Pilot experiment: Characterizing perceptual warping for vowels vs. CVs

We first examined whether perceptual warping of categories varies among different speech sounds (vowels vs. consonants). To this end, we ran a pilot sample that included N=5 young adults. Participants were native speakers of American English and reported normal hearing. We used 7-step continua of vowels (/u/ to /ɑ/) with F1 frequencies spanning from 430 to 730 Hz and consonant-vowel (CV) syllables (/dɑ/ to /gɑ/) used in previous studies[7,44,45]. Listeners were instructed to listen to these stimuli through headphones and respond by clicking on an onscreen button whether they heard "oo" or "ah" in the vowel conditions and "da" or "ga" in the CV condition. With each condition, listeners heard 10 repetitions of each token (total = 70 tokens per condition). The pilot task was conducted via internet-based data collection using paradigms coded in E-Prime 3.0 delivered using E-Prime Go[46].
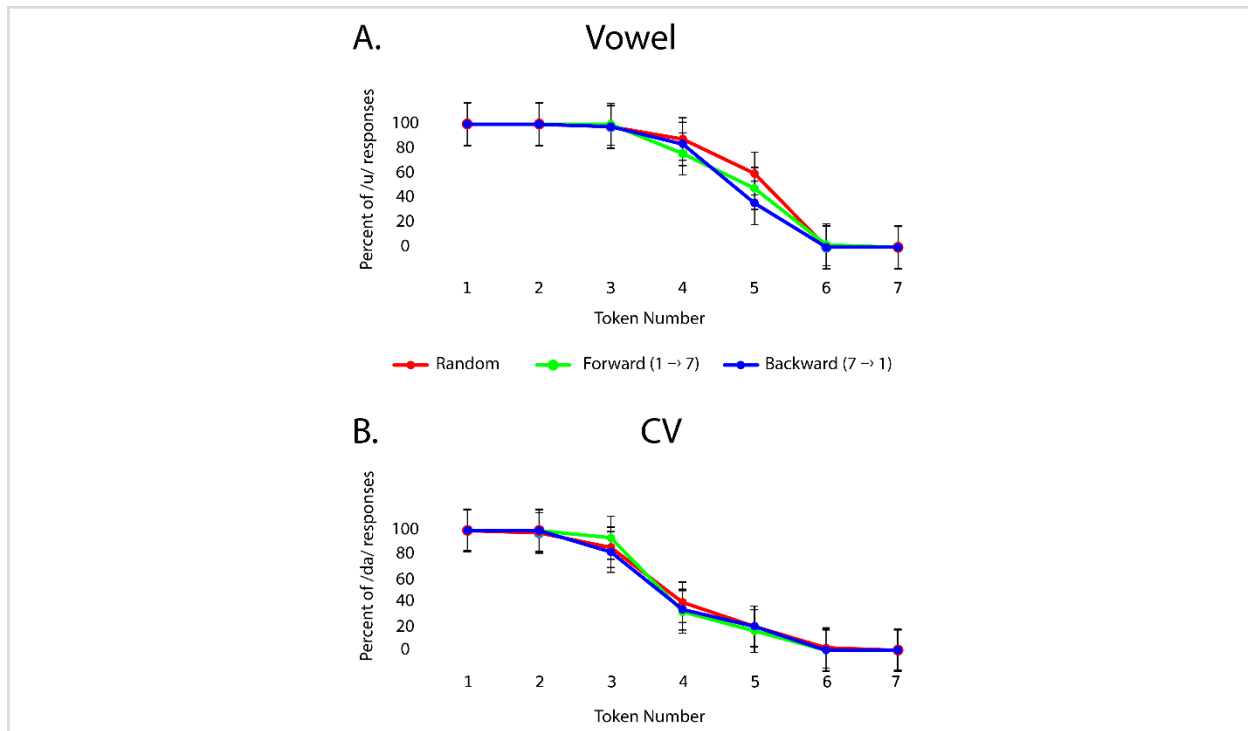

Figure S1: Psychometric functions (n=5), comparing the identification for **(A)** vowels and **(B)** consonant-vowel syllables (CVs). Vowels exhibited more nonlinear response patterns than CVs as evidenced by the more salient movement of the perceptual boundary (e.g., see Tk4-Tk5). Error bars = ±1 s.e.m.

Figure S2: Scalp topography of ERPs. Boxes denote superchannels used in the primary analysis. Negative is plotted up.

Subject Num	Tk3 Yule's Q	Tk5 Yule's Q	Response Pattern (listener type)
S1[†]	-0.87*	-0.75*	Hysteresis
S2[†]	0.08	0.66*	Enhanced Contrast
S3	0.00	0.38*	Enhanced Contrast
S4[†]	0.00	0.00	Critical Boundary
S5	-0.84*	-0.49*	Hysteresis
S6	-0.77*	0.00	Hysteresis
S7	-1.00*	0.00	Hysteresis
S8	-1.00*	-0.74*	Hysteresis
S9	0.00	-0.59*	Nil
S10	-0.44*	0.00	Hysteresis
S11	-0.76*	-0.48*	Hysteresis
S12	-0.23	0.40*	Enhanced Contrast

S13	-0.60*	-0.30	Hysteresis
S14	0.00	0.88*	Enhanced Contrast
S15	-0.76*	-0.17	Hysteresis

Table S1: Yule's Q values for Tk3/5 (i.e., tokens flanking the expected $\beta 0$) and response patterns by participant. More negative/positive Yule's Q denotes hysteresis/enhanced contrast response patterns, respectively. *Yule's Q of medium-to-large effect size $|Q| \geq 0.33$. [†]Individuals shown in **Fig. 1E-G**