# Relationship between individuals' compensation for coarticulation and production

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This study examines the relationship between perceptual compensation and production. 55 native English speakers were tested for perceptual compensation of /s/ before /u/ vs. /a/. Then they read a word list, followed by an imitation task in which some of the words with /s/ before /u/ and /ai/ were manipulated to sound over-coarticulated (/ʃ/-like), e.g. '*s*aiba'/'*s*ooba'.

Two non-linear models were performed to predict the imitation production. They assume that the detailed information of the stimuli is stored in the perceptual memory and projects to the production domain. For each individual, the perception and the initial production distributions were approximated using the perception task and the baseline production. The PC model assumes the stimuli are stored differently before different vowels and thus calculates the relative positions of the stimuli in the /$s_a$/ and /$s_u$/ perception distribution, respectively; the non-PC model assumes the storage are the same and assumes only one /s/ distribution. The relative positions were mapped to the production distributions using a linear function. The transformed stimuli were weighted and added to the initial production distributions to predict the imitation production. The predictions were regressed on the actual production. Log likelihood tests showed a significant improvement of the PC model, suggesting perceptual compensation plays a role in imitation.