

# The University of Pittsburgh ~ Department of Linguistics

## Colloquium Series *Presents:*

### “Toward a Rational Account of Channel Bias”

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What factors shape the synchronic typology of sound patterns and how should these factors be assessed? One commonly recognized factor is known as channel bias (Moreton, 2008). That is, certain sound patterns might be intrinsically more frequent and salient than other patterns due to the relative robustness of the phonetic precursors. In this talk, I will address two closely related issues concerning the nature of the channel bias: the mechanism of phonologization and the measurement of phonetic precursor robustness.

It is often assumed that sound change takes place when the listener mistakes the effects of the speakers' production system and of ambient effects on the acoustic stream of her own perceptual system as representative of the speaker's internal representations. Such an account hinges on the assumption that errors in perception lead to adjustment in perceptual and production norms. The mechanisms through which this adjustment takes place (i.e. phonologization) is not only under-articulated, it is further challenged by mounting evidence that listeners are very adept at compensating for contextual variation in speech perception and production. That the factors regulating phonologization have not figured prominently in theoretical discussion constitutes a serious gap in our understanding of the development of sound patterns: intrinsic variation in speech production and perception provides only the necessary but not sufficient conditions for change.

In this talk, I explore the idea that the likelihood of a new variant becoming phonologized is determined by the robustness of the listener's compensatory response. Perceptual compensation (PC) is modeled in terms of a rational analysis of speech perception and production. Using Bayesian inference, perceptual compensatory responses are explained as the consequence of the listener trying to reconcile evidence with prior beliefs or assumption. I propose that PC and phonologization are fundamentally one and the same problem. Both questions can be recast as a matter of understanding shifts in speaker's optimization responses.

Using this same rational model of speech perception, a method, called Slope of Precursor Robustness (SPROB), is proposed, which estimates phonetic precursor robustness by the degree of uncertainty a given context introduces to the identification of an intended sound category. The utility of SPROB is illustrated through a case study of the phonetic precursors to vowel-to-vowel height dependencies (HH) and dependencies between vowel height and consonantal voicing (HV).

**Friday, March 27, 2009 at 3:00 p.m.**

**Room G8 ~ Cathedral of Learning**