

On Learning Allophonic Relations: Phonetic Identity or Functional Similarity?

Daniel Silverman (daniel@cogsci.uiuc.edu)

Department of Linguistics, 4088 FLB, 707 S. Mathews, Urbana IL 61801

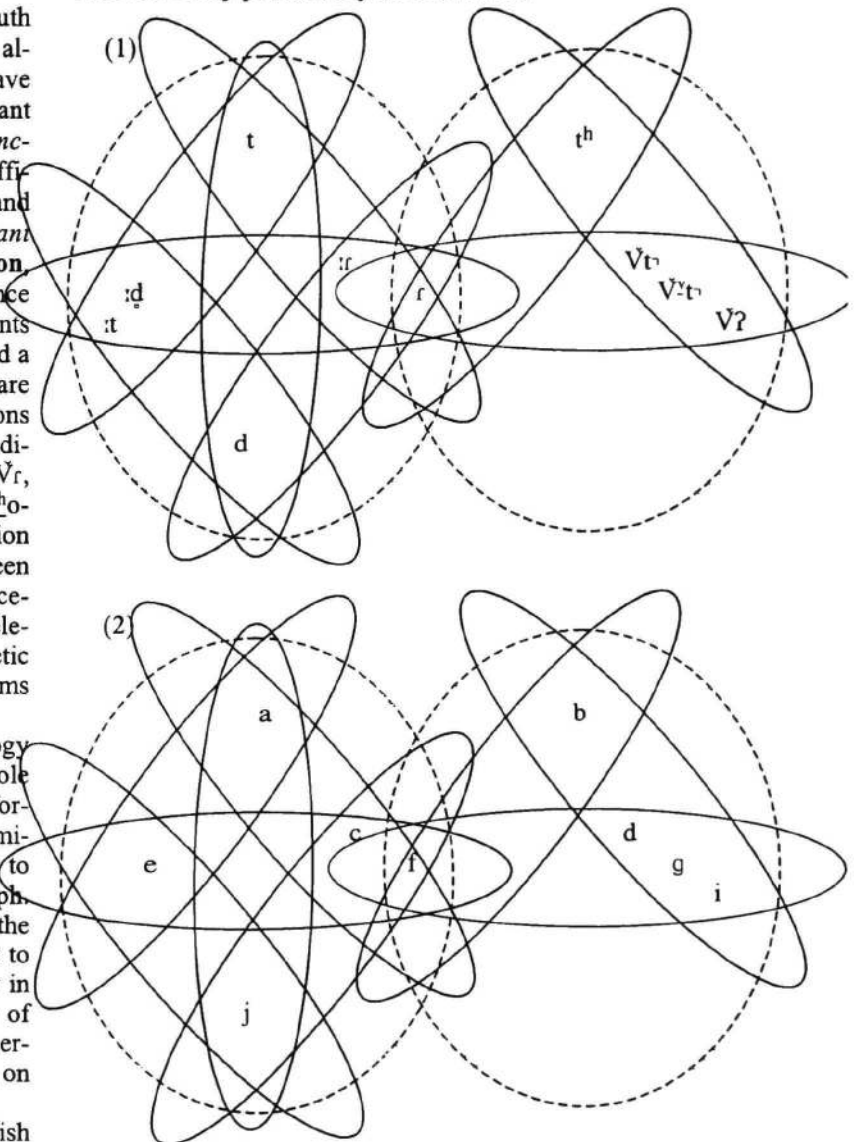
In this paper I consider methods of teasing apart the role of phonetic similarity versus the role of functional identity in phonological category formation, and the relevance of this issue for language acquisition and mental representation.

Linguists may be easily fooled by the surface near-truth of the traditional “phonetic similarity” diagnostic for allophony, but the functional and historical forces that have shaped the surface in this way may nonetheless be irrelevant to learners. Rather, the mere *presence or absence of functional identity* between one phone and another may be sufficient for learners to conclude which are allophonic, and which are contrastive. The functional information *relevant to the learner* then, comes in two forms: (a) **alternation** which informs the learner about the functional irrelevance of the observed phonetic distinctness among alternants themselves, that is, that the phonetic change does not yield a change in meaning. Also relevant, it should be noted, are alternation *chains*, in which a series of allophonic relations may functionally link alternants that rarely if ever immediately alternate with each other. Thus English has $V^{\text{r}}t^{\text{r}} \sim Vr$, and $Vr \sim t^{\text{h}}$, but $t^{\text{h}} \sim V^{\text{r}}t^{\text{r}}$ is exceedingly rare (e.g., *dictat^ho-ri-al~dictat^re*). Nonetheless, due to the existing alternation chain, a functional link may be readily established between the two. (b) **substitution**, by which a paradigmatic replacement of one phone with another indeed has functional relevance, i.e., yields a change in meaning. Thus ‘phonetic similarity’ may play no immediate functional role in terms of category formation by the learner.

Now, it is well known from the experimental psychology literature that similarity indeed seems to play a crucial role in category formation: categories are more difficult to formulate when the stimuli to be grouped together are dissimilar (Shepard et al. 1961). These results, of course, seem to fly in the face of the suggestions of the previous paragraph. However such experimental procedures do not possess the added dynamic dimension of alternation that is inherent to language. It may well be the case that when stimuli vary in ways which result in no functional change (as in cases of alternation) such information may augment—or even override—the otherwise natural tendency to categorize based on similarity.

Back to English now, it is possible then, that the English stop system (1) is no easier to learn than one which displays no phonetic similarity among allophones (2). Such a system is improbable *not* because of its hypothetical unlearnability, but only because it does not make natural phonetic or historic sense. By contrast, learning/representational models in the post-SPE generative school have been structured to encode the supposed “costliness” of rare and “unnatural” allophonic patterns (such as, for example, the Southern Min

tone circle, or Japanese palatalization), and yet there is no evidence that such unnatural patterns are any more difficult to master than natural ones: learnability does not appear to be a contributing factor to such patterns’ rarity; the reasons for their rarity presumably lie elsewhere.



Reference

Shepard, R.N., C.L. Hovland, and H.M. Jenkins (1961) Learning and memorization of classifications. *Psychological Monographs* 75(13, whole number 517).