

Voicing and Other Laryngeal Properties in North Saami

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Three kinds of arguments can be advanced to show that a sound [α] is specified [X] as opposed to [Y], but these arguments require assumptions that can easily be challenged. One is based on analogy to a known quantity: if b and v are part of a class excluding p and f , we conclude that b is voiced based on knowing that v is voiced — if we were to know that v is voiced, not unaspirated. A second argument uses typological asymmetry, the presumption that certain processes pertain to specific features, thus palatalization is triggered by vocalic frontness and not, for example, roundness. But many typological implications are soft-core and may be counterexemplified in a few languages (for example, rounding *does* trigger labial palatalization in a few Southern Bantu languages). Finally, recourse can be had to presumed phonetic correlates for features, whereby [nasal] might be diagnosed just in case nasal airflow is detected during a sound, and [voice] might be assigned if and only if vocal fold vibration is present. But this begs the question whether there is a phonological component separate from physical realization, and this argument gives physical measurements dispositive power to resolve matters of mental state. Since the actual presence of vocal fold vibrations varies during the production of segments, the notion of a symbolic phonological segment would be rendered incoherent by too tightly yoking feature representations to physical production.

Resolving the status of voicing in the Guovdageaidnu dialect of North Saami faces theoretical and analytical problems similar to those connected to voicing in English. On the surface, there are voiced stops, for example *stoobe* “can”, *geađegi* “stone”, *baldo* “ice floe”. Insofar as some publications on the language (e.g. Sammallahti 1998) represent these as voiceless unaspirated stops — which may be correct for those dialects and speakers — the claim that there are surface voiced stops requires defense. We defend that claim with acoustic and physiological evidence from electroglottography, demonstrating that vocal fold vibration *is* present during stop closure in this dialect.

As with analyses of similar facts of English, the phonetic facts are consistent with a phonological analysis where b , d , g are [(+)voice], as well as one where b , d , g are distinguished from p , t , k with the latter being [(+)spread glottis], phonetically implemented with vocal fold vibration. A crucial phonological question is whether [(+)voice] plays any contrastive role in the language. We show that it does: there are minimal pairs distinguished exclusively on the basis of voicing, viz. [soabbi] “staff (nom. sg)” versus [soappi] “staff (acc. sg)”. We can exclude an analysis of this contrast in terms of aspiration (where *soabbi* has an unaspirated stop and *soappi* has an aspirated one). First, [pp] in *soappi* is phonetically unaspirated. Second, under standard assumptions about the representation of tautomorphic geminates, [pp] would be monosegmental and moraic. But we show that a monosegmental moraic aspirated stop in North Saami is (analogous to Icelandic) realized with preaspiration, and phonologically speaking, surface [baahpa] “minister (acc. sg)” is /baap^h:a/, /p^h:/ being a moraic aspirated stop. The same representation cannot then stand for *pp*.

Interestingly, contrastive obstruent voicing only exists for geminate stops, one of the most marked contexts for voicing. Even in this context, voicing is a surface-contrastive but ultimately predictable property, being the realization of a floating mora which marks certain inflectional categories. We conclude, then, that [voice] is necessarily present in some surface forms e.g. [soabbi], and it is always derivationally predictable so not necessarily part of underlying forms. This leaves open the interpretation of singleton voiced stops in forms like [čiega] “corner (acc. sg)”. Surface singleton voiced stops arise from underlying aspirated stops under prosodic conditions — being non-moraic — whereby [čiega] derives from

/čiek^ha/ (cf. /čiek^h:a/ → [čiehka] “corner (nom. sg.)”). Loss of aspiration is part of a wider alternation which we analyze in this presentation, whereby glottalization is also licensed in moraic nasals (/deɑ̃:u/ → [deɑ̃nu] “river (nom. sg.)”) but deleted in non-moraic nasals (/deɑ̃u/ → [deanu] “river (acc. sg.)”). This makes plausible a phonological analysis where *čiega* leaves the phonology as [čieka] with an unaspirated stop, because it derives from /čiek^ha/ via deletion of laryngeal features, and the voicing of unaspirated *k* might be the result of non-phonological physical modifications giving rise to vocal fold vibration.

Evidence to decisively choose between a phonological output [čieka] subject to interpretation with vocal fold vibration, versus a phonological derivation from intermediate *čieka* to [čiega] with a categorial change to [+voice] intervocalic stop is hard to find. A further phonological consideration is that the result of deaspirating /t^h/ between vowels is not [d] but in fact [ð], as shown by the alternation /goat^h:i/ → [goahti] “big house (nom. sg.)” versus /goat^hi/ → [goaði] “big house (acc. sg.)” under deaspiration. The process leniting *d* to [ð] is clearly phonological and not physical implementation, because although it applies generally to *d* between vowels, it is counterfered by a vowel epenthesis rule inserting a vowel between a moraic sonorant and a consonant according to which /gear:ti/ → [gearedi] “layer (nom. sg.)”. Lenition is typological evidence supporting the phonological-voicing hypothesis, because intervocalic lenition of voiced stops to voiced fricatives is common, whereas direct lenition of voiceless stops to voiced fricatives is apparently unattested (examples from Tibetan and Kalenjin indicate that spirantization requires prior voicing, and takes place in a subset of voicing contexts), and is least likely to affect coronal stops — coronal consonants are the ones excluded from lenition in Tibetan, Kalenjin, Finnish and Modern Hebrew. The fact that *d* must be positively identified to the exclusion of *t^h* is evidence that voiced stops have an identifying property (do not just lack properties), which is what is implied by the specification [(+)voice].

Another phenomenon relevant to laryngeal features in North Saami stops is word-final laryngeal neutralization. Word-finally consonants are severely limited to non-affricated coronals, where coronal stridents become [s] or [š], and all stops and non-strident continuants become preaspirated [ht]. The expected lexical contrast between [g] and [hk] is neutralized, as seen in *čuoivvaht* “yellow-brown reindeer (nom. sg.)” cf. *čuoivvag-in* (essive) versus *aa-sođaht* “residence (nom. sg.)” cf. *aa-sođahk-an* (essive), also *jufaanaš* “little John (nom. sg.)” cf. *jufaanažž-an* (essive). Final aspiration, while rare, is motivated in other languages (Klamath, Kashmiri), and in some theories is claimed to be the proper account of German final devoicing (Iverson & Salmons 2007). Word-final laryngeal neutralization in North Saami fills a typological gap, in providing another example of neutralization feeding final aspiration, but in addition, coda aspiration in North Saami is realized as pre-aspiration, which demonstrates that whatever the teleology of final aspiration is, it cannot depend on the typical phonetic realization of aspiration after the consonant release.

Iverson, Gregory & Joseph Salmons. 2007. “Domains and directionality in the evolution of German final fortition”. *Phonology* 24: 121-145.

Sammallahti, P. 1998. *The Saami languages*. Kárášjohka: Davvi Girji