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The Syllabification of Syllabic Nasals

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Introduction

- Generative phonology

It formalises two distinct aspects of phonological processes: the **functional** and the **representational**.

- Issue: representations

- What kind of representation is most appropriate for recent models of generative phonology?
- Focus on **syllabic nasals** in Japanese and attempt to identify a suitable representation for N .

Syllabic nasals

- Syllabic nasals:

exhibit both **consonantal** and **vocalic** characteristics in terms of their tonal/metrical properties and static distribution (Ferguson 1963, Hyman 1985, Nasukawa 2004).

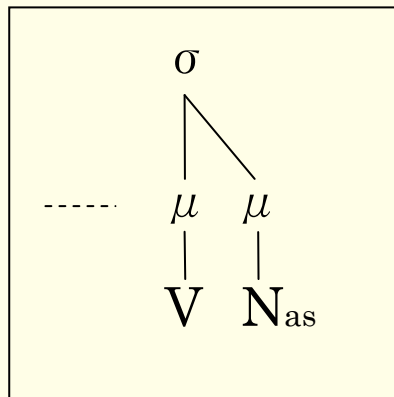
- This dual character:

typically represented by being syllabified in a single position (**nucleus** or **mora**) (cf. Hyman 1985, Bickmore 2007 and others).

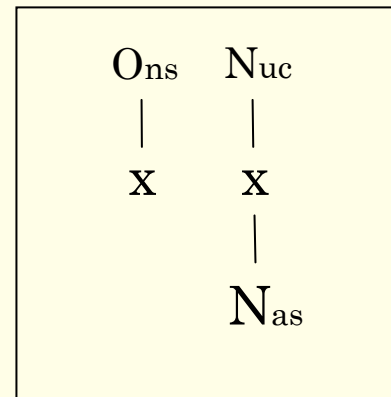
Possible representations

- Two contrasting points of view concerning the syllabification of syllabic nasals:
 - (i) they occupy a syllable coda → (1a)
 - (ii) they occupy a syllable nucleus → (1b)

■ (1a)



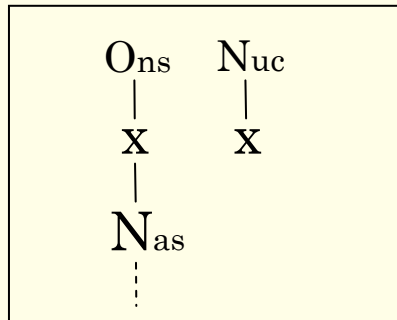
(1b)



Proposal

- This paper proposes an alternative syllabification of syllabic nasals.
 - Syllabic nasals in **the onset of a syllable with an empty nucleus.**

(2)



- This has the advantage of being able to account for a range of phonological phenomena that are difficult to explain under a (1a) or (1b) analysis.

Syllabic nasals in Japanese

- Consonantal characteristics
 - Nasality is not distinctive on vowels in Japanese.
 - The syllabic nasal never bears pitch accent, which is also the case with consonants in Japanese (McCawley 1968, Vance 1987).
- Vocalic characteristics
 - *n* has no clear place of articulation: **placeless** nasal.
 - *n* bears high/low **pitch** just as vowels do (McCawley 1968, Vance 1987).
 - *n* behaves like a vowel in certain phonological processing tasks (e.g. **transposition** in speech errors Kubozono 1985), **secret language games** (e.g. Babibu language: Haraguchi 1991), and **particle vowel reduction** in casual speech (Hasegawa 1979).

The Japanese syllabary

- An interesting insight
 - In Hiragana and Katakana, most of the letters represent a CV sequence (or sometimes CjV).
 - CV is the basic structure of the Japanese syllabary.
 - *n* and *a, i, u, e, o* do not fit this pattern.
 - Vowels occupy only the V position of CV.
 - C is not filled with any consonantal material.
 - The syllabification of *n* causes some controversy.

Phonotactics of nasals

- Japanese has three phonemic nasals:
 - alveolar nasal n → nV followed by V
 - bilabial nasal m → mV followed by V
 - syllabic nasal N → VN preceded by V
- N exhibits four allophonic variants:
 - $[n]$ in $ho[n]doo$ 'main temple' < hoN 'main, real' + doo 'temple'
 - $[m]$ in $ho[m]mono$ 'real thing' < hoN 'main, real' + $mono$ 'thing'
 - $[ŋ]$ in $ho[ŋ]kan$ 'main building' < hoN 'main, real' + kan 'building'
 - $[N]$ in $ho[N]i$ 'real intention' < hoN 'main, real' + i 'intention'
 - These variants retain their **syllabicity**/moraicity.
- Placed nasals → in syllable onsets.
But, some controversy the structure of N .

Syllabic status of \mathcal{N}

- Two approaches to syllabification:
 - (i) Coda approach (1a) (Itô 1986, 1993, *et passim*):
 $\mathcal{N} \rightarrow$ the coda position of CVC
The coda belongs to 'mora' (μ) for \mathcal{N} 's syllabicity.
 - (ii) Nucleus approach (1b) (Yoshida 1990):
 $\mathcal{N} \rightarrow$ the nucleus of CV; the onset \rightarrow empty
The nucleus is for \mathcal{N} 's syllabicity.

- The coda approach:
 - no explanation why the syllabic nasal is in a coda.
 - no evidence for CVC in Japanese.

- The nucleus approach:
 - no empirical evidence to support \mathcal{N} in nucleus.

Resyllabification

■ Concatenation triggers resyllabification:

■ In the coda analysis:

šin. 'to die' + *-a.na.i* NEGATIVE > *ši.na.na.i* '(somebody) does not die'

■ In the nucleus analysis:

ši.n 'to die' + *-da* PAST > *šin.da* 'died'.

■ Prosodic reorganisation:

■ undesirable under a monostratal P&P approach to representations (Harris 2004).

■ entails a degree of arbitrariness and has the effect of **weakening the restrictiveness** of the theoretical model.

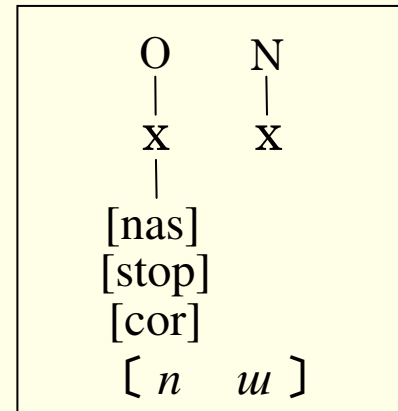
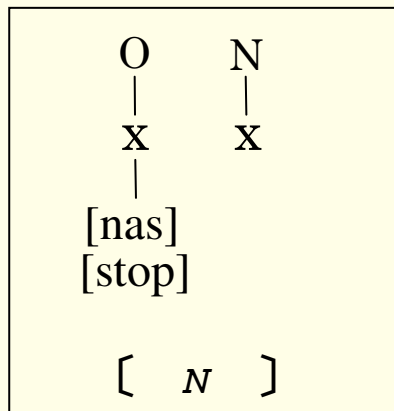
■ *n* in a nucleus/mora:

■ Incorrectly predicts that other nasalised melody (e.g. nasal vowels) is also permitted in this position.

An alternative proposal

- *N* consists of a two-position sequence: **an onset and a nucleus**.
 - Onset → consonantal; Nucleus → vocalic/syllabic
 - [nasal] and [stop] in the onset → **realised as a placeless nasal stop**

- (3a) Syllabic placeless nasal (3b) Alveolar nasal



Phonetic interpretation

Syllabicity and the neutral vowel *u*

- Syllabicity/moraicity
 - Interpreted as a following empty nucleus
 - The interpretation of empty nuclei:
 - (i) acoustic resonance of a ‘vowel’, and/or
 - (ii) its contribution to **metrical structure**

(As long as one ‘beat’ can be detected, the interpretation of an empty nucleus does not have to be a ‘vowel’.)
- The empty nucleus:
interpreted as a **high back unrounded vowel**, the most neutral vowel in Japanese (often used as an unmarked vowel in the nativisation of loanwords: e.g. *slip* ‘slip’ > *surippu*).
- The presence of a place feature (e.g. [cor]) in an onset prevents that position from merging phonetically with the acoustic resonance of a following empty nucleus. (The result is a sequence of a placed nasal *n* followed by the neutral vowel *u*: Nasukawa 1998).

Evidence for the proposed structure

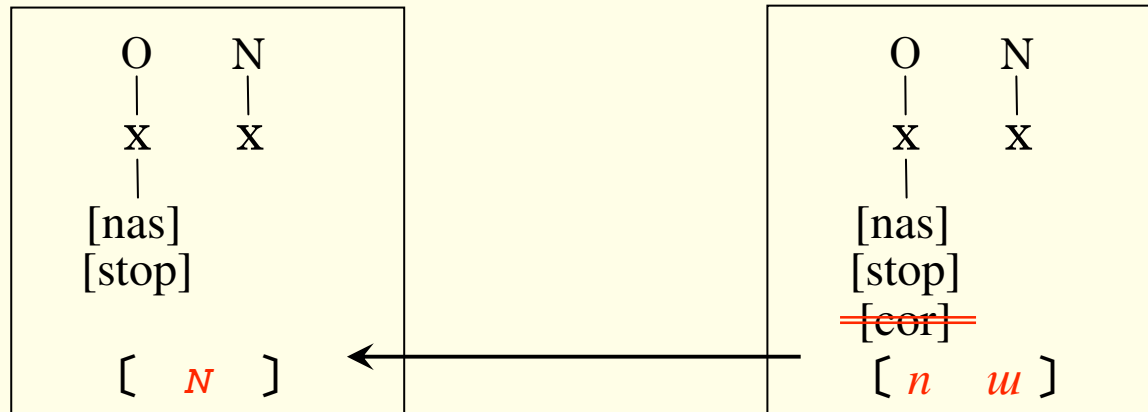
- Physical duration:
n is longer than other nasal consonants and is **equal to the duration of a consonant plus a vowel**.
- *u* plus a nasal consonant is often interpreted as a syllabic nasal (e.g. *uma* 'horse' > *mma*), providing evidence that *u* is apt to receive nasality from a neighbouring position, and hides its independent segmental status as well as its contribution to syllabicity.
- *N* is perceived as a sequence consisting of ***u* plus a nasal consonant** by kindergarten children when they play a word game called Shiritori (which one player has to say a word starting with the last syllable of the word given by the previous player).

Simplified explanation

- A dialectal change in the Oogami and Kagoshima dialects:
 - In these dialects, *mu* in the Tokyo dialect
→ *N* word-finally (e.g. *iN* 'dog' ← *imu* in Tokyo dialect).
 - Only the single process of lenition is involved:
a place element is suppressed in the onset (see 4).
- Historical sound changes:
the Old Japanese negative suffix *mu* > *N*
(e.g. *siramu* 'someone does not know' > *siraN*)
- No prosodic reorganisation during concatenation (see 5):
(e.g. *si.n∅* 'to die' + *a.na.i* NEGATIVE > *si.na.na.i* '(somebody) does not die'; *si.N* 'new' + *ka* 'turning' > *si.ŋ.ka* 'evolution').
→ theoretical restrictiveness

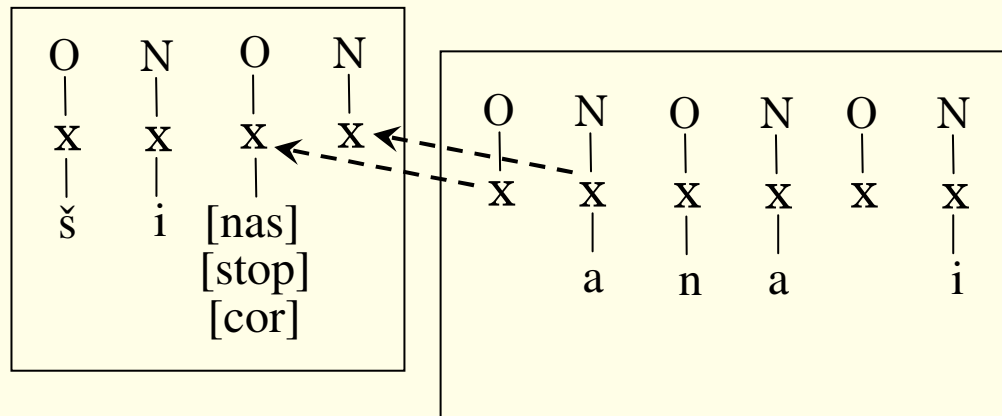
Simplified explanation (examples)

- (4a) Syllabic placeless nasal (4b) Alveolar nasal



- (5) $si.n\emptyset + a.na.i > si.na.na.i$ (AVOID EMPTY CATEGORIES:

Nasukawa 2005a)



Conclusion

- The structure of syllabic nasals consists of a sequence comprising an onset filled by a nasal and a following melodically empty nucleus.
 - Its consonantal and vocalic properties are specified in the onset and the empty nucleus respectively.
 - The interpretation of empty nuclei is not really the characteristic acoustic resonance of 'vowel', but rather, its contribution to metrical structure. (As long as one 'beat' can be detected, the interpretation of an empty nucleus does not have to be a vowel sound.)
 - Employing this structure, an analysis involves no syllabic reorganisation during the course of morphological concatenation.

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