Relativized Sonority: Nasal adaptivity in syllable phonotactics

Martin Krämer (University of Tromsø) & Draga Zec (Cornell University)

While sonority, the sonority hierarchy (SH), and their role in phonology have been debated extensively (e.g., recently in Parker & Lahiri 2012) there hasn't been any survey yet that systematically investigates how individual segment classes behave with respect to sonority across languages. It is taken as a given by most authors that nasals occupy a position on the SH above obstruents and below liquids. In this paper we challenge this commonplace with data from over 200 languages that show that, in addition, nasals may also be of higher sonority than liquids. We propose that there are two kinds of nasals that occupy different positions on the SH. This is consistent with claims in the literature that nasality is of ambivalent nature for its compatibility with voiced stops as well as vowels and its aversion against fricatives and liquids (Cohn 1993, Botma 2004; cf. Mielke 2005).

In our database, of currently 204 languages from 53 families, out of 115 languages with restricted consonant inventories in coda position 83% contain nasals and 25% exclusively nasals. The languages solely displaying either liquids, or fricatives, or stops, jointly sum up to only 6%. In this corpus we also coded languages for which consonants can occupy the nucleus of a syllable. Of the 74 languages in the corpus that allow syllabic consonants, 92% display syllabic nasals and 57% of these allow only nasals to be syllabic, while only 39% allow syllabic liquids and only 7% allow only liquids as consonantal nuclei.

In some cases (coda) nasals pattern with vowels. In Gilbertese (Austronesian), root final nasals are invariably moraic, even when parsed as onsets, triggering mora transfer (Blevins & Harrison 1999); in Ciyao (Niger-Congo), one of the two moraic nasals retains its moraicity in all contexts (Hyman & Ngunga 1997); Ikwere has a syllabic nasal that bears tone and triggers phrase-initial onset epenthesis (Clements & Osu 2005). The relatively low sonority of nasals is corroborated by their frequent alternation with voiced or prenasalized stops (e.g., Yukaghir, Rotokas, Maxakalí, Apinayé, Lushootseed) as well as by their low frequency as the second member of onset clusters, with CN onsets implying CL onsets (Greenberg 1978, Berent et al. 2007). Among the nasal coda languages we found 3 with complex onsets (Karen Pwo, Lendu, Wan). In all three, only liquids can figure as the second member of an onset cluster. Yet, in all three, only nasals occur in the coda, to the exclusion of liquids, leading to a sonority paradox.

These typological observations pose a problem to the SH and its role in syllable phonotactics. It is widely assumed that sonority negatively correlates with compatibility with onset position and that sonority positively correlates with compatibility with nucleus and coda position and moraicity (Sievers 1876/1893, Pike 1943, Hooper 1976, Vennemann 1988, Zec 1988, 2007, Clements 1990, Blevins 1995, Prince & Smolensky 1993, Morén 2001, Baertsch 2002, Davis & Baertsch 2011, among others). We would thus expect nasals in coda as well as nucleus position to imply the presence of liquids, yet this is not supported by our database.

We conclude that nasals are adaptive, preferably low sonority segments in onsets and preferably high sonority segments in codas and nuclei. If we want to maintain the SH and the associated principles governing phonotactic patterns it has to be revised with nasals taking two positions, one below and one above liquids, depending on the syllable constituent they are associated with.

Revised SH: Vowels > Nasal vocoids > Liquids > Nasal stops > Obstruents

This broader set of options allows for at least three types of languages: those with only nasal stops, those with only nasal vocoids, and those that admit both.

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