Acquisition of Default Inflectional Suffixes: Japanese Adjectives*

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1 Introduction

This study reports on how children come to learn two inflectional classes of adjectives in Japanese. Are the two inflectional classes learned simultaneously or is one learned before the other? Do children use the same class of inflectional suffix as the default as adults? On what basis do children distinguish the two classes of inflections?

The study was designed to test which class of inflectional suffix would be used by children and adults on both existing and novel words. They were asked to provide the past form of the adjectives, which they heard in their nonpast forms. The results show the past-tense form for one inflectional class is acquired earlier than the other, and overgeneralized for both existing and novel adjectives (4-year-olds). Interestingly, this is not the default form adults extend productively to novel adjectives. However, once the other inflectional class is acquired, children, like adults, use this form as the default, and overgeneralize this form (5-year-olds). The results also show that children do not use the morphological information (i.e., suffix) in the stimuli as effectively as adults in determining class membership of novel adjectives.

This paper is organized as follows. Section 2 introduces the two inflectional classes for Japanese Adjective. I present research questions about the Japanese Adjective inflectional classes from the child language acquisition of view. Section 3 illustrates an experiment conducted to answer the research questions. Section 4 reports the results. Section 5 presents a possible acquisition sequence to account for the results and raises further questions for future research.

2 Japanese Adjectives

Japanese has two types of adjectives in one language system (Kuno 1973, Martin 1975 and many others). One is called Verbal Adjective (VA) and the other Nominal Adjective (NA). The morphological differences between

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these two types of adjectives are observed in their predicative use in (1), attributive use in (2) and negative clauses in (3). In predicative use, VAs inflect for tense with a nonpast tense *–i* suffix and a past tense *–katta* suffix, as shown in (1a). The paradigm of NAs, on the hand, follows that of the copula: nonpast tense *–da* and past tense *–datta*, as shown in (1b).

(1) a. Ano hito-ga utukusi***-i/-katta*** (VA)
that person-NOM beautiful-NONPAST/PAST[1]
'That person is/was beautiful.'
b. Ano hito-ga kiree**-da/-datta** (NA)
that person-NOM beautiful -NONPAST/PAST
'That person is/was beautiful.'

In adnominal position, VAs require a suffix *-i* (2a), while NAs require a suffix *–na* (2b).

(2) a. utukusi-***i*** hito (VA)
beautiful-ATT person
'beautiful person'
b. *kiree-**na*** hito (NA)
beautiful-ATT person
'beautiful person'

In negative clauses, when the adjectives are followed by a negative suffix *na-i/-katta* NEG-NONPAST/PAST, VAs need a suffix *–ku* (3a) and NAs need a suffix *–de* (3b) between the stem and the negative. [2]

(3) a. Ano hito-ga utukusi-***ku****-na-i/-katta* (VA)
that person-NOM beautiful-ku-NEG-NONPAST/PAST
'That person is/was not beautiful.'
b. Ano hito-ga kiree***-de****-na-i/-katta* (NA)
that person-NOM beautiful-de-NEG-NONPAST/PAST
'That person is/was not beautiful.'

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[1] The abbreviations in the examples are as follows: NOM (nominative), ATT (attributive), and NEG (negative).

[2] How to analyze these two suffixes, *-ku* and *–de*, is an interesting controversial issue, but I do not analyze them here since it is beyond the scope of this study. All I assume here is that these two are used in a parallel manner. See Martin (1975), Urushibara (1993) and Nishiyama (1998) for their analyses of these two suffixes.

As shown above, VAs and NAs are morphologically different. However, these two types of adjectives both denote properties and are not semantically distinguishable. For example, as shown in the examples above, the primary or central concept of "BEAUTIFUL" can be either expressed by a VA *utu-kusi-* or an NA *kiree-* (Urushibara 1993: 40-41). Thus, I assume that VAs and NAs are not categorically different (i.e., both are Adjective), and that each of them constitutes an inflectional class for Adjective. The two inflectional classes, VA class and NA class, are summarized in Table 1.

	VA class *utukusi-* 'beautiful'	NA class *kiree-* 'beautiful'
Predicative		
Nonpast	*-i*	*-da*
Past	*-katta*	*-datta*
Negative	*-ku-na-i/-katta*	*-de-na-i/-katta*
Attributive	*-i*	*-na*

Table 1: Suffixes for Japanese adjective inflections

We need to know, for a given adjective, which class it belongs to in order to use the appropriate inflectional suffix. How do we assure that a given adjective will choose an appropriate suffix for a given morphosyntactic property array? Nishiyama (1998) observes that all VAs are native words and monomorphemic, while NAs are loan-words or bimorphemic. However, this vocabulary stratum (whether it is native or loan) is not an appropriate predictor of inflection class because even native speakers of Japanese do not necessarily know the origin of a given word. They, especially children, do not have access to the etymology of the word. So on what basis is the suffix for a given adjective chosen over another?

What Nishiyama's observation tells, however, is that the VA class is a fixed list of only native adjectives, while NA is an open list, in which bimorphemic native words and any loan words can enter newly. In other words, NA class inflections are used as the default in the adult language system. This means that if a given adjective is classified as a VA, use the VA class inflectional suffixes. Otherwise, use NA suffixes.

We have seen so far that Japanese Adjectives have two inflectional classes, VA class and NA class, and that the NA class inflections seem to be used more productively than the VA class inflections. The two inflectional classes of Japanese adjectives raise an interesting question: How are these two classes acquired? More specifically, we can set up the following research questions.

(4) Research Questions

a. At what point do Japanese speaking children correctly differentiate VAs from NAs?

b. On what basis do they categorize a given adjective as VA or NA?

In particular, in this study, we will ask:

c. Do the children acquire both classes' inflections simultaneously? If not, which one is first?

d. Do they overgeneralize one class of inflections to the other systematically? If so, which direction?

e. Which class of inflectional suffixes do they use when they encounter novel adjectives?

In order to answer these research questions, I conducted the following pilot study, focusing on the past and the nonpast tense inflectional suffixes.

3 Method

Ten children (five 5-year-olds [age 5;0-5;3] and five 4-year-olds [age 4;0-4;7]) and 24 adults participated in this study. They were all monolingual native speakers of Japanese. All the children's data were collected in Japan, while that for adults was in the Unites States.

Thirty-two existing adjectival stems (16 VAs and 16 NAs) and thirty-two novels adjectival stems (16 VAs and 16 NAs) were used as spoken stimuli.[3] The stimuli using existing adjectival stems consisted of two patterns: the grammatical combination of the stem and the nonpast tense suffix (8 VA-*i* [e.g., *haya-i* 'fast-nonpast'] and 8 NA-*da* [e.g., *hen-da* 'strange-nonpast']) and an ungrammatical combination of the stem and the suffix (8 *VA-*da* [e.g., *haya-da*] and 8 *NA-*i* [e.g., *hen-i*]). The stimuli with novel adjectival stems also had two patterns: the stems with matching suffixes (8 VA-*i* [e.g., *kutosi-i*] and 8 NA-*da* [e.g., *buran-da*]) or with mismatched suffixes (8 VA-*da* [e.g., *kutosi-da*] and 8 NA-*i* [e.g., *buran-i*]).

The subjects were asked to instruct a puppet in providing the past tense form of the adjectives, which they heard in their nonpast form. The puppet was introduced to the subjects as a beginning learner of Japanese, who did not know past tense forms and used only nonpast forms when past forms were appropriate. They were also told that the puppet might make a mistake in what it said or make up new words. With these in mind, the subjects were asked to say the past tense forms of the adjectives the puppet had produced in nonpast forms.

[3] Many of the novel adjectival stems were taken from Hagiwara *et al* (1997), which were made to sound like either VA or NA adjectives. Some were created following their criteria of VA and NA sounds.

The subjects' responses were categorized based on the types of the past tense suffixes they produced (VA suffix –*katta*, or NA suffix –*datta*).

4 Results

The results show that the adults' default past suffix is –*datta* (NA), while that of the 4-year-olds is –*katta* (VA). In fact, the data suggest that 4-year-olds do not yet realize that the NA class, in contrast to the VA class, exists and thus analyze –*katta* as the past suffix for adjectives in general. On the other hand, the 5-year-olds' data indicate they have acquired both VA and NA inflections. Moreover, the NA –*datta* suffix is overgeneralized to the extent that it replaces the VA inflection –*katta*.

The results also show that children (both 4 and 5 years) did not use the morphological information (i.e., suffix) in the stimuli as effectively as adults in determining which past tense suffix should be used for the novel stem stimuli.

4.1 Existing Stems

The Figure 1 shows the percentages of the past tense forms (VA suffix –*katta* and NA suffix –*datta*) produced by adults in response to each stimulus. Stimuli shown at each end of the graph (VA-*i* and NA-*da*) are grammatical and the ones in the middle (*VA-*da* and *NA-*i*) are ungrammatical. Adults used appropriate past forms for grammatical stimuli almost perfectly. When the nonpast suffix was not matched with the stem type in stimulus, the *-datta* suffix was used more often than –*katta* (Compare the percentages of –*datta* responses for *VA-*da* with that of –*katta* for **NA*-*i*). This result suggests that adults used NA suffix –*datta* as the default.

On the other hand, the results of the 4-year-olds in Figure 2 demonstrate that the children predominantly used the VA suffix –*katta*, for both ungrammatical stimuli (*VA-*da* and **NA*-*i*). They also used –*katta* as often as the NA suffix –*datta* even for the grammatical NA-*da* stimulus, where the –*datta* suffix was the appropriate suffix. These results illustrate a case in which the VA suffix –*katta* was used as the default.

The results of the 5-year-old children in Figure 3 show that they appropriately used past forms for the appropriate combination of the stem and the nonpast suffix (VA-*i* and NA-*da*). At least, this suggests that the 5-year-old children use both –*katta* and –*datta* suffixes. They also use both past tense suffixes (-*katta* and –*datta*) for each inappropriately combined stimulus (*VA-*da* and **NA*-*i*), but this is due to the fact that some subjects only used

–*katta* and some only used –*datta.* Two subjects used mostly –*katta* as the default for the ungrammatical stimuli, while the other three predominantly used –*datta* as the default. Thus, Figure 3 does not reflect any of the 5-year-old individual subjects' response pattern.

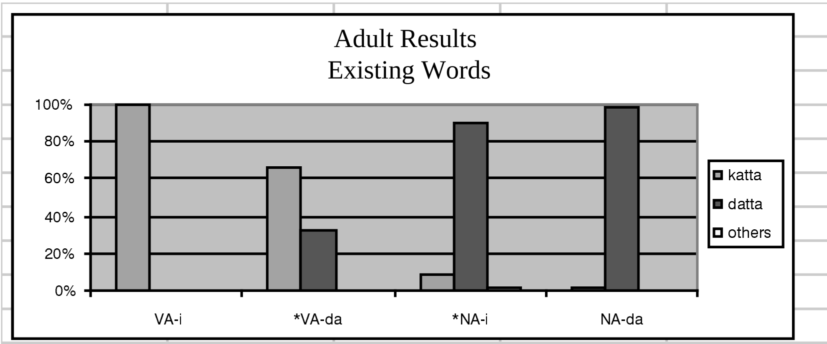

Figure 1: Percentages of the past tense suffixes, produced by adults, for the stimuli with existing stems and nonpast suffixes.

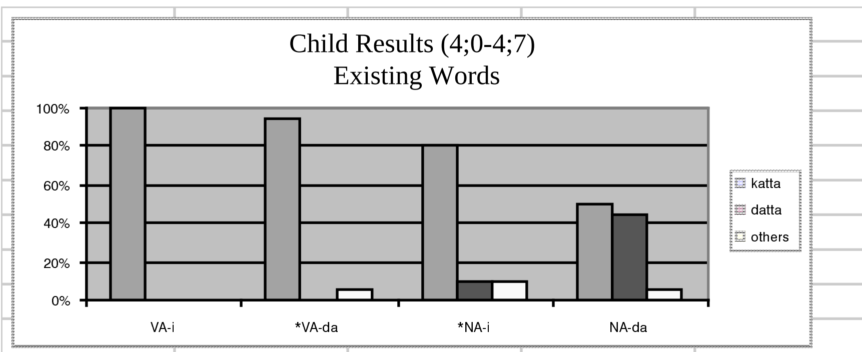

Figure 2: Percentages of the past tense suffixes, produced by 4-year-old children, for the stimuli with existing stems and nonpast suffixes.

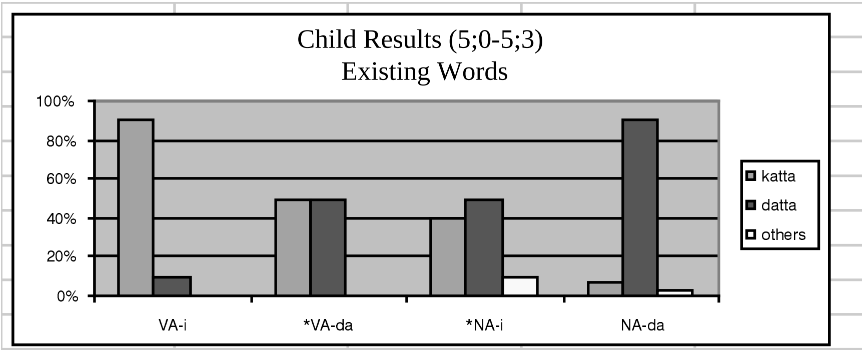

Figure 3: Percentages of the past tense suffixes, produced by 5-year-old children, for the stimuli with existing stems and nonpast suffixes.

4.2 Novel Stems

Figure 4 shows the adult results for the novel stem stimuli. The results show that the choice of the past tense suffix tended to rely on the nonpast suffix in the stimuli. That is, for the stimuli with the VA nonpast suffix *-i* (VA-*i* and NA-*i*), the VA past suffix *–katta* was used more often than the NA past suffix *–datta*. On the other hand, for the stimuli with the NA nonpast suffix *–da* (VA-*da* and NA-*da*), the NA past suffix *–datta* was used more often than the VA suffix *–katta*.

Figure 4 also indicates that the suffix *–datta* was also used as the default. The responses to the inappropriately combined stem and the suffix (VA-da and NA-*i*) included the suffixes which were not chosen based on the type of the suffix in the stimuli. When you compare the percentage of the *–katta* suffix chosen for the VA-*da* stimulus and that of the *–datta* suffix for NA-*i*, the latter is larger than the former. It implies that there is a tendency to use *–datta* as the default.

The results of the 4-year-olds in Figure 5 clearly demonstrate that there is a strong tendency to use the VA suffix *–katta* almost regardless of the stimuli. This suggests that the suffix *–katta* was the only productive suffix.

Figure 6 shows that the use of *–datta* by the 5-year-olds was more productive than by adults or the 4-year-olds. The 5-year-olds' result is in fact a mixture of the subjects using *–datta* overwhelmingly and those who used in more adult-like pattern. Three children used *–datta* very productively and we observe overgeneralization of *–datta*.

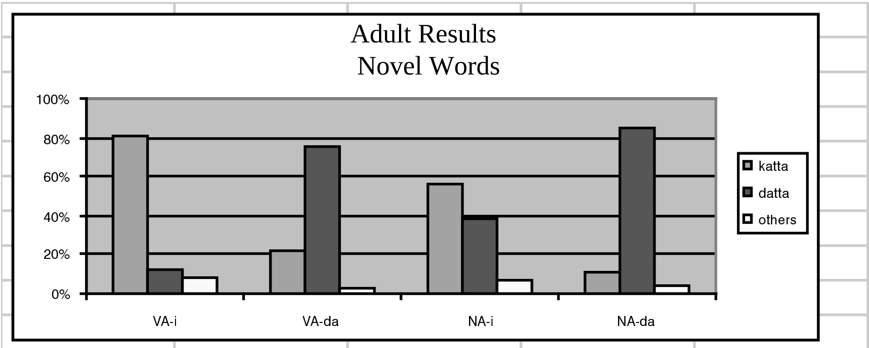

Figure 4: Percentages of the past tense suffixes, produced by adults, for the stimuli with novel stems and nonpast suffixes.

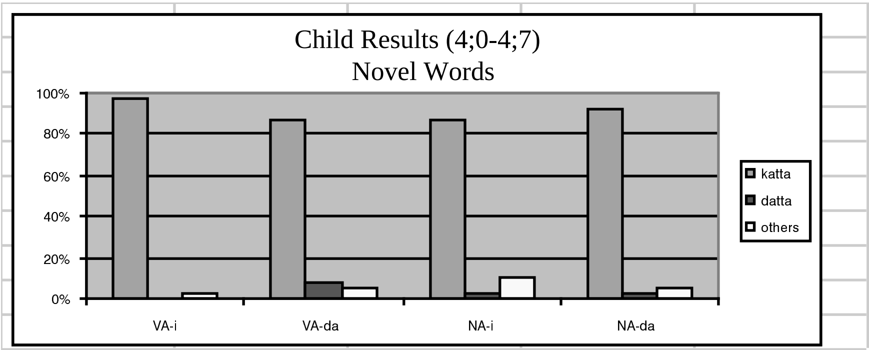

Figure 5: Percentages of the past tense suffixes, produced by 4-year-old children, for the stimuli with novel stems and nonpast suffixes.

The following tables further provide data which indicate that the suffix –*datta* is more productively used by the adults and the 5-year-olds than the 4-year-olds. Tables 2, 3 and 4 show the details of the novel stems forms to which the past tense suffixes were attached. The focus is on the case where the subjects failed to identify the novel stems correctly, in other words, the case where they failed to separate the nonpast suffixes from the stems. Those

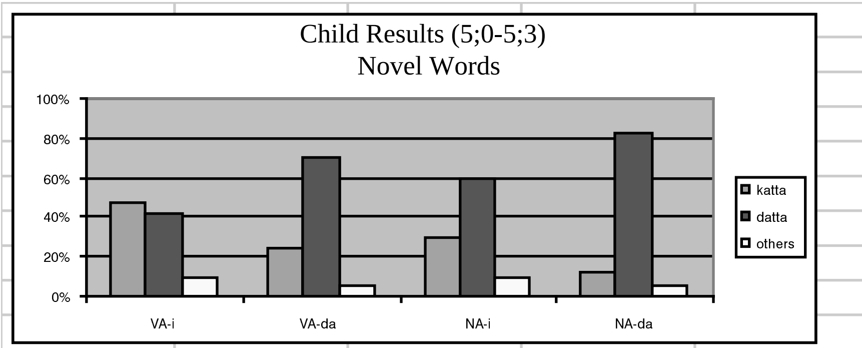

Figure 6: Percentages of the past tense suffixes, produced by 5-year-old children, for the stimuli with novel stems and nonpast suffixes.

responses are stem-**i**-*katta* / stem-**da**-*katta* and stem-**da**-*datta* / stem-**i**-*datta* and they are highlighted in the boxes in the tables. These indicate which past tense suffix the subjects chose when they could not base their choice on the nonpast suffix in the stimuli.

Table 2 shows that adults more often used –*datta* than –*katta* when they failed to identify the correct stems. The 4-year-olds in Table 3, on the other hand, demonstrate that they used only –*katta*. In addition, the table shows that the 4-year-olds separated the suffix in the stimuli better with the VA nonpast suffix –*i* than with the NA *-da.* In Table 4, the 5-year-olds used mostly –*datta* in the environment where a default suffix is expected. It is also illustrated that the 5-year-olds were not good at separating the suffixes from the stems in the stimuli.

These three tables suggest that –*datta* is the default for adults and the 5-year-olds but not for the 4-year-olds. Moreover, Table 4 illustrates that many of the overgeneralization cases of the suffix –*datta* by the 5-year-olds was actually caused by their inability to identify the nonpast suffix in the stimuli. Since they could not base the choice of the past tense suffix on the suffix in stimuli, they chose the suffix –*datta* as the default.

	TYPE OF RESPONCES							
stimuli	**katta**			**datta**			**others**	
	stem-	**stem -i/da-**	truncated stem-	stem-	**stem -i/da-**	truncated stem-	others	(sum)

VA-i	73%	**3%**	4%	2%	**8%**	2%	8%	100%
VA-da	15%	**1%**	6%	65%	**8%**	2%	3%	100%
NA-i	43%	**6%**	7%	13%	**25%**	1%	6%	100%
NA-da	8%	**1%**	2%	77%	**7%**	1%	4%	100%

Table 2: Percentages of the past tense suffix and stem forms the adults chose for each stimulus.

	TYPE OF RESPONCES							
stimuli	**katta**			**datta**			**others**	
	stem-	**stem -i/da-**	truncated stem-	stem-	**stem -i/da-**	truncated stem-	others	(sum)
VA-i	53%	**38%**	8%	0%	**0%**	0%	3%	100%
VA-da	20%	**63%**	5%	5%	**0%**	3%	5%	100%
NA-i	45%	**35%**	8%	0%	**0%**	3%	10%	100%
NA-da	18%	**64%**	10%	3%	**0%**	0%	5%	100%

Table 3: Percentages of the past tense suffix and stem forms the 4-year-olds chose for each stimulus.

	TYPE OF RESPONCES							
stimuli	**katta**			**datta**			**others**	
	stem-	**stem -i/da-**	truncated stem-	stem-	**stem -i/da-**	truncated stem-	others	(sum)
VA-i	45%	**3%**	0%	3%	**40%**	0%	10%	100%
VA-da	23%	**3%**	0%	35%	**35%**	0%	5%	100%
NA-i	25%	**3%**	3%	18%	**43%**	0%	10%	100%
NA-da	8%	**5%**	0%	44%	**38%**	0%	5%	100%

Table 4: Percentages of the past tense suffix and stem forms the 5-year-olds chose for each stimulus.

4.3 Major Findings

In summary, we have found that the productive suffix is different between the 4-year-olds and the 5-year-olds/adults. The first finding is that the adults' default past tense suffix for adjectives is *–datta* (the NA suffix). Second, on the other hand, the 4-year-olds' default form is *–katta* (the VA suffix). The data suggest that the 4-year-olds have not yet distinguished the NAs from the VAs perfectly, and that their productive suffix is *–katta* (VA). Third, the suffix *–katta* is no longer the default among the 5-year-olds; rather, the 5-

year-olds' data suggest that the *–datta* suffix is default. This *–datta* suffix is overgeneralized to the contexts where the VA suffix *–katta* should be used. In other words, the suffix *–katta*, which was productively used by the 4-year-olds, does not block the use of the suffix *–datta* even when the *–katta* suffix is appropriate.

We have also found that the degree of the use of morphological information is different between adults and children. The fourth finding is that there is less use of morphological information in the stimuli for both 4 and 5-year-olds. Adults use morphological information (i.e., the nonpast suffix) to determine the class-type of novel adjectives to a certain extent, while children (both 4 and 5 years old) do not use this information as effectively as adults. This resulted in the cases where they failed to identify the nonpast suffixes and failed to separate them from the stems (Table 3 and Table 4). Fifth, the NA suffixes (*-da/-datta*) are not fully acquired by the 4-year-olds. They recognized the NA suffix *–da* less well than the VA suffix *–i* as a suffix in the stimuli. Moreover, they hardly produced the NA suffix *–datta* in production (except for the response to the existing NA-*da* stimulus, which is a grammatical one. In the next section, we will see a possible scenario of acquiring both types of Japanese adjectives that might explain the findings we have just seen.

5 Discussion

The present data suggests the following acquisition sequence, as schematized in Figure 7.

No class distinction between VAs and NAs (4-year-olds)
→ Children analyze that *–katta* is the past tense suffix for adjectives in general.

↓

Productive use of the NA suffix *–datta*: replacing *–katta* with *–datta.* (5-year-olds)
→ Overgeneralization

↓

Reanalyzing and relearning of VA as a separate class from NAs
→Two inflectional classes of adjectives (VA class and NA class as the default)

Figure 7: A proposed acquisition sequence for Japanese adjectives

The 4-year-olds use the VA past tense suffix *–katta* predominantly. They produce the NA past suffix *–datta* only when the stimuli are the appropriate

NA nonpast forms, i.e., a NA stem + *da* (see Figure 2). However, even for this grammatical stimulus, they produced *–datta* in only half of the responses. This indicates that the VA class suffix (*-katta*) is better acquired than the NA class suffix (*-datta*) at this age.

I posit that the 4-year-old children have not yet realized that Japanese adjectives can be categorized into two classes, each of which has its own inflectional paradigm. They have only one adjectival inflectional paradigm (i.e., VA class: *-i, -katta,* etc.), and they have not yet realized the other paradigm (i.e., *-da*, *-datta* etc.) for other type of adjectives (NAs). Some use of *–datta* can be explained in that children learn these lexical items individually, but they have not yet realized that these suffixes (*-da –datta* etc.) indicate another inflectional class for adjectives. Thus, for the 4-year-olds, the VA suffix *–katta* is the ONLY productive past tense suffix they have for adjectives in general. This explains why we only see the VA suffix *–katta* as a productive suffix in the 4-year-olds' results, especially for the responses to novel adjectives (See Figure 2 and Figure 5).

The reason why NA class suffix (*-datta*) is less well acquired by the 4-year-old children can be related to the fact that this NA inflectional class paradigm is a less marked paradigm in Japanese. Almost the identical paradigm is used for noun (N) and post positional phrase (PP).[4] On the other hand, the VA class inflectional paradigm is unique to VAs and, in that sense, it is more marked within the language. In other words, the VA class inflections are more easily identified with adjectives than the NA class inflections. Thus, the 4-year-old children first analyze that VA suffixes are used for all adjectives in general. The second possible reason for less well acquired NA suffixes could be the optional use of the NA nonpast tense suffix *–da*. In spoken language, the suffix *–da* is often omitted, while the VA counter part suffix *–i* is obligatory. This might make it easy for children to form the VA *-i* vs. *–katta* contrast than the NA *–da* vs. *–datta*.

Then, later, the 5-year-olds come to realize that *–datta* is also an adjectival suffix. They have learned the existence of the NA class. Some replaced *–katta* with *–datta*, even when *–katta* was the appropriate suffix. This means that the suffix *–katta* could not block the use of *–datta*. This supports the idea that the inflectional suffix *–katta* was not learned as the suffix of VAs, but that it was rather learned as the suffix for adjectives in general. Because of its weak identification with VAs, the *–katta* suffix could not stop the suffix *–datta*, and the overgeneralization of *–datta* takes place here.

Eventually, children come to realize the two distinct classes of adjectives and relearn the *–katta* suffix as a VA class suffix, as opposed to the

[4] The only difference is the attributive form.: NA-*na*, N-*no* and PP-*no*.

general suffix for adjectives. As a result, children learn that there are two inflectional classes of adjectives in Japanese: one has VA inflectional paradigm and the other has NA paradigm as the default, which is supposed to be what the adults have.

This study made it clear that Japanese children started with one of the adjectival inflectional suffixes (*-katta*), which was not the default form in the adult language. Eventually, they came to learn the other inflectional suffix (*-datta)* and started to use it as the default, like the adults. What remained unanswered is how the children come to distinguish the two types of adjectives. Once the category distinction has been acquired, on what basis do children classify the adjectives they encounter every day? Are they stored in memory or triggered by some class features? We will leave these questions to future research.

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