Prestopped Nasals in Banyaduq: Issues in Represenatation

Adam Jardine
Angeliki Athanasopoulou
Peter Cole

University of Delaware

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Introduction

- Banyaduq is a previously undescribed Land Dayak language spoken in West Borneo Province, Indonesia
- Our consultant is from Sangke, a village in the northwest of the province:

Figure: Approximate location of Sangke in West Borneo (©2012 Google – Map data©2012 Tele Atlas, Google, MapIT)

- Banyaduq has word-final nasal stops with a preceding homorganic oral occlusion:

  (1) a. [ika**tn**] 'fish'
  b. [muru**pm**] 'to fly'
  c. [tura**kŋ**] 'bone'

- These sounds are reminiscent of similar sounds in languages of the area referred to as *preploded* or *prestopped nasals* (PSNs) (Blust, 1997; Anderson, 1976; Durvasulah, 2009)
- In analyses of related languages, PSNs are treated as 'complex' allophones of 'clear' nasals (Yanti, 2010; Anderson, 1976; Scott, 1964, among others)

- However, we shall show that the allophonic analysis is untenable for Banyaduq and PSNs must be present in the underlying representation (UR)
- Given this, we argue they are *not* complex segments but sequences
- What diachronic explanation is there for Banyaduq prestopped nasals?

Overview

- Phonological background on Banyaduq
- PSNs crosslinguistically
- Predictability of PSNs in Banyaduq
- Theoretical implications:
  - Banyaduq PSNs are *not* allophones of clear nasals
  - Banyaduq PSNs are phonologically *sequences*, not complex segments
- Diachronic oralization of word-final nasal stops

Banyaduq Phonology

Phoneme Inventory (ignoring PSNs)

Consonants

	Bilabial	Alveolar	Palatal	Velar	Laryngeal
Obstruents	p b	t d	c ɟ	k g	ʔ
Fricatives		s			h
Nasals	m	n	ɲ	ŋ	
Trill		r			
Lateral		l			

Vowels

	Front	Back
High	i	u
Mid	e	o
Low	a	

Phonotactics (ignoring PSNs)

- The syllable structure of Banyaduq is overwhelmingly (C)V(C)
- Nasals seem to have a special status
  - Word-internal codas can only be nasals homorganic with the following consonant:

    (2) a. [maŋ.kan] 'to give'
    b. [ma.kaʔ] 'upwards'
    c. *[mat.kaʔ]
  - Word initially, nasals create NC sequences in apparent violation of the above syllable template

    (3) a. [**n**tipatn] 'scorpion'
    b. [**ŋ**liliŋ] 'around'
    c. [**m**bada] 'very'
- The nasals in (3) need to be analyzed as either syllabic or extrasyllabic

Nasal Spread

- Banyaduq has a progressive nasal spread process common in many languages of the area
- Nasal consonants induce nasality on following vowels.
- This process applies iteratively, with nasality "spreading" to subsequent vowels.

(4) a. /nium/ → [nĩ̃ũm] 'smell'
b. /mahu/ → [mãhũ] 'female'

- Non-laryngeal consonants block this:

(5) a. /nele/ → [nẽle] 'to see'
b. /murah/ → [mũrah] 'to enter'
c. /matoh/ → [mãtoh] 'to throw'

Prestopped Nasals

- PSNs occur across lexical categories, occurring in nouns, verbs, and adjectives.
- PSNs only occur word-finally
- Attested with labial, alveolar, and velar places of articulation.

(6)

[pm]

a. [asupm] 'mango'
b. [murupm] 'to fly'

[tn]

c. [mototn] 'farming highlands'
d. [matatn] 'to throw away'

[kŋ]

e. [barekŋ] 'hand'
f. [idukŋ] 'nose'

- Note: PSNs are variously transcribed as [^{t}n], [tn], [t^{n}]; we will use [tn] as a neutral transcription for the surface representation

- Oral portion is without exception voiceless.
- Phonetically, the oral occlusion has a small release into the nasal stop, which is on average shorter in duration than word-final clear nasals.

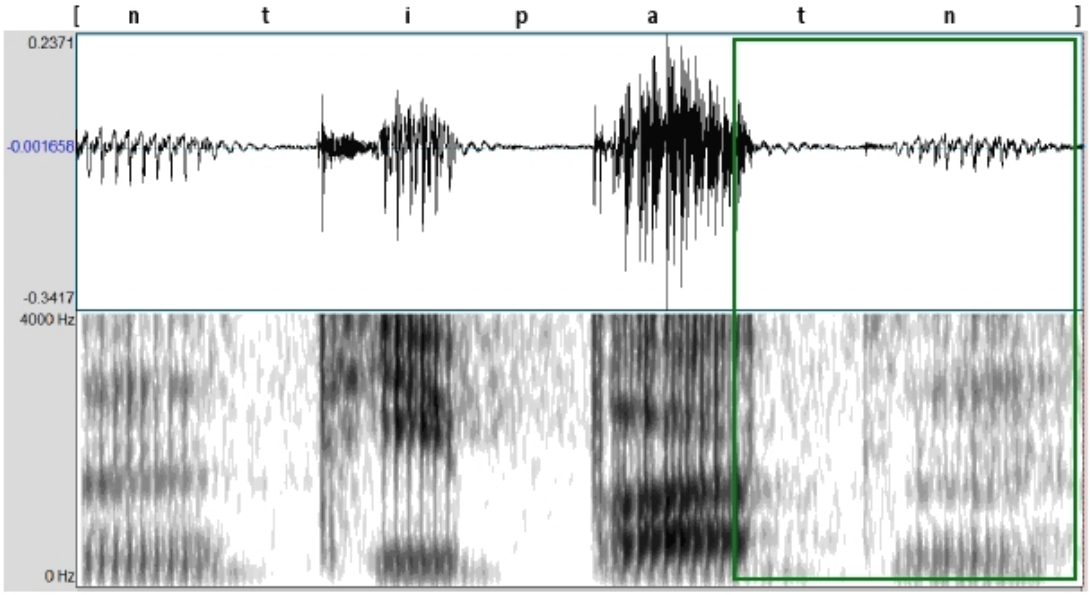

Figure: Waveform and spectrogram for [ntipatn] ‘scorpion’

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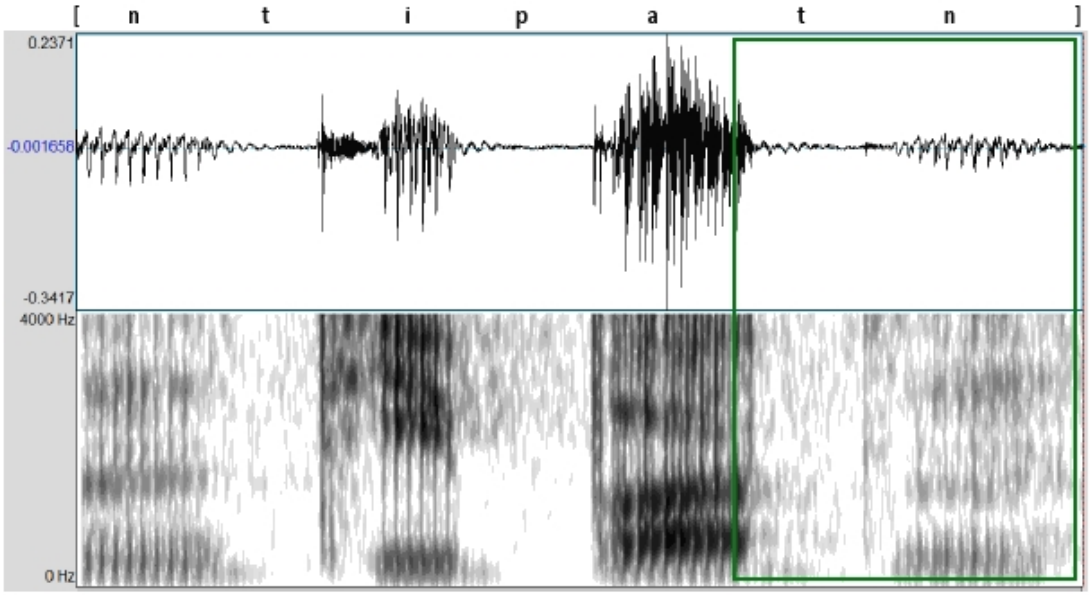

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Prestopped Nasals Crosslinguistically

- PSNs are a well-documented phenomenon in Austronesian languages of Indonesia and the surrounding area, with attestations in Borneo, Sumatra, Thailand, and the Phillippines (Blust, 1997)
- Blust notes that they derive from an interaction with progressive nasal spread
- Whether a final nasal is prestopped or not depends on whether its preceding vowel is nasalized
- Word-final nasals are prestopped when nasality fails to spread to a final vowel, due to the absence of an earlier nasal segment or through the presence of an intermediate blocking segment.

- A typical example of PSN can be found in Jambi Malay (JM, Yanti (2010)), a dialect of Malay spoken in Sumatra
- Jambi PSNs appear phrase-finally after an oral vowel (unlike Banyaduq, the oral portion is voiced):

(8) JM PSNs (Yanti, 2010, (41))

a.	/malam/	'night'	[mãlam] ∼ [mãla^{b}m]
b.	/lapan/	'eight'	[lapan] ∼ [lapa^{d}n]
c.	/batrʊŋ/	'k.o. fish'	[batrʊŋ] ∼ [batrʊ^{g}ŋ]

- Word-final nasals are not prestopped when nasality spreads to the end of the word:

(9) JM clear nasals (Yanti, 2010, (42))

a.	/minum/	'drink'	[m̃ĩnũm], *[m̃ĩnũ^{b}m]
b.	/taŋan/	'hand'	[taŋãn], *[taŋã^{d}n]
c.	/kuniŋ/	'yellow'	[kuni̋ŋ], *[kuni^{g}ŋ]

- Avoiding a specific theoretical framework, (10) informally summarizes the cross-linguistic generalization:

  (10) Nasal Prestopping Generalization (NPG): Clear nasals become prestopped word-finally following an oral vowel.

- This synchronic prestopping analysis is correct for JM (Yanti, 2010)
- For languages with the same distribution as JM, prestopped nasals are allophonic variants of underlying clear nasals

The Predictability of PSNs in Banyaduq

Predictions

- If the NPG were a phonetically motivated automatic process, would make two predictions:
  1. Word-finally, clear nasals will only surface when nasal spread has reached the final vowel.
  2. Prestopped nasals will only appear when this nasal spread has been blocked by a preceding consonant (any consonant excluding /h/), or when there is no nasal segment earlier in the word to initiate nasal spread.
- A fair number of forms in Banyaduq are in concord with these two predictions:

(11)
a. [nĩũm] 'smell'
b. [gũnõŋ] 'mountain'
c. [mãntimũn] 'cucumber'
d. [banũn] 'husband'

(12)
a. [mõrupm] 'to fly'
b. [itapm] 'black'
c. [gurikŋ] 'to lie down'
d. [mãtatn] 'to throw away'

- However, a number of forms do not. The following native Banyaduq vocabulary have prestopping following a nasal vowel:

(13) a. [dinĩkŋ] ‘wall’ *[dinĩŋ]
b. [anãpm] ‘sick’ *[anãm]
c. [paruŋãkŋ] ‘mosquito’ *[paruŋãŋ]
d. [ŋãhãpm] ‘yawn’ *[ŋãhãm]

- Also, the following have clear nasals after an oral vowel:

(14) a. [mãŋkaŋ] ‘to give’ *[mãŋkakŋ]
b. [ŋãrum] ‘night’ *[ŋãrupm]
c. [ikin] ‘first person singular’ *[ikitn]
d. [sosoŋ] ‘breast’ *[sosokŋ]

- Note the near-minimal pair in (12a) [mõrupm] ‘to fly’ and (14b) [ŋãrum] ‘night.’

- Furthermore, prestopped nasals are rare in Malay loanwords, with clear nasals instead appearing after oral vowels:

(15)
a. [dʒarum] 'needle' *[dʒarupm]
b. [kampoŋ] 'village' *[kampokŋ]
c. [kuciŋ] 'cat' *[kucikŋ]
d. [bidan] 'midwife' *[bidatn]

- The exceptions in (13)–(15) show that an automatic, phonetic interpretation of the NPG is untenable
- Suprasegmental phonology does not offer a phonetic cue; stress is consistently ultimate, and there are no tonal distinctions

Against a Co-phonology Analysis

- Malay loans could be said to occupy a lexical stratum in which NPG does not exist.
- However, there is no explanation why some native Banyaduq words without the expected PSN would occupy this stratum (i.e., (14d) [sosoŋ] 'breast').
- Also no explanation of why other native words with unexpected PSN (i.e., (13a) [diñ̃kŋ] 'wall') occupy a separate stratum in which a similar but separate NPG applies even when following nasalized vowels.
- Since there is no alternation ([ikatn] 'fish' under no circumstances alternates with *[ikan]), more plausable that native speakers encode prestopped nasals in UR.

Representing Banyaduq PSNs

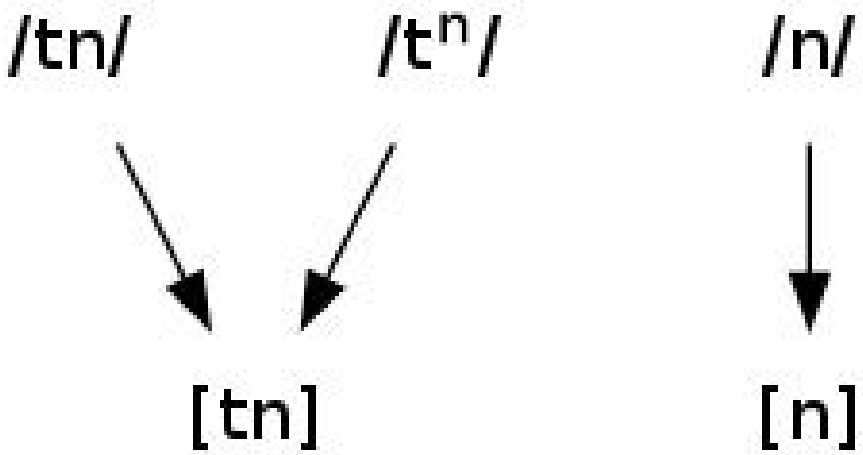
- So *how* are they encoded?
- Two options: /t^{n}/ (complex segment) or /tn/ (sequence)
- We base our decision on phonological patterning, not phonetic properties

- François (2010, p.404):

  Whatever a 'full instrumental study' might tell us about these segments' *phonetics*, it is doubtful whether it would provide us with any legitimate conclusion about their *phonological* status. In principle, these are two distinct dimensions, which should be kept apart. The phonetic properties of each phase—timing, intensity, formant transitions, etc.—do not necessarily mirror the emic features which are relevant to account for their phonological behaviour in the system. There *may* be a correlation between phonetic prominence and phonemic status, but this must not be taken for granted, nor must one be a criterion for the other. It could well be that the two dimensions do not line up: this would be the case, for example, if the phase which is phonologically essential happened to be less prominent in the surface forms.

The OT perspective

- An OT analysis would ensure [tn] is realized no matter what the underlying form, as long as the [n]/[tn] contrast is preserved. For example:



- Therefore OT, for all its merits, does not help address the specific nature of the underlying representation.

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Advantages:

- Fits into (C)V(C) syllable structure

Disadvantages:

- Increases the inventory
- Must come with restriction that it only occurs word finally

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Disadvantages:

- Creates a word-final CN cluster

- Recall the initial nasals in words like [ntipatn] 'scorpion' (3a)
- These word-initial Ns in NC clusters must be analyzed as either syllabic or extra-syllabic
- Compared in this way, /tn/ allows for a more parsimonious phonology

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Interim Summary

- PSNs are *not* allophones of clear nasals in Banyaduq; they are phonemic
- Underlyingly, it is preferable to analyze them as sequences (/tn/), rather than complex segments (/t^n/)
- If prestopped nasals are clusters in Banyaduq, then, why do they exist in a language with few other clusters, and in a language family where consonant clusters are rare?

Banyaduq PSNs Diachronically

- It is undeniable that there is a diachronic relationship between prestopped nasals and final clear nasals following an oral vowel
- proto-Malayo-Polynesian *hikan (Blust, 1993) 'fish' $\rightarrow$ Banyaduk [ikatn] id.
- A diachronic explanation: An earlier stage of Banyaduq had a synchronic prestopping rule, but speakers of Banyaduq have reanalyzed allophonic PSNs as underlying consonant sequences.

- Occasional deletion of the nasal portion can then be seen as common historical process of final consonant loss
- In some Austronesian languages, historical clear nasals are reflected as oral stops in the PSN environment
- JM 'eight' is [lapan]∼[lapa^{d}n], is cognate with [lapat] in Urak Lawoi'(Blust, 1997, p.160)
- Perhaps the Banyaduq situation is part of a diachronic oralization process
- Of course, a diachronic explanation for the native Land Dayak exceptions in Banyaduq is necessary
- There are explanations for some exceptions, but much work remains on painting a better diachronic picture of Bornean languages

Thanks & References

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