

Affricates and stop epenthesis in Italian: acoustic and aerodynamic data

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The investigation on affricates and stop epenthesis is performed by taking into account both alveolar affricates and alveolar stop epenthesis in some central and southern varieties of Italian. In such varieties, regular affricates are found and stop epenthesis is realized in /n, l, r/ plus /s/ contexts. Regular affricates and such stop+fricative clusters are studied by means of both semispontaneous (Map Task dialogues) and read speech.

A first set of data was collected by analysing 5 Map Task dialogues realized by Pisa Italian speakers, and 40 words read in isolation by all the speakers who took part in the semispontaneous speech recordings. The relevant contexts were selected and both duration and energy (rms) measurements were performed. As for duration, the preceding consonant, the following vowel, and the affricate (both as a whole and as plosive+fricative phase) were measured. As for the energy measurements, they were performed within the friction phase and related to the minimum and maximum value, their delta and the rise time, i.e. the time needed to reach the maximum from the beginning of the friction. On a subset of data a detailed analysis of the spectral characteristics in the friction phase was also performed by measuring the frequency of highest intensity values in four points within the friction (3 points located at the beginning of the first half, and one point in the middle of the second half) The same measurements were also performed on a small set of fricatives produced in homogeneous contexts. Results show that affricates are realised with a shorter friction phase and a smaller rise time than fricatives, as expected according to the results described in the literature, and that the intensity peaks may be realised at progressively lower frequency values. In many cases, though, no clear closure phase was found in affricates. The correlates described above probably account for the perception of affrication in these contexts. In order to shed some light on this lack of closure in the realisation of affricates, some airflow measurements have been then taken into account.

A second set of data was then collected by analysing both acoustic and aerodynamic material recorded by Neapolitan and Calabrian speakers. They were asked to read aloud three times a list of 38 words in isolation, and their speech plus the oral and nasal airflow were recorded by means of the EVA station. The relevant contexts were selected and segmented, and duration, oral and nasal airflow mean value, and airflow volume values were measured. Preliminary results show that speakers of these varieties do not show the same amount of epenthetic stops that Pisa speaker produce. In case of regular affricates and epenthetic stops followed by a fricative in /n, l, r/ contexts, however, data coherently show that in many cases no oral closure is realised within /l, r/ and the following fricative. The perception of affrication appears to be due, again, to noise's characteristics at the boundary between the fricative and the preceding consonant, which is often characterised by a certain amount of friction. As far as the nasal contexts is considered, the nasal is often unvoiced, the oral closer is realised while the nasal closure is not. In these contexts, the noise characteristics appear to play a role in the perception of affricates vs. fricatives, but the nasal devoicing could also help in perceiving the presence of an oral plosive. Therefore both acoustic and airflow data point to the fact that defining affricates (and epenthetic stop+fricative) as realised by a closure followed by a fricative phase may not offer a precise characterisation of the actual production properties of these phones.