Nasal substitution in vernacular Japanese

1 Introduction

The nature of phonological knowledge is perhaps the most central question in the domain of spoken word processing. On one hand, speakers’ phonological knowledge appears to be quite general. Speakers apply such knowledge when they generate novel sequences, such as nonce borrowings and unique sentences. Speakers also apply such knowledge when they comprehend words spoken with a wide range of variation in phonetic details, such as accent and co-articulation. These observations have led linguists to posit abstract categories such as voiceless and sonorant.

On the other hand, speakers appear to have detailed phonological knowledge about specific words and patterns. Such detailed knowledge seems to emerge through the repeated processing of natural language, and leads to routinization and practice effects. Such an approach predicts that frequency is main factor to behind phonological variation such as assimilation and reduction (see Beckner et al 2009, Bybee 2010, MacWhiney & O’Grady 2015 for general reviews). Very commonly-occurring words and expressions are practiced over and over again, resulting in the gradual abbreviation of the articulatory gestures used to produce those words. Reduced articulatory gestures, in turn, lead to phonological assimilation and reduction. English examples illustrating this process are the production of *I’m going to* as [aɪmə] and *I don’t know* as [doʊnnoʊ] (Bybee reference).

Another possible (although not necessarily incompatible) driving factor behind emergent linguistic phonological knowledge is effective communication. In this approach, a crucial part of phonological processing is the probabilistic inference made during speech production and perception. Speakers us their emergent linguistic knowledge to infer the relative probability of a word given the context. Highly predictable words need less phonetic cues to accurately process than less predictable words. Thus, tokens with improvised phonetic cues due to reduced articulatory gestures are still accurately comprehended when they are predictable. Consequently, speakers need not produce canonical phonetic forms for words in predictable contexts. This approach predicts that that the main factor influencing phonological variation such as reduction and assimilation is the conditional probability of the linguistic unit in its context (see Clopper and turnbull 2018, Jaeger and Buz, Handbook of Psycho; Ernestus 2014). However, whether the most appropriate linguistic unit is the word or the phoneme is not yet clear.

Our goal is to contribute to this ongoing research on generative and emergent phonological knowledge with a corpus-based study of nasal substitution in vernacular Japanese. Nasal substitution refers to the synchronic process of replacing a non-nasal moraic syllable with the moraic nasal. Nasal substitution occurs both in standard Japanese and vernacular Japanese. One example of nasal substitution in Standard Japanese is mimetic word intensification (Kubozono, 2015: 263). Intensification occurs as a moraic consonant infix /C/ between the first and second syllables, as shown in (1). In the case of a following voiceless obstruent (1a), the moraic consonant infix appears as a voiceless geminate, and in the case of a following voiced obstruent (1b), as the moraic nasal.

() /sa-C-pari/ *sappari* ‘clean, openhearted’

/ko-C-sori/ *kossori* ‘secretly, stealthily’

/za-C-buri/ *zamburi* ‘with a plop’

/ma-C-ziri/ *manziri* ‘without a wink of sleep’

(examples from Kubozono, 2015: 263)

An example of nasal substitution in vernacular Japanese is the substitution between a verb stem-final /r/ onset syllable and the moraic nasal. The examples given in (2) show the standard form on the left with the stem-final /r/ syllable, and the vernacular form on the right with the moraic nasal. Nasal substitution occurs not only at the right edge of a word (2a), but also word internally (2b, 2c).

() a. *taberu nen teben nen* eat + sfp[[1]](#footnote-1)

b. *wakara-nai wakan-nai* ‘do not understand’

*kawara-nai kawan-nai* ‘do not change’

c. *kaeri-nasai kaen-nasai* ‘Go home!’

In this paper, we focus exclusively on the (2a) case of word-final nasal substitution (hereafter, just nasal substitution). Such a study makes two notable contributions beyond the above-mentioned contribution to our theoretical linguistic knowledge on generative and emergent grammar. To date, variationist studies on Japanese are still relatively limited in number, and in the case of nasal assimilation nonexistent. A search for nasal assimilation (Japanese *hatuonbin*) on CiNii yields only three hits, and all three works are about historical Japanese.[[2]](#footnote-2) Contrast this void with, for example, the rich history of studies on t/d deletion in English, beginning over half a century ago with studies such as Fasold (1972), and still continuing today (for a recent example, see Pavlík, 2017). A similarly well-studied phenomenon occurring in the Japanese language is case marker omission (see for example, Heffernan, Imanishi, & Honda, 2018, Fujii & Ono, 2000, and Yoshizumi, 2016). Thus, the first contribution is reporting on a previously undocumented linguistic phenomenon.

The second contribution concerns the nature of nasal substitution. The data that we present in this study is of particular interest when we consider the contexts in which the nasal substitution variants occur. According to references, nasal substitution occurs before a following grammatical word beginning with a nasal phoneme, as illustrated by the example sentences given in (3). In all examples, the location of nasal substitution underlined. Equivalent standard form examples are given in (4).

() *nanka* *an* *nen.yan* (KSJ/058/m/1)[[3]](#footnote-3)

something exist dm

‘There’s like this thing.’

*hitori-bun-te tukun-no muzukasii yaro* (TKC/031/m/6)

one.person-volume-top make-nmlz difficult dm

‘Making for just one person is tough, isn’t it?’

*nan-zi-ni* *kaen* *no* (KYT/026/f/5)

What-time-dat go.home qm

‘What time will you go home?’

() *sima-ga* *aru nen* (KSJ/018/m/6)

island-nom exist sfp

‘So there’s this island.’

*zibun-de tukuru-no kekkoo taihen ya kara* (KSJ/095/m/4)

self-dat make-nmlz quite ordeal cop sfp

‘Making it by yourself is quite an ordeal.’

*moo kaeru no* (KSJ/135/f/8)

already go.home qm

‘Are you going home already?’

Hereafter, we refer to the context of a following nasal phoneme as traditional, and differentiate it from all other contexts. One of the traditional contexts for nasal substitution is preceding the frequently-occurring morpheme *no*, which when following a verb may be a genitive case marker, a nominalizer, a sentence-final particle, or a discourse marker. In vernacular Japanese, this morpheme is variably realized as the moraic nasal *n*. Nasal substitution naturally occurs before the moraic nasal variant as well. In such as case, the resulting double moraic nasal sequence reduces to a single moraic nasal, as indicated in (5).[[4]](#footnote-4) The examples given in (6) illustrate the reduction of a double moraic nasal sequence to single moraic nasal. For comparison, similar non-reduced sequences are given in (7).

() verb-*ru* + *no* → verb-*ru* + *n* → verb-*n* + *n* → verb-*n*

standard form *no* reduces to *n* nasal substitution reduce *n*+*n* sequence

() *doo sun* (KSJ/049/f/5)

how do.qm

‘What will you do?’

*tanbo-te nan sun yaro* (KSJ/164/f/7)

rice.field-top what do dm

‘What was that we do with the rice fields?’

*onna-ni tuko-ten-wa omae* (KSJ/066/m/2)

women-dat use-hab.nmlz-top you

‘The one that is spending (money) on women is you.’

() *doo suru n* (KSJ/010/f/2)

how do qm

‘What will you do’

*benkyoo-ga deki-na-ku naru n.yaro* (KSJ/020/f/4)

study-nom can.do-neg-adv become dm

‘It’ll become so that you cannot study, won’t it?’

*maitoshi het-teru no-wa tasika ya-kara* (KSJ/016/m/5)

every.year reduce-prs.perf nmlz-top certain cop-dm

‘That it is becoming less every year is for sure.’

Interestingly, nasal substitution also occurs in a limited number of non-traditional contexts, as illustrated by the examples given in (8), with similar standard form examples given in (9). In these examples we see nasal substitution occurring before non-nasal sounds. In these examples, the nasal substitution site could hypothetically conceal a following *no* particle that has merged with the preceding moraic nasal, as per (5). However, the sequences *no-de* and *no-kedo* do not occur in the corpus, ruling out this possibility. Add a footnote listing all sequences. Thus, the usage of the nasal substitution form in the examples given in (8) appears to be an anomaly and its usage is a mystery. The second objective of our study is attempt to shed some light on the usage of the nasal substitution variants in non-traditional contexts.

() *kore 425 kirokarorii an de* (KYT/014/f/3)

this 425 kilocalorie exist sfp

‘This has 425 kilocalories!’

*bikkuri sun de* (KSJ/051/f/3)

be.surprised do sfp

‘You’ll be suprised.’

*ore Oozi.kooen-ni sun-den kedo* (KSJ/004/m/2)

I Oji Park-loc live-hab dm

‘I live in Oji Park.’

*setumee si-yoo to omo-tte.n kedo* (KSJ/002/f/2)

explain do-vol quot think-cont sfp

‘I’m thinking that I’ll explain.’

() *iroiro aru de* (KSJ/040/f/4)

various exist sfp

‘There’s a variety.’

*baabon-tte dokutyoo.na azi suru de* (KSJ/073/m/6)

burbon-top peculiar taste do sfp

‘Burbon has a peculiar taste.’

*hon-mo iPod-de yon-deru kedo na* (KSJ/021/m/5)

book-add iPod-ins read-hab dm sfp

‘I also read books on the iPod.’

*ii ka.na to omo-tte.ru kedo* (KYT/018/m/2)

good sfp quot think-cont dm

‘I’m thinking that is good.’

2 Section Two: Theories

3 Methodology

3.1 The data

The source of our data is the the *Corpus of Vernacular Japanese*. The data consists of 194 sociolinguistic interviews conducted by university students attending a private university in Japan, following the methodology described in Tagliamonte (xxxx). The interviewees are either family members or close acquaintances of the interviewers. Both the interviewers and the self-reported that they were native speakers of the Kansai dialect. The interviewers were instructed to speak in a casual manner using the local vernacular variety of Japanese. The topics discussed were chosen by the interviewers, and included topics such as school life, dating, work, family life, and tragic events. The interviews lasted approximately one hour. Each interview was transcribed, checked for accuracy, parsed at the morpheme level, and tagged with part of speech information using the MeCab parser (kyoto). The tagged data was checked line by line by hand and mistakes corrected. This methodology yielded approximately 2.2 million lines of data, of which 1.5 million lines were produced by the interviewees. In this study, we only examine the speech of the interviewees (hereafter speakers).

3.2 Initial considerations

The nasal substitution variant form verb+*ten* (standard form verb+*teru*) overlaps with vernacular past-tense suffix variant -*ten* (standard form -*ta*). The etymology of the two forms differs. The former form is derived via nasal substitution; the latter form is derived from the past tense verb suffix -*ta* plus the sentence-final particle *no*. Thus, only the former form is relevant to this study.

The MeCab parser is not capable of accurately differentiating these two forms and therefore it encodes both forms with the same part of speech information. The form verb+*ten* occurs a total of 4,560 times in the data. Each of these tokens was recoded according to its corresponding standard form, either -*teru* or -*ta*, based on the context. For the most part, determining the standard equivalent form was straightforward. However, some tokens were ambiguous, and we were unable to clearly determine the verb’s tense. An example of an ambiguous case is given in (10). For the purposes of this project, ambiguous cases were coded as -*ta* and were excluded from analysis. This coding process resulted in 1,304 (28.6%) of the -*ten* tokens being coded as equivalent to -*teru*.

() *si-te mi-tai na to omot-ten* (TKC/005/f/2)

do-inf see-des sfp quot think-prog/pst

‘I thought/am thinking that I want to try that.’

As pointed out in Section 1, the nasal substitution variant occurs in non-traditional contexts, albeit, relatively infrequently. In order to better understand the factors that correlate with nasal substitution in a non-traditional context, we did not constrain the scope of the study to the tradition context. Specifically, we extracted the following to items from the corpus, regardless of the context of occurrence: verb forms that end in *-ru*; and verb forms that end in -*n*, and whose equivalent standard form ends in -*ru*. We coded the former as the standard variant and the latter as the nasal substitution variant.

Three of the 194 speakers did not use nasal substation variants. The data for these three speakers were removed from the study.

3.3 Social characteristics of the speakers

We included three social characteristics in the analysis: age cohort, gender, and speech style. As a preliminary investigation of age suggested that it would not be a significant factor in the final analysis, we did not concern ourselves with equal representation of all age cohorts. Consequently, the age cohorts are not balanced. Specifically, number of speakers in a cohort range from 10 to 33, with an average of 21.5. The age range of each age cohort is as follows: 1, 15 to 18 years old (N=23); 2, 19-23 years old (N=33); 3, 24-29 years old (N=22); 4, 30-39 years old (N=16); 5, 40-49 years old (N=22); 6, 50-59 years old (N=21); 7, 60-69 years old (N=23); 8, 70-79 years old (N=21); 80-85 years old (N=10).

Gender is balanced with 98 female speakers and 93 male speakers.

Speech style index is a value that theoretically ranges from zero to one, and indicates the extent to which a speaker used standard Japanese during the interview (see H and H 2017 for details). For this study, we calculated speech style index by averaging the following six measures:

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This methodology resulted in speech style index scores that ranged from 0.099 to 0.819, with an average value of 0.338 standard deviation of 0.144.

3.4 Linguistic factors

3.4.1 Location of nasal substitution target

The tokens were coded by the location of the nasal substitution target. The target may directly follow the main verb root, or there may be intervening morphemes between the main verb root and the target. We coded the former as adjacent and the latter and non-adjacent. Targets occurring at the end of compound verbs such as *furi-kaeru* ‘look back’ were coded as adjacent. Targets occurring at the end of auxiliary verbs following the infinitive *-te* were coded as non-adjacent. In spoken Japanese, the vowel of *-te* morpheme often coalesces with the following vowel, obscuring the morphological boundary between the main verb and the auxiliary verb. Examples of adjacent targets are given in (11) and non-adjacent targets in (12).

() *tamatama ore-ga ki-ni naru nen* (KSJ/122/m/7)

coincidently I-nom attention-dat become sfp

‘I unintentionally became aware of it.’

*tyotto ore ki-ni nan nen kedo* (TKC/024/m/2)

a.little.bit I attention-dat become sfp dis

‘I become a bit concerned’

() *ato Tookyoo-ni hikooki ton-deru shi* (KSJ/016/m/5)

also Tokyo-dat airplane fly-hab dis

‘There are also planes flying to Tokyo.’

ue-wa hikooki ton-den de (KSJ/080/f/9)

above-top airplane fly-prog sfp

‘There are bomber airplanes flying above us.’

We follow the Romanization rules of the journal of the Linguistics Society of Japan, as described in http://www.ls-japan.org/modules/documents/LSJpapers/j-gkstyle2017.pdf

Age

Gender

Speech Style

Verb Type

Trigger Word POS

Trigger Sound Nasality

Trigger Sound Voicing

Target Word Frequency

Phrase Frequency

Turnbull et al. 2018

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Target Word Predictability: bigram probability of target word given trigger word

Target Sound Predictability: the probability of the target segment (phoneme) conditioned on the preceding segments within the word

Trigger Word Predictability: bigram probability of trigger word given target word

Trigger Sound Predictability: the probability of the trigger segment (phoneme) conditioned on a preceding word boundary (i.e., the segment is word initial)

Turnbull 2018

Number of phonemes in target word

Biphone probability (the probability of the phoneme given the previous phoneme)

Pavlik 2017

Target word conditional probability given the next word

Turnbull (2018) investigated the reduction of phonemes both at the word level and the phoneme level in the *Corpus of Spontaneous Japanese.* At the word level, he found that longer words and more frequent words tended to contain reduced phonemes. At the phoneme level, he found that the biphone probability (the probability of a phoneme given the previous phoneme) correlated with rate of reduction. He also investigated the probability of reduction of each phoneme, and found that /u/ tended to reduce but /r/ did not.

Turnbull et al. (2018)

Examined nasal place assimilation in a corpus of spoken English. They point out that nasal place assimilation

phonology, starting with the moraic nasal. The moraic nasal, along with the moraic obstruent, are the only consonants that occur in coda position, contribute to the moraic weight of the syllable, and assimilates place of articulation to the following consonant (Kubozono, 2015: 9-10).

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1. The following glosses are used: add = additive, adv = adverb(ializer), conj = conjunctive, cont = continuative, cop = copula, dat = dative, des = desiderative, dm = discourse marker, hab = habitual, inf = infinitive, ins = instrumental, neg = negative, nmlz = nominalizer, nom = nominative, prog = progressive, pst = past, perf = perfective, prs = present, qm = question marker, quot = quotative, sfp = sentence-final particle, top = topic, vol = volitional. Two glosses separated by / indicates an ambiguous choice. [↑](#footnote-ref-1)
2. CiNii is the search engine for academic literature written in Japanese. The URL is https://ci.nii.ac.jp/ja. [↑](#footnote-ref-2)
3. Examples taken from the *Corpus of Vernacular Kansai Japanese* are followed by brackets containing the following speaker characteristics: corpus code, eitherKSJ, KYT, or TKC; identifier number; gender, either female (f) or male (m); and age cohort (1 through 9; see Section 3 for details). [↑](#footnote-ref-3)
4. We acknowledge that such an explanation is bias in favor of a genitive account and bias against an emergent account. We equally consider both possibilities during the analysis of the results. [↑](#footnote-ref-4)