The Phonological Optimization of Japanese Nicknames: Why kids don't sing "Sachi-chan wa ne"

Ralph L. Rose <rose@gpwu.ac.jp >

Gunma Prefectural Women's University

1 Introduction

Nicknames (also called hypocoristics in the literature) in Japanese involoves truncation of the root name to a bimoraic stem and suffixation of a dimunitive morpheme. Previous descriptions (Mester, 1990; Poser, 1990) of nickname formation have identified three dominant patterns. Given a root name with the form $(C_1)V_1C_2V_2x$ where x comprises one or more syllables, these patterns are as shown in (1a-c).[1]

(1) a. kumiko → kumiĉaN
b. masahiro → ma:ĉaN
c. saĉiko → saĉ:aN

According to Poser (1990), there is some variation in the relative acceptability of these three forms depending on the phonetic makeup of the root. He claims first that for any given name, the simple form shown in (1a) is always possible and second, that for a name in which C_2 is a voiceles coronal affricate (i.e., /ĉ/ and /T/) and V_2 is a high vowel, the geminated form in (1c) is preferred.

In this paper, I examine these claims with an experiment designed to obtain native judgments from naive participants. After a more in-depth review of the literature on nickname formation I will present the results of this experiment. In short, results confirm only the second claim while revealing a previous unnoticed effect: When C_2 is a voiceless fricative followed by a high vowel (e.g., as in yasunao), the three nickname forms are nearly equally likely.

I present an Optimality Theoretic (OT: Prince and Smolensky, 1993) account using variable constraint rankings (Anttila, 1997) as a means of partially explaining the observed variation in outcomes. This account builds on Tsuchida's (2001) account of the well-known phenomenon of high-vowel devoicing in Japanese.

[1]In this paper, I will use the following typographic conventions. A ':' after a vowel represents a long (bimoraic) vowel. A ':' after a consonant represents a geminated consonant. 'N' represents the moraic nasal continuant found in coda position. 'S' represents a palatalized coronal fricative (i.e., *sh*). 'T' and 'ĉ' represent the palatalized coronal affricates found before the high vowels /*u*/ and /*i*/, respectively.

2 Background

2.1 Nickname formation

As noted in the Introduction, nickname formation in Japanese involves truncation of the root name into a bimoraic template and suffixation of a dimunitive morpheme. There are many commonly used dimunitives including /ĉaN/, /kuN/, /ko/, /ĉi/, and /pi/. Of these, however, /ĉaN/ appears to be the most established and widely used—often for young children, females younger than the speaker, and intimates of any gender. It therefore serves as the focal point for the present investigation.

The three dominant patterns of nickname formation with /ĉaN/ identified in (1) are described more formally in (2) with illustrative data from Poser (1990).

(2) SIMPLE form: All phonetic material after the second mora is deleted. (ayako → ayaĉaN, fumiko → fumiĉaN)
V-LENGTHENED form: All phonetic material after the first mora is deleted and the stem vowel is lengthened.[2] (kiyoko → ki:ĉaN, masako → ma:ĉaN)
GEMINATED form: All phonetic material after the first mora is deleted and the second mora of the stem assimilates to the suffix onset. (aTuko → aĉ:aN, yasuko → yaĉ:aN)

According to Poser (1990), for any given name, the SIMPLE form is always possible. However, he notes that there are some preferences for other forms. In particular, names with a $(C_1)V_1tV_{[+high]}$ sequence predominantly take the geminated form. He cites a study of nicknames in a girls' high school (Sasaki, 1977) which finds that all the girls whose names follow this pattern have GEMINATED nicknames. This suggests the possibility of an Obligatory Contour Principle effect (OCP: Goldsmith, 1979, 1990) resulting from adjacent consonant onsets with the same place of articulation.

[2]In earlier work (Mester, 1990; Poser, 1990), this particular form has been described as *lengthening*. Such a name may be confusing because the stem is not lengthened: it is bimoraic like the other forms. Instead it is the vowel which is lengthened. Therefore, in this paper, I call this the V-LENGTHENED form.

A pilot study of the current investigation in which native Japanese participants judged the acceptability of nicknames from novel Japanese names similarly demonstrated this effect and points toward the combination of a coronal stop or affricate and a high vowel as motivating output of the GEMINATED form. However, because coronal onsets to high vowels are always fricated in Japanese, frication may be an additional factor. In other words, it may be the convergence of three features—PLACE, FRICATION, and VOWEL HEIGHT—which motivates the GEMINATED form. This hypothesis is examined in the experiment described in Section 3.

The SIMPLE form appears to be the preferred outcome when C_2 is voiced or nasal. Consider the names in (3)-(4). In (3a), all three forms are possible, but the GEMINATED and V-LENGTHENED forms are marginalized in (3b) under the apparent influence of the voiced consonant. The outcomes of (4a) are similar to those of (3b) because C_2 is again a voiced consonant. However, when a nasal feature is added as in (4b), then the GEMINATED and V-LENGTHENED forms are heavily marked.[3]

(3) a. yasuko → yasuĉaN, ya:ĉaN, yaĉ:aN
b. kazuko → kazuĉaN, #ka:ĉaN, #kaĉ:aN

(4) a. sadafumi → sadaĉaN, #sa:ĉaN, #saĉ:aN
b. manami → manaĉaN, *ma:ĉaN, *maĉ:aN

In short, existing evidence suggests that a variety of both consonantal and vowel features influences choice of nickname. The experiment described in Section 3 will manipulate these features to examine the relative strength of their influence.

2.2 High-Vowel Devoicing

The high vowels, */i u/* are frequently devoiced (represented orthographically with a dot under the vowel) when immediately surrounded by voiceless consonants as in (5.)

(5) a. hakụSima (place name)
b. sekịsui (company name)
c. SịTu *room*
d. -maSịta (past tense morpheme)
e. akịko (personal name)
f. fụtoN *bed mattress*

The environments which motivate the GEMINATED form in nicknames appear to be a subset of these devoicing environments where the voiceless consonants are further specified to be coronal and fricated. Thus, the account of nickname formation which I will describe in Section 5 is founded on an account of high-vowel devoicing.

[3]Here I use the devices '*' and '#' to denote degrees of (relative) markedness rather than ungrammaticality.

3 Experiment

As outlined in the previous section, Poser (1990) makes two claims regarding nickname formation in Japanese, as summarized in (6)-(7).

(6) For any given name, the SIMPLE form is always possible.

(7) For a name in which C_2 is a voiceless coronal affricate and V_2 is a high vowel, the GEMINATED form is preferred.

The experiment described in this section tests these two claims.

3.1 Materials

The stimuli used in this experiment were drawn from the set of Japanese names of the form $(C_1)V_1C_2V_2\#x$, where x comprises at least one syllable. Hence, all stimuli are at least trimoraic and trisyllabic. The morpheme boundary requirement was included to ensure that the absence of a morpheme boundary did not block truncation.

The phonetic make-up of the names varied in two dimensions: height of V_2, and features of C_2. Dividing the vowel inventory into two categories, high (/i/, /u/) and nonhigh (/a/, /e/, /o/) results in two vowel conditions, as in (8.)

(8) Vowel Conditions

$V_{2[+HIGH]}$	/okinori/	/uTuki/
$V_{2[-HIGH]}$	/asao/	/Sigesato/

As discussed in the previous section, consonantal features that were hypothesized to be relevant for motivating the different forms include place of articulation (i.e, coronal versus noncoronal), frication, voicing, and nasality. As such, this dimension of the stimuli was separated into six categories as in (9).

(9) Consonant Conditions

voiceless coronal stops/affricates	/saĉio/
voiceless noncoronal stops	/fukumi/
voiceless fricatives	/kiSiro:/
voiced obstruents	/kazuki/
nasals	/kanetomo/
glides, liquids	/kiyoteru/

For each of the 2 Vowel × 6 Consonant = 12 conditions, six male and six female names were selected from a book of Japanese baby names (Tamiya et al., 2001) following the $(C_1)V_1C_2V_2x$ criterion. A sample of the 144 names is shown in Table 1.

Each stimulus was presented in a contextualizing vignette which introduced two characters, only one of which was named. The name was printed in kanji and the pronunciation, with morpheme boundary indicated

Table 1: Sample of Names used as Stimuli

	$V_{2[+HIGH]}$	$V_{2[-HIGH]}$
voiceless coronal stops/affricates	saĉio	otofumi
voiceless noncoronal stops	fukumi	ĉikatoSi
voiceless fricatives	kiSiro:	asao
voiced obstruents	TuguyoSi	Sigesato
nasals	kimitaka	Tunayuki
glides, liquids	teruhiko	ayao

(following standard dictionary style), was printed immediately after in parentheses. The vignette set up a situation in which the unnamed character needed to get the attention of the named character in order to make some statement. A sample vignette is shown in English in (10).

(10) Imagine there is a young elementary school boy named Kishirou (/kishi#ro:/). His mother has just finished preparing dinner and is calling him to come and eat. What does she say?

"_____ chan, time for dinner!"

3.2 Procedure

21 native speakers of Japanese participated in the study. Each participant took the test via a web-based form, entirely in Japanese. The task was a free response task. For each item, participants were asked to input their first choice of nickname for the given name, and then to input any other choices. Participants were instructed to rely on their intuition to input only names which they deemed "natural". Participants were free to input as many responses as they wished.

4 Results

Participants in this experiment showed a greater overall preference for the SIMPLE form than any other form, listing it as a first choice 49% of the time while the V-LENGTHENED and GEMINATED forms were listed as a first choice 17% and 15% of the time, respectively. However, in contrast with Poser's assertion that the SIMPLE form is always available, for 21 stimuli (14.6%), the SIMPLE form was never listed as either a first or an other choice.

There are three major patterns in the data. First, in line with predictions, when the root name contains a voiceless coronal affricate followed by a high vowel (naTuho), the most common choice was the GEMINATED form: in fact, every stimulus in this category (12) displayed this preference without exception. Conversely, for root names with a voiceless coronal stop followed by a low vowel (kotoe), the most common choice was the SIMPLE form. This effect was significant ($\chi^2 = 65.17$, $p < 0.001$).

The second major pattern observed was with voiceless fricatives. When preceding a nonhigh vowel (masaoki), the most common choice was the SIMPLE form. However, when the voiceless fricative is followed by a high vowel (yasunao), the three output forms were equally likely. This effect was also significant ($\chi^2 = 12.9$, $p < 0.005$).

Finally, for all of the other consonant categories, whether with a high or nonhigh vowel, the SIMPLE form was the most likely option.

5 Discussion

A summary of the three main observations in the experiment is given in (11)-(13).

(11) The SIMPLE form is the default form.
(12) When C_2 is a voiceless coronal affricate and V_2 is a high vowel, the GEMINATED form is strongly preferred.
(13) When C_2 is a voiceless fricative and V_2 is a high vowel, the three forms are equally likely.

Below, I explain the first two of these observations with an OT account using variable constraint rankings. This account builds on Tsuchida's 2001 account of high-vowel devoicing. I begin with an overview of her account and then extend it to explain observations (11) and (12). I will reserve an account of (13) for future work but give some comments below.

5.1 High-vowel devoicing

Tsuchida's 2001 account of high-vowel devoicing relies crucially on two markedness constraints which I will adopt without question. First she proposes a constraint against sequences of [-voice][+voice][-voice] which she calls *VOICECONTOUR. Her second constraint is against vowels carrying the spread-glottis feature [+sg]. She assumes that this feature is inserted on a vowel surrounded by voiceless stop consonants. This constraint applies separately to high and nonhigh vowels as *$\text{HIGHV}_{[+sg]}$ and *$\text{NONHIGHV}_{[+sg]}$. Tsuchida ranks these constraints as shown in (14).

(14) *$\text{NONHIGHV}_{[+sg]}$ > *VOICECONTOUR > *$\text{HIGHV}_{[+sg]}$

The key facts to be captured about gemination are that it occurs when two adjacent voiceless consonant onsets have the same place of articulation and have an intervening high vowel. Gemination is prevented when the vowel is not a high vowel, or when one of the consonants is voiced. In order to capture this, I propose constraints from the MAXIO family—which stipulates that elements in the input must have correspondents in the output—and from the IDENTF family—which stipulates that correspondents must have identical features. In order to capture the place identity restriction, I propose IDENTF-$C_{[place]}$ as a high ranking constraint. The voicing requirement can also be captured

by a high-ranking IDENTF constraint, IDENTF-$C_{[voi]}$. The high-nonhigh vowel restriction can be captured by using a MAXIO constraint, subdivided according to vowel height: MAXIO-$V_{[-high]}$ and MAXIO-$V_{[+high]}$. The former is ranked high in the constraint hierarchy to rule out candidates with nonhigh vowels while the latter constraint is low-ranking to make high-vowel candidates more likely to geminate.

The tables below illustrate how geminated forms are derived. Table 2 shows a geminated output, while Table 3 and Table 4 show non-geminated outputs. Also, for the remainder of the paper, I assume that the *NONHIGH$V_{[+sg]}$ constraint (designed to rule out candidates with devoiced nonhigh vowels) is undominated and therefore exclude the constraint and such candidates from the tableaus and discussion.

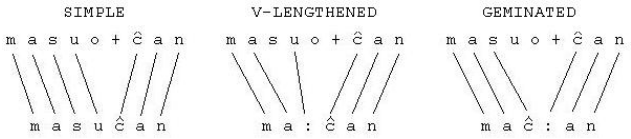
This adaptation explains the subset of high-vowel devoicing contexts in which gemination takes place under consonant [PLACE] identity. Next, I optimize the constraint set further based on the results of the experimental investigation. However, I would like to make one more methodological comment. The *VOICECONTOUR and *HIGH$V_{[+sg]}$ constraints (hereafter, the devoicing constraints) are violated only by the respective voiced and devoiced vowel candidates of the SIMPLE form in each evaluation of the grammar. For the sake of simplicity, in each tableau, I include only the candidate predicted to win under the ranking given in Tsuchida (2001): *VOICECONTOUR > *HIGH$V_{[+sg]}$. Hence, in the high-vowel condition, the devoiced candidate is included and in the nonhigh-vowel condition, the voiced candidate is included.

5.2 Optimization of the constraint set

5.2.1 Producing the GEMINATED form

The correspondence relations between the underlying representation and the surface form which I assume in this paper are shown in Figure 1. In essence, I assume a left-to-right filling of the bimoraic nickname template matching vowels and consonants, respectively, and everything after the second mora of the input name is ignored.

Figure 1: Correspondence Relations for Nickname Forms



As is, the constraint set nearly explains the GEMINATED observations, except that currently, there are no constraints violated by the V-LENGTHENED form. I introduce here two constraints which address the V-LENGTHENED form but postpone an explanation of their motivation until later in the paper. These constraints are MAXIO-$C_{[+cont]}$ and MAXIO-$C_{[-cont]}$ where the former is ranked higher than the latter. With these constraints, the GEMINATED form is derived as illustrated in Table 5.

Crucially, I propose that in this system, MAXIO-$V_{[-high]}$ is an undominated constraint while MAXIO-$V_{[+high]}$ is a universally dominated constraint. It is this alternation which, in part, drives the gemination process. The other driving force is consonant identity. In order to ensure this constraint on the GEMINATED form, I propose IDENTF-$C_{[place]}$ is also an undominated constraint. Table 6 illustrates how the GEMINATED form is ruled out with voiceless noncoronal stops.

The OT analysis given so far is consistent with observations on both high-vowel devoicing and gemination, and explains one major result (see (12)) of the experimental investigation: choice of the GEMINATED form with voiceless coronal affricates. This account also explains the kind of OCP effects discussed in Section 2.1 without positing a separate constraint to cover them.[4]

5.2.2 SIMPLE form as default

For voiced consonants in C_2, candidates of the SIMPLE form have no violations because the devoicing constraints do not apply (recall that [+sg] is inserted only in the presence of voiceless consonants and with voiced consonants there is no voice contour). With no violations, the SIMPLE form would be predicted always to be the outcome for such root names. While indeed, results show that the SIMPLE form appears to be the default form, there is still some slight variation across all conditions. In order to effect this variation, it is necessary for the SIMPLE form candidate in the $C_{2[-voi]}$ case to violate some constraint, albeit low-ranking. I therefore propose a universally dominated constraint, ALIGNL(σ,FT), which requires every syllable in a foot to be aligned at the left edge of the foot. In Japanese, since foot structure is bimoraic (see Itô, 1990; Suzuki, 1995; Poser, 1990), this constraint effectively penalizes bisyllabic feet over monosyllabic feet. Using the ALIGNL(σ,FT) constraint, the appropriate predictions for voiced consonants obtain, as illustrated in Table 7.

5.2.3 Free variation and voiceless fricatives

Because of space limitations, a full account of the free variation observed when a voiceless fricative C_2 is followed by a high vowel will have to be reserved for later work. However, I will give a brief outline of how that account might look. In order to effect free variation, there needs to be three constraints which are comparably ranked and which are violated by the respective three candidate nickname forms. One strategy I am

[4] This may be of interest to some recent efforts to explain OCP effects in terms of markedness constraints (cf., Itô and Mester, 1998)

Table 2: High-Vowel Devoicing and Gemination, I

/koku+kai/	IDENTF-C$_{[place]}$	IDENTF-C$_{[voi]}$	MAXIO-V$_{[-high]}$	*VOICECONTOUR	*HIGHV$_{[+sg]}$	MAXIO-V$_{[+high]}$
kokụ̲kai					*!	
koku̲kai				*!		
kokugai		*!				
→ kok:ai						*

Table 3: High-Vowel Devoicing and Gemination, II

/koku+go:/	IDENTF-C$_{[place]}$	IDENTF-C$_{[voi]}$	MAXIO-V$_{[-high]}$	*VOICECONTOUR	*HIGHV$_{[+sg]}$	MAXIO-V$_{[+high]}$
kokụ̲ko:					*!	
koku̲ko:				*!		
→ kokugo:						
kok:o:						*!

Table 4: High-Vowel Devoicing and Gemination, III

/gaku+sei/	IDENTF-C$_{[place]}$	IDENTF-C$_{[voi]}$	MAXIO-V$_{[-high]}$	*VOICECONTOUR	*HIGHV$_{[+sg]}$	MAXIO-V$_{[+high]}$
→ gakụ̲sei					*	
gaku̲sei				*!		
gakuzei		*!				
gas:ei	*!					*

Table 5: Voiceless Coronal Affricates and High-Vowel Root Names

/saĉiko+ĉaN/	MAXIO-V$_{[-high]}$	...	MAXIO-C$_{[-cont]}$	...	*VOICECONTOUR	*HIGHV$_{[+sg]}$	...	MAXIO-V$_{[+high]}$
saĉ̱ĉaN						*!		
sa:ĉaN			*!					
→ saĉ:aN								*

Table 6: Voiceless Non-Coronal Stops and High Vowel Root Names

/mikiko+ĉaN/	IDENTF-C$_{[place]}$	...	MAXIO-C$_{[-cont]}$	...	*VOICECONTOUR	*HIGHV$_{[+sg]}$	...	MAXIO-V$_{[+high]}$
→ mikị̂ĉaN						*		
mi:ĉaN			*!					
miĉ:aN	*!							*

Table 7: Voiced consonants, I

/hideaki+ĉaN/	IDENTF-C$_{[voi]}$	MAXIO-V$_{[-high]}$	...	MAXIO-C$_{[-cont]}$	...	ALIGNL(σ,FT)
→ hideĉaN						*
hi:ĉaN				*!		
hiĉ:aN	*!	*				

currently taking is as follows. The V-LENGTHENED form violates MAXIO-C$_{[+cont]}$. I propose another new comparably-ranked constraint to the set which is violated by the GEMINATED form: IDENTF-C$_{[cont]}$.

The central question then becomes what constraint the SIMPLE form violates which would then allow free variation. There are several tight restrictions on the work this constraint must do. The key fact is that it must be violated by *both* the voiced and devoiced high-vowel candidates: if only one of these violates the constraint then there will not be free variation. The constraint must also *not* be violated by the voiced non-high vowel SIMPLE form candidate, or it will not be the preferred output in that case. These restrictions make it rather difficult to find an appropriate constraint. At present, I leave this to future work.

5.2.4 Summary

In summary, (15) gives the complete constraint hierarchy as proposed herein.

(15) { *NONHIGHV$_{[+sg]}$, IDENTF-C$_{[voi]}$, IDENTF-C$_{[place]}$, MAXIO-V$_{[-high]}$ } > { MAXIO-C$_{[-cont]}$ } > { IDENTF-C$_{[cont]}$, MAXIO-C$_{[+cont]}$ } > { *VOICECONTOUR, *HIGHV$_{[+sg]}$ } > { MAXIO-V$_{[+high]}$, ALIGNL(σ,FT) }

Crucially, the most salient observation of the experiment described above—the strong preference for the GEMINATED form when C_2 is a voiceless coronal affricate and V_2 is a high vowel—can be explained in terms of two conclusions: First, it is preferable to lose a high vowel completely than merely to devoice it (*HIGHV$_{[+sg]}$ > MAXIO-V$_{[+high]}$) and it is preferable to lose a high vowel than to lose a non-continuant (MAXIO-C$_{[-cont]}$ > MAXIO-V$_{[+high]}$). These preferences are what promotes the GEMINATED form over the SIMPLE and V-LENGTHENED forms, respectively.

6 Conclusions

In this paper, I've described an experiment designed to get native judgments on a variety of nickname forms using the diminutive /ĉaN/. Results do not support Poser's (1990) claim that the SIMPLE form is always available. However, support for the GEMINATED form when a voiceless coronal affricate C_2 is followed by a high-vowel was observed. Finally, the experiment revealed one previously unnoticed trend: when a voiceless fricative C_2 was followed by a high vowel, all three forms were equally likely.

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