Reconsidering Nasality in Nasal Clicks

Wm. G. Bennett
Rutgers University

While the existence of click consonants widely known, the existence of nasal clicks is frequently overlooked in phonological theory. These segments are generally assumed to be phonologically nasal – i.e. [nǀ] (a nasal dental click) is the 'click equivalent' of [n]. This talk argues that the general view is incorrect: nasal clicks are not phonologically nasal.

True, synchronic phonological alternations involving clicks are rare. As such, previous work on nasal clicks ascribes a [+Nasal] feature specification to them either on the basis of audible nasal airflow (Ladefoged & Traill 1984), or by inference from the classification of non-click consonants in a given language (Sagey 1986; Miller et al. 2007). Cross-linguistic investigations have generally taken the latter approach (Güldemann 2001), though this often results in phonetically nasalized clicks being classified differently in languages with different non-click inventories.

All of these previous analyses fail to note an important universal: if a language has any clicks at all, then it has nasal clicks. This suggests that nasal clicks are somehow phonologically less marked than oral clicks. That conclusion is further supported by Dahalo, a language which has nasal clicks, but no oral clicks; and Sandawe, which requires clicks in word-medial positions to be nasalized. (Similar patterns appear in ritual speech (Hale & Nash 1997) and language games (Nathan 2001), as well.)

Explaining the implicational relationship between oral and nasal clicks is problematic if nasal clicks are phonologically nasal. Under this assumption, any implication would be expected to go in the opposite direction, since nasal segments are normally *more* marked than non-nasals (nasal vowels are more marked than oral vowels, e.g.). Thus, the intuitive analysis of nasal clicks as [+nasal] makes their behavior cross-linguistically very puzzling. This puzzle has a straightforward solution, though, if we abandon the assumption that clicks are phonologically nasal.

The phonetic nasality of clicks can be derived independently of the phonological feature [±nasal], as the result of an aerodynamic interaction. Clicks are unique among consonants in utilizing a lingual (ingressive) airstream mechanism. The main articulatory closure combines with a second dorsal closure to form a sealed cavity of air in the mouth, and suction applied to this cavity provides the energy for the click's burst. An important consequence of this process is that the oral cavity is sealed during click production. It follows, then, that pulmonic airflow during a click can only escape the vocal tract by going through the nasal cavity. If the velum is raised during a click, pulmonic air gets confined in the pharyngeal tube; this results in a rise in pharyngeal pressure. Lowering the velum during a click avoids increased pharyngeal pressure by venting pulmonic airflow through the nasal cavity. Viewed in this way, click nasality can be re-interpreted in terms of airflow, controlled by two phonological features. Clicks are distinguished from non-clicks by the airstream feature [±lingual]. The contrast between nasal and oral clicks is represented by the feature [±pulmonic]: oral clicks are [-pulmonic], and nasal clicks are [+pulmonic]. This [+pulmonic] specification requires pulmonic airflow to continue, which forces lowering of the velum in nasal clicks (thereby allowing airflow to continue through the nasal cavity).

Once nasal clicks are reanalyzed as [+lingual, +pulmonic], an explanation of the oral → nasal click implication follows automatically: nasal clicks are less marked than oral clicks because [+pulmonic] segments are less marked than [-pulmonic] ones. This idea is formalized using the constraint AGREE-[±pulmonic], which favors nasal clicks over oral clicks anytime they occur next to [+pulmonic] segments (such as vowels). AGREE-[±pulmonic] interacts with a set of IDENT constraints (which preserve underlying values of [±lingual] or [±pulmonic]) & *[+lingual] (a constraint which militates against clicks) to derive the fact that every language with oral clicks also has nasal clicks, and capture the typology of nasal vs. oral click distribution patterns attested cross-linguistically.

Examples: (Hunziker et al. 2008, Wright et al. 1995)

(1)   Contrasting oral and nasal clicks in Sandawe:
a. ǁǒː   'path'
b. nǁǒː   'child'

(2)   Word-medial clicks in Sandawe must be nasal:
a. /malʔa/   [manǀʔa]   'louse'
b. /ǃuǃʔe/   [ǃunǃʔe]   'kidney'
c. /nǀanǀaʔo/   [nǀanǀaʔo]   'to cut'
d. /gligǀo/   [gǀingǀo]   '(type of) finch'

References:

Güldemann, Tom. (2001). Phonological regularities of consonant systems across Khoisan lineages. University of Leipzig Papers on Africa, Languages and Literatures 16. Leipzig: Institut für Afrikanistik, Universität Leipzig.

Hale, Ken & David Nash. (1997). Damin & Lardil Phonotactics. In: Tryon, D & M. Walsh (eds.), Boundary Rider: essays in honor of Geoffrey O'Grady, 247-259.

Hunziker, Daniel A., Elisabeth Hunziker, and Helen Eaton. (2008). A Description of the Phonology of the Sandawe Language. SIL Electronic Working Papers 2008-004.

Ladefoged, Peter and Anthony Traill. (1984). Linguistic Phonetic Descriptions of Clicks, Language 60 (1), 1-20.

Miller, Amanda, Johanna Brugman, Bonny Sands, Levi Namaseb, Mats Exter, and Chris Collins (2007). The Sounds of Nǀuu: place and airstream contrasts. In Pittyaporn, A. and Lee, H.S.,(eds.), Working Papers of the Cornell Phonetics Lab.

Nathan, Geoffrey S. (2001). Clicks in a Chinese Nursery Rhyme. Journal of the International Phonetic Association, 31: 223-228.

Prince, Alan & Paul Smolensky. (1993). Optimality Theory: Constraint Interaction in Generative Grammar. MIT Press. RuCCS-TR-2. ROA-537.

Sagey, Elizabeth. (1986). The representation of features and relations in nonlinear phonology. Ph.D dissertation, MIT. Cambridge, Mass.

Wright, Richard, Ian Maddieson, Peter Ladefoged, & Bonny Sands. (1995). A phonetic study of Sandawe clicks. UCLA Working Papers in Phonetics 91. 1– 24.