

How are sounds stored?

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The question of how (or even whether) speakers store speech sounds (segment-sized linguistic units) has been a contentious one for over a century. Since the concept of the phoneme was first introduced as a synchronic notion in the late nineteenth century, conflicting views have proliferated and contended with each other. Along with the mental target view of Baudouin, Sapir and Stampe, the distinctive feature view of Trubetzkoy and various flavors of generative-oriented phonology, including OT, a few new views have gained hold recently, including a much more concrete storage-heavy view termed ‘usage-based’ (Bybee et al.) and one based on exemplar theory (Pierrehumbert and others), as well as historically-based explanations such as Blevins. The issues raised by these competing theoretical standpoints differ along a number of dimensions related to how speech is stored, produced and perceived, and how those three issues relate to each other. Some of the dimensions include:

- 1 whether variants (however defined) are stored or computed online,
- 2 if they are computed online, are the computed variants morphophonemically related, allophonically related, phonetically related or something else
- 3 whether that storage is in fully specified or reduced (e.g. ‘distinctive feature’) form,
- 4 whether those features are all specified or whether some are ‘later’ filled in by rule
- 5 whether the mode of phonological storage is articulatory, acoustic, perceptual, all three, or some kind of more abstract fusion of one or more of those modes.
- 6 if speech sounds are a kind of category, what kind of category is it (Aristotelian, fuzzy, prototype, exemplar or other)

This paper will examine the issues that these dimensions raise for synchronic descriptions of phonology and our understanding of how phonology is acquired and produced. It will argue that each of these dimensions constitutes a pair of competing cognitive pressures. The ‘solution’ human language has chosen is a system based on an understanding of phonological processing similar to that proposed in Natural Phonology. It represents the results of a naturally emergent system consisting of a compromise between the demands of the local speech community and the physical and cognitive demands of the speakers.

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