Whose change of state do resultative adverbalised adjectives describe in Japanese locative-alternating constructions?

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Abstract

In Japanese locative-alternating constructions, a resultative in the locatum-subject/object variant can express the change of location, whilst a resultative in the location-subject/object variant can signify the change of locatum. Therefore, these constructions are considered to have counter-examples of Direct Object Restriction (DOR), which states that resultative predicates in a sentence can only modify an object (internal-argument) of the verb. To elucidate under what conditions resultative does or does not follow DOR in Japanese locative-alternating construction, this study investigated the difference in type and token frequency between the resultatives which are predicated of object/subject (i.e. examples supporting DOR) and the resultatives which are predicated of an oblique (i.e. counter-examples of DOR) in the Japanese locative-alternating constructions. We collected the corpus examples where adverbalised adjectives as resultatives describing either a locatum or location. As previous studies have pointed out, this study also confirmed that the resultatives describing an oblique were rare, both in terms of type and token frequency. However, the result indicates that a specific combination of the construction variant and orientation of a resultative is used to describe a certain event or change of state.

1 Locative alternation in Japanese: counter-examples of DOR

An event where some actions move some material from or to a certain location is described by a pair of construction variants. The alternation of such a pair is called locative alternation, and the two variants express an NP denoting the material and an NP denoting the location in mutually different syntactic structures. Hereafter, the moving material is called *locatum* and the location is *location*, following E. V. Clark and H. H. Clark (1979). As shown in (1), there are two construction variants to describe a *smearing* event: (1 a) an NP denoting the locatum *the paint* as its object, and a PP denoting the location *on the wall*; (1 b) an NP denoting the location *the wall* as its object, and a PP denoting the locatum *with paint*.

(1) a. John smeared **the paint** *on the wall*. (locatum-object variant)
   b. John smeared **the wall** *with paint*. (location-object variant)

Apart from English, Japanese also has locative alternation. However, Japanese locative-alternating constructions are considered as the counter-examples of Direct Object Restriction (DOR), which states that resultative predicates can only modify an (underlying) object of the verb, when the constructions hold a resultative predicate.

Before we review the evidence that a resultative often modifies an oblique (non-object) in Japanese locative-alternating constructions in Section 3, we outline four types of Japanese locative-alternating verbs in Section 2.

2 Japanese locative-alternating verbs and their constructional characteristics

In Japanese, locative-alternating verbs can be either transitive or intransitive, as shown in Table 1.

The transitive verbs which allow locative alternation have the locatum-object variant and location-object variant: the former has a locatum NP as its syntactic object and a location NP as its oblique; the latter has a location NP as its object and a locatum NP as its oblique. Moreover, the case marking in the variants differs depending on whether the verbs have a removal meaning, as further demonstrated in Section 2.1 and 2.2. The intransitive verbs with locative alternation have the locatum-subject variant and location-subject variant: the former has a locatum NP as its subject and location NP as its oblique; the latter has a location NP as its subject and a locatum NP as its oblique. Similar to the transitive verbs, the case-marking in the variants of intransitive verbs differs depending on whether the verbs have a removal meaning, as demonstrated in Section 2.3 and 2.4 in detail.

2.1 Transitive verbs without removal meaning (*Spray/Load*-like alternation)

Some Japanese transitive locative-alternating constructions allow each locatum-object and location-object variant to have both a locatum and location NP. (2 a) demonstrates that the locatum-object variant has an oblique location NP *kabe* 'wall', and (2 b) shows that the location-object variant has an oblique locatum NP *penki* 'paint'. English *Spray/Load* alternation (Levin 1993, pp.51–52) is homologous to this pattern since each variant has both a locatum and location NP.

Note that, in the locatum-object variant as shown in (2 a), a locatum NP (*penki* 'paint') is marked with ACC and a location NP (*kabe* 'wall') with DAT. In the location-object variant as shown in (2 b), a locatum NP has an INS case and a location NP has an ACC case.

Transitivity	Removal sense	Alternating Verb
intransitive	non-removal	*afureru* 'to overflow' *tsumaru* 'to be clogged, to be stuffed' *komu* 'to be crowded' *chirakaru* 'to be scattered' *sasaru* 'to pierce' *umaru* 'to be buried' *michiru* 'to fill' *nijimu* 'to stain' *tsukaeru* 'to get stuck'
	removal	*katazuku* 'to be tidy, to be settled' *moru* 'to leak' *kaeru* 'to hatch' *kareru* 'to dry up'
transitive	non-removal	*kukuru* 'to tie up' *maku* 'to roll' *tsumeru* 'to pack' *chirakasu* 'to scatter' *sasu* 'to stab' *iru* 'to shoot' *kazaru* 'to decorate' *moru* 'to heap' *haru* 'to stretch' *mabusu* 'to sprinkle (with powder)' *nuru* 'to paint' *shibaru* 'to tie up' *fuku* 'to thatch' *mitasu* 'to fill' *karameru* 'to entwine, to cote (with a sause)' *nagasu* 'to pour' *tomeru* 'to pin, to fasten' *aeru* 'to dress (food with a sauce)'
	removal	*toku/hodoku* 'to untie' *asaru* 'to scavenge' *akeru* 'to empty' *shiboru* 'to squeeze' *kezuru* 'to remove' *kesu* 'to erase' *nuguu* 'to wipe' *fuku* 'to wipe' *susugu* 'to snow' *arau* 'to wash' *soru* 'to shave' *katazukeru* 'to put away' *sarau* 'to dredge' *kosu* 'to filter'

Table 1: The locative-alternating verbs

(2) a. **locatum-object variant**

Tarō=ga kabe=ni penki=o nut-ta.
T.=NOM wall=DAT paint=ACC smear-PST

'Tarō smeared paint on the wall.'

b. **location-object variant**

Tarō=ga kabe=o penki=de nut-ta.
T.=NOM wall=ACC paint=INS smear-PST

'Tarō smeared the wall with paint.'

The verbs which have this alternation pattern usually signify packaging, adhesion, or diffusion, such as *mitasu* 'to fill', *kazaru* 'to decorate', and *chirakasu* 'to scatter' (Kishimoto 2001; Okutsu 1981, see Table 1).

2.2 Transitive verbs with removal meaning (*Wipe*-like alternation)

The locative-alternating verbs with removal meaning show a different hypallage from the above-mentioned verbs without removal meaning. In the locatum-object variant, as shown in (3 a), a locatum NP is realised as an object marked with the ACC case *o* and a location NP is introduced as an oblique marked with the ABL case *kara*. However, there is no option to grammatically introduce a locatum NP into the location-object variant as demonstrated in (3 b). English *Wipe* alternation (Levin 1993, p.53) is homologous to this pattern, as only the locatum-object variant has both a locatum and location NP whereas the location-object variant suppresses a locatum NP.

(3) a. **locatum-object variant**

Tarō=ga tēburu=kara yogore=o fui-ta.
T.=NOM table=ABL dirt=ACC wipe-PST

'Tarō wiped the dirt off the table.'

b. **location-object variant**

Tarō=ga tēburu=o (*yogore=de/ni/kara)
T.=NOM table=ACC dirt=INS/DAT/ABL
fui-ta.
wipe-PST

'Tarō wiped the table (*of the dirt).'

The verbs with this alternation pattern usually signify removal, such as *akeru* 'to empty' and *katazukeru* 'to put away' (Kishimoto 2001; Okutsu 1981, see Table 1).

2.3 Intransitive verbs without removal meaning (*Swarm*-like alternation)

There are also locative-alternating intransitive verbs and they have the locatum-subject and location-subject variant. (4 a) demonstrates that a locatum NP *doro* 'mud' is realised as a subject marked with the NOM case *ga* and that a location NP *paipu* 'pipe' is an oblique marked with the DAT case *ni*. (4 b) indicates that a locatum NP *doro* 'mud' is realised as an oblique marked with the INS case *de* and that a location NP *paipu* 'pipe' is a subject marked with the NOM case *ga*. English *Swarm* alternation (Levin 1993, pp.53–55) is homologous to this pattern, since both a locatum and location NP can appear in the locatum-subject and location-subject variant.

(4) a. **locatum-subject variant**

Doro=ga paipu=ni tsumat-ta.
mud=NOM pipe=DAT clog-PST

'Mud clogged the pipe.'

b. **location-subject variant**

Doro=de paipu=ga tsumat-ta.
Mud=INS pipe=NOM clog-PST

'The pipe clogged with mud.'

The verbs which have this alternation pattern usually signify packaging, adhesion, or diffusion, such as *afureru* 'to overflow' and *nijimu* 'to stain' (Kishimoto 2001; Okutsu 1981, see Table 1).

2.4 Intransitive verbs with removal meaning (intransitive *Clear*-like alternation)

Other locative-alternating intransitive verbs have a location-subject variant which does not grammatically incorporate a locatum NP in itself, although their locatum-subject variant allows both a locatum and location NP to appear. (5 a) shows that the locatum-subject variant holds a locatum NP as a subject marked with the NOM case *ga* and a location NP as an oblique marked with the ABL case *kara*. On the other hand, (5 b) shows that the location-subject variant prohibits a locatum NP from appearing in the sentence. English intransitive *Clear* alternation (Levin 1993, p.55) is homologous to this pattern, since both a locatum and location NP can appear in the locatum-subject variant but a location NP can only appear in the location-subject variant.

(5) a. **locatum-subject variant**

gomi=ga   heya=kara katazui-ta.
Rubbish=NOM room=ABL clear-PST

'Rubbish cleared from the room.'

b. **location-subject variant**

*Heya=ga   (*gomi=de/ni/kara)*
Room=NOM rubbish=INS/DAT/ABL

katazui-ta.
clear-PST

'The room cleared (*of rubbish).'

The verbs with this alternation pattern usually have a sense of removal or leakage, such as *moru* 'to leak' and *kareru* 'to dry up' (Kishimoto 2001, see Table 1).

3 Japanese resultatives in locative alternation: Describing the locatum/location expressed as an object or non-object

3.1 Resultatives in Japanese

In Japanese, the resultative adverbs indicate the state of the subject of an intransitive verb, or of the object of a transitive verb, resulting from the reailsation of a movement denoted by a verb (Nitta 2002). A resultative adverb describes the state which persists after the end of the action denoted by the verb, not the state which ceases with the end of the action (cf. Nitta 2002, p.71).

3.2 Change of state of the direct object's referent

As Simpson (1983, p.144) stated, '[i]n the transitive sentences, the resultative attribute is always predicated of the OBJECT, while in the intransitive sentence it is predicated of the SUBJECT', in English. This observation has been elaborated by Levin and Rappaport Hovav (1995) as Direct Object Restriction (DOR). Levin and Rappaport Hovav (1995, pp.34–41) affirmed that the resultatives describe the direct object of a transitive verb and the subject of an unaccusative intransitive verb, but not an oblique. Moreover, Kageyama (2001) demonstrated that Japanese resultative constructions also follow DOR and that the resultatives can only describe the status of the referent of the verb's internal argument.

In locative alternation constructions, locatum and location can both occur as an object/subject or oblique. Therefore, DOR predicts that in the locatum-object/subject variant, the resultative represents a change of state of locatum, and in the location-object/subject variant, the resultative represents a change of state of location. However, Japanese allows resultatives to describe the change of state of the locatum or location which is expressed in an oblique.

3.3 Change of state of the referent expressed in non-direct object

3.3.1 Location-describing resultatives in locatum-object/subject variants

Nitta (2002), Miyakoshi (2006), and Nakazawa (2020) pointed out that resultative adverbs can describe changes in the referent of non-direct objects (especially obliques).

Nitta (2002, p.52) asserted that the construction of verbs with sense of adhesion can be understood in a way that what is attached to (i.e. what bears goal role or location) can be changed by the attachment of the other entity (i.e. what bears theme role or locatum). Nitta (2002, p.52) demonstrated that a resultative represents the change of state in a location in the locatum-subject variant of the intransitive *nijimu* 'to stain' and in the locatum-object variant of the transitive *nuru* 'to paint'.

These are the counter-examples of DOR, since DOR predicts that what the resultative predicates is the locatum in locatum-subject/object variant.

Miyakoshi (2006, p.10) also affirmed that some resultatives in Japanese are predicated of non-object (agentive subject, goal/source oblique), although most resultatives are object-describing. Related to locative-alternating verbs, Miyakoshi (2006, pp.9–10, 16) demonstrated that resultatives were predicated of the NPs which are syntactically oblique and semantically goal theme in the locatum-object variant of the locative-alternating verbs such as *tsumeru* 'to pack', and *nuru* 'to paint'. Miyakoshi (2006) argued that the action denoted by the verbs with injection/loading sense (e.g. *tsumeru* 'to pack'), with painting sense (e.g. *nuru* 'to paint') and with removal sense would also change the status of a goal of an injection/loading and painting action, and the source

of a removal action (i.e. location), as well as the patient expressed in the direct object (i.e. locatum). Thus, Miyakoshi (2006) concluded that such a location can be interpreted as 'patientive entity' or what is affected by the action, and that resultatives can describe the change of state of 'patientive entity' including a location, if a verb expresses a change of state of such a 'patientive entity' and a resultative provides an additional information on the change.

To provide a uniform account for the grammaticality of both the examples in line with DOR and those counter-examples of DOR, Miyakoshi (2006, pp.11–13) suggested that if a verb and resultative overlap in meaning, both direct object-describing and non-object-describing resultatives are grammatical ('Syntagmatic Information Sharing'). In other words, a resultative predicates a theme/patient argument (i.e. a direct object) or an NP denoting what is conceived as 'theme/patient' entity (i.e. a non-object), if a verb implies their change of state, and a resultative provides an additional information on such a change.

As demonstrated in this section so far, resultatives which appear in locatum-object/subject variants of locative-alternating verbs can describe a change of state that occurred in a location which a *ni*-marked oblique NP denotes.

3.3.2 Locatum-describing resultatives in location-object variants

Nakazawa (2020) and Kawano (2021) showed that resultatives can indicate that a change of state occurs in a locatum denoted by a *de*-marked oblique NP in the location-object variant.

Nakazawa (2020, p.61) pointed out that 'resultative phrases can also be predicated of the locatum argument whether it is realized as the direct object or a *de*-marked oblique NP in Japanese'. Kawano (2021, p.29) also provides examples of resultative adverbs in the location-object variant that expresses the state of a *de*-marked oblique NP denoting a locatum rather than the *o*-marked direct object denoting a location.

3.3.3 Resultatives with locative-alternating verbs with removal sense

Miyakoshi (2006, p.10, 16) pointed out that in the constructions of verbs with removal sense, resultatives can describe the status of a source ar-

gument which is expressed in obliques marked with the ablative *kara*. Although the verbs given by Miyakoshi (2006) were not locative-alternating verbs, Nakazawa (2020) confirmed that resultatives can describe the status of what the oblique expresses in the constructions of the locative-alternating verbs with removal sense. Nakazawa (2020, pp.61–64) elicited such examples from the Balanced Corpus of Contemporary Written Japanese (BCCWJ, Maekawa et al. 2014) that the resultative expresses a change of state of location in the locatum-object variant and that the resultative expresses a change of state of locatum in a location-object variant. This finding is striking since the location-object variant of the removal verbs cannot grammatically incorporate any locatum NP implicitly (see (3 b) and (5 b)), though resultatives indicate such a tacit locatum in the location-object variant.

4 Remaining questions: What resultatives are predicated of oblique?

Previous studies have shown that resultatives often describe the change of state of the referent expressed in an oblique NP. Syntagmatic Information Sharing (Miyakoshi 2006, pp. 11–13, see also Section 3.3.1) explained why both locative constructions with oblique-describing resultatives and with object-describing resultatives are possible.

However, it is still unclear how these two constructions differ in their function. It is particularly necessary to investigate what motivates resultatives to predicate the oblique NP, i.e. the location expressed in an oblique in the locatum-object variant and locatum expressed in an oblique in the location-object variant.

Miyakoshi (2006, p.17) stated that the entity affected by an action is expressed in the thematic role of theme/patient, and that such an argument is usually realised as a syntactic object. Furthermore, Miyakoshi (2006, p.17) asserted that arguments whose thematic role is a goal or source can also be interpreted as a theme/patient, so that resultatives can describe the status of the referent of the goal/source arguments.

This explanation entails a consequence that a locatum, which takes the theme/patient role, is likely to be expressed in an object in locative alterna-

tion, and thus locatum-object variant is likely to occur. However, if the location argument, which takes the goal/source role, can also be interpreted as a theme/patient, such a locatum can be expressed in a syntactic object, which has high affinity to theme/patient, forming the location-object variant. Moreover, the Japanese speakers can use the location-object variant with a resultative which describes the location realised as the direct object.

For example, when Japanese speakers explain the location *kabe* 'wall' become red (*akaku* 'red') due to the painting and conceive the location as a theme/patient, it is more natural for them to use an object-describing resultative in the location-object variant shown in (6 b), rather than an oblique-describing resultative in the locatum-object variant shown in (6 a).

(6) a. **locatum-object variant**

Tarō=ga kabe=ni penki=o aka-ku
T.=NOM wall=DAT paint=ACC red-ADVZ
nut-ta.
smear-PST

'Tarō smeared the wall red with paint (lit. Tarō smeared paint on the wall red.)'

b. **location-object variant**

Tarō=ga kabe=o penki=de aka-ku
T.=NOM wall=ACC paint=INS red-ADVZ
nut-ta.
smear-PST

'Tarō smeared the wall red with paint.'

As we see, Miyakoshi (2006)'s proposal alone cannot explain the motivation for using the locatum-object variant with an oblique-describing resultative.

Also, the motivation for using a location-object variant with an oblique-describing resultative needs to be clarified. For instance, if Japanese speakers are to illustrate the locatum *batā* 'butter' becomes thick (*atsuku* 'thick') due to spreading and conceive the locatum to be a theme/patient, it would be more natural to express the locatum that has undergone the change as a syntactic object (cf. Miyakoshi 2006, p.17). Thus, it will also be more natural for the speakers to use the object-describing resultative in the locatum-object variant shown in (7 a), rather than an oblique-

describing resultative in the location-object variant shown in (7 b).

(7) a. **locatum-object variant**

Tarō=ga furaipan=ni batā=o
T.=NOM pan=DAT butter=ACC
atsu-ku nut-ta.
thick-ADVZ smear-PST

'Tarō spread butter thick on the pan.'

b. **location-object variant**

Tarō=ga furaipan=o batā=de
T.=NOM pan=ACC butter=INS
atsu-ku nut-ta.
thick-ADVZ smear-PST

'Tarō spread butter thick on the pan (lit. Tarō spread the pan with butter thick.)'

Under what conditions, then, does Japanese speakers choose constructions with oblique-describing resultatives, which are syntactically more unnatural, over constructions with object-describing resultatives? To explore the motivation for the use of oblique-describing resultatives compared to object-describing resultatives, we investigated what resultatives are specifically oriented to oblique arguments.

In addition to this main question, we dealt with the two questions on resultatives in the constructions of locative-alternating intransitive verbs, which previous studies have not addressed in much detail: (1) Do locatum-describing resultatives co-occur in the location-subject variant of the intransitive verbs? (2) Regarding locative-alternating intransitive verbs with removal sense, is any resultative predicated of the change of state of location in the locatum-subject variant, or predicated of the locatum's change of state in the location-subject variant?

5 NLP-aided Data collection and data annotation

5.1 Data extraction from BCCWJ and screening by JUMAN++/KNP

In this study, we collected the actual examples where resultative phrases modify one of the locative-alternating verbs and signify the change of state of the referent of the oblique NP from the corpus of

written Japanese. Note that this study used adverbalised adjectives as the resultative phrase and only one of the two kinds of Japanese adjectives was analysed, namely *i*-adjectives (*keiyōshi*), which are 'native Japanese adjectives that cover semantically primary vocabulary' (Hasegawa 2018, p.8).

We collected the actual written examples in which adverbalised adjectives precede locative-alternating verbs listed in Table 1 from BCCWJ (accessed in 20 April 2021, Maekawa et al. 2014). However, the search engine of BCCWJ lacks the ability to extract the instances by specifying the dependency structure, thus, the data undesirably contained sentences that the adverbalised adjectives never modified in the succeeding locative-alternating verbs.

To extract the sentences where adverbalised adjectives were syntactically dependent on verbs from the data collected from BCCWJ, we annotated the dependency structure of each example using Kurohashi-Nagao Parser 5.0 (KNP, Revision.0209a5ef on 2021-02-06, Kurohashi and Nagao 1992). We also used a morphological analyser Juman++ Version 2.0.0-rc3 (Dictionary: 20190731-356e143 / LM: K:20190430-7d143fb L:20181122-b409be68 F:20171214-9d125cb, Tolmachev, Kawahara, and Kurohashi 2018, 2020) to feed the word segmentation information to KNP. We manipulated Juman++/KNP via their Python wrapper pyknp (Richardson et al. 2021) using Python 3.9.5 (Van Rossum and Drake 2009), running under Ubuntu 18.04 on Windows Subsystem for Linux.

5.2 Classification of resultatives by which NP they describe

We analysed the sentences where adverbalised adjectives were syntactically dependent on the target verb in them, according to KNP. We excluded the passive and causative sentence, since the grammatical relation of NPs differed from the sentences with active voice. We verified whether the parser correctly analysed the grammatical relation of NPs in these sentences, and corrected the results if the parser failed. If either locatum or location NP is omitted from the sentence or marked with a case other than the verb required, we supplemented it based on the pre-context and/or post-context of the sentences. If both the locatum and location NP were syntactically absent, we did not supplement them, since it

was impossible to decide whether the sentence was the locatum-object/subject or location-object/subject variant. Through these procedures, we obtained 749 sentences.

We classified the 749 sentences into the following 10 categories by what their adverbial adjectives described: (1) they describe the change of state of a **locatum** only; (2) they describe the change of state of a **location** only; (3) they describe the change of state of either a locatum or location, but it is impossible to decide which, although both of the locatum and location NP are present (**ambiguous**); (4) they describe the manner of motion (**manner**); (5) they describe the change of state of either a locatum or location, but it is impossible to decide which, although one of the locatum and location NPs are present in the sentence (**one-absent**); (6) they describe the change of state of either a locatum or location, but it is impossible to decide which, since the sentence lacked both of the locatum and location NP (**inconclusive**); (7) they may describe the change of state of either a locatum or location, but it is also possible that they may describe the manner of the action (**indeterminable**); (8) they do modify the target verbs but the verbs are used in a metaphorical meaning or used as idioms (**metaphor**); (9) The target verbs are not used as the locative-alternating sense, due to the fact that they are polysemic (**non-alternation**); (10) the parser failed to analyse the sentence (e.g. it returned an adverbial adjective which does not modify the target verb, or misanalysed a word as an adverbial adjective; **failure**).

6 Results

As Table 2 indicates, 162 sentences contained the adverbalised adjectives describing either a locatum or location. In these examples, there was no instance of the location-subject variant of the intransitive verbs in which locatum-describing resultatives co-occur. Also, there was no sentence containing locative-alternating intransitive verbs with removal sense which contains resultative adverbalised adjectives. Therefore, we did not have their locatum-subject variant with a location-describing resultative, or their location-subject variant with a locatum-describing resultative. As previous research has not provided such examples, this research confirmed that

Transitivity	Removal sense	Alternating Verb	Entity modified by the resultative	Variant	Resultatives (Adverbalised Adjectives; The numbers in brackets are the token frequecies of each adjective)	Type frequency (Variety of adjectives)	Total token frequency (Sum of the numbers in brackets)
Intransitive		*michiru* 'to fill'	ambiguous	locatum	*aoi* 'blue' (1)	1	1
		nijimu 'to stain'	location	locatum	*akai* 'red' (1)	*1*	*1*
			locatum	locatum	*namanamashii* 'vivid, fresh' (1), *usui* 'thin' (2)	**2**	**3**
		tsumaru 'to be stuffed'	locatum	locatum	*kisokutadashii* 'regular, systematic' (1)	**1**	**1**
		umaru 'to be buried'	ambiguous	locatum	*asai* 'shallow' (1), *fukai* 'deep' (1)	2	2
			location	location	*kuroi* 'black' (1)	**1**	**1**
			locatum	locatum	*fukai* 'deep' (1)	**1**	**1**
		haru 'to stretch'	locatum	locatum	*asai* 'shallow' (1), *fukai* 'deep' (4), *ookii* 'large' (3)	**3**	**8**
		karameru 'to entwine, to cote (with a sause)'	location	locatum	*kitsui* 'tight' (1)	*1*	*1*
			locatum	locatum	*usui* 'thin' (2)	1	2
		kazaru 'to decorate'	ambiguous	locatum	*baransuyoi* 'well-balanced' (1)	1	1
			location	location	*akarui* 'bright' (1)	1	1
			locatum	locatum	*ooi* 'many' (1)	1	1
		kukuru 'to tie up'	ambiguous	location	*yurui* 'loose' (1)	1	1
		maku 'to roll'	ambiguous	locatum	*kitsui* 'tight' (1)	1	1
			location	location	*marui* 'round' (1), *yurui* 'loose' (1)	2	2
			location	locatum	*kitsui* 'tight' (1), *yurui* 'loose' (1)	*2*	*2*
			locatum	locatum	*atsui* 'thick' (1), *buatsui* 'very thick' (1), *kitsui* 'tight' (3), *usui* 'thin' (1), *yurui* 'loose' (1)	**5**	**7**
	non-removal	*moru* 'to heap'	ambiguous	location	*takai* 'high' (1)	1	1
			ambiguous	locatum	*utsukushii* 'beautiful' (1)	1	1
			location	locatum	*irodoriyoi* 'colourfull' (1)	*1*	*1*
			locatum	location	*ooi* 'many' (1)	*1*	*1*
			locatum	locatum	*kawaii* 'cute' (1), *utsukushii* 'beautiful' (1)	2	2
		nagasu 'to pour'	locatum	locatum	*usui* 'thin' (1)	**1**	**1**
		nuru 'to paint'	ambiguous	locatum	*muranai* 'even, uniform' (1)	1	1
			location	location	*akai* 'red' (5), *aoi* 'blue' (1), *kuroi* 'black' (8), *shiroi* 'white' (3)	4	17
			location	locatum	*akai* 'red' (1), *kuroi* 'black' (1), *shiroi* 'white' (1)	*3*	*3*
			locatum	location	*marui* 'round' (1)	*1*	*1*
			locatum	locatum	*atsui* 'thick' (3), *awai* 'light, faint' (1), *chiisai* 'small' (1), *koi* 'thick (in colour or density)' (1), *usui* 'thin' (53)	**5**	**59**
		sasu 'to stab'	locatum	locatum	*marui* 'round' (2)	**1**	**2**
Transitive		*shibaru* 'to tie up'	ambiguous	location	*kitsui* 'tight' (1)	1	1
			ambiguous	locatum	*kitsui* 'tight' (1)	1	1
			location	location	*kitsui* 'tight' (3)	1	3
			locatum	location	*katai* 'hard' (1), *kitsui* 'tight' (1)	*2*	*2*
			locatum	locatum	*yurui* 'loose' (1)	1	1
		tsumeru 'to pack'	locatum	locatum	*katai* 'hard' (5), *komakai* 'small, fine' (1)	**2**	**6**
		fuku 'to thatch'	locatum	locatum	*usui* 'thin' (1)	**1**	**1**
		fuku 'to wipe'	locatum	locatum	*usui* 'thin' (1)	**1**	**1**
		kesu 'to erase'	ambiguous	location	*ookii* 'large' (1)	1	1
			location	locatum	*kokochiyoi* 'comfortable' (1)	*1*	*1*
			locatum	locatum	*shiroi* 'white' (1)	1	1
	removal	*kezuru* 'to remove'	ambiguous	location	*komakai* 'small, fine' (1), *usui* 'thin' (1)	2	2
			location	location	*chiisai* 'small' (2), *futoi* 'thick, bold' (1), *hosoi* 'lean, thin' (2), *katachiyoi* 'well-formed' (1), *marui* 'round' (3), *ookii* 'large' (1), *takai* 'high' (1)	7	11
			locatum	location	*ookii* 'large' (1)	*1*	*1*
		nuguu 'to wipe'	locatum	locatum	*chiisai* 'small' (1)	**1**	**1**
		shiboru 'to squeeze'	location	location	*katai* 'hard' (2)	**1**	**2**

Table 2: The locative-alternating verbs and resultative

there was no real example for the locative-alternating intransitives.

In the constructions of locative-alternating verbs shown in Table 2, a number of adverbalised adjectives described the object of the transitive verbs, or the subject of the intransitive verbs, in terms of type and token frequency. More specifically, the locatum-describing resultatives co-occurred more with the locatum-object/subject variant than the location-object/subject variant; and the location-describing resultatives co-occurred more with the location-object/subject variant than the locatum-object/subject variant. The type frequency of the adverbalised adjectives indicates that across the verbs, wider variety of adverbalised adjectives were used to describe the change in referents of subjects or objects (bold numbers) than to describe the change in referents of obliques (bold italic numbers). The result quantitatively confirmed Miyakoshi (2006, p.18)'s intuitive observation that the resultative describing an oblique is exceptional and atypical in type frequency. Moreover, the total token frequency also indicates that the resultatives describing an oblique were less productively used than the resultatives describing a subject or object across the verbs.

Furthermore, the result may imply that a certain combination of the construction variant and orientation of a resultative (i.e. whether a resultative describes the location or locatum) is used for describing a specific change of state. As for *nuru* 'to smear', for instance, when the resultative described the change in colour of the location, both the location-object variant and the locatum-object variant were used, as illustrated in (8)[1].

(8) a. **location-object variant with location-describing adjective**

   kodomo-tachi=ga kao=o   sumi=de
   child-PL=NOM   face=ACC ink=INS
   kuro-ku   nut-tari, ...
   black-ADVZ smear-CVB, ...

   'The children painted their own faces black with ink, ...' ("Shōka no keshiki", 2005; PB57_00120; 16020; 10260)

b. **locatum-object variant with location-describing adjective**

   Urushi=o   kuro-ku
   Japanese.lacquer=ACC black-ADVZ
   nur-i,   tō=o   shige-ku   mai-ta
   paint-INF, cane=ACC many-ADVZ wind-PST
   yumi
   bow

   'A bow painted black with Japanese lacquer and wound with cane' ("Kokugo Sōgō", 2006; OT03_00010; 12910; 9060)

However, when the resultative described other kinds of change of locatum, the locatum-object variant was exclusively used (five adverbalised adjectives; 59 instances; see (9a)), but the location-object variant was rarely used (one adverbalised adjective; one instance; see (9b)[2]).

(9) a. **locatum-object variant with locatum-describing adjective**

   te=ni   usu-ku   saradaabura=o
   hand=DAT thin-ADVZ salad.oil=ACC
   nur-i, ...
   smear-INF, ...

   'Put salad oil on your hands, ...' ("Orangepage Cooking", 2004; PM41_00063, 55430, 34120)

b. **location-object variant with locatum-describing adjective**

   ..., Hō=no tokoro=o maru-ku
   cheek=POSS place=ACC round-ADVZ
   pinkuiro-ni nut-te-i-ta
   pink-ADVZ   smear-INF-PFV-PST

   '(A young man) had painted his cheeks round and pink.' (*There fell a shadow* "Maboroshi no owari", 1991; LBf9_00207; 29510; 18580)

Although these findings would be a mere coincidence due to the scarce data, they might show that 'Syntagmatic Information Sharing' proposed by Miyakoshi (2006, pp.11–13) requires redefinition. Further investigation is necessary to clarify the combination of the construction variants and orientation

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[1]The alphanumeric strings after the bibliographic information indicates Sample ID; Character Starting Position; and Sequence Number of the data in BCCWJ.

[2]In (9b), no locatum NP appears, although locatum NP should represent some kind of cheek rouge.

of a resultative that are mainly used for a certain event.

7 General discussion and limitation

This study focused on investigating the difference between the resultatives which are predicated of an oblique (i.e. counter-examples of DOR) and the resultatives which are predicated of object/subject (i.e. examples supporting DOR) in the Japanese locative-alternating constructions. From the real data of BCCWJ, we collected and analysed the sentences where adverbalised adjectives, serving as resultatives, describe a locatum or location. This study also confirmed the conclusion in previous studies that the resultatives that describe an oblique were rare, both in terms of type and token frequency. However, a certain event or change of state would be compatible with a specific combination of the construction variant and orientation of a resultative.

To elucidate such characteristics, it is necessary to obtain more data, for instance, by collecting sentences in which *na*-adjectives (*keiyō-dōshi*) describe the change of state of a locatum or location. Further research could explore pairs of the locative-alternating verbs and resultatives in passive and causative constructions, which were excluded from the present analysis. Moreover, comparing data from other Japanese corpora with the current data from BCCWJ would also be useful to validate if the paucity of our data is due to a certain bias that BCCWJ has, though BCCWJ is the only balanced corpus of Japanese which is publicly available. Last but not least, psycholinguistic experiments would also be fruitful to overcome the scarcity of the data. Production experiments, for instance, could provide support for the hypothesis that Japanese speakers prefer to produce a particular pair of construction variant and resultative orientation to describe a particular event.

Appendix: Abbreviations

The glossing abbreviation in this article follows Leipzig Glossing Rules (Department of Linguistics of Max Planck Institute for Evolutionary Anthropology 2008) and Miyaoka (2021), last accessed on 31 July 2021.

-	affix boundary
=	clitic boundary
∗	ungrammatical
ABL	ablative
ACC	accusative
ADVZ	adverbaliser
CVB	converb
DAT	dative
INF	infinitive
INS	instrumental
NOM	nominative
PST	past
PFV	perfective
PL	plural
POSS	possessive

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