Acquisition of V-V and N-N Compounds in Japanese: From the Viewpoint of the Compounding Parameter*

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1 Introduction

Complex predicates, such as resultatives, causatives, verb-particle constructions, and compounds, have been one of the central topics in the theoretical and typological literature (e.g., Alsina, Bresnan & Sells 1997; Amberber, Baker & Harvey 2010; Kishimoto & Yumoto 2014). Among these previous studies, an intriguing parametric proposal has been made by Snyder (1995, 2001, 2007, 2012, 2016). Based on a series of detailed cross-linguistic and

* We would like to thank William Snyder and the audience of Japanese/Korean Linguistics 25 for feedback on an earlier version of the study. We are also grateful to Phillip Kroh for proofreading the manuscript. This study was partially supported by JSPS Grants-in-Aid for Scientific Research (C) Grant Number 15K02510.

Japanese/Korean Linguistics 25.
Edited by Shin Fukuda, Mary Shin Kim, and Mee-Jeong Park.

acquisition studies, he has proposed *the Compounding Parameter* (TCP). TCP determines the availability of complex predicates and creative, endocentric nominal compounds (N(oun)-N(oun) compounds, NNs) such as *frog chair*. It is observed that [+TCP] languages such as English, Japanese, and Korean permit both complex predicates and NNs (e.g., *kirei-ni huku* [clean wipe] 'wipe clean' and *kaeru-isu* [frog-chair] 'frog chair' in Japanese), while [-TCP] languages such as Spanish and Egyptian Arabic allow neither of these constructions.

Snyder (2007, 2012, 2016) have reported that there are at least two groups of [+TCP] languages: Some [+TCP] languages such as English permit verb-particle constructions like *throw a ball in* while others such as Japanese and Korean do not. Japanese instead utilizes compound verb constructions that consist of two adjoined verbs (V(erb)-V(erb) compounds, VVs) in many cases, like *nage-ireru* [throw-put.in] 'throw in.'

It is widely known that V-V compounds are available in some East Asian languages such as Japanese and Korean. Among them, Japanese allows the richest variety of V-V compounds and many studies have endeavored to examine the nature of this construction (e.g., Kageyama 1993, 2016; Saito 2014; Kishimoto & Yumoto 2014; among many others). These studies have argued that the first verb element V_1 and the second verb element V_2 are sisters under the same node, similar to other kinds of complex predicates.

In light of these above findings, the present study proposes that the availability of V-V compounds depends on the positive setting of TCP, based on spontaneous speech data from Japanese-speaking children. Specifically, our corpus study elucidates that these children acquire NNs and VVs at around the same time and proposes that TCP also regulates the availability of VVs, as well as NNs and other complex predicates.

This paper is organized as follows: In the next section, previous studies on syntactic analyses of V-V compounds and TCP are briefly surveyed, followed by a survey of previous acquisition studies on Japanese NNs and VVs. In Section 3, we report our corpus analysis study on Japanese-speaking children's N-N and V-V compounds. The results of the corpus analysis and their implications are discussed in Section 4. Section 5 concludes the paper.

2 Background

2.1 Japanese V-V Compounds and the Compounding Parameter

A V-V compound is a verbal complex that consists of two verbs but functions in the same way as a single verb. According to theoretical studies such as Kageyama (1993), V-V compounds can be largely divided into two

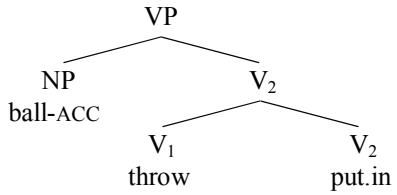
types: lexical VVs (LVVs) and syntactic VVs.[1] Examples of Japanese LVVs and Korean LVVs are given in (1).

(1) a. Japanese LVVs:
nage-ireru [throw-put.in] 'throw in'
osi-dasu [push-move.out] 'push out'
hiki-nuku [pull-extract] 'pull out'
ori-mageru [fold-bend] 'fold up'
b. Korean LVVs:
ccille-cwukita [stab-kill] 'stab to death'
pata-tulita [receive-put.in] 'accept'
kala-thata [change-get.on] 'transfer'
cikhye-pota [protect-watch] 'watch over'

(Tsukamoto 2013: 302)

The present study focuses only on LVVs and follows recent theoretical studies, such as Saito (2014). These studies have argued that Japanese LVVs such as *nage-ireru* [throw-put.in] 'throw in' are constructed in the syntax, and not stored in the lexicon, despite its nomenclature, and that the preverbal form of V_1 directly merges with V_2 to form a verbal complex as shown in (2).[2]

(2)



Another characteristic shared in [+TCP] languages including Japanese and Korean is the availability of novel NNs and complex predicate constructions such as resultatives. Snyder (1995, 2001) conducted a cross-linguistic survey and found that the availability of complex predicate constructions in a language is related to the availability of novel NNs. Languages such as English, Japanese and Korean, for example, allow the free

[1] Syntactic V-V compounds include head verbs which denote aspectual meanings such as inception (e.g., V_1-*hazimeru* 'begin to V_1'), (in)completion (e.g., V_1-*oeru* 'finish V_1-ing'), and retrial (e.g., V_1-*naosu* 'V_1 again'). See Kageyama (1993, 2016) for further detail.

[2] LVVs whose V_1 functions as a prefix or prefix-like verb, such as *hip-paru* [(originally) pull-stretch] 'pull' and *kut-tuku* [(originally) eat-stick.to] 'attach' are out of scope of the present study, because V_1 no longer maintains the original verbal meaning in these cases.

creation of NNs as well as complex predicate constructions, while languages such as Spanish and Egyptian Arabic do not. Based on this cross-linguistic survey, Snyder (2012, 2016) argue that NNs and complex predicate constructions are both controlled by TCP, with GM playing a role in their interpretation, given in (3) below.

(3) a. The Compounding Parameter (TCP)
The language (does / does not) permit Generalized Modification.
b. Generalized Modification (GM)
If α and β are syntactic sisters under the node γ, where α is the head of γ, and if α denotes a kind, then interpret γ semantically as a subtype of α's kind that stands in a pragmatically suitable rela tion to the denotation of β.
(Snyder 2012: 285)

Snyder (2012) takes the English NN, *frog chair*, and the resultative phrase, *wipe clean*, as examples to demonstrate how GM works, as shown in (4).

(4) a. NN:
⟦ frog chair ⟧ = chair of a type related to frogs
b. Complex predicate construction (e.g., resultative):
⟦ wipe clean ⟧ = a subtype of the "wiping" kind of event, that stands in a pragmatically suitable relation to the "clean" kind of state
(Snyder 2012: 285-286, 289)

In the NN *frog chair*, *frog* and *chair* are directly merged and both denote kinds of individuals. Because *chair* is the head of the compound, application of GM yields the interpretation given in (4a). Likewise, if we assume that *wipe* and a full AP *clean* in the resultative phrase form a syntactical constituent, GM can apply to the node that dominates them, yielding the meaning in (4b).

Now we can see an interesting syntactic and semantic similarity between LVVs and the constructions we have just seen above. The two verbs of Japanese LVVs such as *nage-ireru* [throw-put.in] 'throw in' are sisters, with V_2 serving as the head of the compound. It is then reasonable to presume that GM applies to the V_2, yielding the meaning 'a subtype of putting (something) in event-kind denoted by throwing,' and that the availability of LVVs also has to do with [+TCP] just like the NNs and complex predicate constructions.

Note that Japanese and Korean disallow one type of complex predicates, verb-particle constructions like *throw a ball in*. According to Snyder (2016),

all [+TCP] languages on the basis of NNs permit resultatives such as *wipe clean*, but only a proper subset of these languages allow verb-particle constructions.

Given the cross-linguistic findings by Snyder and the above fact, it is fair to surmise that there are at least two types of [+TCP] languages: Those which allow verb-particle constructions like English and those which permit LVVs like Japanese. Moreover, if the availability of LVVs also stems from TCP, it is predicted that there is a correlation between the acquisition of NNs and LVVs in Japanese-speaking children. The report of our corpus analysis in Section 3 examines this acquisitional correlation.

2.2 Previous Acquisition Studies on Japanese NNs and VVs

There is much evidence suggesting that the [+TCP] setting determines the acquisition of novel creative NNs and complex predicates in children acquiring languages such as English, German, and Japanese (e.g., Snyder 1995; Hanink & Snyder 2014; Miyoshi 1999; Sugisaki & Isobe 2000). These previous studies report that the age of acquisition of novel NNs and of complex predicates correlate with each other. Miyoshi (1999), for example, examined the Aki corpus (Miyata 2004a) in the Japanese section of CHILDES (MacWhinney 2000; Oshima-Takane et al. 1998) and found that the child produced NNs and complex predicates, such as causatives, almost concurrently.

There is one study which examines both V-V and N-N compounds observed in utterances by a Japanese-speaking child. Using the Aki corpus, Kido (to appear) found that the child first produced the V-V compound at age 2;7 (years; months), slightly later than his first use of NNs at 2;5 (see also Miyoshi 1999). Based on this finding, Kido (to appear) claims that one of the parameters necessary for the availability of V-V compounds is TCP.

3 Corpus Analysis

3.1 Corpora

Three longitudinal Japanese corpora available in CHILDES were used for the present study. Detailed information of these three corpora is summarized in Table 1.

Child	*Collected by*	*Age*	*# of utterances*
Tai	Miyata (2004b)	1;5-3;1	33,336
Sumihare	Noji et al. (2004)	0;0-6;11	39,993
Nanami	Nisisawa & Miyata (2009)	1;1-5;0	27,416

Table 1: Corpora analyzed

Among these three corpora, sound files are available for those of Tai and Nanami.

3.2 Method

We analyzed all the files of the three longitudinal corpora in CHILDES (see Table 1) to locate all the uses of both LVVs and creative NNs for each child. We conducted this analysis by hand without using the CLAN program, while excluding repetitions and imitations. When we found candidates for LVVs and novel NNs and could not clearly judge whether candidates were indeed compounds in the child's utterances, we listened to the sound files available for Tai and Nanami to check their intonations for ones peculiar to Japanese compounds.[3]

3.3 Results

Tables 2-4 show the number of each child's utterances containing LVVs and creative NNs, with some of the examples including their 'first of repeated uses' (FRUs) of them (Snyder 2007: 77-78). As for the uses of each construction after FRUs, even when the same combination of NNs or LVVs appears in the later files, we no longer counted it as another instance. For example, even if a child uttered a certain creative NN and the same NN again later, we counted them as just one use, not two.

Tai's data are summarized in Table 2 below.

Age	*Creative NNs*	*LVVs*
2;4	**FRU: *hanbaagu-keeki*** hamburg.steak-cake 'hamburg.steak-cake'	
	1 use of NN	
2;7		**FRU: *moti-dasu*** hold-bring.out 'bring out'
	8 uses of NNs e.g. *densya-eki* (2;11) train-station 'train-station'	3 uses of LVVs e.g. *tori-modosu* (2;10) take-return 'take back'
3;1		

Table 2: Tai's data

[3] Japanese compounds in general form one prosodic unit with a single accent. See Kubozono et al. (1997) and Akinaga (1985) for further detail.

Tai produced his first creative NN, *hanbaagu-keeki* 'hamburg.steak-cake,' at age 2;4 and his first LVV about three months later. After Tai's first use of LVVs, he uttered a total of eight NNs and three LVVs through the end of the corpus.

Table 3 shows Sumihare's data on his creative NNs and LVVs.

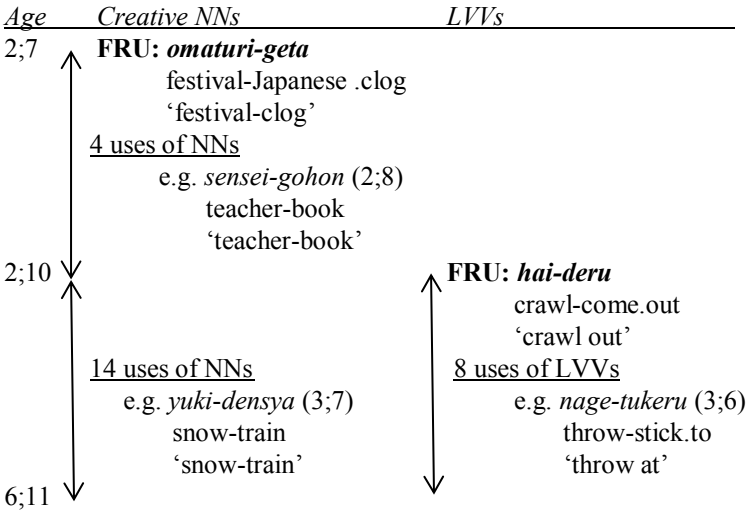


Table 3: Sumihare's data

Sumihare also first uttered a creative NN, *omaturi-geta* 'festival-clog,' at 2;7 and first used an LVV, *hai-deru* 'crawl out,' about three months later. We found a total of sixteen creative NNs and six LVVs.

Finally, Table 4 shows Nanami's data.

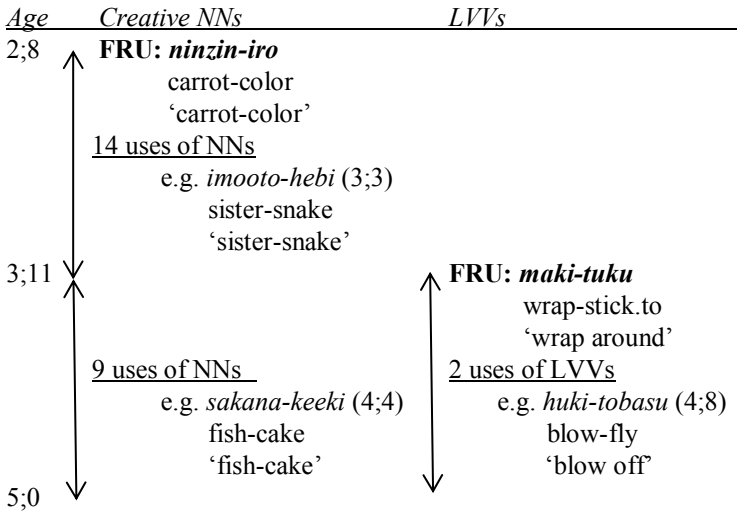


Table 4: Nanami's data

Nanami first produced a creative NN, *ninzin-iro* 'carrot-color,' at age 2;8 and her first clear use of an LVV appeared about one year later. Until then she produced fourteen novel NNs. After the appearance of the first LVV, we counted nine uses of NNs and two uses of LVVs.

All the children began to produce creative NNs earlier than LVVs. In order to assess whether the FRUs of creative NNs were significantly earlier than those of LVVs, we conducted a binomial test based on relative frequencies following Snyder (2007). *P*-values for each child are obtained using the formula and three numbers (x, y, and z) given in (5).

(5) $p = [x/(x+y)]^z$
x: total number of NNs after the FRU of a NN
y: total number of LVVs after the FRU of a LVV
z: total number of NNs between the FRU of NNs and that of LVVs

This calculation gives us the probability of observing the child producing a series of at least z utterances before ever producing an LVV, under the null hypothesis that NNs and LVVs become available concurrently. We calculated probabilities for each child, and the results are given in Table 5.

Child	*p*-value
Tai	.727
Sumihare	.164
Nanami	.060

Table 5: Results of binomial test

The *p*-values for each child are greater than the significance level. Thus the results give us no evidence showing that LVVs and NNs are acquired at distinct stages.

4 Discussion

As demonstrated in the last section, our corpus study found that three Japanese-speaking children in CHILDES started using creative NNs around age two and a half and LVVs a few months later. We also found that each child created quite a few novel NNs that they had never heard before, meaning that at these developmental stages, they noticed that Japanese is a language that allows combinations of two bare nouns. In these children's corpora, the first LVVs appear later than their first NNs. It took three months for Tai and Sumihare, and fifteen months for Nanami to start using LVVs after their first NNs.

Our query was whether these time lags are meaningful or not with respect to the acquisition of compounds. It is possible that we cannot find their first LVVs until a few months later than their first NNs just because LVVs are generally used more sporadically than NNs. It is also possible that there is no parametric correlation in the acquisition of these two types of compounds at all. As described in Section 2, however, we assume that the availability of LVVs in Japanese-type languages also has to do with [+TCP] as well as creative NNs and other complex predicate constructions. If this assumption is on the right track, it is then natural to predict that we would observe a correlation between the acquisition of creative NNs and that of LVVs. Thus, we adopted a binomial test based on relative frequencies to verify this prediction.

The results of the binomial test did not give us evidence suggesting that NNs and LVVs are acquired at distinct stages. But at the same time, the failure to reach significance by the binomial test does not really tell us that NNs and VVs were acquired concurrently either. Although we could not obtain statistically significant results this time, we observed a certain tendency that creative NNs and LVVs are acquired almost concurrently. To investigate this further, it is necessary to examine a greater amount of and more detailed corpus data in Japanese and even in Korean, another language grouped into a similar type of [+TCP] languages.

Before concluding the present study, we would like to discuss the first LVV uttered by Nanami. In Table 4, we reported that she began to use LVVs at 3;11. However, there is another possible candidate for her first LVV at age 2;8: *humi-yabureru* [step.on-get.torn] 'get torn by stepping on,' which does not exist in adult Japanese. A detailed study of LVVs by Kageyama (2016) have revealed that in general, two verbs of a lexical compound are required to have the same argument structure, such as transitive-transitive or unergative-unergative. Verbs of different types cannot form LVVs. Thus, the novel LVV Nanami produced seems to violate this generalization: V_1 *humi-* 'step.on' is a transitive verb and V_2 *yabureru* 'get torn' is an unaccusative verb. Although this compound is never used by adults, it is possible to treat it as the first LVV uttered by Nanami, as she obviously put two verbs together like other LVVs. If we adopted this possibility, the *p*-value would become .917, which would reinforce the possibility of creative NNs and LVVs being acquired concurrently. However, even when we carefully checked the audio file of the LVV, we could not confidently confirm that the alleged novel LVV is a real LVV. Therefore, we do not draw a conclusion regarding this matter in this paper.

5 Conclusion

The present study pointed out that Japanese-type [+TCP] languages allow LVVs instead verb-particle constructions. We further argued that the availability of LVVs is also relevant for the parametric setting of TCP. We then tested the acquisitional prediction derived from the following cross-linguistic fact regarding TCP: If the availability of LVVs also stems from [+TCP], it is predicted that acquisition of LVVs and that of NNs are correlated. The longitudinal corpus data suggest the possibility that Japanese children acquire LVVs and NNs at around the same time. The evidence from Japanese supports the generalization that the presence of a [+TCP] parametric setting can account for the relevant constructions. Our findings that LVVs in Japanese-type [+TCP] languages are among such constructions lend new support to the Compounding Parameter.

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