below will explain the data with proper constraints.

Now, I am ready to present the semantic forms of resultative VVCs. In Section 3, I noted that the two verbs in resultative construction constitute a kind of complex predicate. It is also assumed that a VVC is a realization of this type of complex predicate. The issue here is how these two Vs are semantically compounded. Following Gamerschlag (2002) and Naumann and Gamerschlag (2003), we may analyze the two Vs in terms of the appropriate relation between V1 and V2. Let us examine the Korean and Japanese compounds given in (28).

(28) a. ku koyangi-ka tha-cwuk-ess-ta.

the cat-Nom burn-die-Past-Dec.

‘The cat died in the flame.’

b. kazi de neko-ga yake-sin-da.

fire in cat-Nom burn-die-Past

‘The cat died in the flame.’

The examples in (28) show that two verbs may combine to become a VVC in Korean and in Japanese as well. For the semantics of these VVCs in these head-final languages, we can postulate the semantic types of the two verbs as in (29), so that the matrix verb denoting an activity, which is aspectually more prominent than the RP denoting a state, may take the RP as its complement in order to construct a complex verb.

- (29) a. *tha* ‘burn’: $\langle\langle e,t\rangle,\langle e,t\rangle\rangle$
 b. *cwuk* ‘die’: $\langle e,t\rangle$
 c. *tha-cwuk* ‘burn-die’: $\langle\langle e,t\rangle,\langle e,t\rangle\rangle + \langle e,t\rangle \Rightarrow \langle e,t\rangle$

In (29) the transitive-based unaccusative *tha* ‘burn’ and the intransitive unergative *cwuk* ‘die’ combine to become an intransitive complex verb, i.e. VVC, *tha-cwuk* ‘burn-die’, which is to take a subject argument to become a complete sentence of type $\langle t\rangle$. In this case, according to Li’s (1993) analysis, the subject of *tha* ‘burn’ and the subject of *cwuk* ‘die’ are identified as the theme of the two verbs, actually of the complex VVC *tha-cwuk* ‘burn-die’. The corresponding semantic form will be represented as in (30).

- (30) $\exists e(Tha-cwuk'(e) \ \& \ \exists e_1[Cause(e_1,e) \ \& \ Tha'(e_1) \ \& \ Burning.thing(Cat',e_1)] \ \& \ \exists e_2[Result(e_2,e) \ \& \ Dead'(Cat',e_2)] \ \& \ Appropriate-Result(e_2,e_1) [e_1 < e_2]]$
 [Subject of Matrix V (burn) = Subject of RP (die)], i.e. $\langle\theta_1-\theta_a\rangle$

In Section 3, the basic idea of semantic account was to provide a kind of extended semantic representation of the matrix verb to include the result state, as shown in (7)-(8) there.

Similarly, the Chinese VVC in (31a) can be represented in the form of (31b).

- (31) a. Lisi zhui-lei-le.
 Lisi chase-[himself]-tired-Asp
 ‘Lisi chased himself tired.’
 b. $\exists e(Chase-tired'(e) \ \& \ \exists e_1[Cause(e_1,e) \ \& \ Chase'(e_1) \ \& \ Chaser(Lisi',e_1) \ \& \ Chased(y,e_1)] \ \& \ \exists e_2[Result(e_2,e) \ \& \ Tired'(e_2) \ \& \ Tired'(Lisi',e_2)] \ \& \ Appropriate-Result(e_2,e_1) \ \& \ [e_1 < e_2]]$

Note that, just for convenience’ sake, the tense is not separately indicated in (31b). The same strategy is used in the semantic forms of other sentences. The sentence in (32a) is ambiguous. The ambiguity seems to be responsible for the fact that Chinese is a head-initial language, but we need a further research on this issue. The ambiguity is represented as in (32b).

- (32) a. Lisi zhui-lei-le Zhangsan.
 Lisi chase-tired-Asp Zhangsan
 b. ① Lisi’s chasing Zhangsan caused him (Lisi) to become tired.
 $\exists e(Chase-tired'(e) \ \& \ \exists e_1[Cause(e_1,e) \ \& \ Chase'(e_1) \ \& \ Chaser(Lisi',e_1) \ \& \ Chased(Zhangsan',e_1)] \ \& \ \exists e_2[Result(e_2,e) \ \& \ Tired'(Lisi',e_2)] \ \& \ Appropriate-Result(e_2,e_1) \ \& \ [e_1 < e_2]]$
 [Subject of Matrix V (chase) = Subject of RP (tired)]
 ② Lisi’s chasing Zhangsan caused him(Zhangsan) to become tired.
 $\exists e(Chase-tired'(e) \ \& \ \exists e_1[Cause(e_1,e) \ \& \ Chase'(e_1) \ \& \ Chaser(Lisi',e_1) \ \& \ Chased(Zhangsan',e_1)] \ \& \ \exists e_2[Result(e_2,e) \ \& \ Tired'(Zhangsan',e_2)] \ \& \ Appropriate-Result(e_2,e_1) \ \& \ [e_1 < e_2]]$
 [Direct Object of Matrix V (chase) = Subject of RP (tired)]

In the semantic representation in (31b) and (32b), the indices have the similar function as the indices of Y. Li’s (1993) θ -identification. Concerning the *zhui-lei* ‘chase-tired’ compound, Y. Li (1993:484) gives the θ -structure as in (33). Note that, here, θ_1 and θ_2 are the θ -roles of V1 in the V1-V2 compounds, while θ_a and θ_b are the θ -roles of V2.

- (33) a. V_{CAUSE} : zhui ‘chase’ $\langle\theta_1, \langle\theta_2\rangle\rangle$
 b. V_{RES} lei ‘tired’ $\langle\theta_a\rangle$
 c. Compound: zhui-lei ‘chase-tired’ ① $\langle\theta_1-\theta_a, \langle\theta_2\rangle\rangle$ or ② $\langle\theta_1, \langle\theta_2-\theta_a\rangle\rangle$

In (33), notice that (33c①) corresponds to (32b①) and (33c②) to (32b②). Thus, the syntactic θ -identification in (33) exactly corresponds to the semantic representation in (32).

The typical Korean example in (34a=17a) can be semantically represented as in (34b).

- (34) a. *ku-nun madang-ey* [kkwul-*anc-ass-ta*].(=17a)
 he Top field-on kneel.down-sit -Past-Dec
 ‘He sat on his knees.’
 [He kneeled.down, and as a result sat.]
- b. $\exists e$ [*Kneel.down-sat'*(e) & $\exists e_1$ [Cause(e₁,e) & *Kneel.down'*(e₁) & Kneel.downer(He',e₁)] & $\exists e_2$ [Result(e₂,e) & *Sit'*(He',e₂)] & Appropriate-Result(e₂,e₁) & [e₁ < e₂]]
 [Subject of Matrix V (kneeled.down) = Subject of RP (sat)]
 Where, *Keel.down'* = kneeling.down (activity) event; *Sit'* = sitting result state.

Again, note that the tense is simplified in the semantic representation in (34b). The VVCs are simply treated as complex predicates. Thus, the composition rule in (29) above is automatically incorporated. The semantic form which conforms to the restrictions in (15), in Section 4, has its corresponding syntactic form. For example, each plausible sentence in (35) is ill-formed since its VVC does not satisfy the constraint in (15c).

- (35) **ku-nun madang-ey* [kkwul-*nwup/ket/cap-ass-ta*].
 He-Top field-on kneel.down-*lie.down/*walk/*hold -Past-Dec
 ‘He *lie.down/*walk/*hold on his knees.’

7 Conclusion

In this paper I discussed some resultatives in English, Korean, Chinese, and Japanese. First, I examined regular resultatives and noted that the Direct Object Restriction (DOR) used in syntactic accounts is insufficient in explaining various types of resultatives in English and other languages as well. Taking suggestions of previous researchers, I proposed the appropriate semantic/pragmatic relationship between the matrix verb (MV) and the result phrase (RP). I also proposed a revised version of some of the other constraints such as Wechsler’s ‘Affected Theme Condition.’ With these tools, I offered a proper semantic account of the relevant data within the framework of the event semantics. In addition, I argued that the proposed account can also provide a proper analysis of the resultative Verb-Verb Compounds (VVCs) found in Korean, Chinese, and Japanese.

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