

## ACOUSTICS2008/1796 Spectrotemporal and $f_0$ evidence for a theory of enhancement

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According to Keyser & Stevens, 2006, apart from universal features that are utilized to calculate motoric instructions, there is a second parallel and language-specific process called enhancement, where additional motoric instructions are processed for the enhancement of the saliency of features that are in danger of being obliterated. The "Standard View" on the distinction between voiced stops (VS) and voiced aspirated stops (VAS) in Hindi proposes that the breathy-murmured release following VAS is sufficient to make the contrast between the VS and VAS (Ladefoged & Maddieson, 1996). Hence, audible distinctions between VAS and VS during closure (CD/VLT) are not relevant in maintaining the contrast.

Results from our studies show that CD is a relevant cue in making a distinction between aspirated and unaspirated stops. Spectral intensity measures show that speakers employ different glottal configurations to obtain the breathy/modal voicing contrast. VLT durations are inversely correlated with  $f_0$ , such that longer VLT for VAS leads to further lowering of  $f_0$ .

This evidence suggests that  $f_0$  perturbations, differences in the durations of closure, and nature and extent of aspiration, all contribute in making the four-way stop contrast possible in Hindi, in support of a theory of enhancement.