

## ACOUSTICS2008/2802

### Modeling formant pattern in fricative-vowel sequences

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MRI data indicate that there are two subject-dependent articulatory patterns in French post-alveolar sibilant fricative /'integral of'/. Each type of articulations can correspond to the Polish fricatives /'curled c'/ and /'underdotted s'/ on the basis of their articulatory similarity: palatalized for the former, and the presence of a sublingual cavity as well as lip protrusion for the latter. The F2 transitions, in part, reflect the acoustic contrast between these Polish fricatives, which exhibit a higher locus in the palatalized /'curled c'/ than in /'underdotted s'/. However, no systematic transitional characteristic could be found in French. We hypothesize that the subject-specific formant-cavity affiliation in the adjacent vowel /a/ and/or the difference of scale in vocal tract lengths manifest as the acoustic variation in French, whereas those VT morphological differences are articulatorily compensated in Polish to maintain the distinctiveness of these two post-alveolar fricatives. In order to assess this hypothesis, the F-patterns along /a 'integral of' a/ sequences are simulated for various vocal tract configurations. In calculations, the two different types of the fricative articulations are combined with the vocal-tract area functions appropriate for /a/ but different in shape and in size to taken into account for female and male speakers. The results will be discussed.