

## Issues in unifying nasal vowel markedness

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The behavior of phonemic nasal and contextually nasalized vowels (hereafter conflated as “nasal vowels,” unless otherwise specified) is well documented from an empirical, cross-linguistic standpoint, but there is little consensus on what phonological principle, if any, governs their patterns. Phonological accounts of nasal vowel phenomena often invoke phonetic explanations, such as articulatory or perceptual ease. This trend reflects in part a larger difficulty in distinguishing coarticulation (a phonetic phenomenon) from assimilation (phonological); it also reflects ongoing debates about the purview of the domains in the phonetics-phonology interface. While crucial in our understanding of vowel nasality, phonetic-based explanations are insufficient under a modular approach where phonology is clearly delineated. In this presentation, I propose the Nasal Vowel Markedness Hierarchy as a sonority-based, framework-independent component of phonological grammar, using evidence from cross-linguistic surveys and personally collected nasometric data. I also offer a possible implementation of this hierarchy within a stringent framework (e.g., de Lacy 2006) and evaluate the various, testable predictions made by this system.

Efforts to establish markedness relations among nasal vowels encounter several issues. First, nasalization processes previously analyzed as phonological may in fact be phonetic; this complicates determining attested versus unattested inventory types under the expanded sense of the term “inventory” (including non-contrastive segments of a language as well as phonemes). The difference between process types has typically been thought to be reflected in the duration and/or intensity of nasalization (especially with respect to measurement-specific thresholds), where nasal coarticulation supposedly results in low rates, versus the high to near-complete rates demanded by assimilation. This scale alone introduces the possibility for “grey areas” but is further complicated when one weighs the minimal time necessary to achieve proper nasal coupling against the shorter duration/diminished prominence of certain vowels (especially high and/or central). Depending on the measurement and instrumentation, high percentages of nasalization therefore may not necessarily identify a process as phonological.

Even under the broad definition of the term, nasal vowel inventories often demonstrate several kinds of gaps, whether between oral and nasal congeners, between phonemic and contextually nasalized vowels, or between undergoers of progressive versus regressive nasalization. As such, nasal vowels may give the impression of high levels of irregularity, obscuring motivation of a universal hierarchy. In addition, the directionality of markedness relations among nasal vowels is debatable, especially under phonetic explanations. The notion of low vowels as inherently longer than high, when linked with the perceptual preference for nasality on long vowels, has been taken as evidence for a parameter where low nasal vowels are favored over high. Meanwhile, inherent velic positions and aerodynamic factors provide evidence for the opposite parameter, where high nasal vowels are favored over low (cf. Hajek 1997 for an in-depth discussion).

While some caution must be exercised when applying older data or analyses to phonology, we are not to discount them on this basis, and working hypotheses can still be

gleaned. An examination of Ruhlen’s (1975) survey of 100 languages shows that, with the sole exception of certain Iroquoian languages, no language with nasal vowels (phonemic or allophonic) lacks a low nasal vowel. Though rare, singleton nasal vowel inventories (even under the broad definition) are reported and necessarily consist only of a low vowel (e.g., Ile de Groix Breton). In addition, personally collected nasometric data of Vimeu Picard and several varieties of French support independent evidence for the incorporation of a front-back parameter. Based on these observations (among others), I propose the Nasal Vowel Markedness Hierarchy in (1), along the lines of the general vowel sonority hierarchy.

(1) Nasal Vowel Markedness Hierarchy

High central	>	Mid central	>	High back	>	High front	>	Mid back	>	Mid front	>	Low
ĩ	>	õ	>	ũ	>	ĩ	>	õ	>	ẽ	>	ã

An example of each category is given. ‘ $x > y$ ’ = ‘ $y$  is less marked than  $x$ ’

This hierarchy claims that low nasal vowels are the least marked of their kind. Peripheral nasal vowels will never be more marked than central, but among the peripheral nasal vowels, high are essentially the most marked.

The claims made by the hierarchy in (1) and the strictness thereof are intimately linked to the kind of framework into which the hierarchy is incorporated. One promising possibility is stringency in Optimality Theory (e.g., de Lacy 2006), which has several advantages but one potential disadvantage. First, this framework claims that while markedness relations are universal, competing forces can obscure or conflate them, and it easily derives gapped inventories. Deep-set grammatical relations can thus be captured without sacrificing flexibility; that is, the hierarchy need not be exceptionless, nor must segments be contiguous. In addition, stringency correctly predicts that no system can exclude the least marked member of the hierarchy (i.e., the low nasal vowel), unless all others are excluded as well. However, the current implementation of the hierarchy precludes certain types of nasal vowel raising processes, whereas numerous potential counterexamples are documented (e.g., Beddor 1982). It is not clear what criteria must be met for a process to be considered impossible by the theory, though this is a claim that will warrant substantial investigation in the future.

*References*

Beddor, P. S. (1982). *Phonological and phonetic effects of nasalization on vowel height*. PhD thesis, University of Minnesota.

de Lacy, P. V. (2006). *Markedness: Reduction and preservation in phonology*. Cambridge University Press, Cambridge.

Hajek, J. (1997). *Universals of sound change in nasalization*. Blackwell, Oxford.

Ruhlen, M. (1975). Patterning of nasal vowels. In Ferguson, C., Hyman, L., and Ohala, J. J., editors, *Nasálfest: Papers from a Symposium on Nasals and Nasalization*, pages 333–351. Stanford University, Department of Linguistics.