

ACOUSTICS2008/2966

Probing the independence of formant control

Ewen Macdonald, Bryan Burt and Kevin Munhall

Queen's University, 62 Arch St, Dept. of Psychology, Humphrey Hall, Kingston, ON, Canada K7L 3N6

Previous experiments in speech motor learning have demonstrated that acoustic feedback is used to control formant frequencies (Houde and Jordan 1998; Purcell and Munhall 2006; Villacorta, Perkell, and Guenther 2007). In these studies, the formants of a vowel were shifted using a real-time signal processing system. When subjects spoke a vowel, they heard themselves saying a different vowel. The talkers spontaneously compensated for this auditory feedback perturbation by producing formants in the opposite direction in frequency to the perturbation. The purpose of the present study was to investigate if compensating for a perturbation in either the first or second formant also leads to a change in production of the other formant. A between-subjects experiment was conducted where half the participants had a perturbation applied only to the first formant and the other half had a perturbation applied only to the second formant. As in previous experiments, both groups compensated for the perturbed formant. In compensating for the perturbed formant, the production of the other, unperturbed, formant was also affected. However, the change in frequency was quite small. The results will be discussed in terms of the independent variables of speech motor planning