

COMPLEX ENCODING IN WORD-FINAL VOICED AND VOICELESS STOPS

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In perceptual studies on the word-final voiced/voiceless distinction, the relationship between vowel and closure duration has been largely ignored. Two experiments report on the effect on the VC dyad of speech rate and position in sentence. Exp. I employs synthetic /bæg(k)/ stimuli of 3 durations (370, 310, 270 ms) simulating "Slow", "Neutral" and "Fast" rates of articulation. The vowel-to-dyad ratios ($\frac{V}{D}$) range from 0.95 - 0.33 in 9 steps per rate. Each stimulus was judged 10 times in 3 separate blocks of 90 stimuli by 20 native speakers of English. Exp. 2 uses 8 computer-manipulated natural utterances: "His bag(ck) seems dirty" and "He's dirtied his bag(ck)" spoken at 2 speeds, "Neutral" and "Fast" with $\frac{V}{D}$ ratios adjusted in 5 steps to exceed the values of the natural stimulus of the opposing category. Also, the voicing was removed from the natural [bæg] stimulus, producing a voiceless lenis series for each of the 4 tempo-context-combinations. The 4 sets of 15 stimuli were presented, 10 times each, in random order to 13 native speakers.

In Exp. I the $\frac{V}{D}$ value for the 50 % crossover shifted negligibly from "Neutral" to "Fast" (.70 - .72), indicating an equal perceptual contribution of vowel and closure duration to the combined decoding of phonemic identity and speech rate. The crossover for "Slow", however, occurred at a significantly higher value (.75) than either "Neutral" or "Fast" due to an unchanged closure value from "Slow" to "Neutral". The results of Exp. II confirm those of Exp. I for the sentence-final context, the $\frac{V}{D}$ values for the "Lenis" and "Fortis" conditions bracketing those of the ambiguous synthetic stimuli: Mid-sentence, however, there was a disproportionately low closure-duration and a correspondingly higher $\frac{V}{D}$ crossover value for the "Fast" speech rate. This is attributed to the following [s]. A comparison of position in sentence indicates the perceptual importance of sentence-final lengthening, whereby a significant $\frac{V}{D}$ increase for the "Neutral-Final" combination points to a greater contribution of vowel duration to the juncture signal. All perceptual regularities observed can be linked with corresponding articulatory regularities.