VP-Shell Analysis for the Acquisition of Japanese Intransitive Verbs, Transitive Verbs, and Causatives*

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Abstract

Japanese-speaking children erroneously produce intransitive forms instead of (di)transitive forms, and intransitive/(di)transitive forms instead of causative forms. Murasugi and Hashimoto (2004) provide a uniform account of such verbal errors following Larson's (1988) *v*-VP frame or VP-shell hypothesis: (i) the predicate-argument structures of large V's and small *v*'s are acquired early, (ii) children assume [±cause] *v* to be phonetically null at one stage, and (iii) what requires time is the acquisition of the lexical form of each V and the forms in which [±cause] small *v*'s are realized. Adittional empirical evidence for their *v*-VP frame analysis is obtained from Sumihare Noji's database as well as from the observational data reported in the previous research. Based on the analysis of Japanese-speaking children's common errors widely observed in the previous literature and the two longitudinal studies presented in this article, in this paper, we develop the *v*-VP frame analysis for the acquisition of Japanese verbs and complex predicates.

1. Introduction

Verbal errors in child language are universally observed across languages. English- and Portuguese-speaking children, for example, produce such erroneous sentences as (1) and (2).

(1) Mommy, can you *stay* this open? [1]
(Bowerman 1974:143)

(2) Quem *morreu* ele?
'Who died him?' (die = kill)
(Figueira 1984:115)

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In (1), the verb should be the transitive verb *keep*, but the child uses the intransitive verb *stay* instead. In (2), an example from Portuguese, the transitive verb 'kill' should be used, but the

*We would like to thank Mamoru Saito for discussions, comments, and suggestions for this paper. We also wish to express our gratitude to Sonja Eisenbeiss, William Snyder, Masumi Aono, Tomohiro Fujii, Yoshie Kabuto, Keiko Yano, Eriko Watanabe, Fusako Noji, Sachiko Kato, and Elizabeth Laurencot for the invaluable suggestions. We would like to thank Ann Kelly and the reviewers of Linguistics for their detailed comments.

An earlier version of this paper was presented at the workshop on three-place predicates held at the Max Planck Institute for Psycholinguistics (Nijmegen, Holland) in May, 2003, at the 2nd Yuelu Language Acquisition Workshop (Changsha, China) in September, 2005, at University of Connecticut (Storrs, U.S.A.) in March, 2006, and at workshops held at Nanzan University (Nagoya, Japan) from 2002 through 2006. We benefited from the comments by the participants and colleagues, and also from the stimulating discussion on three-place predicates and the acquisition of verbs from various perspectives at Max Planck, Yuelu Language Acquisition Workshop, UConn, and Nanzan University.

The research reported here is supported in part by the Nanzan University Pache Research Grant I-A and by JSPS Grant-in-Aid (C) (#17520282) to Nanzan University.

[1] The italicized form indicates non-adultlike usage.

child wrongly employs the intransitive verb 'die.'

Similar errors are also observed in Japanese. It is well-known that Japanese-speaking children aged around 2 to 4, incorrectly use the intransitive form for the transitive verbs. Example (3) was reported by Otsu (2002: 185).

(3) Child (3;11):
Otootyan, mado *ai-te*.
daddy window is open-Request
(Intended meaning: 'Daddy, please open the window.')
Father:
Mado ake-te, daro.
window open-Request, isn't it?
'You mean, open the window.'
Child:
Un, mado *ai-te* yo.
yeah window is open-Request please
(Intended meaning: 'Yeah, Daddy, please open the window.')
Father:
Mado ake-te, dayo.
window open-Request, it should be
'It should be "Open the window".'
Child:
Iikara,mado *ai-te* yo, otootyan.
anyway window is open-Request please daddy
(Intended meaning: 'Anyway, please open the window, Daddy.')
(Otsu, 2002: 185[our translation])

In (3), the child asks his father to open the window. The child produces the erroneous intransitive imperative form *ai-te* (be open), instead of the correct transitive form *ake-te* (open), despite the direct correction from his father. The same type of error is observed in (4).

(4) Oniityan-ga *aka* nai. (2;9)
brother-Nom be-opened not
Literal meaning: Brother is not opened (the door).
Intended meaning: Brother does not open (the door).
(Ito 2005: 3)

Errors in causatives have also been observed in the acquisition of various languages: Bowerman (1974) and Figueira (1984), for example, report that there is a stage when children cannot make the adult form for the causatives in English and Portuguese respectively.

(5) You can *drink* me the milk. (Lord 1984:83)

(6) (…) este balanco vai te *cair*.
'This swing is going to fall you.'
Intended meaning: This swing will let you fall (Figueira 1984:83)

In (5), the child tells his or her mother to let (or help) him or her drink milk. However, the causative verb is omitted. A similar example can be found in Portuguese as shown in (6).

The same type of errors can be elicited from Japanese as well. Japanese-speaking children, at around 2 to 4 years of age, produce such erroneous verb forms as (7).

(7) Child (2;2):
Papa fuusen *fukuran-de*.
Daddy balloon swell-Request
(Intended meaning: Daddy, please blow up the balloon.)
Father:
Fukuran-de zyanaidesyo fukuramas-ite desyo.
swell-Request not isn't itblow up-Request isn't it
'It is not "fukuran-de" (swell). It should be "fukuramas-ite" (blow up).'
Child:
Fukuran-de.
swell
(Intended meaning: Blow up (the balloon).)
Father:
Fukuramas-ite.
blow up
'(You should say) blow up (the balloon).'
Child:
Fukuran-de. *Fukuran-de*.
swell swell
(Intended meaning: Blow up (the balloon)! Blow up (the balloon)!)
(Suzuki, 1987;172 [our translation])

The child asks his father to blow up the balloon. The farther provides the child with the correct lexical causative form *fukuramas-ite* (blow up), but it is never successful. The child continues producing the erroneous intransitive imperative form *fukuran-de* (swell).

This type of error is also frequently reported in the Japanese naturalistic studies. Some examples are given in (8).

(8) a. Aririn-ga Yuutyan-ni pazyama-o *kigae-ta*. (4;3)
-Nom -Dat pajamas-Acc change-Past
Literal meaning: Aririn changed clothes to Yuu.
Intended meaning: Aririn helped Yuu into her clothes.
(Murasugi and Machida 1999:411)

b. Kukku *nu-ide*. (2;2)
shoes take off-Request
Literal meaning: Please take off (a pair of) shoes.
Intended meaning: Please take my shoes off. (Ito 1990:206)

c. *Ak-(s)ase-te*. (5;4)
be open-Cause-Request
'Please open (the box of pins)' (Ito 1990:70)

d. Kutu-o *hake-sase-te*. (4;0)
shoes-Acc put on-Cause-Request
'Please put (a pair of) shoes on me.' (Ito 1990:70)

In (8a), instead of the causative form *kigae-sase-ta* (lit. make-change-Past), the child employs the intransitive form *kigae-ta* (change-Past). In (8b), the child asks her mother to take off her shoes. The child produces the request form of the plain transitive verb *nug-u* (take off), or *nu-ide*, although an adult would produce *Kutu-o nug-ase-te*, using the lexical causative form. In (8c), the child uses the unaccusative verb *ak-u* (be open) instead of the transitive verb *ake-ru* (open), just as shown in (3)-(4). In addition, in (8c), furthermore, the child erroneously adds the causative suffix *-(s)ase* to the verb, thereby producing the form **ak-ase-te*. A similar example is found in (8d). Instead of the ditransitive verb *hakas-u* (shoe, transitive), the child

uses the plain transitive verb *hak-u* (put on) or its potential form *hak-e-ru* (can put on). Like (8c), the child erroneously adds the causative suffix *-sase* to the verb erroneously in (8d), yielding the unacceptable verb **hake-sase-te*.

The purpose of this article is to discuss such verbal errors in a systematic way within the framework of generative syntax. We first present an overview of Murasugi and Hashimoto (2004), who based their study on their longitudinal data of a Japanese-speaking child, Akkun,[2] together with the child data reported in the previous researches, show that Japanese-speaking children make various types of errors in the process of the acquisition of agentive verbs and causatives. They account for those errors uniformly employing *v*-VP frame analysis and argue that children produce those errors because [±cause] *v* is assumed to be phonetically null at one stage. This analysis is further confirmed by Fuji (2006). We discuss Sumihare's data (Noji, 1974-1977) and conclude that the very same acquisition process observed by Murasugi and Hashimoto can be found in Sumihare's data (Noji, 1974-1977), thereby providing an additional evidence for the *v*-VP frame analysis.

This article is organized as follows: in Section 2, we introduce and discuss Murasugi and Hashimoto's *v*-VP frame analysis based on Larson's VP-shell hypothesis; in Section 3, we provide evidence obtained from the analysis of Sumihare's data; and in Section 4 we present our conclusion.

2. Murasugi and Hashimoto (2004)

2. 1. The Syntactic Representation of Agentive Verbs in *v*-VP frame

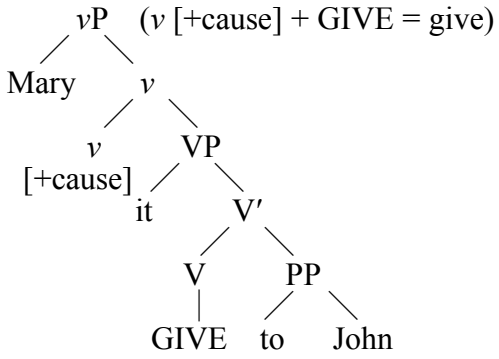
Murasugi and Hashimoto's (2004) *v*-VP frame analysis on the acquisition of complex predicates provides evidence for Larson's (1988) VP-shell hypothesis. The *v*-VP frame ~~is~~ developed out of Larson's (1988) VP-shell analysis of ditransitive sentences such as (9).

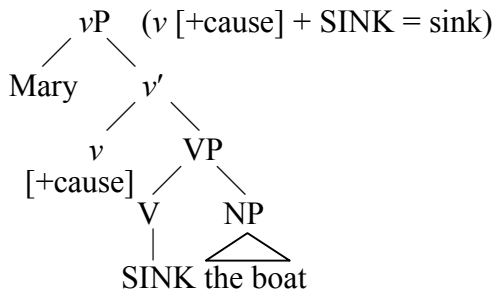
(9) Mary gave it to John.

According to this analysis, there are two layers of VPs where the higher verb assigns the agent role to its Spec. This was generalized to all agentive sentences in Hale and Keyser (1993) and Chomsky (1995). That is, the agent role is always assigned by the higher verb, called small *v* in distinction from the lower verb V, to its Spec. Thus, (9) and (10) can be represented as in (11) and (12), respectively.

(10) Mary sank the boat.

[2] The longitudinal study of Akkun was made from 1;9 until 7;0 of age. Tomoko Hashimoto, Akkun's mother, recorded the naturalistic data 25 hours a week on average, focusing on the full sentences Akkun produced. The purpose of the study was to see the synchronic change in the use of verbs in a Japanese individual child. The record was transcribed by Tomoko Hashimoto, and for confirmation, some target sentences were also elicited in natural context by Tomoko Hashimoto and Keiko Murasugi in the course of the longitudinal study.

(11) 

(12) 

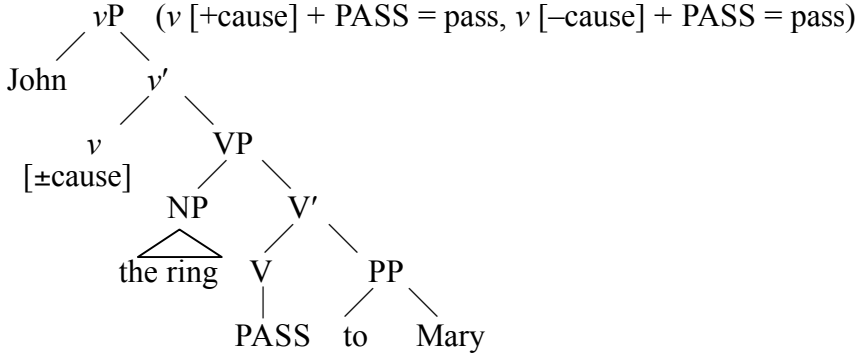
According to one version of this analysis, the verb *give* consists of two abstract verbs, as illustrated in (11). The higher one, small *v*, assigns the agent role to the subject of the sentence and takes a VP complement. It has the meaning of CAUSE. The lower one, capital GIVE, has the basic meaning of GO and takes two arguments, the theme and the goal. In (11), the agent is *Mary*, the theme is *it*, and the goal is *John*. The small *v*-projection represents the ACTIVITY or CAUSE, and the large V-projection represents the CHANGE OF STATE. The precise meaning of the ditransitive sentence (9) is that Mary DID something and that she CAUSED the event that it goes to John. The lower V is raised to the higher *v*-position, and then they together yield the lexical item *give*. And finally, the highest argument, *Mary*, moves to TP Spec, and assumes the subject position of the sentence. (12) is basically the same except that the event Mary CAUSED is the boat's sinking.

This analysis provides an elegant account for the alternation in (13) and also that in (14), discussed in detail in Baker (1996).

(13) a. Mary sank the boat.
b. The boat sank.

(14) a. John passed the ring to Mary.
b. The ring passed to Mary.

The structure of (14a)-(14b) is shown in (15).

(15) 

Exactly as in (11), there are two verbs in the structure of (14a) as illustrated in (15): the small *v* and the capital PASS. The higher verb, small *v*, assigns the agent role to *John*. The small *v*-projection expresses the CAUSE of the event, whereas the lower V-projection expresses the resulting CHANGE OF STATE. Accordingly, the ring GOES or PASSES to Mary. The lower verb, capital PASS, is raised to the small *v*-position, and the small *v* + capital PASS yield the lexical item *pass*. The highest argument, *John*, assumes the subject position of the sentence.

On the other hand, (14b), the unaccusative counterpart of (14a), has only two arguments, the theme and the goal. *The ring* is the theme, and *Mary* is the goal. Since the agent argument is missing, one possibility is that the small *v*-projection is absent and there is only the large V-projection in this case. The highest argument, *the ring*, is raised to the TP Spec position and becomes the subject of the sentence. An alternative possibility, with similar effects, is that the small *v* is present but has the feature [–cause]. Unlike the small *v* with [+cause], the small *v* with [–cause] does not assign the agent role to its Spec position. In this case also, the highest argument is *the ring* because the agent is absent. Hence, *the ring* becomes the subject of the sentence. Capital PASS is raised to the [–cause] *v* and they yield the lexical item *pass*, which is identical to the ditransitive *pass* in form. Murasugi and Hashimoto (2004) assume the latter analysis because the [–cause] small *v* shows up overtly in some (di)transitve/unaccusative verb pairs in Japanese, such as *utu-s-(r)u*(photograph(transitive)-Pres) / *utu-r-(r)u* (photograph (unaccusative) -Pres) verb pair.

This analysis elegantly accounts for the two types of causatives known to exist in English and illustrated in (16) and (17):

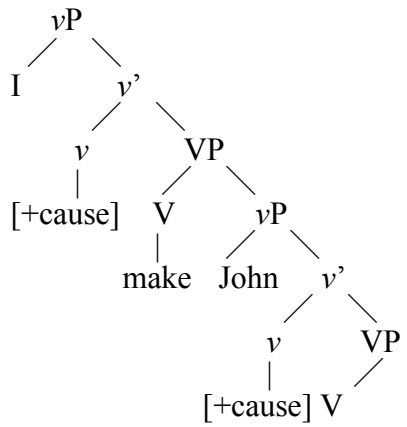
(16) a. I caused John to go.
b. I made John open the window.

(17) a. I opened the window.
b. I put a pair of shoes on John.

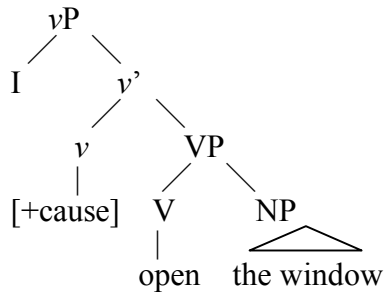
The causative verbs such as ‘make,’ ‘cause,’ ‘let,’ and ‘have’ express causative meanings by themselves. They form a causative sentence with a sentential complement which has a predicate of its own. This kind of causatives is productive, and is derived by syntactic processes. Therefore, the causatives in (16) are called syntactic causatives. In syntactic causatives, both of a causer and a causee can be agents. Thus, they have a biclausal structure.

On the other hand, the causatives in (17) are called lexical causatives. In (17), the transitive verbs *open* and *put* function as causative verbs. The causative meaning and a resultive event are contained in the lexical item itself. In lexical causatives, only a causer like *I* behaves as an agent. Therefore, they have a mono-clausal structure. The structure of (16b) and (17a) are shown in (18) and (19), respectively.

(18)



(19)



It is said that Japanese also has syntactic causatives and lexical causatives like English. As shown in (20), Japanese morphological *-(s)as*e causatives are formed by attaching the causative suffix *-(s)ase* to the verb stems.

(20) a. Taroo$_i$-ga Hanako$_j$-o /ni hasir-(s)ase-ta. (intransitive)
-Nom -Acc/Dat run-Cause-Past
'Taro made/had Hanako run.'

b. Taroo-ga Hanako-ni nimotu-o mot-(s)ase-ta. (transitive)
-Nom -Dat luggage-Acc carry-Cause-Past
'Taro made/had Hanako carry the luggage.'

These examples show that the causee can be the agent of the "embedded" predicate just as in the case of syntactic causatives in English.

As is the case in English, there are some ditransitive and transitive verbs that function as causative verbs in Japanese. Some of them are listed with their unaccusative counterparts in (21).

(21)	(di)transitives	/	unaccusatives
a.	mi-se-ru (= show-Pres)	/	mi-ru (= see-Pres)
b.	utu-s-(r)u (= photograph-Pres)	/	utu-r-(r)u (= photograph-Pres)
c.	todok-e-ru (= deliver-Pres)	/	todok-(r)u (=be delivered-Pres)
d.	os-ie-ru (= teach-Pres)	/	os-owar-(r)u (= be taught-Pres)
e.	ki-se-ru (= dress-Pres)	/	ki-ru (=put on-Pres)
f.	kasan-e-ru (pile up-Pres)	/	kasan-ar-(r)u (=be piled up-Pres)

These verbs function as causative verbs and form lexical causatives. (22) is a lexical causative sentence with the ditransitive verb *kiseru* (dress).

(22) Hanako-ga Taroo-ni yoohuku-o ki-se-ru.
-Nom -Dat clothes-Acc dress-Pres
'Hanako puts the clothes on Taro.'

The sentence (22) does not mean 'Taro puts on his clothes,' rather it means 'Hanako puts them on Taro,' or 'Hanako dresses Taro.' Thus, only *Hanako* is an agent. *Taroo* is not an agent but behaves as a goal. Thus, the lexical causative in (22) has a mono-clausal structure.

It has also been recognized that Japanese morphological *-(s)ase* causatives are biclausal. This is supported by the examples in (23a) and (23b).

(23) a. Taroo$_i$-ga Hanako$_j$-ni zibun$_{i/*j}$-no koto-o hanasi-ta.
-Nom -Dat self-Gen things-Acc tell-Past
'Taro told Hanako (things) about himself.'

b. Taroo$_i$-ga Hanako$_j$-ni zibun$_{i/j}$-no namae-o kak-(s)ase-ta.
-Nom -Dat self-Gen name-Acc write-Cause-Past
'Taro made/had Hanako write self's (her/his) name.'
(Murasugi and Hashimoto 2004:17)

It is well known that the Japanese reflexive pronoun *zibun* (self) is subject-oriented (Kuroda, 1965, among others). Thus, in (23a), only *Taroo* is a subject and *zibun* can take only Taroo as its antecedent. In (23b), however, *zibun* can take either *Taroo* or *Hanako* as its antecedent. This implies that both *Taroo* and *Hanako* function as a subject. Hence, the sentence in (23b) has a biclausal structure.

However, Matsumoto (2000) suggests that when the causative suffix *-(s)ase* is attached to the verbs as in (24), the sentence is ambiguous.

(24)

transitive base verbs		causativized verbs	
hak(-u)	'put … on one's own lower body'	*hak-ase(-ru)*	'put … on someone else's lower body'
mato(-u)	'put … on, wrap oneself in'	*matow-ase(-ru)*	'put … on someone else, wrap'
tabe(-ru)	'eat'	*tabe-sase(-ru)*	'make … eat, feed'
ku(-u)	'eat' (colloquial)	*kuw-ase(-ru)*	'make … eat, feed'
nom(-u)	'drink'	*nom-ase(-ru)*	'make … drink, feed'
su(-u)	'suck'	*suw-ase(-ru)*	'make … suck, suckle'
shir(-u)	'come to know'	*shir-ase(-ru)*	'let … know, inform'
kik(-u)	'hear'	*kik-ase(-ru)*	'let … hear, tell'
mots(-u)	'come to have'	*mot-ase(-ru)*	'make … have, put in the hand of'
nigir(u)	'grasp'	*nigir-ase(-ru)*	'make … take, put in the hand of'
o(-u)	'carry … on one's back, bear'	*ow-ase(-ru)*	'make … bear, burden'

(Matsumoto 2000:144)

(25a) and (25b) are the *-(s)ase* causatives with the verbs *taberu* (eat) and *kiku* (hear/listen).

(25) a. Taroo-ga Hanako-ni pan-o tabe-sase-ta.
-Nom -Dat bread-Acc eat-Cause-Past
'Taro made Hanako eat some bread.'

b. Taroo-ga Hanako-ni ongaku-o kik-(s)ase-ta.
-Nom -Dat music-Acc listen-Cause-Past
'Taro made Hanako listen to music.'

The sentences in (25) are ambiguous; *Hanako* is an agent in one reading, and it is a goal in another reading. The two different readings are shown in (26) and (27).

(26) a. Taro gave an order to Hanako and Hanako ate some bread.
b. Taro fed Hanako with some bread.

(27) a. Taro gave an order to Hanako and Hanako listened to music.
b. Taro played music for Hanako.

In (26a) and (27a) *Hanako* is interpreted as an agent, but as a goal in (26b) and (27b).

In addition, Matsumoto (2000) suggests that this ambiguity disappears when the causee is not capable of the caused or permitted actions by himself or herself. Relevant examples are shown in (28).

(28) a. Hahaoya-wa akatyan-ni kutsushita-o hak-ase-ta.
mother-Top baby-Dat socks-Acc put on-Cause-Past
'The mother put the socks on the baby's feet.'

b. Hahaoya-wa akatyan-ni miruku-o nom-ase-ta.
mother-Top baby-Dat milk-Acc drink-Cause-Past
'The mother fed the baby with milk (in a bottle).'

(Matsumoto 2000: 142)

The interpretation 'the mother gave an order to the baby and the baby put on the socks or drank the milk by himself/herself' is pragmatically unnatural for (28). The only possible readings are the ones indicated by the English translations. In these readings, the causee behaves as a goal. Thus, the sentences have a mono-clausal structure.

The monoclausality of (28a) is supported by the sentence in (29).

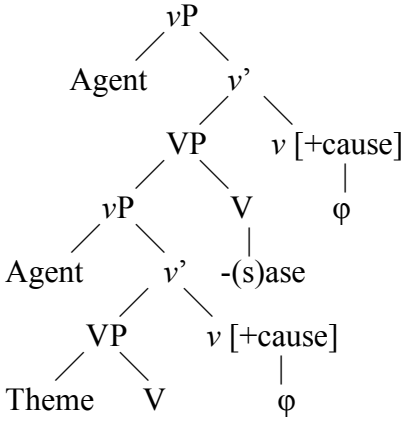
(29) Hanako$_i$-ga umaretabakari-no akatyan$_j$-ni zibun$_{i/*j}$-no kutusita-o
-Nom new born-Gen baby-Dat self-Gen socks-Acc
hak-(s)ase-ta.
put on-Cause-Past
'Hanako put self's (her) socks on a new born baby.'

(Murasugi and Hashimoto 2004:18)

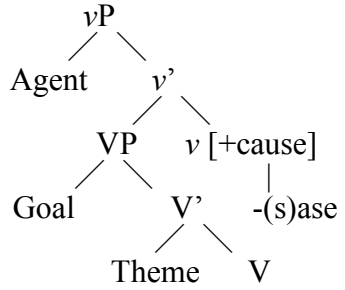
As mentioned before, Japanese reflexive pronoun, *zibun*, is subject-oriented. In (29), it cannot take *akatyan* (the baby) as its antecedent. This indicates that only *Hanako* is an agent and (29) is monoclausal. Matsumoto (2000) named these *-(s)ase* causatives that have a mono-clausal structure "lexical *-(s)ase* causatives."

Based on Matsumoto's (2000) hypothesis, Murasugi and Hashimoto proposed the structures of these two types of *-(s)ase* causatives in *v*-VP frame, as illustrated in (30a) and (30b).

(30) a. syntactic causative



b. lexical *-(s)ase* causative



According to this analysis, *-(s)ase* is ambiguous in the adult grammar of Japanese. When it is an independent large V, it takes a *v*-projection as its complement and yields a complex structure. In this case, the dative argument is interpreted as an agent. In the other case, it combines with a large V and forms a complex verb to yield a simple sentence with no

embedding. The dative argument is then interpreted as a goal. In Murasugi and Hashimoto's terms, this means that *-(s)ase* is a realization of the [+cause] *v*. In the former type of causatives, or the syntactic causatives, as in (30a), since both the causer and the causee function as subjects, an agent role is assigned to the causer by the higher small *v* and to the causee by the lower small *v*. On the other hand, in the latter type of causatives, or the lexical *-(s)ase* causative, as shown in (30b), *-(s)ase* is the realization of [+cause] , and a causee functions as a goal. Here, the causee does not appear in the Spec of *v*P, but it appears in the Spec of VP[3].

2.2. The Analysis of Acquisition Data with *v*-VP Frame

Murasugi and Hashimoto suggest that there are four steps to acquiring verbs and morphological *-(s)ase* causatives in Japanese.

(31) Stage I: the small *v* is *tiyu/tita/tite* (*do/did/doing*)
Stage II: the small *v* is null
Stage III: the acquisition of lexical causatives and transitive verbs;
several erroneous lexical realizations of *v*
Stage IV: the acquisition of syntactic causatives;
several erroneous lexical realizations of V

According to Murasugi and Hashitmoto, before Stage I, Akkun produced sentences without overt verbs at around the age of 2. Some of the examples are shown in (32a) and (32b).

(32) a. Motto koe buubu φ (2;1) φ= *ageru* (give)
more this water
'(I will give) more water to this.'

b. Koe Papa hai doozyo φ (2;0) φ= *suru* (do)
this Daddy yes please
'This one. (I want give it) to Daddy.'

(Murasugi and Hashimoto 2004:3)

In (32a), *ageru* (give) is missing. In (32b), Akkun produced *hai doozyo*. *Hai* means 'yes' and *doozyo* means 'please,' but the phrase *hai doozyo* means 'Here you are.' Murasugi and Hashimoto consider that before Stage I, Akkun initially uses *hai doozyo* to express the meaning of 'give' or possibly transfer of an item from one person to another. He did not use an actual verb in the ditransitive construction.

At around 2;5, which corresponds to the beginning of Stage I (2;5-2;9), Akkun started to place *tiyu/tita/tite*[4] in the sentence-final position quite productively. Some of the relevant examples are cited in (33).

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[3] Matsumoto's (2000) analysis is supported by Murasugi, Hashimoto and Kato (2003, 2005). They report, based on Murasugi and Hashimoto's longitudinal study with Akkun, that lexical *-(s)ase* causatives are acquired earlier than syntactic causatives. The same results are obtained in the experimental study conducted by Fuji (2006). Murasugi, Hashimoto and Kato and Fuji's findings of the two stages in acquiring *-(s)ase* causatives suggest that there are two types of *-(s)ase* causatives in adult Japanese, syntactic and lexical causatives. This is because they are clearly distinguished and there is no reason to suppose that the later acquisition of syntactic causatives results in the loss of lexical causatives.

[4] *Tiyu/tita/tite* are *suru/sita/site* in adult speech, and they correspond in meaning to '*do/did/doing'* in English. (Murasugi and Hashimoto 2004: 4)

(33) a. Mama Akkun hai doozyo *tiyu*. (2;5)
Mommy yes please do
'Akkun (/I) will give it to Mommy.'

b. Mama Akkun paku *tiyu*. (2;7)
Mommy *onomatopoeia* do
'Mommy, please make Akkun(/me) eat this.'

c. Akuun nezi kuyukuyu *tite*, konoko syabeyu. (2;9)
screw turn around doing this one talk
'When Akkun (/I) will wind this one around, it will talk.'
(Murasugi and Hashimoto 2004:5)

Note here that *tiyu/tita/tite* never appeared before Stage I. Murasugi and Hashimoto (2004) observe a number of relevant examples and report that the "predicates" that occur with *tiyu/tita/tite* are typically onomatopoeic or mimetic expressions. For example, *paku* in (33b) is the sound that describes a person putting a food into his/her mouth. The utterance means, 'Please, mother put this in Akkun's mouth' or more literally, 'Mother makes this food go into Akkun's mouth.' *Kuyukuyu* in (33c), which corresponds to *kurukuru* in adult speech, is a mimetic word describing things turning around. The child tried to say that he would wind the screw, or more literally that he would cause the screw to turn around, and as a result the toy would talk.

Based on the close observation of a child's synchronic change of the verbal forms, Murasugi and Hashimoto (2004) propose that the child at this stage uses *tiyu/tita/tite* to describe an activity that causes a certain event or change of state. The adult counterpart of *tiyu/tita/tite*, *suru/sita/site*, can assign the agent role, like the English verb *do/did/doing*. The rest of the utterance describes an event or a change of state. Thus, *tiyu/tita/tite* seems to correspond exactly to the small v[5]. The structure proposed by Murasugi and Hashimoto to the

[5] Note here that the hypothesis that *tiyu/tita/tite* corresponds to the small *v* can be confirmed by the adult grammar of Malayalam. The *-(i)kk* suffixation introduces a new argument into the syntactic frame of the verb to which it attaches. (Madhaavan, 2006) According to Madhavan (2006), Malayalam has regular intransitive-transitive pair, and the suffix *-(i)kk* functions as a transitivizer as in (i).

(i) a. muŋŋ-uka / mukk-uka b. poTT-uka / poTT-ikk-uka
$\text{sink}_{\text{intr}}$ inf sink_{tr} inf $\text{break}_{\text{intr}}$ break_{tr} (Madhavan 2006:1)

This *-(i)kk* suffixation also functions as a causativiser.

(ii) kara-y-uka / kara-y-ikk-uka
cry make cry (Madhavan, 2006:1)

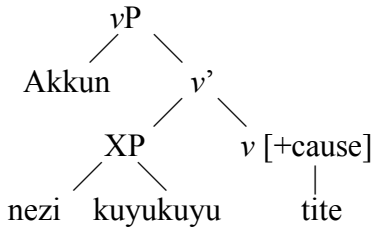
However, *-(i)kk* suffixation is not allowed for loan (foreign) words in Malayalam: *cey* (do) is used instead of the causative suffix *-(i)kk*. The relevant examples are shown in (iii).

(iii) a. John Mary-e kkonta ezut-ipp-ikk-iccu (*-ikk* + *-ikk* → *-ipp* + *-ikk*)
-Acc Postposition write-Cause-Cause-Past 'John made Mary write .'
b. John Mary-e kkonta type ceyy-ikk-iccu
-Acc Postposition do-Cause-Past 'John made Mary type.'
c. * John Mary-e kkonta type-ipp-ikk-iccu
-Acc Postposition -Cause-Cause-Past (Hani Babu, M.T. p.c.)

(iiic) is ill-formed since the causative *-ikk* is attached to the loan word *type*. Under Murasugi and Hashimoto's *v*-VP Frame analysis, in the adult Malayalam, the small *v* is realized as *do* in forming the causatives of the loan (foreign) words; in Japanese child grammar, at Stage I, the small *v* is realized as *do* as well. Thus, the Stage I, where Japanese-speaking children use *suru* (do) to describe the activity, corresponds to one type of the causative formation of adult Malayalam. Intermediate stages in grammar acquisition is restricted in the possible human grammar.

sentence (33c) is shown in (34).

(34)



(Murasugi and Hashimoto 2004:5)

In (34), *tite* describes an activity that causes a screw to turn around, and *Akkun* is the agent. The complement of the small *v* is indicated not as VP but as XP because it lacks a verb. Again, *kuyukuyu* (*kurukuru*) is a mimetic word describing things turning (around), and the XP expresses the meaning of 'the screw turns.' In this stage, the child utilizes the *v*-VP frame, and the small *v* is phonetically realized as *tiyu/tita/tite*.

However, the child, in Stage I is still step away from the adult grammar: the actual lexical items for the *v*-V combination are not acquired.[6] As for Akkun, the unaccusative verbs and ditransitive verbs have been acquired at around 2;9, which we call Stage II (2;9-4;8). The sentences in (35) are examples of correct usage of these verbs.

(35) a. dango-ga uta pakan tite, dango-ga atta. (2;9)
dumpling-Nom lid *onomatopoeia* doing dumpling-Nom there-be
'There was a dumpling (when I) opened the lid of the dumpling (box).'

b. Mama tyotto ageyu. (2;7)
Mommy a little give
'Mommy, (I will) give you a little bit.'

(Murasugi and Hashimoto 2004:6)

In (35a), an unaccusative verb *atta* appears, and in (35b), a ditransitive verb is used correctly.

In Stage II, however, the child also makes some interesting errors. Akkun, for example, often uses unaccusative verbs for transitive or ditransitive verbs. Some of the relevant examples are cited in (36).

(36) a. Koe ziityan ni *miyu*. (2;9)
this Grandfather to see
'I show this to Grandfather.'

b. Kore, *ai*-toku kara saa. (4;5)
this open(unaccusative)-keep as Int.
'(I will) open this and keep it open.'

c. *Todok*-ok-ka, ano hito ni *todok*-(y)oo *todok*-(y)oo. (4;8)
arrive-let's that person to arrive-let's arrive-let's
'Let's send (it). Let's send (it) to that person.'

(Murasugi and Hashimoto 2004:10)

In (36a), although a ditransitive verb, *miseru* (show) must be used in this context, Akkun produces an unaccusative verb, *miyu*[7] (see), "by mistake." The same error can be found in (36b). Akkun uses the unaccusative verb *aku* (be open), instead of the transitive verb *akeru* (open). In (36c), the transitive form *todokeru* (deliver something) would be used by adults,

[6] In English, for example, as was illustrated in (13) and (14), the [+cause] small *v* plus capital PASS is realized as *pass*, and so is the [-cause] small *v* plus capital PASS.

[7] *Miyu* is *miru* in adult usage.

but Akkun uses an unaccusative form *todoku* (be delivered) instead. This kind of error has been observed in the previous literature we surveyed in the first section of this article.

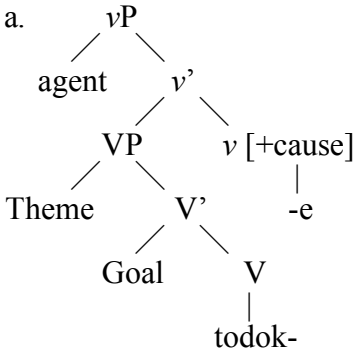
Murasugi and Hashimoto propose that children produce these errors because they assume [±cause] *v* to be zero. The sentences in (37) show verb pairs of transitive and unaccusative in adult grammar. (37a) and (37b) have the representations in (38a) and (38b) respectively.

(37) a. Hanako-ga hon-o Taroo-ni todok-e-ru. (ditransitive)
-Nom book-Acc -Dat deliver -Pres
'Hanako delivers a book to Taroo.'

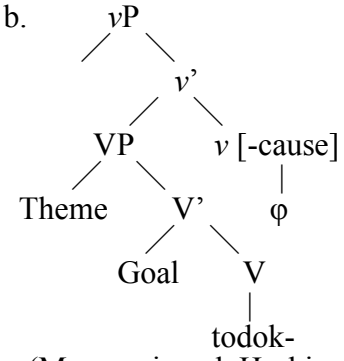
b. Hon-ga Taroo-ni todok-φ-(r)u. (unaccusative)
book-Nom -Dat be delivered-Pres
'A book is delivered to Taroo.'

(Murasugi and Hashimoto 2004:8)

(38) a.



b.



(Murasugi and Hashimoto 2004:8-9)

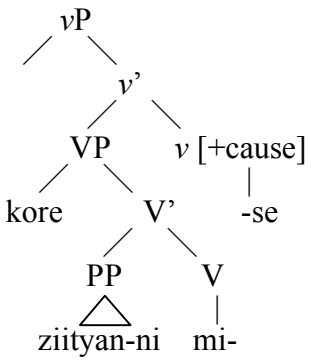
In (38a), *v* is realized as *-e,* but in (38b), [-cause] *v* is not realized phonetically.

Now, let us consider the sentence in (36a). (39) is the adult counterpart of (36a).

(39) Kore ziityan ni miseru.
this Grandfather to show
'I show this to Grandfather.'

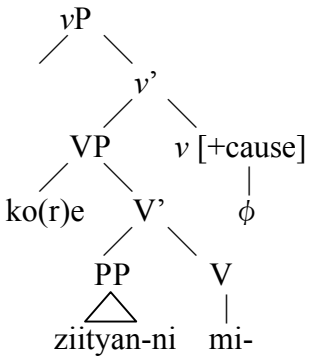
In (39), the ditransitive verb, *miseru* (show) is used. The structure of the adult-grammar form in (39) is illustrated in (40).

(40)



However, if Akkun hypothesized that [±cause] *v* was zero, the structure which Akkun had in his mind would have been as in (41) instead.

(41)



In (41), the small *v* is not realized phonetically. Thus, Akkun produces the unaccusative verb *miyu* instead of the ditransitive verb *miseru*. Akkun optionally used unaccusatives for (di)transitives, but never vice versa,
and Murasugi and Hashimoto observed this type of errors for two years, up to 4;8.[8]

More generally, the Japanese-speaking children start out with the VP, representing STATE or CHANGE OF STATE. Then, they embed this under [±cause] small *v*'s, but initially assume that [±cause] small *v*'s are always a zero morpheme, as in English.

During Stage II, Akkun produced lexical causative sentences without the causative suffix *-(s)ase* as in (42).

(42) a. Mama Akkun *non-de*. (2;8)
Mommy drink-Request
'Mommy, please feed me (with milk).'

b. Mama-ga pantyu *nui-da* toki. (3;2)
Mommy-Nom underpants undress-Past when
Literal meaning: …when Mommy took her underpants off.
Intended meaning: ...when Mommy took my underpants off me.
(Murasugi and Hashimoto 2004:14)

He consistently omitted the causative morpheme *-(s)ase* and only used the regular verbs. For example, in (42a), the causative form *nom-ase-te* should be used in this context, but Akkun omits *-(s)ase* and produces *non-de* instead. He intends to say 'Mommy, please feed me,' but the meaning of what he actually says is 'Mommy, drink Akkun.' Similarly, in (42b), the causative form *nug-ase-ta* should be used in this context, but Akkun omits *-(s)ase* and produces *nui-da* instead. He intends to say '(I hurt) when Mommy undressed my underwear,' but what he actually says was '(I hurt) when Mommy took off her underwear.'

Sentences with the causative suffix, *-(s)ase*, are observed at around the age of late 3;5 or 3;6. We term this stage as Stage III. A couple of relevant examples are shown in (43).

(43) a. Akkun-ni tabe-sase-tee. (3;6)
-Dat eat-Cause-Request
'Please feed Akkun (/me) (with food).'

[8] The "mistake" is related to the alternation in (15), which is widely attested. There are (di)transitive-unaccusative pairs in English, e.g., 'John sank the boat/the boat sank' with the verb *sink*. Both lexical items in the alternation have the same surface forms. In Murasugi and Hashimoto' (2004) analysis, both the [+cause] and the [-cause] small *v*'s are realized as zero-morphemes (i.e., without the phonological content). Hence, we can say that Japanese-sepaking children at Stage II assume that Japanese verbs are composed just like their English counterparts.

b. Nomi-tyatye-te. (*-tyatye* seems to correspond to the adult *-sase*) (3;7)
drink-Cause-Request.
'Please feed me (with miso soup.)'

(Murasugi and Hashimoto 2004:15-16)

(43) can be considered a lexical *-(s)ase* causative. If (43a), for example, is the syntactic causative, the meaning of the sentence should be something like 'You will permit me to eat some food, please,' but (43a) does not have such a meaning. Instead, the meaning of (43a) is 'You feed some food to me,' and with this interpretation, *Akkun* is a goal. Therefore, (43a) is the lexical *-(s)ase* causative, where *-(s)ase* is a realization of [+cause] *v*. The same argument applies for (43b).

The syntactic causatives were observed at around the age of 5. An example is shown in (44).

(44) Obaatyan-no toko de tabe-masu Att, biiru dake **nom-(s)ase**-te
Grandma-Gen place at eat-Pres (formal) Int beer only drink-let-Request
kudasai. (5;3)
please
'(I will) eat (dinner) at Grandma's place. Eh, allow me to drink beer (here), please.' (Murasugi and Hashimoto 2004:15)

In (44), Akkun does not ask his mother to feed him, but asks her to let him drink beer. Thus, although the causee *Akkun* is not overtly produced, it is agentive. Hence, the causative in (44) is considered to be a syntactic causative.

Recall here the errors of unaccusative and transitive pairs in (36). These errors and the causative sentences without *-(s)ase* were observed during the same period. Therefore, Murasugi and Hashimoto propose that Akkun produces sentences like (42) because [+cause] *v* was not phonetically realized. In lexical *-(s)ase* causatives, *-(s)ase* appears in the head of *v*P, but the small *v* is assumed to be zero. Hence, Akkun omitted *-(s)ase* and produced (42). When he starts to produce transitive and ditransitive verbs and lexical *-(s)ase* causatives correctly, he starts to realize the small *v* with an overt morpheme. However, syntactic causatives are acquired later because *-(s)ase* appears in the head of VP in this construction. The late acquisition of Japanese syntactic causatives could be due to by the complex (or "embedded") structure and the variety of the lexical realization of the small *v* in the language.

3. Further Support for *v*-VP Hypothesis from Sumihare's Data

In the previous section, we discussed Murasugi and Hashimoto's *v*-VP frame analyses for the erroneous verb forms observed in Japanese first-language acquisition. In this section, we will provide additional evidence for this analysis. We will show that exactly the same acquisition process can be found with another Japanese-speaking child, Sumihare (Noji, 1974-1977).

The overextensions of transitive/intransitive verb pairs in Japanese child language are also reported by Morikawa (1997). She analyzes the data of Sumihare in the CHILDES, and reports that he erroneously used the intransitive form instead of the transitive form as in (45a).

(45) a. To-o **ai-te*.
door-Acc open(intransitive)-Request

b. To-o ake-te.
door-Acc open(transitive)-Request (Morikawa 1997:82)

Sumihare asked his parents to open the door. While he should have employed the transitive verb *akeru* (open) as in (45b), the intransitive verb *aku* (be open) was used instead as in (45a). This type of error can be categorized as the same type of error as those.

Unlike Murasugi and Hashimoto, however, Morikawa (1997) reports that Sumihare overextended transitive verbs as well. Table 1 shows the frequencies of the overextensions of transitive/intransitive verbs. ('Vi' = intransitive verbs and 'Vt' = transitive verbs.) From 1;11 through 2;1, Sumihare used many verbs correctly. He, however, overextended intransitive verbs for transitive verbs for thirteen times and he overextended transitive verbs for intransitive verbs for 8 times. The number of total overextensions is given in the section of Subtotal.

Morikawa (1997) analyzes 41 overextensions of intransitive and transitive verbs, focusing on the productivity of target verbs. The results are summarized in Table 2.

"Productive target" refers to the verbs for which Sumihare had already acquired the correct form. For example, as for *ageru*, he incorrectly produces the unaccusative verb *agaru* (ascend) instead of the transitive verb *ageru* (raise) at 3;1. At that time, however, Sumihare produces the verb *ageru* correctly in different situations. In contrast, 'unproductive target' refers to the verbs for which Sumihare had not acquired the correct form. Thus, when he incorrectly uses the unaccusative verbs with the transitive meaning at 2;2, the correct form of the transitive verb *ageru* was never found in his production.

Table 1. *Frequencies of overgeneralizations and correct uses of verbs form transitive/intransitive verb pairs*

	Overextensions			Correct	Total
Age level	Vi	Vt	Subtotal	uses	uses
1;11-2;1	13	8	21 (6.3%)	313	334
2;2-2;4	10	0	10 (1.1%)	883	893
2;5-2;7	2	1	3 (0.4%)	681	684
2;8-2;10	1	0	1 (0.1%)	544	545
2;11-3;1	4	1	5 (1.1%)	455	460
3;2-3;3	0	1	1 (0.2%)	406	407
Total:	30	11	41 (1.2%)	3,282	3,323

(Morikawa 1997:83)

Table 2. *Productivity of target verbs in extension errors within transitive/intransitive verb pairs*

Productive target		Unproductive target	
ageru 'raise'	3;1	agaru 'ascend'	1;11
aku 'open'	2;1	ageru 'raise'	2;2
deru 'go out'	2;6	akeru 'open'	2;0
	3;2		2;1
okosu 'wake X up'	3;1	dasu 'take out'	2;0
simeru 'close'	2;10	hazimaru 'begin'	3;0
toru 'take, get'	2;3	hikkomeru 'take X in'	2;11
		katamaru 'coagulate'	2;1
		kuttuku 'adhere'	2;5
		naosu 'fix'	2;5
		naraberu 'arrange in a row'	2;11
		nigasu 'release'	2;4
		nokeru 'remove'	2;2
		noseru 'mount'	2;2
		nukeru 'come off''	2;1
		nurasu 'wet'	2;2
		okosu 'wake X up'	1;11
			2;0
		samasu 'cool'	2;1
		;y	2;3
Total: 6 types / 11tokens		Total: 18 types / 30 tokens	

(Morikawa 1997:85)

The present study analyzes Sumihare's production data[9] in light of Murasugi and Hashimoto's (2004) *v*-VP hypothesis, and reports that the erroneous causative forms without the causative suffix *-(s)ase* were also produced by Sumihare just at the time when he made the overextensions of transitive/intransitive verb pairs. That is, Sumihare went through exactly the same acquisition stages as Akkun[10].

At one year of age, as in (46), Sumihare produces sentences without overt verbs.

(46) a. Ta-ta φ (1;7) φ= hak-ase-te (put on me)
socks
'Please put my socks on me.'

b. Kaatyan hai φ (1;9) φ= age-ru (give)
Mommy yes
'Mommy (I) will give you.'

[9] We found some errors in CHILDES database of Sumihare, e.g., some data are duplicated, some parts in Noji (1974-1977) are not typed in the database, and there are some typological errors. Hence, the present paper makes the analysis based on the original data published by Noji (1974-1977).

[10] There are some individual differences between Akkun and Sumihare, but acquisition order is the same. The age of each stage can be summarized as in (i) and (ii).

(i) Akkun
Stage I: (2;5)-(2;9)
Stage II: (2;9)-(4;8)
Stage III: (3;6-)
Stage IV: (5;3-)

(ii) Sumihare
Stage I: (1;11)-(2;1)
Stage II: (2;1)-(2;5)
Stage III: (2;5-)
Stage IV: (3;4-)

In (46a), the causative form of *hak-(r)u* (put on), that is, *hak-(s)ase-te* is missing. In (46b), though the subject is dropped, the indirect object *Kaatyan* (Mommy) is uttered. Thus, it can be conjectured that a ditransitive verb, *age-ru* (give), is missing here.

Sumihare's Stage I starts at around 1;11, 6 months earlier than Akkun's. Sumihare starts to put *tiyu/tita/tite* (*suru/sita/site*) in the sentence-final position just as Akkun does. In Sumihare's utterances, *tiyu/tita/tite* is *tyuru/sita/site*. Relevant examples are shown in (47).

(47) a. Taabi pai **si-ta**. (1;11)
tabi throw (*onomatopoeia*) do-Past
'I took off (a pair of) *tabi*.'

b. Tootyan, zityan-ga dondon si-ta yo. (1;11)
Daddy a man-Nom beat (*onomatopoeia*) do-Past Int
'Daddy, a man beat (a wall).'

c. Kaatyan ombu tyur-u yo. (2;0)
Mommy piggyback do Int
'Mommy, (I will) give you a piggyback.'

In (47a) and (47b), *sita* (did) is attached to the end of the sentences, and in (47c), *tyuru* (do) is attached to the end of the sentence. As can be seen from the data, two children showed exactly the same process. The frequencies of *suru*-forms are illustrated in Table 3.

It is at 1;11 when *suru (tyuru, or 'do')* appears in Sumihare's production; at this point, for almost all the cases, *sita* form is used. At 2;0, however, the conjugation of *suru (tyuru)* appears. S*uru (tyuru)*-forms can be considered to be one of the main "verbal" forms a child uses at this stage. The frequent use of *suru*-forms at around the age of two, given the *v*-VP frame, indicates that the children at this stage acquire the *v*-VP frame, and they realize the small *v* as *suru/sita/site*.

In Stage II, from around 2;1 through 2;5, while Sumihare uses verbs correctly, he overextends unaccusative verbs as Morikawa (1997:83) reports. Some examples of his correct use of verbs are given in (48).

(48) a. Buu toot-ta ne. (2;1)
car pass-Past Int.
'A car passed.'

b. Boku tete ara-u. (2;2)
I hands wash
'I wash my hands'

c. Teruki-tyan, wa-ga deki-tara age-ru ne. (2;4)
ring-Nom finish-after give Int.
'Teruki, (I will) give (it) to you, after I finish making a ring.'

In (48a) and (48b), unaccusative and transitive verbs are used correctly. A ditransitive verb is also used correctly employed in (48c).

Table 3. *Frequencies of suru(tyuru)/sita(tita) /site(tite)/ siyoo(tyo)/ see(tye) (do, did, doing, let's do, do(imperative) respectively) in the sentence final position at Stage I*

Age	Total Use of *suuru/sita/site/siyoo/see (tyuru/tita/tite/tyo/tye)*										Total Use of Verbs
	Transitives					unaccusatives					
	suru	sita	site	siyoo	see	suru	sita	site	siyoo	see	
1;11	38 (27.3%)										139
	16					22					
	1	14	0	0	1	1	19	0	2	0	
2;00	70 (34.7%)										202
	40					30					
	22	8	7	2	1	12	16	1	0	1	
2;01	144 (16.3%)										880
	99					45					
	52	19	15	8	5	14	17	4	5	5	
Total	252 (20.6%)										1,221
	155					97					
	75	41	22	10	7	27	52	5	7	6	

However, at the same time, he erroneously uses unaccusatives for transitives as shown in (49).

(49) a. Kaatyan *a-ite*. (2;1)
mother be open-Request
Literal meaning: '(Please) be open, mother.'
Intended meaning: '(Please) open (the door), mother.'

b. Koko oite *tyame-ru*. (2;1)
here put get cold
Literal meaning: 'I put (a cup of tea) here and it gets cold.'
Intended meaning: 'I put (a cup of tea) here and make it cold.'

c. Kaatyan taitai *aga*-tte. Boku-no *aga*-tte.
Mommy a carp streamer go up-Request I-Gen go up-Request
aga-tte ya. (2;2)
go up-Request Int
Literal meaning: 'Mommy, please go up my carp streamer. Go up mine. Go up.'
Intended meaning: 'Mommy, please make my carp streamer go up higher. Make it higher. Higher.'

In (49a), the adult would use the transitive verb *ake-ru*, but Sumihare uses an unaccusative verb *ak-(r)u*. In (49b), although a transitive verb *samas-(r)u* must be used in this context, he uses the unaccusative verb *tyame-ru*[11]. The same type of error can be observed in (49c) as well: he uses the unaccusative verb *agar-u* in the context where a transitive verb *age-ru* should be used. Thus, not only Akkun but also Sumihare uses unaccusatives for transitives.

Moreover, as mentioned above, Sumihare also uses transitives for unaccusatives. Examples are shown in (50).

[11] In Japanese, a number of syntactic phenomena, e.g., passives, causatives, honorific sentences, and so on, involve the lexical small *v*, and children have to "learn" the exact lexical realization for each small *v*. *Tyameru* is the child speech of *sameru* (things become cold).

(50) a. *Nu- i-*ta koko. (2;1)
pull-PAST here
Literal meaning: 'I pulled (this) here.'
Intended meaning: '(This) is out from here.'

b. SUM: *Ak-en* *ak-en*. (2;1) (transitive)
open-not open-not
Literal meaning: '(I) don't open it. (I) don't open it.'
Intended meaning: '(It) doesn't open. (It) doesn't open.'

FAT (to MOT): Ak-an tte osiete yari nasai. (unaccusative)
opened-not Comp tell give Imperative
'Tell him that it should be "akan".'
SUM: Ak-an. (unaccusative)
open-not '(It) doesn't open.'
SUM: *Ak-en* *ak-en* *ak-en* wa *ak-en* ga. (transitive)
open-not open-not open-not Int. open-not Int
Literal meaning: '(I)don't open it. (I) don't open. (I) don't open it.'
Intended meaning: '(It) doesn't open. (It) doesn't open. (It) doesn't open.'

FAT: Ak-anai yo. (unaccusative)
open-not Int. 'It doesn't open.'
SUM: *Ak-en* yo. (transitive)
Literal meaning: '(I) don't open it.'
Intended meaning: '(It) doesn't open.'

In (50a), the past form of the unaccusative verb *nuke-ru, nuke-ta,* must be used in the adult grammar, but Sumihare used the transitive verb *nuk-(r)u*. (50b) is an example where the direct evidence does not work in the course of language acquisition. In this particular case, Sumihare couldn't open the door. Hence, the intended meaning is "The door does not open," and the unaccusative verb *ak-an* ((It) does not open) should be employed. Although he was able to parrot his father's direct correction once, he kept producing the transitive form *ak-en* ((I) don't open it) for the unaccusative form *ak-an*. Compare this example with (49a). In (49a), the unaccusative verb *ak-u* is used erroneously for the transitive form *ake-ru*. In (50c), on the other hand, the transitive form is overextended. These examples indicate that overextension of unaccusatives and transitives cannot always be one way: Children use the transitive forms for the unaccusative forms as well.

Note here that this type of error was not observed in Murasugi and Hashimoto's (2004) study. The errors that Akkun produced were always in one direction, unaccusatives for (di)transitives. Then, it could then appear that evidence from utterances as in (50a) and (50b) contradict their analysis. However, these errors are in fact compatible with it.

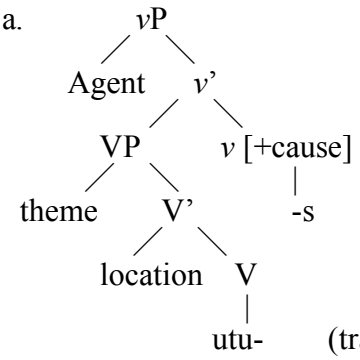
Examples (51a) and (51b) are verb pairs of transitive and unaccusative in adult grammar, and their structures are illustrated in (52a) and (52b) respectively.

(51) a. Taroo-ga Hanako-o syasin ni utu-s-(r)u. (transitive)
-Nom -Acc picture in photograph-Pres.
'Taro takes a picture of Hanako.'

b. Hanako-ga syasin ni utu-r-(r)u. (unaccusative)
-Nom picture in photograph-Pres.
'Hanako appears in a picture.'

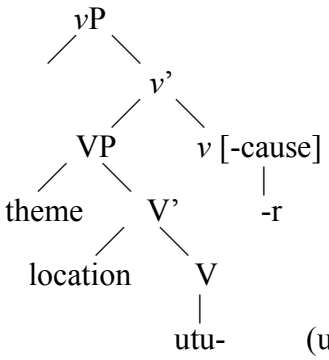
(Murasugi and Hashimoto 2004:7)

(52) a.



(transitive)

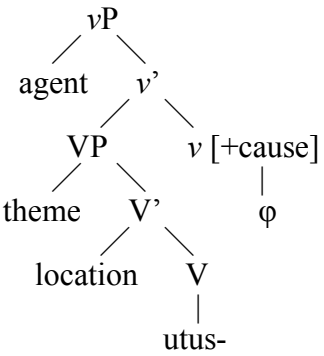
b.



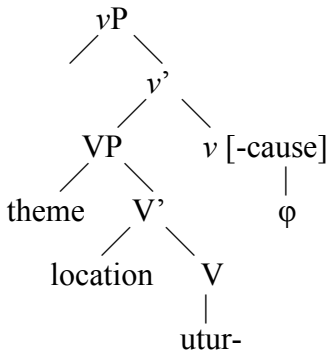
(unaccusative)

Provided that a child assumes [± cause] *v* to be zero, the structures that s/he has in mind to represent the sentences in (51a) and (51b) would be those shown in (53a) and (53b).

(53) a.



b.



(Murasugi and Hashimoto 2004:8)

Since both [+cause] *v* and [-cause] *v* are not phonetically realized, a child does not distinguish (53a) from (53b). However, s/he probably notices that either *-s* or *-r* should be attached to the verb, because a verb without these morphemes is never heard. Thus, the child regards *utus* or *utur* as V. Then, two logical possibilities are attested by Sumihare's "mistakes."[12] Therefore, errors of unaccusatives and transitives should not always be in one direction. The fact that errors occur in both directions actually supports the hypothesis that [-cause] *v* is zero.

Hence, not only the errors in (49), but also those in (50) indicate that Sumihare went through Stage II at around 2;0, where he also assumed [±cause] *v* to be zero. Although Murasugi and Hashimoto's analysis was based on Akkun's errors of using unaccusatives for transitives, the fact that Sumihare overextended transitives as well as unaccusatives gives another piece of strong evidence for their *v*-VP frame analysis.[13]

In this stage, or at Stage II, as in the case of Akkun, causatives without the suffix *-(s)ase* were also found in Sumihare's production. An example is shown in (54).

(54) Kutyu *ha-i*te. (2;1)
a pair of shoes put on-Request
Literal meaning: '(Please) put on (your) pair of shoes.'
Intended meaning: '(Please) put a pair of shoes on me.'

[12] Table 1 shows that unaccusative forms tend to be overextended more than transitive forms are. This is also confirmed by Fuji (2006).

[13] Morikawa (1997) provides different explanation for these data. She points out that Sumihare's overextension is not frequent (41 out of 3,323 cases involve overextension). She argues that the overextension reflects the stages when the child has not acquired the correct form. This conclusion is based in part on the fact that 2/3 of overextension produced by Sumihare occurred with unproductive target as shown in Table 2.

In the context of (54), the causative form *hak-(s)ase-te* should be used. However, Sumihare omits the causative suffix *-(s)ase*, and produces *ha-ite*. Thus, we believe that (54) presents additional evidence for *v*-VP hypothesis: a child hypothesizes that the suffix *-(s)ase* appears in the head of *v*P, but the child omits it since [±cause] *v* is assumed to be zero at Stage II. This stage starts at 2;1 and the productive "overextension" lasts until around 2;3.

Table 4 shows the frequencies of Sumihare's overextended verbs, correct verbs (transitive verbs (Vt) and intransitive verbs (Vi)), the use of *suru/sita/site*, causatives without the suffix *-(s)ase*, and the correct use of lexical and syntactic causatives at Stage I (1;11-2;1) and Stage II (2;1-2;5). At 2;0, almost all the verbs have unaccusative forms; *mi-te* ('see') for *mi-sete* ('show'), and *a-ite* ('is open') for *ak-ete* ('open'), for example, are used. At 2;1 and 2;2, Sumihare overextended quite a few transitives as well as unaccusatives as in (49) and (50), but the overextension decreased after 2;3.The causatives without *-(s)ase* is also observed in Stage II as in the case of Akkun.

As for Sumihare, 2;5 is a turning point. The verbal errors and the causatives without suffix disappear then; while the correct forms of lexical causatives appear. It is around this time when children start lexically realizing *-(s)ase* as the small *v* in the *v*-VP structure.

Sumihare produced the correct forms of lexical causatives productively after around 2;5. Some examples of his Stage III are shown in (55) (see also Table 5).

(55) a. Seizi-kun boku-ga ne nak-asi-tan janaino yo. (2;7)
Seiji I -Nom Int cry-Cause-Past not Int
'It is not me who made Seiji cry.'

b. Okaatyan hak-asi-te. (3;0)
Mommy put on-Cause-Request
'Mommy (please) put (a pair of shoes) on me.'

c. Okaatyan kore Terukityan-ga sin-asi-tan yo. (3;4)
Mommy this -Nom die-Cause-Past Int
'Mommy, Terukityan made this die.'

Table 4. *Frequencies of the erroneous and correct verbal forms at Stage I and Stage II*

Age	Overextension (Errors)		Correct Use of Vt and Vi	*v*=suru/sita/ site	Causatives without suffix-*(s)ase* *v*=φ	Lexical Causatives	Syntactic Causatives	Total Use of Verbs
	Vi	Vt						
1;11	2 (1.5%)	0	99 (71.2%)	38 (27.3%)	0	0	0	139
2;00	6 (2.9%)	0	126 (62.4%)	70 (34.7%)	0	0	0	202
2;1	11 (1.3%)	11 (1.3%)	713 (81.0%)	144 (16.3%)	1 (0.1%)	0	0	880
2;2	10 (0.47%)	1 (0.045%)	1,832 (86.54%)	269 (12.71%)	3 (0.14%)	2 (0.09%)	0	2,117
2;3	3 (0.3%)	0	988 (91.9%)	82 (7.6%)	1 (0.1%)	1 (0.1%)	0	1075
2;4	0	0	805 (94.0%)	51 (6.0%)	3 (0.4%)	0	0	856
2;5	1 (0.1)	0	965 (91.8%)	76 (7.2%)	0	9 (0.9)	0	1,051
Total	33 (0.5%)	12 (0.1%)	5,528 (87.5%)	730 (11.6%)	8 (0.1%)	13 (0.2%)	0	6,320

Table 5. *Frequencies of the lexical and syntactic causatives*

Age	Lexical Causatives	Syntactic Causatives	Total Utterances
1;11-2;1	0	0	8,797
2;2-2;4	3 (0.02%)	0	16,661
2;5-2;7	30 (0.23%)	0	13,324
2;8-2;10	12 (0.08%)	0	13,833
2;11-3;1	7 (0.07%)	0	10,086
3;2-3;4	16 (0.12%)	2 (0.01%)	13,564
3;5-3;7	15 (0.13%)	1 (0.009%)	11,427
3;8-310	9 (0.09%)	1 (0.03%)	9,815
3;11-4;1	12 (0.16%)	1 (0.01%)	7,654
4;2-4;4	3 (0.07%)	0	4,525
4;5-4;7	3 (0.09%)	1 (0.03%)	3,478
4;8-4;10	8 (0.13%)	1 (0.02%)	6,190
4;11-5;1	6 (0.11%)	2 (0.04%)	5,315
5;2-5;4	10 (0.21%)	6 (0.13%)	4,643
5;5-5;7	3 (0.09%)	1 (0.02%)	4,717
5;8-5;10	7 (0.20%)	0	3,645
5;11-6;0	3 (0.23%)	0	1,330
Total	142 (0.10%)	16 (0.01%)	139,004

In (55), causatives are all correctly produced. The context of (55a) is that Seizi was crying and Sumihare wanted to explain that it was not Sumihare who made Seizi cry. Here, *Seizi* is not an agent, as his action, crying, was caused by someone else. The agent is *boku* (I, or Sumihare), and the object *Seizi-kun* is scrambled to (or topicalized in) the sentence initial position. Hence, (55a) can be considered to have a monoclausal structure. In (55b), though an indirect object is not present, Sumihare asked his mother to put a pair of shoes directly on him. Thus, in this case, the indirect object *Sumihare* is a goal, but not as an agent. Then, (55b) is monoclausal. In (55c), *kore* (this) refers to a fly. In this context, it is not the case that the causee, a fly, died because it intended to. Thus, it is not an agent, and (55c) also has a monoclausal structure.[14]

As in the case of Akkun, Stage IV comes late. Sumihare's syntactic causatives appear after around 3;4, and become productive after around 4;7.[15]

(56) a. Mou gohan tabe-sase-n yo. (4;9)
more dish eat-Cause-not Int
'(I) won't let you eat dinner any more.'

b. Tuke-sase-te age-tara funa-o kure-tan yo. (5;3)
put-Cause let-do as fish-Acc give-Past Int
'As (I, or Sumihare) let (the people fishing) put a net trap (in the water), (they) gave me the fish.'

[14] Since Sumihare is a Kansai dialect speaker, he uttered *nakasita*, *hakasite* and *sinasita* instead of *nakaseta*, *hakasete* and *sinaseta,* respectively.

[15] From 3;3 through 4;1 we find a few "syntactic causatives" with "wrong" lexical realization (e.g., *-se* for *-sase*). Sumihare's syntactic causatives can be considered to be fully acquired after around 4;7.

(56a) and (56b) each have two agents in each structure. In (56a), for example, since Sumihare's utterance is directed to his father, the agent of the action *taberu* (eat) would be his father. Thus, (56a) can be considered an example of syntactic causatives. In (56b), the agent of the action *tuke-ru* (put) should be the fishing people (who borrowed Sumihare's net and put it in the water, and gave Sumihare a fish they caught with it later), but not *me*, or Sumihare. On the other hand, the agent of the action *–sase-te age-ta* ('letting the fishing people put the net trap') is *I*, or Sumihare. Hence, (56b) also has two agents in the sentence and can therefore be considered a syntactic causative as well.

The number of lexical and syntactic causatives produced by Sumihare and the ratio of the correct causatives to his total utterances at the stages III and IV are given in Table 5.

Table 5 indicates that while, in general, causatives are quite infrequent in natural discourse, lexical causatives are produced much earlier than syntactic causatives.

To sum up, the observational studies reported in previous Japanese acquisition research, Akkun, and Sumihare show the same acquisition process of intransitive verb, (di)transitive verbs, and causatives. Since the children brought up in different periods and in different places show the same acquisition process, it is quite plausible to conjecture that the data described here meets the descriptive adequacy.

The VP-shell analysis can account for the widely observed in the acquisition studies. Children acquire *v*-VP frame structures relatively early, for example, at around 2;6 for Akkun, and at around 1;11 for Sumihare. In Stage I, children lexically realize *suru/sita/site* (do/did/doing) as the [+cause] *v*. Then, Japanese-speaking children erroneously hypothesize that [± cause] *v* is phonetically null at one stage in the course of verb acquisition, and make the well-known "mistakes" such as intransitive vs. (di)transitive-alternation and causative-suffix-omission errors. This stage shows the pattern of alternation in English (di)transitive- unaccusative pairs, for example, 'John sank the boat/the boat sank' with the verb *sink*. Both lexical items in the alternation have the same surface forms. In Murasugi and Hashimoto's hypothesis that both the [+cause] and the [-cause] small *v*'s are realized as zero-morphemes (i.e., without the phonological content) at Stage II, the children's overextension of the verbs cannot be merely morphological and accidental. It is rather the case that the Japanese-speaking children at this stage consider Japanese verbs to be of English *sink*-type verbs.

We also observed that although children seem to acquire syntactic causatives at around four, they produce isolated examples with *-(s)ase* much earlier. We argued that they employ *-(s)ase* as a realization of [+cause] *v* in those examples. This implies that children assume at one point that the [+cause] *v* can be realized as *-(s)ase* along with the other morphemes (such as *–e*). It then predicts that the children maintain this assumption even after they acquire *-(s)ase* as an independent V taking a sentential complement. This is so because it would require some negative evidence to reject their first assumption. Hence, our analysis suggests that *-(s)ase* can form lexical causatives in addition to syntactic causatives in the adult Japanese. This provides a piece of supportive evidence for Matsumoto (2000), which proposes that there are two *-(s)ase* causatives in Japanese, namely, lexical and syntactic *-(s)ase* causatives.

4. Conclusion

In this article, we presented acquisition data obtained from our longitudinal studies and Sumihare's database and examined their implications for the analysis of agentive (di)transitive verbs. It was shown that the use of *tiyu/tita/tite* (do/did/doing) at the early stage provides direct evidence for the analysis based on small *v* and large V. The elements seem to

be realizations of the [+cause] *v*. Then we examined the process of the acquisition of actual lexical items. We suggested that the "mistakes" made at this stage were due to children's assumption that Japanese is exactly like English, that is, that [±cause] *v*'s are zero morphemes. If the [±cause] *v* are zero morphemes, then the errors receive a straightforward explanation based on the *v*-VP frame. Finally we discussed the acquisition of syntactic causatives. We proposed that the causative morpheme *-(s)ase* is used initially as a realization of the [+cause] *v*. This initial use of *-(s)ase* predicts that it is ambiguous between V and *v* in adult Japanese, and we argued that the prediction is indeed borne out.

The discussion in this article, we believe, provided strong support for the *v*-VP frame. According to our analysis, the process of the acquisition of (di)transitive verbs illustrated in this article does not necessarily reflect the acquisition of the predicate-argument structures associated with verbs. The predicate-argument structures of large V's and *v*'s are acquired quite early. What requires time is the acquisition of the lexical form of each V and more importantly, the forms in which the [±cause] *v*'s are realized — the forms develops on the associated large V in Japanese. This is part of the reason that Japanese-speaking children make the "mistakes" illustrated in sections 2 and 3. As this acquisition process proceeds successfully, they start producing lexical causatives with *-(s)ase* much before they acquire syntactic causatives.

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