

Exploring production-perception relationships for 4-year-old children:  
a study of compensation strategies to a lip-tube perturbation

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The relationships between production and perception for 4-year-old children were examined through a study of compensation strategies to a lip-tube perturbation. Acoustic and perceptual analyses of the rounded vowel [u] produced by 12 4-year-old French speakers were conducted under two conditions: in normal condition and with a 15 mm-diameter tube inserted between the lips. Recordings of isolated vowels were made in normal condition before any perturbation (N1), immediately upon insertion of the tube (P1), for each of the next 20 trials in this perturbed condition (P2), and in normal condition after the perturbed trials (N2). Results of the acoustic analyses reveal speaker-dependent alteration of F1, F2 and/or F0 in the perturbed conditions and after the removal of the tube. For some subjects, the tube introduced very little changes whereas for some others, a clear increase of F2 was observed in P1, which was generally at least partly compensated during the P2 repetitions. Perceptual data confirm these patterns and suggest that the task can be related to linear combinations of F0, F1, and F2 (in bark). The data are compared to a previous study carried out with adult speakers [C. Savariaux, P. Perrier, J.P. Orliaguet and J.L. Schwartz, *J. Acoust. Soc. Am.* 106, 381-393 (1999)].

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