

Semantics-Oriented Resultatives: Evidence from Valency Alternation Verbs

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1. Introduction

Resultative phrases are generally believed to conform to the Direct Object Restriction: that is, they describe the direct object if verbs are transitive. However, some exceptions have occasionally been reported, and this paper investigates the problem by focusing on resultative phrases that occur with the valency alternation verbs in Japanese and Chinese. Verbs that license the locative alternation and locatum-subject alternation describe events that involve two arguments, the location and the locatum, which are perceived to concurrently undergo a change of state. It will be shown that resultative phrases with a valency alternation verb can be predicated of either argument regardless of whether it is expressed as direct object. Furthermore, resultative verbal suffixes in Chinese, interpreted as description of either the location or the locatum, give rise to the locative alternation while their interpretation remains the same (data not shown in the abstract). Thus, it is claimed that in Japanese and Chinese, the predication relation of resultative phrases is not determined by the grammatical function of arguments as generally believed, but rather by the lexical semantics of the verbs.

2. The resultative construction in Japanese

It has been long understood (e.g., Kageyama 1996) that resultative phrases in Japanese describe the referent of direct object as shown in (1), as is the case with English, as originally observed and analyzed by Simpson (1983), later dubbed Direct Object Restriction (Levin and Rappaport Hovav 1995; the DOR henceforth).¹ (In the following examples, resultative phrases are underlined while the NPs that they describe are in bold.)

- (1) Taro-ga **kabin-o** konagona-ni² kowasi-ta.
Taro-NOM vase-ACC pieces-NI break-PAST
'Taro broke a vase into pieces.'

Since resultative phrases describe a result of a change, it follows that the verbs which allow a resultative phrase generally express an event involving a change of state, position, or spatial configuration of arguments. Some authors conclude that verbs that appear in the Japanese resultative construction are more limited than those in English in that they must entail a change as part of their lexical semantics, not just implying a change, calling those verbs "affected-theme transitives" (Koizumi 1994), or "change-of-state verbs" (Kageyama 1996 and 2001). For example, unlike the English counterpart, the Japanese verb of applying force *tatak-* 'hit, beat, pound' does not allow a resultative phrase, e.g. **usu-ku tatak-u* '(lit.) pound thin,' because such a state change of the theme argument is not entailed by the verb although it is likely (Washio 1997: 9).

Furthermore, the Japanese resultative construction allows resultative phrases to describe only a predictable result, called "weak resultatives" by Washio (1997) or "Type B resultatives" by Iwata (2006) as opposed to "strong resultatives" or "Type A resultatives," which express unpredictable result. The sentence *The horses dragged the logs smooth* has no well-formed Japanese equivalent because, it is claimed, logs' being smooth is not a result predictable from

¹Although this paper deals with transitive verbs, resultative phrases in Japanese also cooccur with unaccusative intransitive verbs describing the referent of subject as characterized by the DOR. Among the Simpson's analyses (1983: 146-147), however, a fake object, e.g. *I laughed myself sick*, or an unsubcategory object, i.e. *I ate him out of house and home*, are not allowed in Japanese.
²Resultative phrases are morphologically marked by the suffix *-ni*, as well as *-ku* in (3), depending on their syntactic categories; those suffixes have no significant consequences for the analysis.

horses' dragging them (Washio 1997). Thus, the semantic representation of the verbs contains not only a change of state of an argument but also a reference to a specific result.

3. Resultatives in the locative alternation

Valency alternation verbs exhibit alternative argument structures. Since the DOR states that a resultative phrase is predicated of the direct object, a resultative phrase is expected to be only predicated of the argument that appears as direct object in each structure, as confirmed in the contrast between *John loaded **the wagon full** with hay* and **John loaded the hay into **the wagon full*** (Williams 1980). The verb *load* is a locative alternation verb in English, and the resultative phrase *full*, which describes the state of *the wagon*, is acceptable only when *the wagon* is expressed as the direct object.

Although it is generally claimed that resultative phrases in Japanese also obey the DOR, some authors (e.g. Nitta 2002; Miyakoshi 2006) have pointed out the examples that do not follow the generalization: the resultative *siro-ku* 'white' describes the location argument expressed as an oblique in (2).

- (2) *Kyou-wa tenzyou-to kabe-ni siro-ku penki-o nut-ta.* (Miyakoshi 2006: 9)
 today-TOP ceiling-and wall-to white-KU paint-ACC spray-PAST
 '(lit.) Today, (I) sprayed paint on the ceiling and wall white.'

Note that the alternative structure where the location appears as direct object is also possible: *Kyou-wa tenzyou-to kabe-o siro-ku penki-de nut-ta* 'Today, (I) sprayed the ceiling and wall white with paint.' Example (2) is considered to be a deviation in that the resultative is predicated of the oblique locative, and Miyakoshi (2006) calls it a goal-oriented resultative and Nitta (2002) *ni* 'to'-marked NP resultative, both attributing the deviation to the locative NP. However, the oblique NPs which resultative phrases are predicated of are not limited to the *ni*-marked NP, and this paper shows that what is crucial for the acceptability of (2) is not the locative NP but the locative alternation verb *nut-ta* 'sprayed.' For example, (3a) is taken (and simplified) from the BCCWJ-NT corpus and shows that another locative alternation verb *mak-u* 'wind, bind' appears with the resultative phrase *atuku* 'thick' which describes the locatum *houtai* 'bandage', expressed as *de*-marked oblique NP.

- (3)a. *me-no-ue-o houtai-de atuku mai-ta.* [Nijo 2000; simplified]
 eye-GEN-top-ACC bandage-with thick bind-PAST
 'lit. (Someone) bound the top of eyes with bandage thick.'
- b. *me-no-ue-ni houtai-o atuku mai-ta.*
 eye-GEN-top-LOC bandage-ACC thick bind- PAST

(3b) is the alternative structure where *houtai* 'bandage' is expressed as direct object and described by the resultative phrase *atuku* 'thick' as predicted by the DOR.

Many authors (e.g. Pinker 1989) analyze locative alternation verbs as describing the events which involve two internal arguments: a locatum argument referring to an entity that undergoes motion, and a location argument referring to the goal of motion. Both arguments are perceived to undergo a change of state or position, and it is the simultaneous changes that give rise to alternative syntactic structures, mapping one of the arguments to the direct object. However, examples (2) and (3) show that resultative phrases can be predicated of either argument regardless of which argument is expressed as direct object. As the examples in (3) shows, there is no syntactic clue as to which argument a resultative phrase is predicated of, and a resultative phrase is interpreted on the semantic basis.

4. Resultatives in the locatum-subject alternation

The locatum subject alternation (Levin 1993: 81) provides further evidence for the semantic nature of constraints on the Japanese resultative construction. Locatum-subject alternation verbs also involve the locatum and location arguments, which undergo a change of state. In the alternative syntactic structures, the locatum argument is expressed either as an oblique or the

subject: e.g. *water* in *He filled a bottle with water/ Water filled a bottle*. Levin (1993) shows that in English, only *fill*-type verbs, which require the location argument to appear as direct object, license the locatum subject alternation. In Japanese, however, *mita-su* ‘fill’ is a locative alternation verb and some locative alternation verbs also appear in the locatum-subject alternation. Consequently, the variant (4b) with the locatum oblique appears both in the locative alternation (4a and 4b) and in the locatum-subject alternation (4b and 4c).

- (4)a. Taro-ga bin-ni mizu-o mitas-ita. ‘(lit.) He filled water in a bottle.’
 Taro-NOM bottle-to water-with fill-PAST
 b. Taro-ga bin-o mizu-de mitas-ita. ‘Taro filled a bottle with water.’
 c. mizu-ga bin-o mitas-ita. ‘Water filled a bottle.’

While Section 3 demonstrated resultatives that appear in the locative alternation, the corpus data show that a resultative phrase can be predicated of either argument in the locatum subject variant (such as 4c) as well. The resultative phrase *ike-no-you-ni* ‘pond-like’ describes the location argument *kubon-da-tokoro* ‘a hollow’ in (5). Since the location is expressed as direct object, the predication relation is equally predicted either syntactically or semantically.

- (5) *sizuku-ga* [...] ***kubon-da tokoro-o ike-no-you-ni*** *mitas-i*, ...
 drop-NOM subside-PAST place-ACC pond-GEN-appearance-NI fill-and
 ‘(lit.) Big drops (of water) filled a hollow (in the ground) like a pond ...’
 [Zola 2003; simplified]

Unlike the syntactic prediction by the DOR, however, the locatum subject can also be described by a resultative phrase as demonstrated in (6).

- (6) ***tanihyouga-ga atu-ku tani-o mitas-i*** ... [Takahashi 2006; simplified]
 valley.glacier-NOM thick-KU valley-ACC fill-and ...
 ‘(lit.) The valley glacier fills the valley thick ...’

The resultative phrase *atuk-u* ‘thick’ describes the spatial configuration of the locatum subject *tani-hyouga* ‘valley glacier’ that results from its motion.

These examples together with those in the previous section show that the predication relation of resultative phrases is not constrained by syntactic realization of an argument but by the lexical semantics of verbs. Generally, a resultative phrase can be predicated of either argument in a single variant, and of the same argument in either syntactic variant.

5. Analysis

Since the syntactic notion of direct object is closely tied to the semantic notion of THEME/PATIENT, it is not surprising that there have been semantic approaches to the resultative construction which reanalyze the DOR in terms of the thematic roles. In Construction Grammar approach (Goldberg 1995, 2006), for example, the argument labeled as PATIENT is interpreted as the logical subject of a resultative phrase, and is mapped to the direct object. In Lexical Conceptual Structure (LCS) approach (e.g., Levin and Rapoport 1988; Rappaport and Levin 1988; Kageyama 1996), the notion of thematic roles is represented in terms of argument positions (or variables) of primitive predicates such as CAUSE. Resultative phrases are represented in terms of the primitive predicate BECOME, and its first argument is associated with the direct object. Although the two approaches differ in details, both associate a distinct semantic representation with each variant of valency alternations, and identify a single argument to stand in the predication relation of resultatives in each variant. Given the data in the previous sections, both approaches would pose a problem in analyzing the Japanese resultative construction since resultative phrases are predicated of either location or locatum argument regardless of which variant they appear in.

The proposed HPSG analysis follows the analyses such as Beavers (2005, 2010) and Markantonatou and Sadler (1997) in that each valency alternation verb shares the single underspecified semantic representation which identifies two arguments undergoing a change. It

gives rise to alternative syntactic structures, and the semantic value is further instantiated in each variant. The interpretation of resultative phrases is not anchored to the syntactic realization of each variant, as the DOR predicts, but is determined based on the shared semantics.

The feature-value structure in (7) represents the lexical entry for the locative alternation verb *nut-* ‘spray’ that licenses the variant with the locatum object: e.g. *kabe-ni penki-o nut-ta* ‘sprayed paint on a wall.’

(7) *nur-* ‘spray’

	ARG-ST	< NP _i , NP _j , NP _k >			
SEM	INDEX	s ₁	<	RELN	smear
	RESTR	SMEARER		i	LOCATION
				LOCATUM	k
				BECOME	< s ₂ , s ₃ >
				SIT	s ₁
				>	
				<	
	RELN	colored		>	
	INST	j		<	
	SIT	s ₂		>	
				<	
	RELN	spread		>	
	INST	k		<	
	SIT	s ₃		>	
				<	
	HEAD	verb		>	
SYN	VAL	SPR	<	NP _i	-ga
	COMPS	<	NP _j	-ni,	NP _k
			>	-o	

As specified in the value of SEM, the verb’s main semantic content is a smearing relation among the individuals indexed as *i* for agent (SMEARER), the location *j* (LOCATION), and the locatum *k* (LOCATUM). It also encodes as part of the lexical semantics the state change of two arguments *j* and *k*: *j* becomes *colored* and *k* becomes *spread*. Syntactically, as specified in the value of COMPS, the locatum NP*k* is realized as direct object marked by *-o*. The other variant of the verb (not shown) specifies the location NP*j* as direct object while the semantic value is shared by both verbs.

A resultative phrase is introduced by the lexical rule in (8), following the idea of Wechsler and Noh (2001). It targets verbs with lexical semantics that specifies a change of state of an argument, including, but not limited to, valency alternation verbs, and licenses a resultative phrase which describes the result of the change.

(8) Resultative lexical rule

INPUT	ARG-ST	[1]	<	INDEX	s
	RESTR	<		BECOME	< ... , s' , ... >
				SIT	s
				>	
				<	
	RELN	adj-rel		>	
	INST	x		<	
	SIT	s'		>	
				<	
OUTPUT	ARG-ST	[1] ₊	<	XP	[SEM [RESTR < [2] >]
	VAL	[SPR	<	NP _x	>]]
			>		

The OUTPUT of the lexical rule appends a resultative phrase XP to the ARG-ST list. In effect, the resultative phrase will become an additional member of the VAL and be realized syntactically. Its semantic contribution [2], however, does not introduce an additional predication to the input RESTR list, but rather further instantiate one of them: e.g. the property *colored* in the predication s₂ in (7) is instantiated as *white* if a resultative phrase *shiro-ku* ‘white’ is added by the lexical rule.

The SEM value in (7) captures the characteristic shared by all valency alternation verbs: the concurrent state changes of the location and the locatum arguments. It in turn satisfies the requirements of verbs that license a resultative phrase in Japanese discussed in Section 2: entailing a change of state of an argument, and specifying its predictable result. Furthermore, the lexical rule in (8) targets a situation that appears in the BECOME list, which encodes the state of an

argument that undergoes a change of state. When the lexical semantics of verbs involve more than one argument which undergoes a change of state, as is the case with (7), a resultative phrase can be predicated of only the argument whose property is unifiable with its property: e.g. the property of a resultative phrase *siro-ku* ‘white’ is assumed to be unifiable with *colored*, but not with *spread* in (7). As discussed in Section 3, there is no syntactic clue as to which argument a resultative phrase is predicated of, and a resultative phrase is only interpreted on the basis of semantic plausibility.

6. Conclusion

This paper analyzes the resultative phrases that occur with valency alternation verbs in Japanese, and shows that, unlike commonly believed, the restrictions on the predicate relation in the resultative construction are basically semantic rather than syntactic: resultative phrases can describe the result of a change of state of a participant in the event regardless of whether such a participant is expressed as direct object or not. The data involving valency alternation verbs are used because they denote an event in which both locatum and location arguments are lexically specified to undergo concurrent changes. Resultative phrases are predicated of either argument regardless of which syntactic variant they appear in, providing evidence that their predication relation is constrained not by the grammatical function but the semantic property of arguments.

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