A sound-symbolic alternation to express cuteness and the orthographic Lyman's Law in Japanese

Gakuji Kumagai (National Institute for Japanese Language and Linguistics)

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Abstract

This paper discusses a new process in Japanese that involves a semantically driven process in which /h/ alternates with [p] in nicknaming (e.g., ***h****aruka* 'Haruka' → ***p****aru-ru*; ***h****ikaru* 'Hikaru' + *-ko* 'child' → ***p****ika-ko*). As this nicknaming process is mainly applied to female names, it is speculated that /h/ alternates with [p] to express cuteness, regardless of the surrounding contexts. This study ran an experiment that examines whether the singleton [p] is more likely to offer an image of cuteness than other consonants that can be used in Japanese. The results show that the singleton [p] is most likely to be associated with cuteness.

Additionally, this study focuses on the orthographic Lyman's Law, or OCP (diacritic), which can be defined as a constraint that prohibits two auxiliary signs from occurring in a word (Kawahara in press). In Japanese orthography, voiced obstruents (*da* = "だ"; *ga* = "が"; *za* = "ざ"; *ba* = "ば") are expressed with a diacritical sign called a *dakuten* (゛), and [p] (*pa* = "ぱ") with a diacritical sign called a *han-dakuten* (゜). When this fact is taken into consideration, OCP (diacritic) will prevent the singleton [p] to occur with voiced obstruents in a word. OCP (diacritic) has more explanatory power than the traditional Lyman's Law, in the sense that it can predict the singleton [p] as well as voiced obstruents to induce the devoicing of voiced geminates (Fukazawa et al. 2015; Kawahara & Sano 2016b). The current study focuses on testing the constraint that forbids the singleton [p] to precede a voiced obstruent (i.e. [p…D], in which D denotes a voice obstruent), making use of the new nicknaming phenomenon showing /h/→[p] alternation. The experiment also examines whether the nicknaming formation can be affected by OCP-related conditions across morpheme boundaries or within a word, such as Identity Avoidance (e.g., Kawahara & Sano 2014a, 2016a; Kumagai & Kawahara 2017a) and OCP-labial effect (Kumagai 2017). The conclusion drawn by the second experiment is that *[p…D] is psychologically real in the minds of Japanese speakers, and that the /h/→[p] alternation in the new nicknames created is more likely to cease in OCP-related conditions.

Keywords: sound symbolism; cuteness; Lyman's Law; Identity Avoidance; OCP-labial effect; Japanese nicknaming

1. Introduction

There are morphophonological processes in languages that add meaning to the entire word. Adding diminutive suffixes such as –ie and –y as in *doggie* and *kitty* in English is a process that can express smallness. In Japanese, there is a process called palatalization to possess the function of expressing smallness and creating child-like behaviors (i.e. iconic/expressive palatalization), in which coronal fricatives and /ʦ/ can be replaced with [ʧ, ʤ] even before non-front vowels (e.g., *onaka suita* → *onaka [ʧ]uita* '(Are you) hungry?'; *tumetai* → *[ʧ]umetai* '(Is it) cold?'; *tiizu wa oisii* → *tii[ʤ]u wa oi[ʧ]ii* 'The cheese is yummy') (Alderete & Kochetov in press; Kochetov & Alderete 2011; see also Chew 1969; Mester & Ito 1989).[1] This palatalization is neither assimilatory nor phonologically conditioned, and thus distinguished from the assimilatory palatalization triggered by /i/; for example, /t/ is realized as [ʧ] before /i/, or /s/ as [ʃ] (For palatalization in Japanese mimetics, see Alderete & Kochetov 2009; Hamano 1986; Mester & Ito 1989).

This paper discusses a new process in Japanese that involves a semantically driven process such as the expressive palatalization. In Japanese, there is an /h/→[p] or [pp] alternation in the word-medial position (e.g., *su-* 'bare' + ***h****adaka* 'naked' → *su****p-p****adaka* 'naked'; *kin* + ***h****atu* → *kin-****p****atu* 'blond (golden) hair': Labrune 2012). However, the alternation has recently been observed in nicknaming, even in the word-initial position (e.g., ***h****aruka* 'Haruka' → ***p****aru-ru*; ***h****ikaru* 'Hikaru' + *-ko* 'child' → ***p****ika-ko*). As this nicknaming process is mainly applied to female names, it is speculated that /h/ alternates with [p] to express cuteness, regardless of the surrounding contexts. In this respect, the /h/→[p] alternation in the nicknaming process is not driven by a particular morphophonological condition, but a semantically driven process that involves a sound-symbolic phenomenon, in which a particular sound conveys a particular meaning (see, e.g., Blasi et al. 2016; Dingemanse et al. 2015; Hinton et al. 1994/2006; Kawahara 2017; Lockwood & Dingemanse 2015; Sidhu & Pexman 2017 for recent surveys on sound symbolism). Though Hamano (1986, 2014) argues that the Japanese [p] denotes an "explosion of a tensely stretched surface" or smallness/lightness, there is no study that explores the Japanese sound-symbolic /h/→[p] alternation from the perspective of linguistics. This study is based on an experiment that examines whether the singleton [p] is more likely to offer an image of cuteness than other consonants that can be used in Japanese. The results show that the singleton [p] is most likely to be associated with cuteness in Japanese.

[1] With respect to pragmatic aspects of expressive palatalization, Sawada (2013) argues that it has modes that the speaker treats the addressee as a baby and the speaker himself/herself behaves as a baby.

The current study additionally explores a well-known constraint that is active in Japanese phonology, Lyman's Law (henceforth, LL), which disallows two or more voiced obstruents to occur in a word (e.g., Ito & Mester 1986, Ito & Mester 1995, Ito & Mester 2003; Kawahara 2012; Kawahara & Sano 2014a, Kawahara & Sano 2016a; McCawley 1968; Vance 1979, Vance 1980, Vance 1987, Vance 2015, Vance 2016; a.o). In theoretical terms, LL can also be understood as OCP (-son, +voice) (e.g., Ito & Mester 1986, Ito & Mester 2003). LL works at the underlying level, which accounts for the fact that the Japanese language has few monomorphemic words that contain two voiced obstruents: we find *huta* [ɸɯta] 'lid,' *huda* [ɸɯda] 'tag,' *buta* [bɯta] 'pig,' but not *buda* [bɯda] (Ito & Mester 1995), of which the last word contains two voiced obstruents [b, d]. LL also plays a role in blocking the application of the rendaku rule or inducing the devoicing of consonant gemination. For rendaku, the rule does not apply when the resulting form of compounds will contain two voiced obstruents, as exemplified in (1). For example, while the word *kaki* 'persimmon' undergoes rendaku, then resulting in *gaki* (e.g., *sibu* 'sour' + *kaki* 'persimmon' → *sibu-gaki* 'sour persimmon'), the word *kagi* 'key' does not (e.g., *ie* 'house' + *kagi* 'key' → *ie-kagi* 'house key'/**ie-gagi*). For the devoicing of consonant gemination, voiced geminates are tolerated in Japanese loans (e.g., *doggu* 'dog'; *baggu* 'bag') while they are not in native words (Ito & Mester 1995, Ito & Mester 1999). As presented in (2a), they show devoicing when the word contains a voiced obstruent (Kawahara 2006; Nishimura 2006; see Kawahara 2015a for an overview of geminate devoicing in Japanese). More interestingly, the devoicing of the voiced geminates does not occur solely when the word contains a voiceless consonant, as in (2b). Rather, it does occur when LL is violated by voiced geminates and a voiced obstruent (Nishimura 2006). The studies mentioned above demonstrate that LL plays a vital role in Japanese native and loan phonologies.

(1) Rendaku blocking by Lyman's Law

hitori	'alone'	+	tabi	'travel'	→	hitori-tabi/ *hitori-**d**abi 'travelling alone'
ie	'house'	+	kagi	'key'	→	ie-kagi/ *ie-**g**agi 'house key'
kuro	'black'	+	sabi	'rust'	→	kuro-sabi/ *kuro-**z**abi 'black rust'
tori	'bird'	+	hada	'skin'	→	tori-hada/ *tori-**b**ada 'gooseflesh'

(2) Devoicing of voiced geminates

a.	doggu	'dog'	→	[doggɯ] ~ [do**kk**ɯ]
	baggu	'bag'	→	[baggɯ] ~ [ba**kk**ɯ]
b.	heddo	'head'	→	[heddo] ~ ?*[he**tt**o]
	reddo	'red'	→	[reddo] ~ ?*[re**tt**o]
cf.	bagu	'bug'	→	[bagɯ] ~ ?*[ba**k**ɯ]
	gibu	'give'	→	[gibɯ] ~ ?*[gi**p**ɯ]

Evidently, LL is an important constraint in Japanese phonology and morphophonology. On the other hand, there is also a view that LL can be captured in terms of orthography (Kawahara in press). In Japanese, voiced obstruents are expressed with a diacritical sign called a *dakuten* (``). Since /t, k, s, h/ become [b, d, g, z] with the application of rendaku, respectively, the rendaku rule can be defined as a process that adds the diacritical sign called a *dakuten*, as shown in (3) (Vance 2007, Vance 2015, Vance 2016). In terms of the orthographic system, LL can also be defined as a constraint that prohibits two auxiliary signs from occurring in a word (i.e. OCP (diacritic), Kawahara in press).

(3) Rendaku as a process of adding a diacritical sign

oo	'big'	+	tako ta = "た"	'octopus'	→	oo-**d**ako 'big octopus' da = "だ"
hi	'sun'	+	kasa ka = "か"	'umbrella'	→	hi-**g**asa 'parasol' ga = "が"
oo	'big'	+	sake sa = "さ"	'alcohol'	→	oo-**z**ake 'heavy drinking' za = "ざ"
hude	'pencil'	+	hako ha = "は"	'box'	→	hude-**b**ako 'pencil case' ba = "ば"

Furthermore, Kawahara (in press) goes on to argue that OCP (diacritic) can account for the devoicing of voiced geminates in a word containing the singleton [p]. Recent studies have shown that the devoicing of voiced geminates also occurs in words containing the singleton [p], as exemplified in (4) (Fukazawa et al. 2015), and that geminate devoicing can be induced by the singleton [p] as well as a voiced obstruent (Kawahara & Sano 2016b). In Japanese orthography, a diacritical sign called a *han-dakuten* (°) is used to express [p] (*pa* "ぱ"). When this fact is taken into consideration, OCP (diacritic) will prevent the singleton [p] to occur with voiced obstruents in a word, which is what the traditional LL does not predict. In light of this, the orthographic version of LL, or OCP (diacritic), has more explanatory power than the traditional LL, in the sense that it can predict the singleton [p] as well as voiced obstruents to induce the devoicing of voiced geminates.

(4) /p/-driven devoicing

ai-poddo	'i-Pod'	→	[ai-poddo] ~ [ai-po**tt**o]
piramiddo	'pyramid'	→	[piramiddo] ~ [pirami**tt**o]
kyuupiddo	'cupid'	→	[kʲɯːpiddo] ~ [kʲɯːpi**tt**o]

In addition to the experiment that examines the sound-symbolic alternation to express cuteness, the study examines whether the orthographic LL, or OCP (diacritic), plays a role in

Japanese native phonology beyond rendaku and the devoicing of consonant geminates. If we assume that OCP is a constraint that disallows two identical segments or tones to occur together in a certain domain (see, e.g., Bye 2011; Goldsmith 1978; Leben 1973; McCarthy 1986; Odden 1986, 1988; Rose 2001; Suzuki 1998; Yip 1988 for OCP effects), then the OCP (diacritic) should prevent the singleton [p] to occur with a voiced obstruent, in either environment where whether one precedes or follows the other. However, as the singleton [p] rarely occurs in Japanese native words (e.g., Ito & Mester 1995, Ito & Mester 1999; Nasu 2015), it is difficult to find words in which a voiced obstruent precedes [p]. Thus, the current study focuses on testing the constraint that forbids the singleton [p] to precede a voiced obstruent (i.e. [p…D], in which D denotes a voice obstruent), making use of the new nicknaming phenomenon showing /h/→[p] alternation. The experiment also examines whether the nicknaming formation can be affected by OCP-related conditions across morpheme boundaries or within a word, such as Identity Avoidance (Kawahara & Sano 2014a, Kawahara & Sano 2016a; Kumagai & Kawahara 2017a; Moon 2016) and OCP-labial effect (Kumagai 2017; Moon 2017). The conclusion drawn by the second experiment is that *[p…D] is psychologically real in the minds of Japanese speakers, and that the /h/→[p] alternation in the new nicknames created is more likely to cease in OCP-related conditions.

The organization of the current paper is as follows. Section 2 examines whether the singleton [p] is associated with cuteness; Section 3 examines whether *[p…D] is active and whether OCP-related constraints affect the application of /h/→[p] alternation in nicknaming; and Section 4 is a brief conclusion.

2. Experiment I

2.1 A sound-symbolic alternation

Section 2 begins with a brief explanation of the Japanese voiceless glottal fricative /h/ and its alternations with other consonants. For the Japanese /h/, there are several allophones: /h/ is realized as a voiceless bilabial fricative [ɸ] before /u/, as a voiceless palatal fricative [ç] before /i/, and [h] before /a, e, o/ (e.g., Labrune 2012; Tsujimura 2014). The Japanese /h/ exhibits two patterns of alternation. First, as shown in (5), /h/ becomes [b] in rendaku (see Vance & Irwin 2016 for a collection of recent studies on rendaku) and in post-nasal voicing (e.g., Ito et al. 1995, Ito et al. 2001; Ito & Mester 1999; Rice 1997, Rice 2005) Second, /h/ alternates with [pp] in native words and with [p] before a nasal or a moraic obstruent in Sino-Japanese words

(Labrune 2012).[2] In (6a), /h/ is geminated to create emphatic forms, with the final result of [pp], as the occurrence of /hh/ is limited to loans (e.g., *Mach* → [mahha]; *Gogh* → [gohho]) and a number of Sino-Japanese words and compounds (e.g., *juu* 'ten' + *hari* 'stitch' → [dʒɯhhari] 'ten stitches'; *zet(u)* + *huchoo* 'in a slump' → [zeɸɸɯʧoː] 'bad condition') (Labrune 2012). In Sino-Japanese words, as seen in (6b), /h/ becomes [p] when attached to a stem that ends with a nasal, and, in (6c), /h/ turns into [p], indicating regressive assimilation with the preceding consonant.[3]

(5) /h/ → [b] alternation in (a) rendaku and (b) post-nasal voicing

a.	hako	'box'	+	hune	'ship'	→	hako-**b**une 'ark'
	hude	'pencil'	+	hako	'box'	→	hude-**b**ako 'pencil case'
b.	hun	'to step on'	+	haru	'stretch'	→	hu[m]-**b**aru 'stand firm'

(6) /h/ → [pp] in (a) native words and /h/ → [p] in (b, c) Sino-Japanese words

a.	suki	'empty'	+	hara	'stomach'	→	suki**pp**ara 'empty stomach'
	su-	'bare' (prefix)	+	hadaka	'naked'	→	su**pp**adaka 'naked'
b.	sen	先	+	hai	輩	→	se[m]-**p**ai 'boss'
	en	鉛	+	hitu	筆	→	e[m]-**p**itsu 'pencil'
	san	三 'three'	+	hun	分 'minute'	→	sa[m]-**p**un 'three minutes'
	san	三 'three'	+	hen	編 'volume'	→	sa[m]-**p**en 'three volumes'
	san	散	+	ho	歩	→	sa[m]-**p**o 'walking'
c.	sit(u)	失	+	hai	敗	→	si**p**-**p**ai 'failure'
	zet(u)	絶	+	hin	品	→	ze**p**-**p**in 'a superb piece of work'
	rok(u)	六 'six'	+	hun	分 'minute'	→	ro**p**-**p**un 'six minutes'
	it(i)	一 'one'	+	hen	片	→	i**p**-**p**en 'a piece'
	it(i)	一 'one'	+	hon	本	→	i**p**-**p**on 'a …; one …'

[2] There is a view that *h* is posited as /p/ in underlying forms (see e.g., Ito & Mester 1999, Ito & Mester 2015; McCawley 1968; Nasu 2015). Since the singleton /p/ is not allowed to occur in the onset position in native (and Sino-Japanese) words, it is debuccalized to [h] (e.g., **pune* 'ship' → *hune*). When it is preceded by other words in the word formation as in (6b, 6c), it is realized as [p] or geminated as [pp]. However, as seen in Section 1, the current paper focuses on the nicknaming process in which the singleton /p/ does not show debuccalization even in the word-initial position, and thus, the *h* is assumed to be /h/ in underlying forms.

[3] The /h/ → [p] alternation is blocked in complex compounds (e.g., [*mannen*]$_{\text{compound}}$ 'ten thousands years' + *hitu* 'pen' → [*mannen*]-*hitu*/ **mannen-pitu*; *sin* 'new' + [*hatumei*]$_{\text{compound}}$ 'invention' → *sin*-[*hatumei*]$_{\text{compound}}$ 'new invention') (see e.g. Ito & Mester 2015a; Labrune 2012; McCawley 1968 for details).

Recent examples have been produced in which the /h/→[p] alternation is applied to nicknaming, as exemplified in (7). For example, there is a duo of singers in the Japanese anime "Kirarin-reboryuusyon" that consists of two members, *(Tsukishima) Kirari* and *(Mizuki) Hikaru*. This group is named not *kira-hika* but *kira-pika*, in which ***h**ikaru* turns into ***p**ika* with /h/→[p] alternation.[4] Similarly, we find that a make-up artist named ***h**ikaru* is called ***p**ika-ko* with the suffix *–ko* 'child.' An ex-member of AKB48, a Japanese group that consists of young girls who dance and sing, *(Shimazaki)* ***h**aruka* was called ***p**aru-ru*, in which /h/→[p] alternation occurs, with the second mora *ru* reduplicated and the third mora *ka* deleted. The last two examples show that an /h/→[p] alternation occurs even in the word-initial position, which is different from the /h/→[p] alternation in native and Sino-Japanese words, as in (6). As the new nicknaming trend is often used for females, the /h/→[p] alternation may induce it to express cuteness, irrespective of surrounding contexts. In the remainder of this section, we experimentally examine whether the Japanese [p] is more likely to be associated with cuteness than other consonants.

(7) /h/ → [p] alternation in Japanese nicknaming[5]

kirari	+	**h**ikaru	→	kira-**p**ika
hikaru	+	-ko	→	**p**ika-ko
haruka	+	(RED)	→	**p**aru-ru

2.2 Stimuli

To examine whether the singleton [p] has an impression of cuteness, I prepared 39 pairs of nonce words in which /p/ is minimally contrasted with other Japanese phonemes /t, k, s, h, m, n, r, w, j/ in the word-initial position, as shown in Table 1.[6]

[4] Truncating two moras out of names is a commonplace process observed in Japanese hypocoristics (see e.g. Ito 1990; Ito & Mester 2015b; Mester 1990; Poser 1984a, Poser 1984b, Poser 1990).

[5] As a similar example, we find the case where *hime* 'princess' becomes *pime* (e.g., *ayu* 'Ayu' + *hime* → *ayu-pime*). Note that the word *hime* does not undergo rendaku (i.e. *mai* 'dancing' + *hime* 'princess' → *mai-hime*/**mai-bime*) (Kawahara et al. 2006; Kumagai 2017).

[6] Recent studies on sound symbolic effect (Kawahara et al. 2008; Kawahara & Kumagai to appear) have shown that the contrast on the initial position is more likely to give rise to clear results (i.e. positional effect).

Table 1. Set of stimuli

contrasts	/p/ group	vs.	non-/p/ group
/p/ vs. /t/	**p**aonun	vs.	**t**aonun
	pironen	vs.	**t**ironen
	puhikee	vs.	**t**uhikee
	pemomon	vs.	**t**emomon
	pokatun	vs.	**t**okatun
/p/ vs. /k/	**p**akutun	vs.	**k**akutun
	piisun	vs.	**k**iisun
	pukekee	vs.	**k**ukekee
	pehohen	vs.	**k**ehohen
	pokutun	vs.	**k**okutun
/p/ vs. /s/	**p**ajokin	vs.	**s**ajokin
	pitakon	vs.	**s**itakon
	pukikon	vs.	**s**ukikon
	pesatee	vs.	**s**esatee
	pomitin	vs.	**s**omitin
/p/ vs. /h/	**p**ahenun	vs.	**h**ahenun
	piejoo	vs.	**h**iejoo
	purisun	vs.	**h**urisun
	petajan	vs.	**h**etajan
	potosen	vs.	**h**otosen
/p/ vs. /m/	**p**atoreenu	vs.	**m**atoreenu
	pisimaanu	vs.	**m**isimaanu
	punanuunu	vs.	**m**unanuunu
	pehaiinu	vs.	**m**ehaiinu
	pokikaanu	vs.	**m**okikaanu
/p/ vs. /n/	**p**aesun	vs.	**n**aesun
	pisamuu	vs.	**n**isamuu
	punitun	vs.	**n**unitun
	pesiman	vs.	**n**esiman
	potenun	vs.	**n**otenun
/p/ vs. /r/	**p**awanan	vs.	**r**awanan
	pijamon	vs.	**r**ijamon
	pukikon	vs.	**r**ukikon
	pekehin	vs.	**r**ekehin
	potinii	vs.	**r**otinii
/p/ vs. /w/	**p**atinaa	vs.	**w**atinaa
/p/ vs. *y* /j/	**p**amuen	vs.	**y**amuen
	purunee	vs.	**y**urunee
	posison	vs.	**y**osison

Voiced obstruents /b, d, g, z/ were excluded from the set of stimuli because they offer an image of heaviness and largeness in Japanese (e.g., Hamano 1986, 2014; Kawahara 2017; Kawahara et al. in press; Kawahara & Kumagai to appear; Kawahara & Shinohara 2016). These four consonants are more likely to appear in Japanese male names than in female names (Kawahara 2015b), which is inconsistent with cuteness which is this study's focus. For the first seven consonants, I created five pairs for each consonant in such a way that every vowel /i, e, a, o, u/ followed each consonant (7*5=35 pairs). For the last two consonants, as there are phonotactic restrictions in Japanese native phonology, in which /w/ and /j/ are followed by /a/ and /a, o, u/, respectively, I created a nonce word in which /w/ is followed by /a/, and nonce words in which /j/ is followed by /a, o, u/ (1+3 = 4 pairs). To avoid the experimenter's bias towards creating nonce words, the current experiment employed a random generator of Japanese nonce words that is available at http://bit.ly/2iGaKko. Since the nonce words the website generated seem not to sound as natural as names, I added some suffixes such as /n/, a long vowel /R/, or the combination of a long vowel and *nu* /Rnu/ to the end of the words it generated.

2.3 Participants and procedure

The experiment was conducted using SurveyMonkey, which recruited 35 native speakers of Japanese online. They were presented 39 pairs of stimuli that were translated into Japanese orthography, *katakana*, and then they were asked which name is cuter (*kawaii* in Japanese) than the other (e.g., ***p****aonun* vs. ***t****aonun*). The questions were provided in random order for each participant.

2.4 Results

The rate of response to words containing /p/ is shown in all of the figures presented in this section, in which error bars represent 95% confidence intervals. The overall results are shown in Figure 1. Each response proportion is as follows: /p/ vs. /t/ = 0.79; /p/ vs. /k/ = 0.87; /p/ vs. /s/ = 0.83; /p/ vs. /h/ = 0.9; /p/ vs. /m/ = 0.59; /p/ vs. /n/ = 0.86; /p/ vs. /r/ = 0.79; /p/ vs. /w/ = 0.69; /p/ vs. *y* (/j/) = 0.83. All of these responses are beyond a chance level, although the results of /m/ seem to be less clear (see Figure 3 for more details). Since the current experiment used a forced-choice task, a generalized mixed-effects logistic regression was implemented, using the *glmer()* function of the *language R* and *lme4* packages (Baayen 2008) of R (R Development Core Team 2016). Subjects and items were coded as random effects. The results show that words with /p/ are more significantly judged as cute names than those with other consonants ($z = 17.52$, $p < .001$).

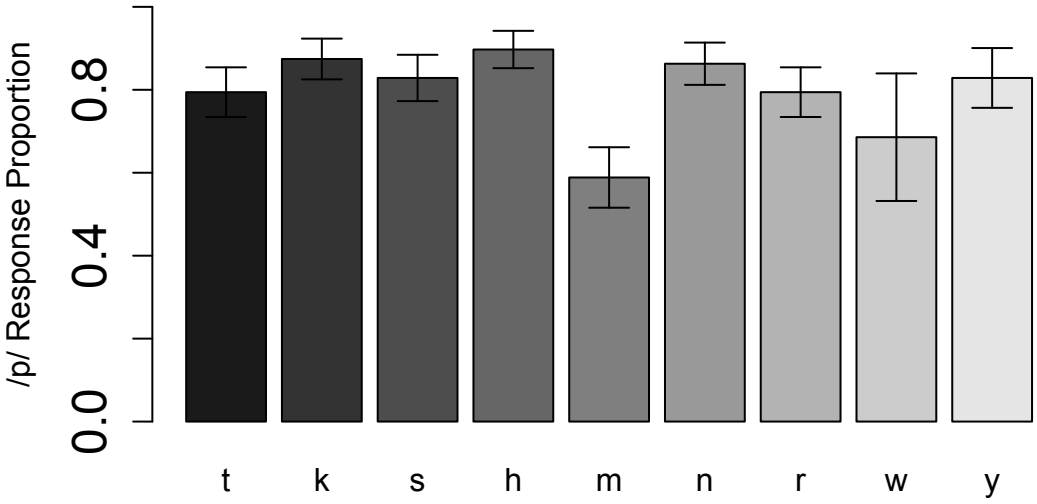

Figure 1: /p/ response proportion

Since we are primarily concerned with /h/→[p] alternation in Japanese nicknaming, we take a closer look at the results of /p/ vs. /h/ pairs in Figure 2. The rate to each vowel is as follows: /pi/ vs. /hi/ = 0.91; /pe/ vs. /he/ = 0.91; /pa/ vs. /ha/ = 0.94; /po/ vs. /ho/ = 0.91; /pu/ vs. /hu/ = 0.8. There was a significant difference between /p/ and /h/ ($z = 12.31$, $p < .001$), which clearly indicates that word containing the singleton /p/ is more likely to be chosen as cute than /h/, no matter what vowel follows the first consonant. This suggests that alternating /h/ with [p] can express cuteness in Japanese.

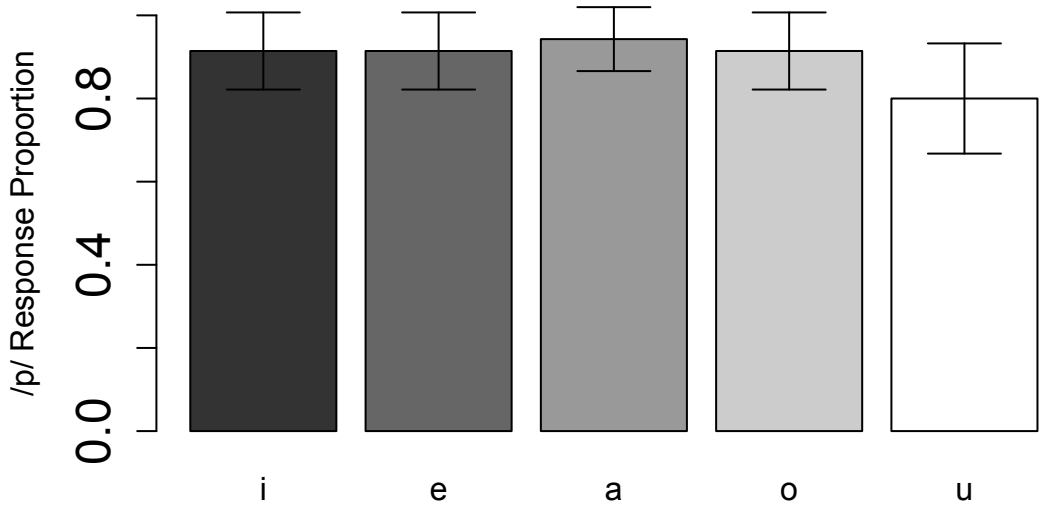

Figure 2: /p/ response proportion (/p/ vs. /h/)

As mentioned above, we obtained less clear results of /p/ vs. /m/ pairs. Detailed results are provided in Figure 3. The rate to each vowel is as follows: /pi/ vs. /mi/ = 0.54; /pe/ vs. /me/ = 0.49; /pa/ vs. /ma/ = 0.49; /po/ vs. /mo/ = 0.66; /pu/ vs. /mu/ = 0.77. A generalized mixed-

effects logistic regression analysis shows that there was also a slightly significant difference between /p/ and /m/ ($z = 2.474$, $p < .05$).

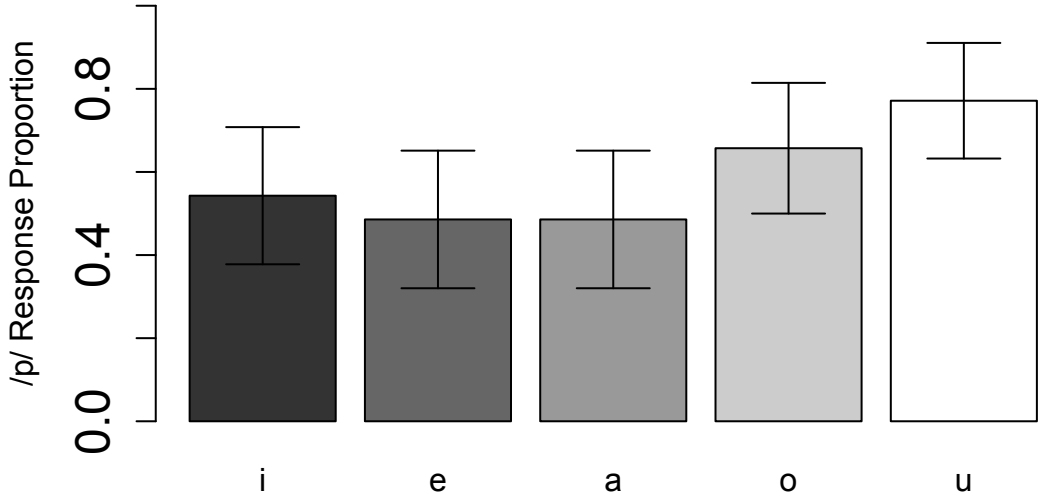

Figure 3: /p/ response proportion (/p/ vs. /m/)

2.5 Discussion

The results indicate that the singleton [p] is most likely to be associated with cuteness than other consonants, although there was a subtle difference between /p/ and /m/. There are two issues that need to be further discussed; the first question is, if we assume that [p] and [m] are consonants used to express cuteness, how do Japanese speakers learn that the labial consonants are associated with cuteness? One presumable answer is that they are associated with babies. Labial stops are known as consonants that babies acquire earlier than other consonants (Jacobson 1941/1968), which is true of Japanese children (see Ota 2015 for an overview of phonological development in Japanese). In addition, Kumagai and Kawahara (2017b) report that the labials [p, m] are contained in well-known Japanese diaper brand names. When these facts are taken into account, it is not surprising for general Japanese speakers to possess a sound-meaning association between labials and babies, which could beget the sound-meaning association between labials and cuteness. If this association comes from acquisition, we may expect it to be observed in languages where labial stops are the first consonants babies acquire. This question should be examined in future research.

The second question is, if not only [p] but also [m] is associated with cuteness, then is there a possibility that /h/ alternates with [m], rather than [p] in Japanese nicknaming? Probably not. At least, in Japanese phonology, /h/ has a closer kinship with [p] than with [m], since there is an /h/→[p] or [pp] alternation in native and Sino-Japanese words. Thus, even if [m] is also a consonant that denotes cuteness, /h/ will not alternate with [m] in Japanese. Whether [m] per

se is another consonant to express cuteness is another interesting topic, but will be left for future research, as it is beyond the scope of the current paper.

To conclude, Experiment I examined if the singleton [p] can create an image of cuteness in the minds of Japanese speakers. The results showed that words with the initial /p/ consonant were more likely to be judged as cute than those with initial non-/p/ consonants. We can thus conclude that the new trend of nicknaming utilizes the /h/→[p] alternation to express cuteness. With this sound-symbolic alternation identified as a part of the nicknaming process, the next section will discuss whether *[p…D] is active in Japanese.

3. Experiment II

3.1 Identity avoidance and OCP effects

Section 3 examines the psychological status of *[p…D] in the minds of Japanese speakers, using the new trend in nicknaming in which /h/ alternates with [p]. Experiment II also tests for Identity Avoidance and OCP-labial effect in the nicknaming process, which we will explain below. Identity Avoidance, or OCP, is the phenomenon in which a sequence of identical consonant or mora is disfavored, or when consonants that share identical features are disfavored (see, e.g., Bye 2011; Goldsmith 1978; Leben 1973; McCarthy 1986; Odden 1986, 1988; Rose 2001; Suzuki 1998; Yip 1988 for OCP effects). In Japanese, a dictionary-based survey (Kawahara et al. 2006) indicated that homorganic consonants are less likely to co-occur in native words,[7] and, as already explained in Section 1, surface forms are severely restricted by LL (aka OCP (-son, +voice)). In experimental settings, Identity Avoidance, or OCP effects, has also been observed across morpheme boundaries (Kawahara & Sano 2016a; Kumagai & Kawahara 2017a; Moon 2016, 2017) and within a word (Kawahara & Sano 2014a; Kumagai 2017). Kawahara and Sano (2016a) have demonstrated that the rendaku rule is more likely to be triggered or blocked when the resulting form of novel compounds produces identical consonants or moras than when it is not; for example, when *iga* (nonce word) is attached to *kaniro* (nonce word), the rendaku rule is less likely to apply because the resulting form would be ***iga-ga****niro*, in which there are identical moras, *ga,* across the morpheme boundary. Kumagai and Kawahara (2017a) show that identical nasals or moras are more likely to be eschewed in word ordering of group names; for example, when you name a group that consists of *hana* (a girl's name) and *nami* (a girl's name), *nami-hana* is more likely to be favored over *ha****na-na****mi*, which has identical moras *na* across the morpheme boundary. Moon (2017) reports that

[7] It should be noted that there are native words in which identical moras are repeated (e.g., *nana* 'seven'; *sasa* 'bamboo'; *haha* 'mother'; *momo* 'peach'; *mimi* 'ear').

identical place features of consonants can affect patterns of compound truncation in loans; she focuses on while ***pa****a****so****naru-****kon****pyuutaa* 'personal computer' is abbreviated as *paso-kon*, ***shaa****pu-****pen****siru* 'sharp pencil' turns into *shaa-pen*, rather than **sha****p****u-****p****en*, in which there is a sequence of the singleton /p/ across the morpheme boundary of truncated compounds (see Moon 2016 for other examples). Her experiment using nonce words demonstrated that, for example, when *riipino* (nonce word) is combined with *panfuretto* 'pamphlet,' *rii-pan* is more likely to be chosen as an acceptable form than the form with double /p/ (i.e. *ri****p****i-****p****an*). In line with these works, Experiment II examines whether the new nicknaming involves Identity Avoidance working at consonantal and CV-moraic levels across morpheme boundaries (i.e. OCP (C) and (CV)).

In Japanese rendaku, there are a number of blocking constraints in addition to LL. For example, /h/ does not undergo rendaku if followed by the labial [m], as exemplified in (8) (Kawahara et al. 2006; Kawahara 2015c). A presumable reason for this rendaku blocking is that, if /h/ turns into the labial [b], it would give rise to a sequence of homorganic consonants [**b**…m], which would violate a putative OCP-labial effect, as observed in other languages (Alderete & Frisch 2007; Bye 2011; Odden 1994; Selkirk 1993; Zuraw & Lu 2009).

(8) [b…m]

	suna	'sand'	+	hama	'beach'	→	suna-hama/ *suna-**b**ama 'sand beach'
	mai	'dancing'	+	hime	'princess'	→	mai-hime/ *mai-**b**ime 'dancing girl'
	kutu	'shoe'	+	himo	'lace'	→	kutu-himo/ *kutu-**b**imo 'shoe lace'
cf.	hako	'box'	+	hune	'ship'	→	hako-**b**une 'ark'
	hude	'pencil'	+	hako	'box'	→	hude-**b**ako 'pencil case'

Kumagai (2017) reported an experiment that examined whether rendaku blocking is confirmed in nonce words that contain labial consonants. The results showed that 1) the OCP-labial effect is at work when the word contains [b, m, ɸ]; 2) it works locally rather than non-locally; and 3) the more similar two consonants are in a word, the more unlikely the rendaku rule is to apply. The last finding is the quasi-universal tendency that the more similar two consonants are, the more strongly they are disfavored (e.g., Berent & Shimron 2003; Berent et al. 2004; Buckley 1997; Frisch et al. 2004; Greenberg 1950; Pierrehumbert 1993). In Experiment II, we will test whether the OCP-labial effect is at work when a labial consonant follows [p] within a word (without extending across the morpheme boundary). If the OCP-labial effect works more widely beyond rendaku, then the resulting form will be more

acceptable when the D is a non-labial than when it is the labial [b], which would violate an OCP-labial constraint.

To sum up, using the nicknaming involving /h/→[p] alternation, Experiment II examines whether *[p…D] is active beyond rendaku and devoicing of consonant geminates, and whether the OCP-related conditions such as Identity Avoidance (across morpheme boundaries) and the OCP-labial effect (within a word) are at work.

3.2 Stimuli

As stimuli, the current experiment uses compound truncation forms (e.g., *Kimura* + *Takuya* → *Kimu-taku*), in which two moras of the first member of the compounds and two moras of the second member of the compounds are left for truncation (e.g., Ito 1990; Kubozono 2015; Moon 2017). In the current case, the first member is a family name, and the second member is a given name.

Table 2 shows the set of stimuli for given names. There are three groups, each of which has three trimoraic names whose first vowel is any of /a, i, u/. The names in each group begin with /h…n/ (e.g., *hanemi*), /h…d/ (e.g., *hadami*), and /h…b/ (e.g., *habiyo*), respectively.[8] The first two moras are left for truncation. When these forms undergo truncation and /h/→[p] alternation applies, they will be [p…n], [p…d], or [p…b], respectively, the last two of which violate *[p…D]. The [p…b] pair also violates OCP (labial).

Table 2. Set of stimuli (Given names)

	[p…n]	[p…d]	[p…b]
*[p…D]	*not violated*	***violated***	***violated***
OCP (labial)	*not violated*	*not violated*	***violated***
a. (V_1 = a)	hanemi → pane	hadami → pada	habiyo → pabi
b. (V_1 = i)	hinako → pina	hidemi → pide	hibari → piba
c. (V_1 = u)	huneko → pune	hudeko → pude	hubeko → pube

[8] Words with /h…z/ and /h…g/ were excluded from the set of stimuli, which will be [p…z] and [p…g], respectively, because we cannot purely compare them with a control group. For /n/ and /z/, there is a difference in continuancy (i.e., /n/ = [-continuant]; /z/ = [+continuant]). Similarly, for /n/ and /g/, there is a difference in place of articulation. Thus, even if the nicknaming with [p…z] or [p…g] is less likely to be tolerated than that with [p…n], we cannot deny the possibility that it comes either from *[p…D] or the difference in continuancy or place of articulation, or both. Note that the Japanese language has no /ŋ/ as a phoneme.

Table 3 shows four conditions of family names. CV condition consists of names with three light (CV-moraic) syllables (e.g., *kasino*). The first two moras of original family names are left after truncation (e.g., *kasino* + *hanami* → *kasi#pana*). Coda-nasal (m#) condition consists of trimoraic names whose second mora is a coda-nasal (e.g., *kanno*).[9] As the nasal ends before /p/ after truncation; it shows articulatory assimilation (e.g., *kanno* + *hanami* → *kan#pana* = [ka**m**pana]). Since, in Sino-Japanese, /h/ alternates with [p] when preceded by a nasal (e.g., *kin* + ***h****atu* → *kin-****p****atu* 'blond (golden) hair') (Labrune 2012), we predict that the coda-nasal condition will be more likely to tolerate /h/→[p] alternation than the CV condition. The other two conditions are related to OCP effects. For these conditions, truncation leaves the first and third moras of original family names. For OCP(C), the consonant of the third mora of a family name is identical to the following one while the vowel is not identical to the following one (e.g., *kempe* + *hanemi* → *ke****p****e#****p****ane*). For OCP(CV), the third mora is identical to the following one (e.g., *tampa* + *hanemi* → *ta****pa***#***pa****ne*).

Table 3. Set of stimuli (Family names)

	CV# CV	m# coda-nasal	/…p#pV/ OCP(C)	/…pV#pV/ OCP(CV)
a.	kasino → kasi	kanno → kan	kempe → kepe	tampa → tapa
b.	kosino → kosi	konno → kon	kampa → kapa	sappinai → sapi
c.	hosino → hosi	honda → hon	simpo → sipo	tampu → tapu

In the current experiment, the nine given names in Table 2 are tested under each condition (9 items*4 conditions = 36 questions).[10] Each given name (a, b, c) is attached to each family name (a, b, c), respectively. The CV condition for example, *kasino* (Table 3a) is combined with *hanemi, hadami*, and *habiyo* (Table 2a), *kosino* (Table 3b) with *hinako, hidemi*, and *hibari* (Table 2b), and *hosino* (Table 3c) with *huneko, hudeko*, and *hubeko* (Table 2c), respectively. All tested items for each condition are presented in Table 4.

[9] The coda nasal is counted as one mora in Japanese (e.g., Kubozono 2015; Labrune 2012; Tsujimura 2014).

[10] The test included 24 other questions that were unrelated to the conditions of the current experiment.

Table 4-1. Test items (CV condition)

	family names	+	given names	→	nicknames	
a.	*kasino*	+	*hanemi*	→	*kasi-pane*	[p…n]
b.	*kosino*	+	*hinako*	→	*kosi-pina*	[p…n]
c.	*hosino*	+	*huneko*	→	*hosi-pune*	[p…n]
a.	*kasino*	+	*hadami*	→	*kasi-pada*	[p…d]
b.	*kosino*	+	*hidemi*	→	*kosi-pide*	[p…d]
c.	*hosino*	+	*hudeko*	→	*hosi-pude*	[p…d]
a.	*kasino*	+	*habiyo*	→	*kasi-pabi*	[p…b]
b.	*kosino*	+	*hibari*	→	*kosi-piba*	[p…b]
c.	*hosino*	+	*hubeko*	→	*hosi-pube*	[p…b]

Table 4-2. Test items (Coda-nasal condition)

	family names	+	given names	→	nicknames	
a.	*kanno*	+	*hanemi*	→	*ka**n**-pane*	[p…n]
b.	*konno*	+	*hinako*	→	*ko**n**-pina*	[p…n]
c.	*honda*	+	*huneko*	→	*ho**n**-pune*	[p…n]
a.	*kanno*	+	*hadami*	→	*ka**n**-pada*	[p…d]
b.	*konno*	+	*hidemi*	→	*ko**n**-pide*	[p…d]
c.	*honda*	+	*hudeko*	→	*ho**n**-pude*	[p…d]
a.	*kanno*	+	*habiyo*	→	*ka**n**-pabi*	[p…b]
b.	*konno*	+	*hibari*	→	*ko**n**-piba*	[p…b]
c.	*honda*	+	*hubeko*	→	*ho**n**-pube*	[p…b]

Table 4-3. Test items (OCP(C) condition)

	family names	+	given names	→	nicknames	
a.	*kempe*	+	*hanemi*	→	*ke**p**e-**p**ane*	[p…n]
b.	*kampa*	+	*hinako*	→	*ka**p**a-**p**ina*	[p…n]
c.	*simpo*	+	*huneko*	→	*si**p**o-**p**une*	[p…n]
a.	*kempe*	+	*hadami*	→	*ke**p**e-**p**ada*	[p…d]
b.	*kampa*	+	*hidemi*	→	*ka**p**a-**p**ide*	[p…d]
c.	*simpo*	+	*hudeko*	→	*si**p**o-**p**ude*	[p…d]
a.	*kempe*	+	*habiyo*	→	*ke**p**e-**p**abi*	[p…b]
b.	*kampa*	+	*hibari*	→	*ka**p**a-**p**iba*	[p…b]
c.	*simpo*	+	*hubeko*	→	*si**p**o-**p**ube*	[p…b]

Table 4-4. Test items (OCP(CV) condition)

	family names	+	given names	→	nicknames	
a.	*tampa*	+	*hanemi*	→	*ta**pa-pa**ne*	[p…n]
b.	*sappinai*	+	*hinako*	→	*sa**pi-pi**na*	[p…n]
c.	*tampu*	+	*huneko*	→	*ta**pu-pu**ne*	[p…n]
a.	*tampa*	+	*hadami*	→	*ta**pa-pa**da*	[p…d]
b.	*sappinai*	+	*hidemi*	→	*sa**pi-pi**de*	[p…d]
c.	*tampu*	+	*hudeko*	→	*ta**pu-pu**de*	[p…d]
a.	*tampa*	+	*habiyo*	→	*ta**pa-pa**bi*	[p…b]
b.	*sappinai*	+	*hibari*	→	*sa**pi-pi**ba*	[p…b]
c.	*tampu*	+	*hubeko*	→	*ta**pu-pu**be*	[p…b]

3.3 Participants and procedure

The experiment was run online using SurveyMonkey. Participants in Experiment II were 69 native speakers of Japanese from various Japanese universities who did not participate in Experiment I. The instruction and questions were written in Japanese. In the instruction session, they were asked to judge the naturalness of nicknames with /h/→[p] alternation already applied, using six scales (1: very unnatural ~ 6: very natural), and were then provided with a few actual examples of nicknames and asked to evaluate for practice before the test session. All test items were written in Japanese orthography, *hiragana*, in which /p, b, d/ are expressed with diacritical signs (e.g., /pa/ 'ぱ'; /da/ 'だ'; /ga/ 'が'). The order of questions was randomized and different for each participant.

3.4 Results

Before going into the detail analysis, we begin with comparing CV and coda-nasal conditions with two OCP conditions. Table 5 shows the average naturalness in each condition. The range of average naturalness is one to six. For average naturalness, the OCP conditions were lower than the CV and coda-nasal conditions, from which it follows that the OCP conditions are less likely to tolerate the forms with /h/→[p] alternation than the CV and coda-nasal conditions. For statistical analysis, the current experiment ran a linear mixed model. The results show that there were significant differences between the CV condition and the two OCP conditions (/CV#p-n/ vs. /p#p-n/: t = -6.764, p < .001; /CV#p-d/ vs. /p#p-d/: t = -6.114, p < .001; /CV#p-b/ vs. /p#p-b/: t = -5.212, p < .001; /CV#p-n/ vs. /pV#pV-n/: t = -5.624, p < .001; /CV#p-d/ vs. /pV#pV-d/: t = -4.957, p < .001; /CV#p-b/ vs. /pV#pV-b/: t = -3.144, p < .01), and that there were also significant differences between the coda-nasal condition and the two OCP conditions (/m#p-n/ vs. /p#p-n/: t = -6.756, p < .001; /m#p-d/ vs. /p#p-d/: t = -4.978, p < .001; /m#p-b/ vs. /p#p-b/: t = -4.527, p < .001; /m#p-n/ vs. /pV#pV-n/: t = -5.495, p < .001; /m#p-d/ vs. /pV#pV-d/: t = -3.895, p < .001; /m#p-b/ vs. /pV#pV-b/: t = -2.404, p < .05).

Table 5. Average naturalness in each condition

	CV	Coda-nasal	OCP(C)	OCP(CV)
p-n	3.28	3.31	2.39	2.54
p-d	2.77	2.68	2.06	2.19
p-b	2.49	2.43	1.91	2.14

Figure 4 shows the average naturalness in the CV and coda-nasal conditions. For the CV condition, there were significant differences between /CV#p-n/ and /CV#p-d/ (t = 3.429, p < .001) and between /CV#p-n/ and /CV#p-b/ (t = 5.542, p < .001). For the coda-nasal condition, there were also significant differences between /m#p-n/ and /m#p-d/ (t = 4.384, p < .001) and between /m#p-n/ and /m#p-b/ (t = 6.355, p < .001). These results suggest that *[p…D] is active in the nicknaming process. With respect to the OCP-labial effect, there was a slightly significant difference between /CV#p-d/ and /CV#p-b/ (t = 1.984, p < .05). There was not a significant difference between /m#p-d/ and /m#p-b/ (t = 1.841, *n.s*), but it was nearly significant (p = .062). These results suggest that OCP (labial) seems to be at work.

For the difference between the CV and coda-nasal conditions, we found no significant differences between each group (/CV#p-n/ vs. /m#p-n/: t = 0.22, *n.s*; /CV#p-d/ vs. /m#p-d/: t = -0.679, *n.s*; /CV#p-b/ vs. /m#p-b/: t = -0.52, *n.s*), which means that a nasal before the morpheme boundary does not always induce /h/→[p] alternation in the nicknaming process. This will be discussed in Section 3.5. The results might lead one to think that conditions before the morpheme boundary have nothing to do with naturalness judgment of the resulting form of novel nicknames, but, as we will see in Figure 5, the average naturalness can be reduced in OCP conditions.

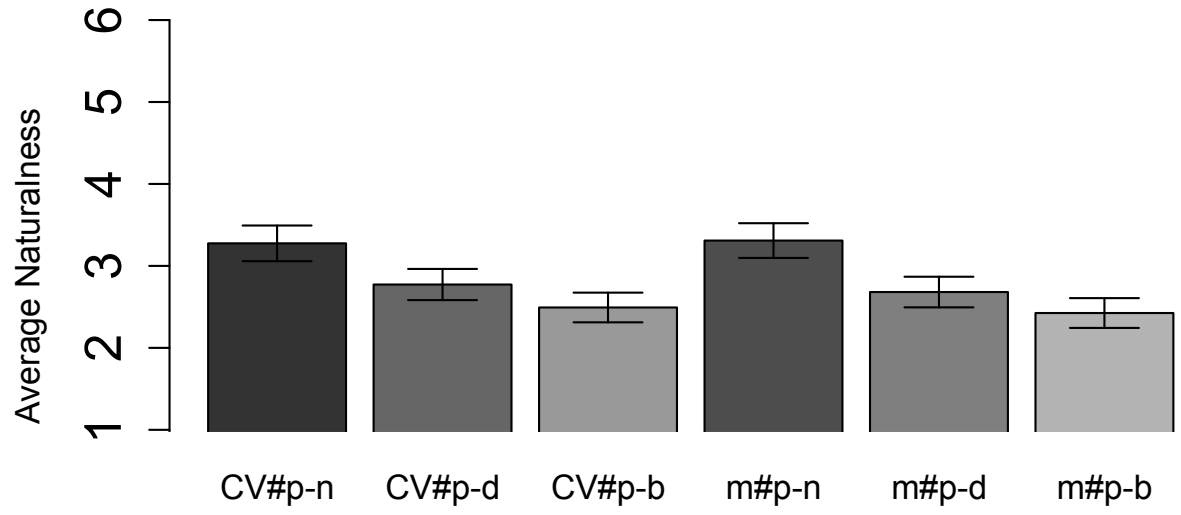

Figure 4: Average naturalness in control and coda-nasal (m#) conditions

Figure 5 shows the average naturalness in the OCP(C) and OCP(CV) conditions. For the OCP(C), there were significant differences between /p#p-n/ vs. /p#p-d/ ($t = 2.797$, $p < .01$) and between /p#p-n/ vs. /p#p-b/ ($t = 4.326$, $p < .001$). For the OCP(CV), there were significant differences between /pV#pV-n/ vs. /pV#pV-d/ ($t = 2.805$, $p < .01$) and between /pV#pV-n/ vs. /pV#pV-b/ ($t = 3.388$, $p < .001$). These results suggest that *[p…D] is active in OCP conditions as well as in non-OCP conditions. For the OCP-labial effect, there were no significant differences in each condition (/p#p-d/ vs. /p#p-b/: $t = 1.355$, *n.s*; /pV#pV-d/ vs. /pV#pV-b/: $t = 0.454$, *n.s*). Why did the OCP-labial effect not show up in OCP-related conditions? The reason may be that the average naturalness in OCP(C) and OCP(CV) conditions was too low for there to be a difference between /p-d/ and /p-b/.

Looking closely at the difference between the OCP (C) and OCP (CV) conditions, the average naturalness is higher in the OCP (CV) than in the OCP (C), which implies that Japanese speakers *favor* a sequence of identical moras across the morpheme boundary over that of identical consonants. In terms of statistical analysis, there may be no or little significant differences in naturalness between the OCP(C) and OCP(CV) conditions (/p#p-n/ vs. /pV#pV-n/: $t = 1.209$, *n.s*; /p#p-d/ vs. /pV#pV-d/: $t = 1.168$, *n.s*; /p#p-b/ vs. /pV#pV-b/: $t = 2.309$, $p < .05$), but this consequence was unintended because the previous experiments on OCP(C) and OCP(CV) (Kawahara & Sano 2016a; Kumagai & Kawahara 2017a; Moon 2016) have shown that identical moras are disfavored. This will be discussed in detail in Section 3.5.

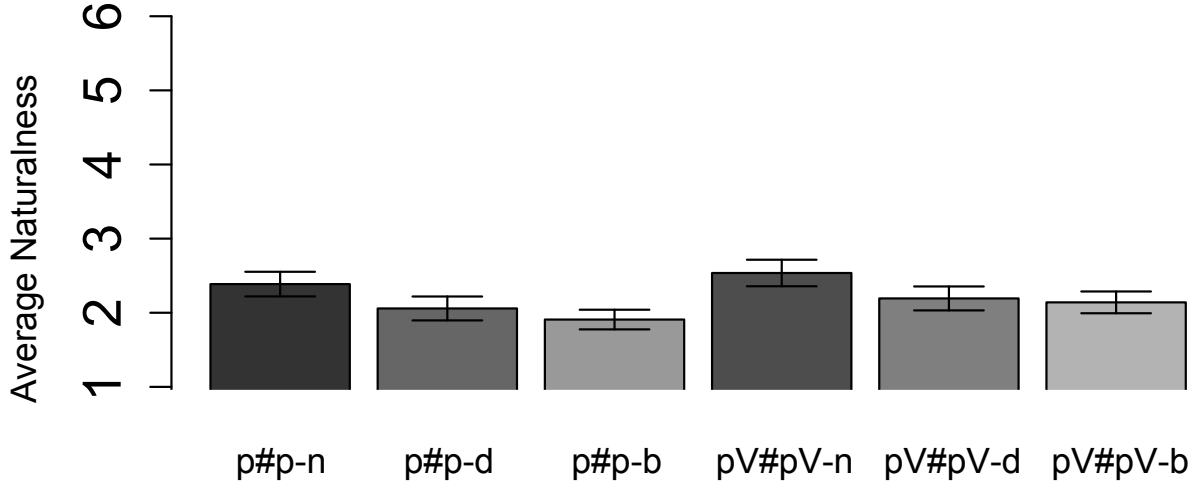

Figure 5: Average naturalness in OCP(C) (p#p) and OCP(CV) (pV#pV) conditions

To recapitulate, Experiment II has revealed the following five points: 1) *[p…D] is active in Japanese nicknames showing /h/→[p] alternation; 2) the OCP-labial seems to work in non-OCP conditions but not in OCP conditions; 3) there was no difference in affecting the average naturalness between the CV and coda-nasal conditions; 4) the average naturalness deteriorates in two OCP conditions; and 5) there was no difference in the average naturalness between the OCP(C) and OCP(CV) conditions (cf. Kawahara & Sano 2016a; Kumagai & Kawahara 2017a; Moon 2016).

3.5 Discussion

Experiment II has demonstrated the psychological status of the orthographic LL, or OCP (diacritic), although it focuses on part of it, *[p…D]. It has also revealed that Identity Avoidance across morpheme boundaries and the OCP-labial effect within a word have been observed in the nicknaming process. There are two issues discussed below. The first question is why the coda-nasal condition did not affect the average naturalness. Since /h/ becomes [p] when it follows a nasal in Sino-Japanese (Labrune 2012), we predicted that the coda-nasal condition was more likely to tolerate /h/→[p] alternation in the nicknaming than the CV condition, but the results showed that there was no significant difference between the coda-nasal and CV conditions. This outcome means that the /h/→[p] alternation in nicknaming is not phonologically conditioned, but is a sound-symbolic alternation to express cuteness, as demonstrated by Experiment I.

The second question that should be addressed is why the difference between OCP (C) and OCP(CV) conditions was not observed. In principle, when a form violates OCP(CV), it always violates OCP(C) as well. If this is correct, the OCP(CV) condition should render an average naturalness lower than the OCP(C) condition, but Experiment II indicated that there was no or little difference in the average naturalness between the OCP(C) and OCP(CV) conditions. There are two possibilities for this result. The first possibility is that OCP(CV) does not work, at least, in the Japanese nicknaming process. If there does not exist OCP(CV) at all, we can expect there to be no difference in the average naturalness in OCP(C) and OCP(CV) conditions. However, the previous experiments on OCP(C) and OCP(CV) have demonstrated that OCP(CV) has a strong effect on rendaku formation (Kawahara & Sano 2016a), group naming (Kumagai & Kawahara 2017a), and compound truncation (Moon 2016). Kumagai and Kawahara (2017a) also show that in the analysis of group naming and rendaku in the framework of Maximum entropy grammar, the weight for OCP(CV) is higher than the weight for OCP(C). Therefore, the first possibility may not be legitimate.

The second possibility is that identical moras are *favored* over identical consonants in Japanese nicknaming, which could also result in the case where there is no difference in the average naturalness in OCP(C) and OCP(CV) conditions. Looking back at the third example presented in (7), ***H**aruka* was called ***P**aruru*, in which, while the third mora of her original name, *ka,* is omitted, the second mora, *ru,* is reduplicated. This reduplication has been pervasive as a process in Japanese nicknaming (e.g., *Aya* → *Ayaya*; *Riho* → *Ripopo*; *Yuna* → *Yunana*: see Hashimoto 2016 for other examples), which is why the Japanese speakers who participated in the current experiment may have opted more positively for forms with identical moras repeated (e.g., *ta**pa-pa**ne*; *sa**pi-pi**na*; *ta**pu-pu**ne*) than for forms with identical consonants repeated (e.g., *ke**p**e-**p**ane*; *ka**p**a-**p**ina*; *si**p**o-**p**une*). In other words, in the case of the nicknaming process, the OCP(CV) conditions did not affect the average naturalness in a negative way. The results of the current case suggest that OCP(CV) conditions do not always yield more unacceptable forms when compared to forms under OCP(C) conditions. However, cases are still uncertain where OCP(CV) conditions are favored over OCP(C) conditions. A more exhaustive examination of Identity Avoidance is needed using other morphophonological processes in Japanese.

Before concluding, I add that there is an issue about the OCP-labial effect that should be resolved in further research. In testing the OCP-labial effect on rendaku, Kumagai (2017) examined other Japanese labial consonants, arguing that rendaku involves both OCP (labial) and OCP (labial, -continuant). The experiment revealed, strictly speaking, the effect of OCP (labial, -continuant), rather than the effect of OCP (labial), since it only examined the condition where [p] is followed by [b]. Thus, we need to examine whether OCP (labial) as well as OCP (labial, -continuant) is at work in the nicknaming process.

4. Conclusions

The current study focused on the new nicknaming process in Japanese showing /h/→[p] alternation. Experiment I examined whether this nicknaming process involves sound symbolism phenomenon to indicate cuteness. The results showed that the Japanese [p] is more likely to be associated with cuteness than other consonants. Also focusing on the new nicknaming trend, Experiment II examined the psychological status of *[p…D] constraint and OCP-related constraints such as Identity Avoidance and OCP-labial. The results showed that *[p…D] manifests itself in the Japanese nicknaming process as well as that the OCP-related constraints affect the application of /h/→[p] alternation in the nicknaming process.

Acknowledgments

To be added.

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