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On the Necessity of Functional Projections for Resultative Predicates: A View from the Japanese Language

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Abstract

This paper provides a possible solution to the issue of whether functional projections are necessary for secondary predicates. Focusing on manner adverbs and resultative predicates in Japanese because they have the same particles *-ni* or *-ku*, I will present several pieces of evidence that these two kinds of phrases are of the same syntactic category but should be given different treatments. As a proposal, I argue that, although in Japanese, resultative predicates are syntactic adjuncts, both manner adverbs and resultative predicates are headed by functional projections that take adjectival phrases in their complements and are responsible for the result meaning. I further claim that particles of Japanese resultative predicates are realizations of the functional projection, while adverbial categorizers in the sense of Distributed Morphology are realized as the particles of manner adverbs. It will also be shown that the functional projection is obligatorily realized as *-ni* or *-ku*, but this restriction is not imposed on the adverbial categorizer, which undergoes various realizations. The differences between these two phrases can be accounted for by assuming different syntactic structures for these phrases, leading to the conclusion that functional projections are necessary with respect to resultative predicates in Japanese.

Keywords: syntax, resultative constructions, manner adverbs, functional projections

1. Introduction

This paper tackles the issue of whether functional projections head secondary predicates. Secondary predicates are generally classified into two types: depictive and resultative predicates. Examples of each in English are given below in (1), and their Japanese counterparts are in (2).¹⁾

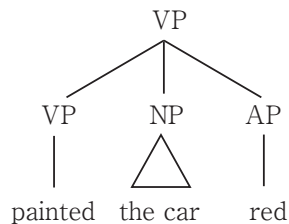
- (1) a. John ate the meat *raw*.
b. Mary painted the wall *red*.

- (2) a. Taroo-ga niku-o *nama-de* tabeta.
 Taroo-Nom meat-Acc raw-DE ate
 ‘Taro ate the meat raw.’
- b. Hanako-ga kabe-o *aka-ku* nutta.
 Hanako-Nom wall-Acc red-KU painted
 ‘Hanako painted the wall red.’

In (1), *raw* and *red* are secondary predicates; the former is a depictive predicate, and the latter is a resultative predicate. Depictive predicates describe the temporal state of their semantic subjects during events denoted by verbs, and resultative predicates express the result state of their subjects in the event of verbs. In the Japanese counterparts, *nama-de* ‘raw’ and *aka-ku* ‘red’ are the predicates. Secondary predicates in English are generally adjectives or prepositional phrases, and in Japanese, the predicates must be followed by a particle *-de* in the case of depictive predicates and *-ku* or *-ni* in the case of resultative predicates.

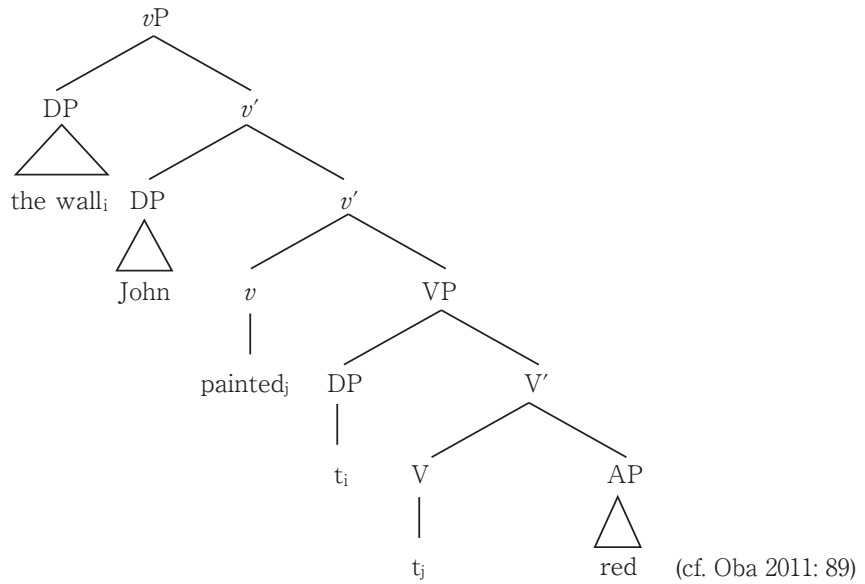
Secondary predicates have intrigued many linguists, and many analyses have been presented in linguistic fields such as generative syntax (cf. Williams 1980, Rothstein 1983, McNulty 1988, Nakajima 1990, Hasegawa 1999), formal semantics (cf. Kratzer 2005, Pylkkänen 2001), and lexical semantics (cf. Kageyama 1996). The proposals in the syntactic field can be roughly divided into two approaches. One is the direct generation approach, and the other is the functional projection approach. In the former approach, predicative phrases are directly employed in the derivation. The latter approach assumes that secondary predicates consist of a predicative phrase and a functional head that induces the meaning of secondary predicate constructions. The following structures instantiate the two approaches:

- (2) Direct generation approach
 a. A ternary branching analysis



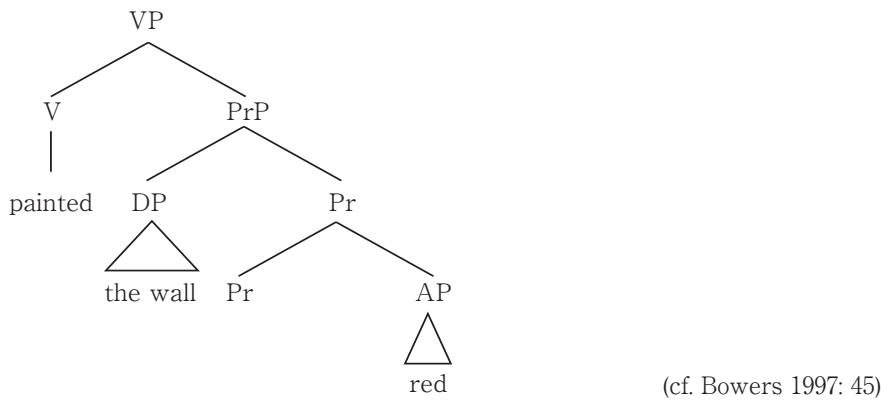
(Rothstein 1983: 35)

b. A complex predicate analysis

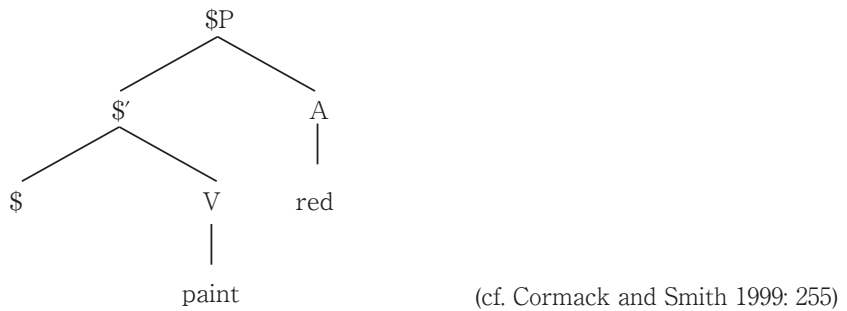


(3) Functional projection approach

a. A small clause analysis



b. A complex predicate analysis



The issue is determining which approach is appropriate to account for the linguistic properties of secondary predicates. Under the strong minimalist thesis, which is a tenet of the minimalist program (Chomsky 2000, 2001, 2008, to name a few), there should be no functional heads if the properties of secondary predicates can be explained without seemingly redundant projections because language is an optimal solution to the conditions at interfaces. However, I argue that functional projections for secondary predicates are necessary to account for the linguistic properties of secondary predicates. In this paper, I present evidence for this claim by observing Japanese resultative predicates. As mentioned above, resultative predicates in Japanese must be followed by *ni-* or *ku-*particles, and some other phrases such as manner adverbs have the same particles. Examples of resultative predicates and manner adverbs are given in (4) and (5), respectively.

- (4) a. Hanako-ga kabe-o *aka-ku* nutta. (= (2b))
 Hanako-Nom wall-Acc red-KU painted
 ‘Hanako painted the wall red.’
 b. Taroo-ga tetu-o *pikapika-ni* migaita.
 Taro-Nom iron-Acc shiny-NI polished
 ‘Taro polished the iron shiny.’
- (5) a. Hanako-ga *yasasi-ku* hohoenda.
 Hanako-Nom gentle-KU smiled
 ‘Hanako smiled gently.’
 b. Taroo-ga *yuuga-ni* odotta.
 Taroo-Nom elegant-KU danced
 ‘Taro danced elegantly.’

This paper claims that the phrases with homophonous particles have the same syntactic distribution: therefore, they belong to the same category. However, it is also shown that they have some different properties, and the differences can be accounted for if we assume that the particles of resultative predicates are realizations of functional projections, while those of manner adverbs have an adverbial categorizer only. The analysis in this paper serves as an argument in favor of the functional projection approach.²⁾

This paper is organized as follows: Section 2 illustrates the similarities of resultative predicates and manner adverbs, claiming that they are to be treated similarly in syntax. Section 3 introduces the differences between the two types of phrases to show that they require different analyses. Section 4 presents a new proposal, and finally, Section 5 concludes the paper.

2. Similarities

This section shows that, in Japanese, resultative predicates and manner adverbs have the same syntactic properties and thereby argues that resultative predicates in Japanese are also syntactic adjuncts. Nitta (1993, 2002) extensively conducts research on adverbs in Japanese in terms of their usage and properties, and he also argues that Japanese resultative predicates are adverbs. However, few syntactic studies have focused on the syntactic category of the predicates because many previous studies have analyzed resultative constructions in the same way as in English, in which resultative predicates have properties as syntactic arguments (cf. Simpsons 1983, Carrier and Randall 1992). This section will show two pieces of syntactic evidence for the adjuncthood of resultative predicates in Japanese.³⁾

2.1. Multiple Uses

First, manner adverbs are capable of appearing more than once in the same clause, which is a typical property of adjuncts. Although semantic restrictions are imposed, this property is also observable in the case of resultative predicates. See (6–8).

- (6) a. Taroo-ga yuka-o *subaya-ku teinei-ni* migaita.
 Taroo-Nom floor-Acc quick-KU neat-NI polished
 ‘Taro quickly polished the floor neatly.’
 b. *Subaya-ku_i* Taroo-ga yuka-o *t_i teinei-ni* migaita.
- (7) a. Taroo-ga kizi-o *usu-ku taira-ni* nobasita.
 Taroo-Nom dough-Acc thin-KU flat-NI spread
 ‘(Lit.) Taro spread the dough thin flat.’
 b. *Usuku_i* Taroo-ga kizi-o *t_i taira-ni* nobasita.
- (8) a. Hanako-ga tetu-o *kirei-ni pikapika-ni* migaita.
 Hanako-Nom iron-Acc clean-NI shiny-NI polished
 ‘(Lit.) Hanako polished the iron clean shiny.’
 b. *Kirei-ni_i* Hanako-ga tetu-o *t_i pikapika-ni* migaita.

The examples in (6) illustrate cases in which the multiple manner adverbs *subaya-ku* ‘quickly’ and *teinei-ni* ‘neatly’ are employed. As (6a) shows, adverbs can appear in one clause. Sentence (6b) demonstrates that the two manner adverbs do not form a constituent with a null conjunction, indicating that the two adverbs are distinct lexical items. The cases of resultative predicates are shown in (7) and (8), and the a-examples indicate that multiple

resultative predicates can appear in the same clause in Japanese and that this property can be witnessed even if the particles *-ku* and *-ni* are different. As in the case of manner adverbs, the two resultative predicates in examples (7b) and (8b) are separate phrases. The discussion here shows that manner adverbs and resultative predicates in Japanese behave identically in terms of multiple uses, leading us to conclude that they are categorically the same.

2.2. Extraction from Negative Islands

The marginality of extraction from negative islands serves as another piece of evidence for the identical properties of manner adverbs and resultative predicates in Japanese. Tanaka (2014) provides an argument–adjunct asymmetry paradigm in Japanese, arguing that adjuncts cannot be scrambled out of negative islands, while arguments do not show this property. Observe (9):

- (9) a. Taroo-ga [kessite yuka-o subaya-ku migaka-nakat] ta.
 Taroo-Nom never floor-Acc quick-KU polish-Neg Past
 ‘Taro never polished the floor quickly.’
 b. Yuka-o_i Taroo-ga [kessite *t_i* subaya-ku migaka-nakat] ta.
 c. ??Subaya-ku_j Taroo-ga [kessite yuka-o *t_j* migaka-nakat] ta. (Tanaka 2014)

In (9b), an internal argument *yuka-o* ‘the floor’ undergoes extraction from the negative island, and the example is grammatical. In contrast, the manner adverb *subaya-ku* ‘quickly’ is extracted in (9c), and this movement results in marginality. The unavailability of scrambling from negative islands is also detected in the case of resultative predicates. See (10) and (11):

- (10) a. Taroo-ga [kessite kabe-o *aka-ku* nura-nakat] ta.
 Taroo-Nom never wall-Acc red-ku paint-Neg Past
 ‘Taro never painted the wall red.’
 b. ??Aka-ku_i Taroo-ga [kessite kabe-o *t_i* nura-nakat] ta.
 (11) a. Hanako-ga [kessite tetu-o pikapika-ni migaka-nakat] ta.
 Hanako-Nom never iron-Acc shiny-NI polish-Neg Past
 ‘Hanako never polished the iron shiny.’
 b. ??Pikapika-ni_i Hanako-ga [kessite tetu-o *t_i* migaka-nakat] ta.

The cases of resultative predicates with *ku*-particles and those with *ni*-particles are shown in (10) and (11), respectively. Each b-example illustrates that, in Japanese, extracting resultative predicates from negative islands yields marginal results, as in the case of manner adverbs in (9c). This similarity also demonstrates that manner adverbs and resultative predicates are of the same syntactic category.

In summary, manner adverbs and resultative predicates show identical syntactic behavior from the viewpoint of multiple uses and extraction from negative islands. Therefore, it is reasonable to conclude that these two types of phrases are categorically the same. In the next section, I claim that although they share some syntactic properties, different properties are also found so that completely identical explanations cannot be applied to account for the linguistic properties of these phrases.

3. Differences

The previous section has shown that manner adverbs and resultative predicates in Japanese have the same syntactic properties, suggesting that they are the same lexical item and should be explained in the same manner. However, if we focus on the types of phrases that are homophonous, it will be evident that they have some different features in terms of semantics and syntax, two of which this section introduces.

3.1. A Semantic Difference

The first difference concerns the semantic characteristics of manner adverbs and resultative predicates in Japanese. It is apparent that manner adverbs and resultative predicates can be interpreted in different ways. Some manner adverbs and resultative predicates are homophonous, so if they had completely the same properties, it would be expected that the homophonous phrases would appear in the same environment, contrary to fact. This is indicated by (12), which has two different interpretations depending on how the adverb *kirei-ni* ‘beautiful/clean-NI’ is interpreted.

- (12) Hanako-ga *kirei-ni* yuka-o huita.
Hanako-Nom beautiful / clean-NI floor-Acc wiped
‘Hanako wiped the floor beautifully / clean.’
- a. How Hanako wiped the floor was beautiful.
 - b. The floor became clean as a result of Hanako’s wiping the floor.

The adverb *kirei-ni* can be interpreted in two ways: the manner of wiping the floor or the result state of the floor being wiped. If the two uses of *kirei-ni* are derived from the same lexical item, then this ambiguity is not predicted to occur; however, this prediction is not borne out. This result induces us to claim that manner adverbs and resultative predicates in Japanese are differentiated in a certain way.

3.2. Optionality of Particles

The second difference is related to the optionality of particles. Some manner adverbs are allowed without overt particles, but this property is not detectable in the case of resultative predicates.

- (13) a. Hosi-ga *pikapika*-Ø / *-ni* kagayaku.
 star-Nom bright-Ø / -NI twinkle
 ‘Stars twinkle brightly.’
- b. Taroo-ga tetu-o *pikapika*-*Ø / *-ni* migaita.
 Taroo-Nom iron-Acc shiny-Ø / -NI polished
 ‘Taro polished the iron shiny.’

As (13a) shows, the manner adverb *pikapika(-ni)* ‘brightly’ can appear without a particle, and the meaning does not change whether or not the manner adverb has an overt particle. This prompts us to contend that the particles of some manner adverbs are optional.⁴⁾ Resultative predicates, however, must be followed by particles, as illustrated in (13b), where the particle *-ni* is obligatory for the resultative predicate *pikapika-ni* ‘shiny.’ This difference in the optionality of particles also serves as another piece of evidence that manner adverbs and resultative predicates in Japanese have different linguistic properties.

This section discusses the differences between manner adverbs and resultative predicates in Japanese, showing that (1) manner adverbs and resultative predicates are sometimes homophonous, but with different meanings and that (2) manner adverbs are less restricted than resultative predicates with respect to the optionality of particles they accompany. The differences cannot be captured if they are identical lexical items. This fact indicates that the two types of phrases should be treated differently. In the next section, I present my proposal to account for the similarities and differences between the two phrases.

4. A Proposal

This section presents a new proposal. First, let us recap the similarities and differences between manner adverbs and resultative predicates observed in Sections 2 and 3. The properties of the two types of phrases are summarized in (14).

- (14) a. Manner adverbs and resultative predicates are both adjuncts.
- b. Manner adverbs and resultative predicates express different meanings even if they are homophonous.

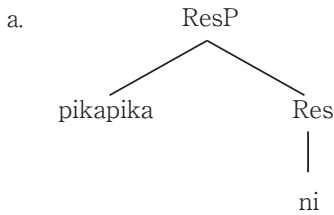
- c. Manner adverbs are sometimes available without particles, but resultative predicates must be followed by a particle.

This paper proposes a theoretical account of the properties of manner adverbs and resultative predicates in Japanese. I argue that a functional projection derives the differences between manner adverbs and resultative predicates in Japanese. In particular, I claim that resultative predicates are headed by a functional head that is responsible for the resultative meanings and that the particles of resultative predicates are the realization of the functional head. However, manner adverbs do not employ functional projections, and adverbial categorizers in the sense of Distributed Morphology (Halle and Marantz 1993) are realized as their particles. In the following subsections, I present my concrete proposal and explain how the proposal captures the properties in (14).

4.1. A Functional Projection for Resultative Predicates

I propose that resultative predicates in Japanese have the structure shown in (15a), and under the Event Semantics (Davidson 1967), I claim that the functional projection denotes the semantics in (15b).

(15) pikapika-ni



b. $\llbracket \text{Res} \rrbracket = \lambda P \langle v, t \rangle \lambda Q \langle v, t \rangle \lambda e \exists e' \exists e'' [P(e') \wedge Q(e'') \wedge e' \Rightarrow e' \wedge e' \oplus e'' = e \wedge \text{Theme}(e'') = \text{Theme}(e') = \text{Theme}(e)]$

c. $a \Rightarrow \beta = 1$ if and only if a temporally precedes β and a causally implicates β .

In (15a), the functional head Res is the head of the resultative predicate *pikapika-ni*, and it must undergo phonological realization as *ni*. The functional head is realized as *ku* in the case of another kind of resultative predicate such as *aka-ku* 'red.' This difference rests on the types of phrases the particles attach to: *-ni* attaches to adjectival nouns, while *-ku* attaches to adjectives.⁵⁾ The Res head plays the role of a kind of adverbial categorizer in that it creates the adverbial status of the phrase in its complement. The semantics in (15b) denotes in prose that for an event e , there is an event e such that e' and e'' , e'' temporally precedes and causally implicates e' , e is a composition of e' and e'' , and the theme of e'' is shared as a

theme of e' and e .

4.2. An Explanation

This subsection explains how the proposal in (15) works to account for the property of resultative predicates in Japanese, but we first need to observe where the predicates are located in the syntactic structure. In the following discussion, we will discover that resultative predicates in Japanese are adjoined to VP. First, v P-cleft sentences reveal that the predicates are at least in v P because they must be in the focused position. See (16):

- (16) a. Taroo-ga sita koto-wa [v P kabe-o *aka-ku* nuru koto] da.
 Taroo-Nom did thing-Top wall-Acc red-KU paint thing Cop
 'What Taro did was paint the wall red.'
- b. *Taroo-ga *aka-ku* sita koto-wa [v P kabe-o nuru koto] da.
 Taroo-Nom red-KU did thing-Top wall-Acc paint thing Cop
 '(Lit.) What Taro did red was paint the wall.'

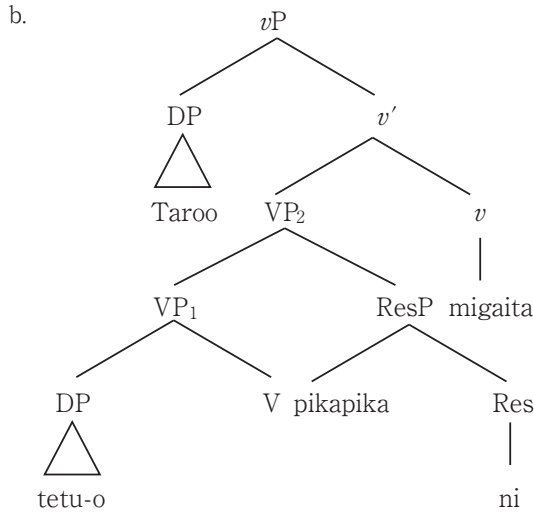
The resultative predicate *aka-ku* 'red' is located inside the focused position in (16a) but not in (16b). The ungrammaticality of (16b) shows that resultative predicates must reside in v P. The next question is: to which nodes are the predicates adjoined, v P or VP? Assuming with Fukui and Sakai (2003) that verbs in Japanese remain in v and do not move to T, we can discover the position of resultative predicates in Japanese.

- (17) a. Taroo-ga [v P kabe-o *aka-ku* nutta].
 Taroo-Nom wall-Acc red-KU painted
- b. *Taroo-ga [v P kabe-o nutta] *aka-ku*.

The examples in (17) illustrate that the resultative predicate must precede the verb *nutta* 'painted'. This fact shows that Japanese resultative predicates cannot be adjoined to v P but have to be in a deeper projection than v P, suggesting that they are adjoined to VP.

Let us observe how my proposal captures the properties of Japanese resultative predicates. Witness (18):

- (18) a. Taroo-ga tetu-o pikapika-ni migaita.
 Taroo-Nom iron-Acc shiny-NI polished
 'Taro polished the iron shiny.'



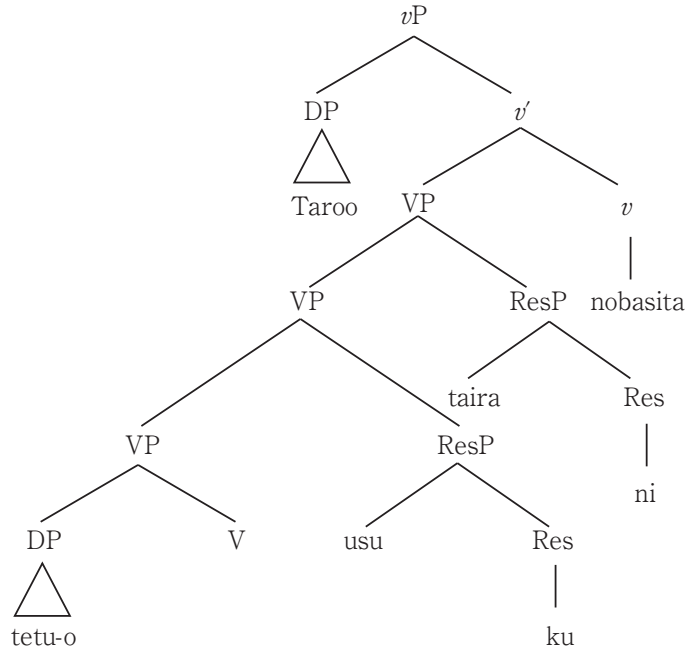
- c. $\llbracket \text{VP}_1 \rrbracket = \lambda e. [\text{polish}(e) \wedge \text{theme}(e) = \text{iron}]$
- d. $\llbracket \text{pikapika} \rrbracket = \lambda e. [\text{shiny}(e)]$
- e. $\llbracket \text{ResP} \rrbracket = \lambda Q_{\langle v, t \rangle} \lambda e. \exists e' \exists e'' [\text{shiny}(e') \wedge Q(e'') \wedge e'' \Rightarrow e' \wedge e' \oplus e'' = e \wedge \text{Theme}(e') = \text{Theme}(e'') = \text{Theme}(e)]$
- f. $\llbracket \text{VP}_2 \rrbracket = \lambda e. \exists e' \exists e'' [\text{shiny}(e') \wedge \text{polish}(e'') \wedge e'' \Rightarrow e' \wedge e' \oplus e'' = e \wedge \text{Theme}(e') = \text{Theme}(e'') = \text{Theme}(e) = \text{iron}]$
- g. After Existential closure:
 $\exists e \exists e' \exists e'' [\text{shiny}(e') \wedge \text{polish}(e'') \wedge e'' \Rightarrow e' \wedge e' \oplus e'' = e \wedge \text{Theme}(e') = \text{Theme}(e'') = \text{Theme}(e) = \text{iron}]$

The semantics in (18g) reads as follows: There is an event e such that e is a sum of e' and e'' ; e' is an event of being shiny, and e'' is an event of polishing iron; e' causally implicates e'' ; and the theme of e' is equal to the theme of e'' and e .

The structure in (18b) and the semantic composition in (18c–g) can account for the properties that Japanese resultative predicates possess. The resultative predicate in (18b) is adjoined to VP, which correctly captures the adjuncthood of the predicates. Sentences with multiple resultative predicates have the structure shown in (19b), which has two resultative predicates adjoined to VP.

- (19) a. Taroo-ga kizi-o usu-ku taira-ni nobasita. (= (7))
 Taroo-Nom dough-Acc thin flat spread
 '(Lit.) Taro spread the dough thin flat.'

b.



The resultative meaning of the predicates is obtained from the semantics of the functional head Res. As observed in (13b), repeated here as (20), null particles are unavailable for Japanese resultative predicates. This is because the sentence without the *ni*-particles does not employ the functional head for the resultative meaning because Res must be phonologically realized.

- (20) Taroo-ga tetu-o *pikapika*-* \emptyset / -*ni* migaita. (= (13b))
 Taroo-Nom iron-Acc shiny- \emptyset / -NI polished
 ‘Taro polished the iron shiny.’

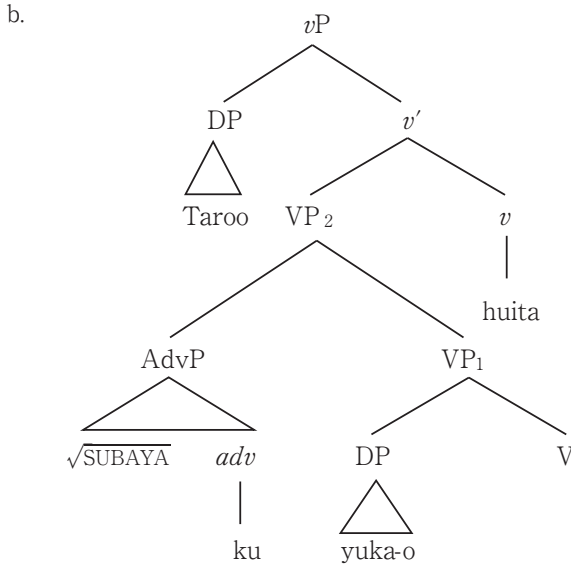
If neither *ni*-particle nor *ku*-particle is exerted, resultative meanings are not obtainable. This implies that *pikapika* in (20) can be interpreted as a manner adverb because manner adverbs are available without particles. This is actually borne out: (20) can describe a situation in which Taro polished the iron, and how Taro performed the action was shiny, which is a weird interpretation. The important idea here is that a resultative meaning is not allowed when *pikapika* does not have the *ni*-particle. This fact is readily accounted for in my proposal.

4.3. Manner adverbs

Let us shift to a discussion on manner adverbs. I argue that, contrary to resultative predicates, Japanese manner adverbs are not headed by a functional projection for the

meaning of the manner of motion. Their particles are realizations of adverbializers in the sense of Distributed Morphology (Halle and Marantz 1993, Embick 2010), which assumes that the categorizer determines the category of a phrase and lexical items are introduced in the derivation as roots, an element whose category is not specified.⁶⁾ See (21):

- (21) a. Taroo-ga subaya-ku yuka-o huita.
 Taroo-Nom quick-KU floor-Acc wiped
 ‘Taro wiped the floor quickly.’



- c. $[[VP_1]] = \lambda e.[wipe(e) \wedge Theme(e) = floor]$
 d. $[[AdvP]] = \lambda P \lambda e.[P(e) \wedge quick(e)]$
 e. $[[VP_2]] = \lambda e.[wipe(e) \wedge quick(e) \wedge Theme(e) = floor]$
 f. After Existential closure:
 $\exists e.[wipe(e) \wedge quick(e) \wedge Theme(e) = floor]$

In (21), the adverb *subaya-ku* ‘quickly’ consists of an adverbializer that is realized as *ku* and the root \sqrt{SUBAYA} . The category of \sqrt{SUBAYA} is not determined until it merges with the categorizer, so it can be an adjective when it merges with an adjectivizer *-i*, creating *subaya-i* ‘quick.’ Manner adverbs, along with other types of adverbs, are analyzed as predicates of events. The meaning of the manner of motion is obtained after merging with VP. In prose, the semantics in (21f) reads as follows: there is a wiping event that is conducted quickly, and the theme of the event is the floor.

The main difference between manner adverbs and resultative predicates in Japanese is

the availability or unavailability of null particles. In the case of resultative predicates, I have argued that a functional head for the result meaning is responsible for the particles. As for manner adverbs, I claim that the adverbializer can be potentially realized in multiple ways, in contrast with the resultative functional head. In (13a), both null and *ni*-particles can follow the manner adverb *pikapika*. In addition to the two particles, *to*-particle is also allowed for manner adverbs but not for resultative predicates. This is illustrated in (22).

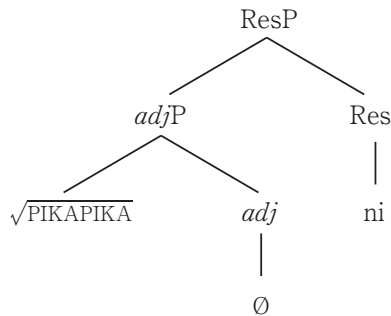
- (22) a. Hosi-ga *pikapika*- \emptyset / *-ni* / *-to* kagayaku. (cf. (13a))
 star-Nom bright- \emptyset / -NI / -TO twinkle
 ‘Stars twinkle brightly.’
- b. Taroo-ga tetu-o *pikapika*-* \emptyset / *-ni* / **-to* migaita. (cf. (13b))
 Taroo-Nom iron-Acc shiny- \emptyset / -NI / -TO polished
 ‘Taro polished the iron shiny.’

If a manner adverb is also headed by a functional head for the meaning of manner of motion, we have to assume that a single functional head is realized in many ways for the same lexical item to express the same meaning. If this claim is on the right track, it is unclear why resultative predicates are not available with null particles or *to*-particles. Therefore, it is reasonable to conclude that particles of manner adverbs are realizations of adverbial categorizers, not those of functional heads for the meaning of manner of motion.

4.4. Resultative Predicates Revisited

One might question the status of Japanese resultative predicates and wonder why the structure in (15a) does not have a categorizer for resultative predicates. I claim that resultative predicates also contain categorizers for adjectives, and their structure should be similar to that in (23).

(23) *pikapika-ni*



I assume that the adjectival categorizer in (23) must undergo null realization, and the functional head *Res* works as a sort of an adverbializer, making the whole structure in (23) adjunct. The motivation for the adjectival categorizer is that the resultative predicate is interpreted as a state of an argument at the end of an event described by a verb, and in general, adjectives denote states. Furthermore, I argue that Japanese is subject to the impossibility of overt multiple particles or categorizers. Unlike other languages such as English, in which multiple categorizers can be realized overtly, Japanese usually disallows multiple categorizers to overtly attach to the same lexical items.

- (24) a. **yuuga-na-ni*
 elegance-NA-NI
 ‘elegantly ($\sqrt{\text{ELEGANCE}}$ + adjectivizer + adverbializer)’
 b. **yuuga-ni-na*
 c. *yuuga-na / -ni*

(25) nationalization:

 nation-al-ize-tion (nation + adjectivizer + verbalizer + nominalizer)

In (24a, b), the root $\sqrt{\text{YUUGA}}$ ‘elegance’ is followed by two overt categorizers: an adjectivizer *na* and an adverbializer *ni*, and the ungrammaticality of these two examples indicates that multiple overt categorizers are not possible in Japanese. However, English allows multiple categorizers that appear overtly. I claim that Japanese is not compatible with overt multiple categorizers because a stricter phonological restriction is employed in this language.

(26) Phonological Restriction on Continua in Japanese

$\sqrt{\text{ROOT}}$ + categorizer₁ + ... + categorizer_{n+1}, where categorizers other than category_{n+1}
 are overtly realized.

From the observation above, it is natural to assume that the adverbializer in (23) undergoes null realization to avoid violating this restriction.

5. Conclusion

This paper has presented a theoretical account of the necessity of a functional projection for resultative predicates in Japanese. Although in Japanese, manner adverbs and resultative predicates share some linguistic properties, they are not identical lexical items; therefore, they should be given different treatments. Resultative predicates are headed by a functional projection that is responsible for the result meaning, while manner adverbs are not. The

functional projection for resultative predicates is phonologically realized as *ni* or *ku*, and the adverbial categorizer undergoes *ni*, *to*, or null realization in the case of manner adverbs.

All of the properties of resultative predicates and manner adverbs in Japanese that this paper has observed are correctly captured under my proposal. This paper has mainly employed Japanese data, so it is not very clear whether functional projection analysis is correct for other languages such as English. However, if the analysis is heading on the right direction, my proposal serves as one argument in favor of the existence of functional projection for resultative predicates at least in Japanese, suggesting that the functional projection analysis is appropriate for Japanese.

However, some problems remain to be solved. One of the problems in my proposal relates to the formal definition of the causal relation in (15b) and of a restriction in (26). I will tackle these problems in future research. Another problem is concerned with particles of manner adverbs. I have claimed that some manner adverbs are available with multiple particles, but they are actually rare cases, as I have noted in endnote 4. Manner adverbs such as *yuuga-ni* ‘elegantly’ and *subaya-ku* ‘quickly’ must be followed by *ni* and *ku*, respectively.

- (27) a. Taroo-ga yuuga*(-ni) mai-o odotta.
 Taroo-Nom elegant-NI dance-Acc danced
 ‘Taro performed a dance elegantly.’
- b. Hanako-ga subaya*(-ku) yuka-o huita.
 Hanako-Nom quick-KU floor-Acc wiped
 ‘Hanako wiped the floor quickly.’

This is not predictable under my proposal, so I will leave it open for future research.

Notes

1) Abbreviations are as follows.

- Acc: Accusative
- Cop: Copula
- Neg: Negation
- Nom: Nominative
- Prog: Progressive
- Top: Topic

2) Note that this paper does not answer whether resultative constructions in English should be given

a small clause analysis or a complex predicate analysis. I will leave this question open because it requires a tremendous analysis.

- 3) See Yamaguchi (2019, 2020a, 2020b) for the relevant discussion.
- 4) I do not claim that all manner adverbs are allowed without particles. Manner adverbs such as *subaya-ku* ‘quickly’ and *yuuga-ni* ‘elegantly’ are not available without the *-ku* and *-ni* particles.

- (i) Taroo-ga subaya-ku / *-Ø yuuga-ni / *-Ø odotta.
Taroo-Nom quick-KU elegant-NI danced
‘Taro quickly danced elegantly.’

Onomatopoeia adverbs, such as *batabata*, tend to have optionality of particles. For an extensive study of onomatopoeia, see Pantcheva (2006) for example.

- (ii) Kodomo-ga batabata- / -to hasiri-mawat-teiru.
child-Nom noisy-Ø / -TO run-around-Prog
‘The children are running around noisily.’

- 5) This paper does not explore why functional heads for resultative predicates are realized as *-ni* and *-ku* in the case of adjectival nouns and adjectives, respectively. This is among phonological matters, and this is beyond the scope of this paper.
- 6) One of the Research and Inquiry reviewers questioned the necessity of analyzing manner adverbs with Distributed Morphology. A motivation for this analysis is that assuming a functional projection for the meaning of manner adverbs is not necessary because manner of motion is the most basic meaning for verbal adverbs. Functional projections are generally posed for special meanings, it seems unnatural to pose a functional projection for a common meaning. However, some studies such as Alexeyenko (2012) claim that the meaning of manner of motion is accounted for by means of a functional projection. It requires an enormous amount of analyses to verify the superiority of my proposal to a functional projection approach to manner adverbs, so this issue should be tackled in future research. However, assuming a functional projection for manner adverbs do not undermine my proposal because manner adverbs and resultative predicates express different meanings, and they should have different functional projections.

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