

The Japanese Moraic Nasal Revisited: A First Glance¹

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Abstract

This article reviews the representation of the moraic nasal in Japanese, typically transcribed as N, and proposes that the phonological identity of this “special mora” (see Bloch 1954; Labrune 2012) is that of a nasal vowel. This segment is typically described as a coda consonant which is underlyingly specified only for nasality (Itō 1987, Vance 2008), though it has also been described as a nasal feature floating below an empty Onset and Nucleus pair (Yoshida S. 1996, 2003; Yoshida Y. 1999). In this paper, I first discuss the phonetic and phonological description and facts of N. I crucially examine processes of pitch accent assignment and vowel nasalisation in Tokyo Japanese and tone spreading in both the Tokyo and Owari dialects. I then examine previous theoretical proposals, showing that they are a poor fit for the facts. I then claim that any sequence of what is traditionally described as a vowel followed by the moraic nasal N is in fact a long nasal vowel in phonological representation. I present a proposal within the framework of Strict CV (Lowenstamm 1996), and I consider the outcomes of such a proposal on our understanding of Tokyo Japanese and other dialects.²

Keywords: Japanese, moras, syllable, nasalisation, tone assignment, Japanese dialects

1. Introduction

In this paper, I consider the phonological representation of the Japanese moraic nasal N, also known as the *hatsuon*. This segment is counted as moraic in relation to metre, pitch accent assignment and word truncation (see Labrune 2012; Kubozono 2015a for recent overviews of the mora and syllable). N is also written as a single mora in the *kana* syllabary, represented as <ん>, or <N>. It is typically included in the set of special or deficient moras which appear in the second position within a syllable (Bloch 1954; Vance 2008; Labrune 2012). These moras are Q (second half of a geminate), R (second half of a

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² This is a revised presentation of proposals from Youngberg (2017); see this work for further discussion of “special moras” with no syllable constituent in the representational framework of Strict CV (Lowenstamm 1996, Scheer 2004). See also Yoshida S. (1996) and Yoshida Y. (1999) for earlier discussion of accent assignment and Government Phonology representations.

long vowel) and J (second half of a diphthong). Special moras are defined as unaccentable positions within a word, and accent is always assigned to the head initial mora of a heavy bimoraic syllable (Kalahari 2015). R and J are defined as vocalic moras, while N and Q are defined as [+consonantal] or associated to a C position. In general, it is agreed that N is a mora specified underlyingly for nasality at a minimum, and it is assumed that N receives place features from a following consonant (Itō 1987). When this fails, it is realised with default uvular or dorso-uvular place (Vance 2008; Labrune 2012). Consider the following data.

(1) Data with N typical transcription (compare with McCawley 1968; Itō 1987; Yoshida S. 2003; Labrune 2012)

- | | | | |
|----|------------------------------------|------------------|---------------|
| a. | Word-finally | | |
| | [hoN] | ‘book’ | |
| | [raN] | ‘lotus’ | |
| | [giN] | ‘silver’ | |
| b. | Preceding an alveolar stop | | |
| | [kantaN] | ‘simple’ | |
| | [kaunta:] | ‘counter (loan)’ | |
| | [honto] | ‘book-with’ | /hoN-to/ |
| c. | Preceding a velar stop | | |
| | [giŋko:] | ‘bank’ | |
| | [kiŋg'o:] | ‘gold fish’ | |
| | [hoŋka] | ‘book-INT’ | /hoN-ka/ |
| d. | Preceding a bilabial stop | | |
| | [tombo] | ‘dragonfly’ | |
| | [tempura] | ‘tempura’ | |
| | [hombak:ari] | ‘book-only’ | /hoN-bak:ari/ |
| e. | Intervocally (careful realisation) | | |
| | [taNi] ~ [taũi] | ‘credit, unit’ | |
| | [oNiN] ~ [oũiũ] | ‘phonology’ | |
| | [hoNo] ~ [hoũo] | ‘book-ACC’ | /hoN-o/ |

In this article, I re-examine the phonetic description and phonological patterning of N. I expand on previous representations framed within Government Phonology (henceforth GP) (Kaye, Lowenstamm & Vergnaud 1990), where N is optionally realised as a vowel word-finally (Yoshida S. 1996; Yoshida Y. 1999). I assume familiarity with the principles of GP below. I argue that the representation of N in all contexts is that of a vowel, and I frame my representations within the Strict CV (Lowenstamm 1996; Scheer 2004) development of GP. I first consider the phonetic descriptions of N in Section 2 and relevant phonological data in Section 3 before considering its phonological representation.

2. The variable phonetic realisation of N

Bloch (1954), Vance (1987, 2008), Akamatsu (1997) and Yoshida S. (1996, 2003), among others, have noted that the realisation of N depends on the surrounding segmental context. It is typically assumed in phonological accounts of Japanese that N is a homorganic nasal consonant when preceding another consonant, as in [hondana] ‘bookshelf’. Word-finally, N is realised phonetically as a uvular nasal consonant in some accounts, as in [hoN] ‘book’ (e.g. Vance 1987, 2008; Yoshida S. 1996, 2003; Labrune 2012). Vance (1987, 2008) notes in a review of phonetic studies that closure in this position is not always assured. From an acoustic and instrumental point of view, Vance (1987: 34-35) points out that closure during the realisation of final N is unclear and variable. Various instrumental studies show either a lack of closure (Aoki 1976: 204-204; Kawakami 1977: 43) or existence of closure (Nakano 1969: 220) during final N.

The intervocalic representation of N is debated, but it surely is not a consonant with full closure from a phonetic point of view. Vance (2008) claims that in intervocalic position, N is realised as a nasal glide, giving [saũ̃i] for /saN-i/ or ‘third rank’. Yoshida S. (2003) proposes that N can be realised as a nasal vowel, /hoN-o/ [hoũ̃o] ‘book-ACC’ in careful speech, or a nasal vowel copy of the preceding vowel in informal speech, as in /hoN-o/ [hoõ̃o] ‘book-ACC’.

With regards to the effect of N on the preceding vowel, Bloch (1954), Vance (1987, 2008, 2013) and Kawahara (2015) further claim that the nasal N may nasalise the preceding vowel, giving the word /hoNo/ the surface form [hõ̃õ̃o] ‘book-ACC’. Not all sources transcribe or note nasalisation preceding N, however. Nasalisation preceding N is not noted in discussions of Japanese phonetics from Shirota (1993) and Akamatsu (1997). Vowel nasalisation is discussed in other sources, namely as “anticipatory nasalisation” in an instrumental EMG study from Ushijima & Hirose (1974). Nasalisation is also noted in further phonetic studies by Nakano (1969) and Campbell (1999).

The independence of the moraic nasal with regards to preceding and following segments is supposedly uncontroversial. For example, Vance (1987: 67ff) discusses the ability of the moraic nasal to be given the status of a beat in poetry and song. Vance (2008: 101) further claims that native speakers have an intuition that N is similar in duration to a normal CV syllable. Labrune (2012) also notes that N is never realised as a typical nasal onset in isolation, e.g. /ta.N.i/ ‘credit’ is never realised as *[tani]. In some careful speech, such as read speech, it is clear that orthographic N may be realised in isolation as [ũ̃], noted in Nakano (1969) and Yoshida S. (2003). Let us now consider the representation of N.

3. The phonological behaviour of N

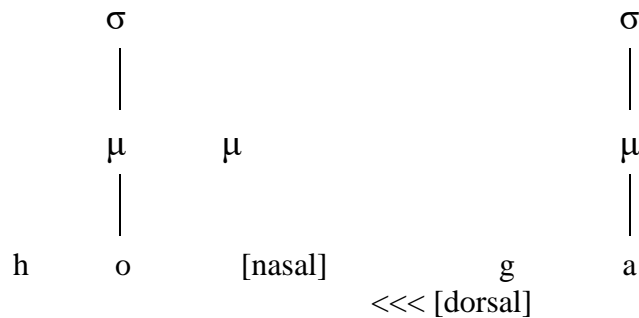
As I have mentioned briefly, N is assumed to be a special or deficient mora. Below, I discuss the relation of N to the phonological processes of vowel nasalisation, nasal assimilation, pitch accent assignment, and tone spreading.

3.1. Vowel nasalisation and nasal assimilation

We have seen above that nasalisation is found in any vowel preceding N, but is often not transcribed (e.g. Yoshida S. 2003). The orthographic word <hoN> or <ほん> is realised as [hōN] ‘book’, but it is often transcribed as [hoN]. The domain of nasalisation is assumed to be the syllable in Vance (2008) and Kawahara (2016). Vance proposes that the feature [nasal] spreads to the preceding vowel within a syllable. A representation is shown below in (2).

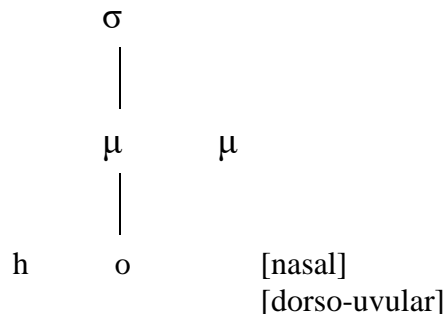
Nasal assimilation also occurs in Japanese, where N is realised as [n], [m], or [ŋ] when an alveolar, bilabial or velar consonant follows. Data has been presented earlier in (1). This is also found in languages such as English or Spanish. In most approaches utilising the traditional syllable-and-mora approach, N is underspecified in some manner. If a following consonant is found, manner and stricture features spread. This is seen below in /hoN/ ‘book’ suffixed with the nominative particle /-ga/, realised as [hōŋga] ‘book-NOM’

(2) Representation of spreading in [hōŋga] ‘book-NOM’, following Vance (2008), see also Itoh (1987)



If no consonant follows N, Vance (2008) proposes that a default uvular or uvulo-velar place feature is added to the specification of N, giving a nasal glide [ũ]. One challenge is that uvular consonants are unattested elsewhere in the phonology of Japanese. In addition, this segment may also be analysed as a vowel, as in the proposal from Yoshida S. (2003). I discuss these alternatives shortly.

(3) Representation of <hoN> as [hōũ] ‘book’ following Vance (2008)



3.2. Pitch accent/tone assignment

Let us now consider the assignment of tone and the behaviour of N. I argue in Youngberg (2017) that “pitch accent” in Japanese is better understood as a privative high tone system. Tone in Japanese is either underlyingly marked in the lexical entry of the word, with a high tone or accent marked in the lexicon, or it is not specified underlyingly and is assigned by default. See also Haraguchi (1977) and Kawahara (2015), who use both a High and a Low tone, as well as Yoshida Y. (1999), who assumes that high tone is the manifestation of an accent with no use of low tone. The two classes are typically called accented and unaccented words. In words containing only light syllables with three or fewer vowels, a final high tone is assigned by a default rule of high tone association (Haraguchi 1977), phrasal tone association (Pierrehumbert & Beckman 1988) or final nucleus accent assignment (Yoshida Y. 1999). In native and loanwords of four moras or more, accent is typically antepenultimate (McCawley 1968; Haraguchi 1991; Yoshida Y. 1999). See the data below:

(4) Antepenultimate accent		
[purogúramu]	‘program’	(loan)
[razánia]	‘lasagne’	(loan)
[hototógisu]	‘lesser cuckoo’	(native)
[murásaki]	‘violet’	(native)

When the antepenultimate mora is one of the special moras N, Q, R or J, it cannot be assigned an accent and accent is assigned to the pre-antepenultimate mora (McCawley 1968; Labrune 2012; Kawahara 2016). See the loanword data below, with each mora separated by a full stop.

(5) Pre-antepenultimate accent in loanwords (Kawahara 2015)		
a.	[pa.i.ná.p.pu.ru]	‘pineapple’
b.	[tá.k.ku.ru]	‘tackle’
c.	[gu.rá.m.pu.ri]	‘Grand prix’
d.	[ká.n.za.su]	‘Kansas’
e.	[ka.ré.n.da.a]	‘calendar’
f.	[pu.rí.n.se.su]	‘princess’
g.	[su.nó.o.ke.ru]	‘snorkel’
h.	[pá.a.pu.ru]	‘purple’
i.	[rá.i.fu.ru]	‘rifle’
j.	[ta.i.pu.rá.i.ta.a]	‘typewriter’
k.	[ri.sá.i.ku.ru]	‘recycle’
l.	[bu.ró.i.ra.a]	‘broiler’

McCawley (1968) proposes that accent is assigned to the syllable containing the antepenultimate mora, but that a special mora cannot be the location of an accent. Kawahara (2015) claims that this is because the initial mora in a heavy syllable is the head mora. See also Labrune (2012) for a proposal where an OT-style constraint [NADM]

prevents accentuation on a special mora, which is deficient. Yoshida Y. (1999) alternatively claims that accent shift is due to non-projection of an inert nucleus within the structure of N; see also Youngberg (2017).

3.2.1. N and unaccented words

However, when N is found domain-finally³ in a lexically unaccented word, this segment does exhibit high tone in certain conditions. In unaccented words, underlying forms have no underlying tone specified and receive a final High tone, shown below.

- (6) Unaccented words (tone spreading unmarked)
- | | | | |
|----|----------|----------|---------------|
| a. | /sakura/ | [sakurá] | ‘cherry tree’ |
| b. | /kagami/ | [kagámí] | ‘mirror’ |
| c. | /kuruma/ | [kurumá] | ‘car’ |

In unaccented words with a final special mora, this mora can support a high tone, which is assigned by default when produced in isolation.

- (7) Unaccented words with final special mora (NHK 2012)

- | | | |
|----|---------------|----------------|
| a. | [a i ji N] | ‘lover’ |
| b. | [ka tsu bo o] | ‘longing’ |
| c. | [ga n ta i] | ‘eyepatch’ |
| d. | [o su i] | ‘sewage’ |
| e. | [ha tsu ko i] | ‘first love’ |
| f. | [u do N] | ‘udon noodles’ |

3.3. Tone spreading in Japanese

In addition to high tone assignment, high tone also exhibits regressive spreading. High tone spreads regressively up to and excluding the initial mora, as in the word /kagami/ ‘mirror’, realised as [kagámí]. Two patterns are attested in Tokyo Japanese. The first is largely found in normative materials such as accent dictionaries (which I call Pattern A) and the second is that found commonly in the speech of Tokyo speakers (which I call Pattern B).

Consider the following data drawn discussed in Yoshida Y. (1999) from tone spreading Pattern A, exemplifying lexically unaccented words which are assigned a final high tone which spreads until the initial mora.

³ By domain-final, I refer to the final position in a phonological domain (cf. Kaye 1995). This is typically referred to as “word-final”, but the word has no status as a constituent in the framework under discussion below. See Kaye (1995), Yoshida Y. (1999), and Youngberg (2017) for more usage.

(8) Tokyo Pattern A (drawn from Yoshida Y. 1999, compare with NHK 1985, 2012)

- | | | |
|----|------------|----------------------------|
| a. | [sa ku ra] | ‘cherry tree’ |
| b. | [ko o ri] | ‘ice’ |
| c. | [bjo o ki] | ‘illness, sick’ |
| d. | [ka i te] | ‘buyer’ |
| e. | [to i ci] | ‘whetstone’ |
| f. | [ba t ta] | ‘grasshopper’ ⁴ |
| g. | [ke ŋ ka] | ‘quarrel’ |

Above, the moras of a heavy initial syllable are treated independently for the purposes of tone spreading. Pattern A differs from Pattern B in the behaviour of heavy syllables. Consider the below data.

(9) Tokyo Pattern B⁵

- | | | |
|----|------------|-----------------|
| a. | [sa ku ra] | ‘cherry tree’ |
| b. | [ko o ri] | ‘ice’ |
| c. | [bjo o ki] | ‘illness, sick’ |
| d. | [ka i te] | ‘buyer’ |
| e. | [to i ci] | ‘whetstone’ |
| f. | [ke ŋ ka] | ‘quarrel’ |
| g. | [ba t ta] | ‘grasshopper’ |

⁴ I retain the transcription of high tone on a geminate from Yoshida Y. (1999), though Haraguchi (1977) claims that production and perception of a high tone on a geminate is unlikely. I do not address this issue here.

⁵ Similar data is discussed in the literature cited throughout and I have confirmed these forms and pronunciations with one of my consultants, Miki Matsuoka, in spring 2017. I thank her for in-depth discussion of the data.

For Tokyo Pattern B speakers, heavy CV:, CVi and CVN syllables trigger further spreading which affects the initial mora in receiving high tone in (9b-f). Heavy CVQ syllables do not exhibit the same behaviour, (see 9g). The behaviour of heavy syllables as tone attractors is also evidenced in the Owari dialect (see Youngberg 2015 and references therein). Tone spreading does not affect the initial or pen-initial mora unless a CV: or CVN syllable intervenes. CVQ syllables do not trigger tone spreading to the initial mora.

(10) Owari tone spreading, representative (Ebata 2013)

[sakurá] ‘cherry tree’

[tó:mó] ‘ricefield’

[réŋkó] ‘lotus root’

[tep:ó] ‘pistol’

With regards to the above process, one first questions why CVN syllables pattern with CV: and not CVQ for tone spreading. Furthermore, why doesn’t a heavy CVQ syllable pattern with other heavy syllables? Let us now consider the representational view.

3.4. The challenges for a suitable representation

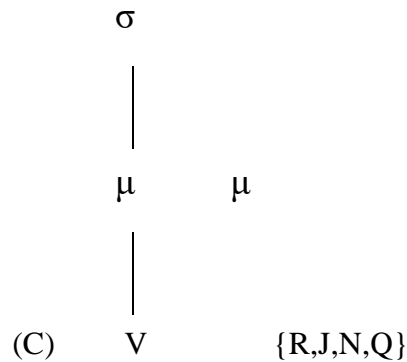
First, N shows a variety of realisations. It is surely not a homorganic consonant in all contexts, and may be a nasal vowel domain-finally and intervocally. In addition, representations must account for: 1) the vowel-like ability of N to support an accent, 2) the vowel-like patterning of CVN syllables with CVV syllables, 3) nasalisation and 4) patterns of assimilation. Let us first take a look at how the syllable-and-mora representation fares. I then reconsider these facts by examining alternative representations.

4. The phonological representations of N

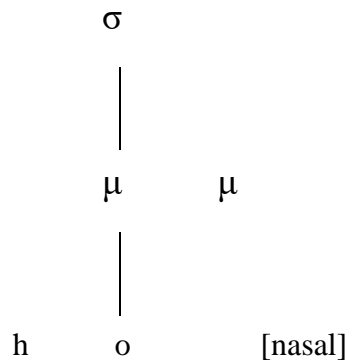
4.1. The syllable account

First, let us consider the syllable-based representation of CVN syllables. A representation for /N/ as an underspecified [+nasal] consonantal position is first presented in Itō (1987), and a similar representation of a nasal feature associated to a coda constituent is found in Abe (1987). In mora-based analyses from Vance (2008) and Kawahara (2015), the special moras N, Q, R, and J are assumed to be the second mora within a syllable, affording them a deficient or dependent status. N is again represented as an underspecified nasal segment consisting of only a nasal feature, and further features are associated from a following consonant or filled in with default features. While I do not discuss the mora-only proposal of Labrune (2012) here, note that this approach has an underspecified C position with the [+nasal] feature associated to the C position within a mora (or prosodeme). Crucially, all of these representations assume that N is a consonant and that it is underspecified. Consider the template for a Japanese syllable and the representation of <hoN> ‘book’ below, repeated for convenience.

(11) The template for the Japanese syllable



(12) Representation of <hoN> [hōN] ‘book’



The above representations raise some questions with regards to the previously discussed processes. The representation of N as a consonant in the aforementioned works is able to account for the realisation of /N/ as a homorganic nasal consonant through feature spreading. The non-accentuation of a special mora can be defined with reference to avoidance of accent on a special or non-head mora. However, the representation of all heavy syllables as bimoraic syllables cannot divide CVN, CVR and CVJ syllables from CVQ syllables in order to capture tone spreading in Tokyo Pattern B and Owari Japanese. The stipulation that special moras cannot be accented also fails to account for the final tone assignment of special moras in unaccented words, and it is further surprising that N patterns with R and J in supporting final tone. With regards to the domain-final realisation of N, Vance (2008) associates the feature [nasal] to the second mora of a syllable and claims that N intervocalically is realised as a nasal approximant or [ũ] through association of a default [dorso-uvular] place feature. What is perhaps concerning here is that such a default place feature does not occur elsewhere in the phonology of Japanese. It is unclear why a vocalic representation for N is unsuitable.

I argue that in fact N is best represented as a nasal vowel to account for the preceding facts. To begin, I first discuss the proposal of Yoshida S. (1996, 2003), who argues that <N> is a

nasal vowel intervocally and domain-finally. Yoshida Y. (1999) also presents a similar representation to that discussed by Yoshida S., but I discuss only the most recent proposal below⁶.

4.2. N according to Yoshida S. (2003)

In examining N, Yoshida S. (2003) first considers the various final and medial realisation of N in more detail. Consider the data below drawn from Yoshida S. (2003: 528-532), who draws data on his own observations. As the transcription of /N/ preceding a fricative or glide varies greatly between all of the sources discussed thus far, I focus only on the realisation of N intervocally, preceding a pause and preceding obstruents⁷. Yoshida S. provides both “more careful” pronunciations typical of emphatic speech and “less careful” pronunciations typical of informal speech. More careful pronunciations and less careful pronunciations are separated with a tilde, with less careful pronunciations on the right.

(13) Moraic nasal realisation variation (Yoshida S. 2003: 528-532)

a. Preceding a pause – variation between uvular/velar nasal or nasal vowel

/kiN/	[kiN]/[kiŋ] ~ [kiĩ]	‘gold’
/seN/	[seN]/[seŋ] ~ [seẽ]	‘line’
/saN/	[saN]/[saŋ] ~ [saã]	‘Mr., Ms.’
/hoN/	[hoN]/[hoŋ] ~ [hoõ]	‘book’
/buN/	[buN]/[buŋ] ~ [buũ]	‘sentence’

b. Preceding bilabial/alveolar/velar consonants – no variation

/hoNpo/	[hompɔ]	‘head store’
/hoN+bakari/	[hombakari]	‘book.only’
/hoN+mo/	[hommo]	‘book.also’
/hoN+to/	[honto]	‘book.and’
/hoN+de/	[honde]	‘book.by’
/hoN+no/	[honno]	‘book.GEN’
/hoNteo:/	[honteo:]	‘the central gov’t office’
/hoN+ka/	[hoŋka]	‘book.INT’
/hoN+ga/	[hoŋga]	‘book.NOM’

c. Preceding vowel

/taN’i/	[taũi] ~ [taĩi]	‘credit’
/hoN’i/	[hoũi] ~ [hoõi]	‘real motive’
/nihoN+e/	[nihoũe] ~ [nihoõe]	‘Japan.LOC’
/siN’ai/	[eiũai] ~ [eiĩai]	‘affection’

⁶ Yoshida Y. (1999) attempts to account for the complementary distribution between accented [nu] and the historical development of [N] found elsewhere. My criticisms for Yoshida S.’s proposal regarding inability to account for nasalisation and tone spreading processes also apply to her proposal, though I do not discuss this issue further here for reasons of space.

⁷ I do not expand on these issues as my proposal below in fact claims that N is always a vowel and the process of nasal assimilation is not a phonological process.

/naN+a/	[naũa] ~ [naãa]	‘South Africa’
/hoN+o/	[hoũo] ~ [hoõo]	‘book.ACC’
/keN’o/	[keũo] ~ [keõo]	‘hatred’
/iN’utu/	[iũutsu] ~ [iõutsu]	‘gloomy, melancholy’

To provide further evidence in support of the variable nature of the syllabic nasal, I present dynamic alternations of /N/ with suffixed forms of the word /hoN/ ‘book’ below. Note that I do not transcribe vowel nasalisation below, following the data transcription above. I revisit this omission below, and inclusion of this phenomenon leads me to revisit the representation of N.

(14) Variation of /N/ in /hoN/ ‘book’

a. Preceding a pause

/hoN/	[hoN]/[hoŋ]~[hoõ]	‘book’
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b. Preceding obstruents

/hoN+bakari/	[hombakari]	‘book.only’
/hoN+mo/	[hommo]	‘book.also’
/hoN+to/	[honto]	‘book.and’
/hoN+de/	[honde]	‘book.by’
/hoN+no/	[honno]	‘book.GEN’

c. Preceding vowels

/hoN+o/	[hoũo]~[hoõo]	‘book.ACC’
/hoN+e/	[hoũe]~[hoõe]	‘book.LOC’

(15) Summary of syllabic nasal realisations (Yoshida S. 2003: 534)

<u>Following Segment</u>	<u>Phonetic realisation</u>	
# (None)	Careful	[N, ŋ]
	Less careful	[ĩ, ẽ, ã, õ, ù]
Stop, affricate		[m, n, ŋ]
Vowel	Careful	[ũ]
	Less careful	[ĩ, ẽ, ã, õ, ù]

Consider the summary of N realisation above. Domain-final “more careful” pronunciations consist of a uvular or velar nasal e.g. [hoN] ‘book’, while careful intervocalic pronunciations of N result in [ũ] as in [taũi]. Less careful pronunciations of /N/ result in a nasalised copy of the preceding vowel domain-finally and domain-medially, as in [hoõ]

‘book’ and [tãi] ‘credit’. No variation is found preceding stops, with /N/ being realised universally as a homorganic nasal obstruent, as in [bumpo:] ‘grammar’.

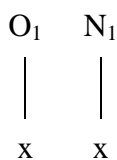
Yoshida S. (2003) argues that the “careful” pronunciation of the syllabic nasal realised as a uvular or velar obstruent [N] or [ŋ] is irrelevant. He notes that pre-pausal vowel-final words in Japanese are typically followed by an unreleased glottal stop e.g. [te]~[tẽ] ‘hand’. Yoshida S. claims that glottal closure is not a part of the phonological representation of these words, and this glottal closure is not claimed anywhere in the literature to be a part of phonological representation. He extends this line of reasoning, claiming that the same analysis is possible for the syllabic nasal. Formal [N] is thus better analysed as a nasal vowel followed by glottal closure or [ũ̃]. Yoshida S. notes that since a glottal stop is only found following a nasal or a vowel prepausally, such a realisation is never found domain-medially and therefore that the “less careful” pronunciation is one that should be considered.

I further argue that all “more careful” pronunciations of /N/ should be disregarded entirely, as a pronunciation such as [tãi] for /taNi/ ‘credit’ is highly marked in normal, everyday speech, and is typical only of emphatic pronunciation, such as when one is reading out orthography. I only consider here Yoshida’s discussion of less careful realisations of /N/. The representation of more careful pronunciations is discussed at length in Yoshida S. (2003), where N realised intervocally and finally is the product of |N| associated to the nucleus, combined with the phonetic realisation of an unlicensed empty nucleus which is [u], giving [ũ̃].⁸

4.2.1. The variability of N in Standard GP (Yoshida S. 2003)

Turning now to a GP analysis of the above variation, consider the proposed representation of the syllabic nasal from Yoshida S. (2003) below.

(16) Revised representation of /N/ proposed by Yoshida S. (2003)



|N|

Yoshida S. (2003) proposes that the moraic nasal is best represented as a floating nasal element, which I represent as |N| following Yoshida S. (2003). (See Ploch 1999; Botma

⁸ See Yoshida S. (1996), Yoshida Y. (1999) and Nasukawa (2010) for discussion of [u] as the realisation of an empty nucleus in Japanese. I assume there are both lexical [u]’s and those which are the interpretation of empty nuclei. I propose briefly that epenthetic vowels in loanwords are realised empty nuclei, but I do not discuss this proposal further here.

2004 and Nasukawa 2005 on the merger of the elements |N| for nasality and |L| for voicing within Element Theory.) The nasal element |N| associates to an onset when a following onset is present, contracting a governing relation with the following onset and triggering assimilation in order to satisfy the phonological Empty Category Principle (ECP) (Kaye, Lowenstamm & Vergnaud 1990), which regulates the silence and p-licensing of empty nuclei. The ECP is reproduced below from Kaye (1995). See Kula (2002) for an expanded formulations of the ECP and Scheer (2004) and Cyran (2010) for formulations outside of Standard GP.

(17) The Phonological ECP (Kaye 1995: 295)

A p-licensed (empty) category receives no phonetic interpretation.

P-licensing:

- a. Domain-final (empty) categories are p-licensed (parameterised).
- b. Properly governed (empty) nuclei are p-licensed.
- c. A nucleus within an inter-onset domain is p-licensed.

I assume, following Yoshida S. (1996), Yoshida Y. (1999) and Nasukawa (2010), that the domain-final parameter in (a) is set [OFF] in Japanese, which accounts for the lack of word-final consonants as Japanese as well as “epenthetic” vowels in loanwords and in certain other contexts, which are the realisation of an empty nucleus which fails to be p-licensed.

When an Onset is available following the structure of the moraic nasal, the nasal element |N| attaches to the nucleus and this nucleus is realised as a nasal vowel with its resonance elements spreading from the preceding nucleus. Yoshida S. argues that [u] is the phonetic interpretation of an unlicensed empty nucleus in Japanese; see also Yoshida Y. (1999) and Nasukawa (2010). I examine these representations in depth shortly. The various phonetic realisations of N are thus linked directly to the surrounding segmental and structural context. This builds on previous proposals presented in Yoshida S. (1996) and Yoshida Y. (1999). Let us now examine the proposed structure of N and its behaviour in further detail.

4.2.1.1. N as an assimilated consonant

Preceding an onset, Yoshida S. accounts for “coda assimilation” of N through association of the |N| element to the onset with concomitant assimilation through Onset-to-Onset or Inter-Onset Government (Gussmann & Kaye 1993; Cyran 2010). Recall that the syllabic nasal preceding obstruents is always realised as a homorganic nasal obstruent. N in this position, represented underlyingly as |N|, gains any elements from the following onset, and is realised as |A?N| or [n] preceding alveolars, |U?N| or [m] preceding bilabials and |?N| or [ŋ] preceding velars. For more on the representation of Japanese segments in Element Theory, see Yoshida S. 1996; Yoshida Y. 1999; Nasukawa 2005 and Youngberg 2017). Yoshida S. (2003) proposes that the floating nasal element is associated to the onset as a following obstruent is available to form an Inter-Onset Government (IOG) domain, shown in (18). This has the effect of p-licensing the empty nucleus present within the onset-nucleus pair. Consider the representation of /hoN-to/ [honto] ‘book-and’ below. (I exclude onset licensing and government licensing from the below diagram).

(18) Representation of [honto] ‘book-and’ (Yoshida S. 2003: 540)

O ₁	N ₁	O ₂	<u>N</u> ₂	O ₃	N ₃
x	x	x	<u>x</u>	x	x
h	o	n		t	o
		N			
		ʔ	<<	ʔ	
		A	<<	A	

An IOG relation contracts between O₃ and O₂. Melodic material from the governing onset head is shared as a governing relation is created, giving rise to a homorganic nasal consonant with spreading of the place element |A| and closure element |ʔ|.

4.2.2. Domain-final N

To account for the vocalic realisation of N in domain-final position, Yoshida S. proposes that |N| associates to the nucleus when no following onset is found. Assimilation from the preceding nucleus further affects this position. /N/ is thus realised as a nasal vowel with place assimilation in casual speech, as in [hoõ] ‘book’.

Yoshida S. (2003) accounts for this realisation through the association of the floating element to the empty nuclear position. The nasal element cannot associate to the onset position domain-finally, as an IOG relation cannot contract. If |N| were associated to the onset preceding the final nucleus, the domain-final nucleus would be empty and the ECP would fail to be satisfied. Recall that domain-final empty nuclei in Japanese are not p-licensed by the domain-final parameter of the ECP. The floating |N| therefore associates to the final nucleus position to satisfy the ECP. To account for the fact that the final nasal vowel is the target of assimilation, Yoshida S. further claims that other elemental material is gained from the preceding nucleus. While he does not present a representation, I provide one below.

(19) Representation of [hoõ] ‘book’, drawing on Yoshida S. (2003)

O ₁	N ₁	<u>O</u> ₂	N ₂
x	x		x

h	o		õ
			N
	U	>>	U
	A	>>	A

Yoshida S. does not clarify why elemental material spreads to the nucleus containing |N|, where N is an element correlating to nasality. (Note that this element is also described as |L| in the literature with both notations used in the Element Theory literature. For arguments in favour of a unified prime for nasality and voicing, see Ploch 1999; Nasukawa 2005 and review in Backley 2011.)

4.2.3. Intervocalic N

In the proposal from Yoshida S., the syllabic nasal is also realised as a vowel intervocalically, as there is no following onset to enact an IOG relation. As with domain-final N, the nucleus would remain empty and fail to be p-licensed if |N| were associated to the onset, as proper government is not freely active in Japanese. Consider the following representations of /N/ intervocalically as in /taNi/ [taãi] ‘credit’. As with the domain-final realisation of /hoN/ seen previously, |N| associates to the empty nucleus and elemental material is shared from the preceding nucleus. The following representation is from Yoshida S. (2003: 539)

(20) Representation of [taãi] ‘credit’ (Yoshida S. 2003: 539)

O ₁	N ₁	O ₂	N ₂	O ₃	N ₃
x	x		x		x
t	a		ã		i
	A	>>	N		A

While these representations do account for the data presented by Yoshida S., I claim that the data itself should be revisited. Consideration of phonological processes should be incorporated into the discussion and reflected in the proposed representation. Finally, theory internal issues with this representation are present and must be accounted for.

4.2.4. Additional facts to be incorporated into our analysis of N

The above facts and the representation are a poor fit for the data with regards to the earlier discussed processes. First, recall vowel nasalisation. The vowel preceding the moraic nasal N is nasalised in all cases, whether N is realised as a homorganic stop or not. This is exemplified in words such as [hõndana] for /hoNdana/ ‘bookcase’ or [hõõo] for /hoN-o/ ‘book-ACC’. The only proposal to account for nasalisation is found in syllable-based work by Vance (1987, 2013) and Kawahara (2016), where the domain of nasalisation is assumed

to be the syllable. Yoshida S. does not discuss nasalisation and the representations cannot account for it. No relation between consonantal N in the onset position and the preceding nucleus is present. While progressive spread of elemental material is proposed by Yoshida S. when |N| is associated to the nucleus, there is no mechanism which is obvious to account for nasalisation, though mutual spreading and the formation of a nucleus-to-nucleus governing domain would be one possible explanation in order to silence the present empty onset.

An additional issue for the representation of N as a floating |N| element is that this representation allows for an abstract underlying form which never surfaces, containing two unlicensed and unfilled positions in the lexicon. While these positions are not empty following association of |N|, this analysis presumes that all instances of N are underlyingly unassociated.

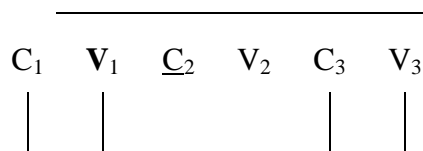
Furthermore, to account for the alternation of N as a nasal vowel and as a consonant in suffixed words, seen in the bare noun /hoN/ [hoõ] ‘book’ and suffixed forms such as /hoN-ga/ [hoŋga] ‘book-NOM’, the association between the |N| element and its nuclear constituent would have to be severed. In Yoshida Y. (1999), the nominative particle /ga/ is analysed as an Analytic suffix (Kaye 1995). The form /hoN-ga/ would be processed as two Analytic domains, one independent and one dependent or [[hoN]ga]. |N| is associated to the final nucleus in /hoN/, giving [hoõ]. In the concatenated [noun-suffix] domain, |N| must be severed from the nucleus, and then associated to the onset. This forms an IOG domain with concomitant assimilation to result in the attested output form [hoŋga] ‘book-NOM’. While this analysis can obtain the correct result, this alteration of the representation of N in the noun violates the Principle of Strict Cyclicity (see Kaye 1992, citing Kean 1974). Relations between segments and their constituents created on one cycle (as well as governing and licensing relations) are not to be undone in further cycles of a derivation. The proposed representation is thus problematic.

It is questionable that vowel plus N in intervocalic context and domain-finally is truly a sequence of oral vowel followed by nasal vowel in terms of phonological behaviour. If nasalisation does in fact occur, VN is in fact a sequence of two nasal vowels.

5. N is a nasal vowel

To account for nasalisation and the patterning of long vowels and so-called vowel nasal sequences, I claim that /VN/ sequences are in fact / \tilde{V} :. This representation is shown below for the word <keNka> ‘quarrel’.

(21) Representation of N as a nasal vowel in [kẽka] ‘quarrel’



k ě k a

First, this representation can account for tone spreading and unification of CVR and CVN syllables, correctly excluding CVQ syllables where necessary. Compare the representations I propose below within Strict CV (Lowenstamm 1996; Scheer 2004) for words initiating in syllables containing special moras of the shape CV, CVR, CVN and CVQ. The data are representative for Tokyo Pattern B spreading. The unaccented words below are assigned surface final high tone, which spreads regressively under the previously discussed conditions.

(22) CV representation of [sakúrá] ‘cherry tree’

	—————					
C ₁	V ₁	C ₂	V ₂	C ₃	V ₃	
s	a	k	u	r	a	

(23) CV representation of [kó:rí] ‘ice’

	—————					
C ₁	V ₁	<u>C</u> ₂	V ₂	C ₃	V ₃	
k	o			r	i	

(24) CV representation of <keNka> or [kě:ká] ‘quarrel’

	—————					
C ₁	V ₁	<u>C</u> ₂	V ₂	C ₃	V ₃	
k	ě			k	a	

(25) CV representation of [bat:á] ‘grasshopper’

	—————					
C ₁	V ₁	C ₂	<u>V</u> ₂	C ₃	V ₃	
b	a			t	a	

Yoshida Y. (1999) has claimed that initial nuclei, or here V positions, are protected from spreading processes; initial nucleus protection effects are also proposed in Yoshida Y. (1990) and Charette (1991). In Youngberg (2017), I have claimed that “weight-sensitive” spreading is a result of V₁ being a head and suspending initial nucleus protection. The targets of high tone spreading to the initial mora, or V position, are unified as long vowels where V₁ and V₂ are associated to the same segment.⁹ A light CV syllable and heavy CVQ syllable have no relation between V₁ and V₂ and thus do not meet the same context where V₁ is a head, and the initial nucleus is protected from tone spreading.

5.1. Further outcomes of this proposal

Nasalisation under this view is in fact nasality inherently present in a vowel. It is not a process of the grammar. This view provides an expansion of the vocalic inventory of Japanese, with contrast between vowels containing [N], giving a nasal vowel, or lacking this element, giving an oral vowel. As a result, our surface vowel inventory of the informal variety of Japanese under discussion is expanded from five oral vowels {a, i, u, e, o} to include nasal counterparts {ã, ã̃, ã̄, ã̅, ã̆}.¹⁰

This is perhaps problematic for some proponents of the syllable, as nasalisation supports the existence of the syllable in Japanese (cf. Kawahara 2016). No mechanisms for government or assimilation are necessary in the above representation of N, as proposed by Yoshida S. (2003). <N> as an independent phonological object does not exist and is only present orthographically. A radical outcome is that nasal “assimilation” with a following consonant is not a phonological process. From the above-proposed representation, the “assimilation” of N is an effect of phonetic interpretation. A phonetic consonant is realised in the transition from nasal vowel to following consonant, but this is not a segment associated to a C position.

6. Accounting for accentuation of N

Now let us consider the accentuation of N in Tokyo Japanese and other dialects briefly. CVR and CVN syllables are above defined by the dependence of the second V position within a “syllable” on the first for melodic spreading. I assume in Youngberg (2017) that these V positions are licensed externally (following Scheer 2004 and works referenced therein), and thus do not project in order to be involved in accent assignment. Dialects

⁹ I exclude discussion of diphthongs for reasons of brevity; see Youngberg (2017) Ch. 6 and 7 for discussion of diphthong representation and an analysis.

¹⁰ Japanese is then a language, which has parallel nasal and oral vowels, as in European Portuguese. That the length of a nasal vowel is always long is a curious fact, but this is analogous to the facts of Montreal French nasal vowels patterning as long (and always long). For more on this, see Ploch (1999) and Charette (In Press). Nasal vowels may contrast in length in some languages, though not in Japanese or Laurentian French. See Hajek (2013) for a recent typological overview of nasal vowel systems and nasalisation spreading from nasal vowels. A reviewer also questions how this analysis aligns Japanese with languages where nasal consonants nasalise a following vowel. Such languages are typically analysed as a case of nasal harmony and I do not discuss this further as this is absent in Japanese. For ample discussion of such languages within a similar framework to that pursued here, see Ploch (1999) and Nasukawa (2005).

differ with respect to the ability to accent “special moras” word-medially and word-finally. In Tokyo Japanese, the “special moras” R, J and N may receive an accent or high-tone word-finally but never word-medially (as seen earlier). In Kansai Japanese, any of the “special moras” may bear an accent, both medially and finally. (compare <oŃna> ‘woman’). In Kagoshima Japanese, special moras are never the site of a pitch accent either domain-finally or domain-medially see Kibe 2010; Kubozono 2015b). Dialects are traditionally divided into syllable dialects (e.g. Kagoshima), syllable-and-mora dialects (Tokyo) and mora dialects (Kansai) with regards to the units of accent assignment. Using the above representation and considering the role of the second V within a heavy syllable, we can refine our accentability of <N> as related to V projection.

6.1. Defining an accentable position

From a Standard GP standpoint, Yoshida Y. (1999) defines an accentable position as an unlicensed, ungoverned nuclear position which projects. Yoshida Y. (1999) claims that unaccentable positions contain nuclei which fail to project. Nuclei are not projected due to government. Yoshida Y. claims that nuclei project in order to seek a licenser – but this is too simplistic to account for the attested patterns.

I agree with the spirit of this proposal, but I claim that a special mora is a V position, which behaves differently to an independent vowel or nucleus in an open syllable due to either external government or licensing. The second position within a long vowel is externally licensed by the following vowel position (see Yoshida S. 1993; Kaye 1995; Lowenstamm 1996; Dienes & Szigetvári 1999; Scheer 2004 for discussion of long vowels, licensing and surrounding positions). I do not discuss the representation of diphthongs here, but I propose that the second V position is governed (see also Szigetvári 2013 for diphthongs as vowels in a licensing relation).

To account for the inability of Tokyo Japanese N to be accented word-medially, I agree with Yoshida Y. (1999) that governed/licensed positions do not project. However, in order to account for the ability of word-final long vowels to be accented, I must claim that governed/licensed positions *do* project. I propose that projection can be parameterised in the spirit of Scheer & Szigetvári (2005). Independent V positions always project. The projection of domain-medial and domain-final governed/licensed V projection is parameterised independently. This can account for the dialect variation noted in the literature without reference to the syllable or mora. Dialects which accent “special moras” are defined as dialects where the licensed or governed V can project and is set to [ON], while those forbidding accent assignment on a special mora in some or all positions are those dialects where the parameter is set to [OFF].

Table 1: projection parameters

	WM Gov/Lic Nuclei	WF Gov/Lic Nuclei
Kagoshima Japanese	[OFF]	[OFF]

Tokyo Japanese	[OFF]	[ON]
Kansai Japanese	[ON]	[ON]

What of CVQ syllables? I claim for the moment that the vowel within geminates does not project in any dialect as it is empty. See Scheer & Szigetvári (2005) for further discussion of the projection of empty V positions.

6.2. Further representational possibilities and questions¹¹

I note briefly that the representation of N as a nasal vowel is not immediately obvious for emphatic Japanese speech as evidenced in classrooms (see Yoshida S. 2003), nor is this representation necessarily supported for other dialects of Japanese besides that of Tokyo and Owari. Let me first consider emphatic speech. In emphatic classroom Japanese and other registers of speech such as sung speech where the Standard or Tokyo dialect is used, <N> is realised as an independent nasal consonant, which is rather similar to the bilabial consonant [m] and which may be considered syllabic. One would encounter the word <beNri> or ‘convenient’ then as the pronunciation [be.m.ri], where a full stop denotes a brief pause. A phonological system must be able to represent this consonant, and I presume that this is an instance of a syllabic consonant, which is represented in Strict CV as a consonant associated to both the C and V positions (see Scheer 2004 and references therein). I propose a preliminary representation for Emphatic N below.

(26) Representation of formal or emphatic ‘N’

C₁ V₁

|N|

This representation is not altogether dissimilar to that proposed for a surface representation of final N in Yoshida Y. (1999), nor is it dissimilar to some of the formal structures proposed by Yoshida S. (2003). If we accept the formal representation of N above, this would mean the further division of the phonological system into an informal system and a formal or emphatic system for certain speech settings.

Within Government Phonology work, the division of a phonological system has been formalised previously by Cyran (2001, 2010). In short, formal Malayalam permits an array of domain-final consonants and informal Malayalam permits only final [m] and [n], with all other consonants produced with a following central vowel. Cyran (2001) differentiates the two speech registers phonologically by different licensing settings, where a V position may

¹¹ I thank a reviewer for pushing me to consider not only cross-dialect investigation but also cross-pragmatic investigation.

license more autosegmental (elemental) content in the preceding C position in the formal register.

If we adopt such a view for Japanese, a re-analysis can be constructed as follows: syllabic nasals in Tokyo Japanese are licensed in formal speech, while they are not licensed in informal speech and the nasal is associated to the preceding vocalic expression. If this analysis were adopted, <hoN> ‘book’ would be underlyingly represented /hoN/ and realised as [hō:] or [ho.m] depending on context. An analysis where phonological realisation is dependent upon pragmatic context is indeed reminiscent of the “polysystemic” analyses of works framed within Firthian Prosodic Analysis (Firth 1948; Palmer 1970). For recent discussion of this framework, see Anderson (1985: 192 and following) and critical comparison with autosegmental phonology in Ogden & Local (1994). While I do not transpose Prosodic Analysis principles here, I believe that a polysystematic approach is on the right track to capture pragmatic variation, and I also believe that a further division of a phonological system can account for the informal/formal “systems” in Tokyo Japanese, *contra* the single-system approach of the phonology function proposed by Kaye (1995).¹²

There is reason to believe that the syllabic nasal approach shown in (27) is the correct analysis also for Kansai Japanese. Nasalisation of the preceding vowel is not discussed for this dialect in the literature, and N may be realised as a consonant in normal speech intervocalically, as discussed by Tronnier (1996). Lastly, N may support a lexical pitch accent. Rather than appealing to projection parameters, it is possible to claim that N in this dialect is in fact a syllabic nasal. In contrast, neither the vocalic nor the syllabic representations of N are appropriate for Niigata Japanese. The available data from Niigata Japanese (Kobayashi 2004) shows that with regards to tone spreading, CVN syllables pattern with CVQ syllables rather than CV: syllables in failing to trigger tone spreading to the initial mora. I claim that in this dialect, N is a nasal coda, or |N| associated to a C position followed by an empty V position. Such a representation would also account for the facts of Kagoshima Japanese, without referring to projection parameters. Space restrictions here restrict me from further discussion of these dialects and their representation in detail, but ongoing acoustic investigation and phonological analysis will be reported in forthcoming work.

7. Other work

The motivation for a Strict CV analysis of Japanese is discussed in Youngberg (2017) at further length, with further review of the GP proposals in the preceding literature also discussed at length. Future investigation of N as a nasal vowel in Tokyo Japanese will incorporate data from loanword adaptation and instrumental phonetic investigation, while other work will consider dialect variation and cross-linguistic comparison of nasal vowels in further depth. For the moment, I look forward to critical feedback of this proposal, and I

¹² Not all seemingly polysystemic facets of a language need be analysed as such; see Youngberg (forthcoming) where I discuss the “category sensitivity” of Japanese tone assignment in verbs, adjectives and nouns as an epiphenomenal effect of the interface and spell-out.

hope that others will critically re-examine well-established ideas about the sounds of languages beyond Japanese.

Abbreviations

ACC	Accusative
ECP	Empty Category Principle
GEN	Genitive
INT	Interrogative
LOC	Locative
NOM	Nominative
WM	Word-medial
WF	Word-final

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