

Title: Neural processing of perturbed voice auditory feedback in volitional vocal pitch changes

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The present study investigated the effect of presenting voice f_0 feedback perturbations before subjects produce volitional f_0 changes and whether volitional intent modulates neural responses to feedback perturbations. Voice and event-related potentials (ERPs) were recorded in 20 subjects in response to ± 50 -cent pitch-shifted auditory feedback in two vocal tasks: 1) steady vowel phonation (/a/) and 2) steady vowel phonation followed by a raise in pitch (planned pitch-change). The results showed that compensatory reflexive responses to pitch-shifted feedback occurring 300ms before and in the same direction of the planned pitch-change cause larger changes in the volitional response when compared to trials with compensatory responses opposing the direction of the volitional responses as well as trials without perturbations. Significant differences in N1 and P2 components suggest that early ERPs are sensitive to pitch-shift stimuli direction in context of volitional intent. Musicians demonstrated larger P3 amplitudes than non-musicians, suggesting that musicianship changes how individuals evaluate pitch-errors across trials. Overall, the results suggest that the audiovocal system can be contextually sensitive to pitch-errors in dynamic conditions and effectively respond to errors that oppose volitional intent.