The emergence of symmetry/dispersion in a self-organized phonology
Daniel Silverman
MFM12

- Martinet (1952), Hayes (1996): cognitive pressure towards systemic symmetry.
- Sapir (1925): asymmetrically distributed elements possess a "psychological aloofness from all other members of the system."
- But even literate adult speakers who are not trained in an alphabetic writing system have no intuitions at all about segmentation (Read Zhang, Nie, and Ding 1986)
- Kingston and Diehl (1994): Speakers choose different pronunciations of a phoneme in order to optimize conveying the contrast in each context that it occurs.
- Kingston (2002): "Speakers must be altruists."

- Shifting the locus of the mechanism
  -from the individual to the social
  -from the synchronic to the diachronic
  -from the teleological to the evolutionary.

PROBABILITY MATCHING

- Animals perform sophisticated statistical analyses as they navigate the world around them, e.g. in foraging, they match their behavior in terms of likelihood of payoff.
- Similar statistical calculations underlie aspects of human linguistic behavior, in that the nature and extent of variation in speech is indeed largely matched as listeners become speakers.
- Variable vocalic nasalization: different languages vary in different ways (Clumeck 1976).
- Ohman (1966), Manuel (1999)
- Optional use of certain morphemes is probability-matched across speakers (Poplack 1980, Hudson and Newport 1999)

EXEMPLAR THEORY

- Perceptual categories are defined as the set of all experienced instances of the category, such that variation among tokens actually contributes to the categorical properties themselves.
- Mikołaj Kruszewski (1881):

  "…In the course of time, the sounds of a language undergo changes. The spontaneous changes of a sound depend on the gradual change of its articulation. We can pronounce a sound only when our memory retains an imprint of its articulation for us. If all our articulations of a given sound were reflected in this imprint in equal measure, and if the imprint represented an average of all these articulations, we, with this guidance, would always perform the articulation in question approximately the

same way. But the most recent (in time) articulations, together with their fortuitous deviations, are retained by the memory far more forcefully that the earlier ones. Thus, negligible deviations acquire the capacity to grow progressively greater…"

PROBABILITY MATCHING PROMOTES CATEGORY SEPARATION AND PHONETIC **STABILITY**

Spanish:

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English:

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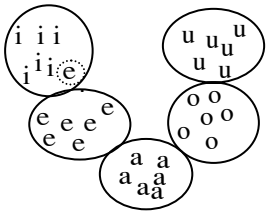
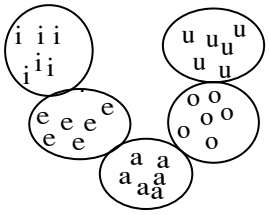
Vowel production:

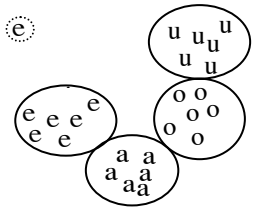


Vowel perception:

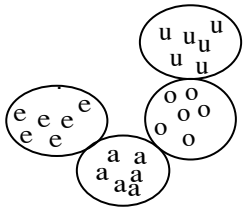


PROBABILITY MATCHING PROMOTES CATEGORY SEPARATION AND PHONETIC **CHANGE**

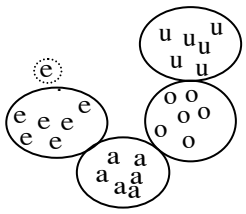
Vowel production:



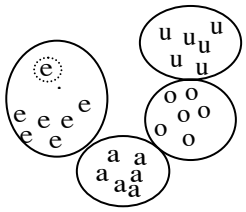
Vowel perception:



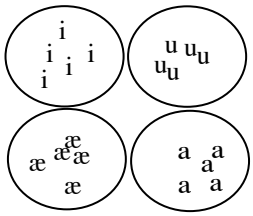
Vowel production:



Vowel perception:



Newly evolved system:



Thanks everybody for everything!