Rhotics in European Portuguese: The variability in phonetic realisations

Susana Rodrigues[1], *Fernando Martins*[2] & *Luis M. T. Jesus*[3]

[1] School of Health Sciences, University of Algarve (UALgESS) and CLUL, Portugal,

[2] Faculty of Letters of University of Lisbon and CLUL, Portugal

[3] School of Health Sciences (ESSUA) and Institute of Electronics and Informatics Engineering of Aveiro (IEETA), University of Aveiro, 3810-193 Aveiro, Portugal

sfrodrigues@ualg.pt, fmartins@fl.ul.pt, lmtj@ua.pt

Introduction: The phonetic variability of rhotics across and within languages has been reported by several authors. From a phonological point of view there are two rhotics in European Portuguese (EP): A tap /ɾ/ and a uvular trill /ʀ/. Current phonetic data on EP is very limited and mainly related with different realisation of the uvular trill. These aspects form the primary motivation for the present study. The purpose of this study is to describe the phonetic realisations of rhotics in EP.

Methods: Data were collected from ten adults (five female and five male speakers), whose ages ranged from 20 to 40 years. They were all monolingual speakers of EP and none had history of speech and/or language disorders. A corpus of real trissyllabic words, with paroxytone stress pattern and rhotics at onset, complex onset and coda positions and seven oral vowel /i, e, ɛ, u, o, ɔ, a/ contexts, were recorded in a frame sentence. Data was collected in a sound proof booth, using a DPA 4006-TL microphone located 30 cm in front of the speaker's lips, connected to an audio interface (TASCAM US-800) and a desktop computer located outside the cabin. The acoustic signal was recorded at 16 bits and a sampling frequency of 44100 Hz, using Audacity 2.0.

Results: There were very few canonical realisations of tap [ɾ] (2%). Voiced alveolar fricative [ɹ̝] occurred in 35% of the possible realisations. Approximant [ɹ] occurred 25%. All speakers presented approximant and voiced alveolar fricative realisations in their utterances. The uvular rhotic [ʀ] only occurred in 8% of total productions. The most frequent realisations were the voiced and voiceless uvular fricative (each one with 46%).

Conclusions: Rhotics show greater phonetic variability, especially the phonological tap. There were very few canonical realisations of rhotics. The most frequent realisations included approximant-like segments, stop-like tap and fricatives. The uvular rhotic is most likely to be produced as a uvular fricative. One could then formulate the following question: If rhotics were mostly produced as fricative sounds, does it make sense to talk about a tap/trill class in EP?

Keywords: European Portuguese; Rhotics; variability; acoustic phonetics