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Variation of /r/ in the dialect of Suelli (Cagliari). An acoustic-articulatory account.

Abstract

Data collected in the village of Suelli (CA) concerning the production of 17 speakers of Campidanian Sardinian have shown the occurrence of a great variety of allophones of the phoneme /r/.

Our experimental study, still in progress, is focused on those syllables which exhibit a complex onset, originated by the metathesis of /r/, a very productive phenomenon within the Campidanian area, that has given rise, among others, to a series of 'exotic' consonant clusters such [tʃr], [tsr], [mr], [ʃr] and [sr], e.g.: [tʃro'βed:u], /tʃro'βed:u/ "brain", [tsrufuru], /tsrufuru/ "sulphur", [mratsu], /martsu/ "rotten", etc.

The aim of this study is to classify the allophones of the rhotic segment and check for potential acoustic-articulatory differences between the various phonetic contexts (post-consonantal vs. intervocalic position, and homorganic vs. heterorganic clusters), paying particular attention to those complex onsets described above.

From an articulatory point of view, apical trills [r] and taps [ɾ] share the same articulator, i.e. the tip/blade of the tongue (Ladefoged 1996). In trills, but differently from taps, the tongue is not an active organ and it is moved by complex aerodynamic conditions which are triggered by a difference in the oral and pharyngeal pressure, a process similar to the one that triggers the glottalic airstream mechanism (Ladefoged 1996, Solé 2002, among others). As it is well-known in the phonetic literature, trills are very complex sounds which are learnt very late in the linguistic acquisition process (around 4 y.o.) and sometimes speakers never succeed in articulating them properly (Solé 2002). In those languages which realize /r/ as a trill, most of the allophones, such fricatives [ɹ] and approximants [ɹ], are trills that have lacked one or more aerodynamic requirements necessary to start and maintain the vibration of the tongue's tip, so they share the same articulatory gesture (Ladefoged 1996, Solé 2002).

Lack of conditions may be due to a fast and/or loose speech that occurs when speakers are not paying much attention to their phonetic production accuracy: in sum, in a hypoarticulated speech. Speakers seem not to be conscious of the sound they produce, and listeners are not aware of the allophone they hear; they categorize all of them as [r]. Also the researcher (being a native speaker of the dialect of Suelli) failed in distinguishing the realized allophone before analyzing the recordings with the help of the software Praat (<http://www.fon.hum.uva.nl/praat>).

As it is known, trills are made up of closure and aperture cycles (Ladefoged 1996). Apertures appear in the spectrogram as very short (ca. 25 ms, Ladefoged 1996) vowels modulated in the central area of the vocal tract (Ladefoged 1996). In our corpus, vowels of similar length and quality are found in the spectrogram before of post-consonantal taps, between the first consonant of the Cr cluster and the rhotic. Such short vowels are considered a phonetic universal (Barbosa 2015) and part of the articulation of taps, which become more salient in Cr cluster for the sake of perception (Savu 2012). She claims taps are constituted by a vocoid, a constriction phase and another vocoid.

At least for what concerns the intervocalic position in our corpus, the experiment we have run has shown that the most common articulation of the phoneme /r:/ in a dialect such Campidanian Sardinian are trills (48% of the occurrences), followed by fricatives (38%), taps (10%) and approximants (4%). Our data show also that the most typical realizations for a single intervocalic /r/ are taps (43%), followed by approximants (30%) and fricatives (27%). No trills were found in this context. A different situation is found when we are dealing with the rhotic in marked Cr clusters (see above in the text). Here, the typical realization of /r/ appears to be an approximant: in [tʃr] contexts approximants are 48% of the total occurrences, followed by taps (33%), fricatives (14%) and trills (5%); analogously, in [mr] clusters we find approximants (51%), taps

(47%), fricatives (2%). Differently, in clusters such [ʈr] we have found taps as the most typical realization (48%), followed by approximants (38%), fricatives (10%) and trills (4%); a similar situation is noted in [sr] clusters: taps (56%), approximants (37%), fricatives (4%), trills (4%). Moreover, in our corpus we have found particular tokens such complete voiceless trills, partly voiceless trills (first cycles are voiceless, last cycles are voiced), sequences of tap and fricatives (i.e. an affricate).

These first results may lead us to claim that in homorganic clusters, taps are easier to articulate, differently from heterorganic clusters, where the tongue tends not to vibrate (i.e. to hit the alveolar region): it moves close the target area but no contact happens, a setting that gives rise to approximant or fricative articulations, according to the distance of the tongue to the alveolar ridge (narrower in approximants, Ladefoged 1996). Obviously, further research is needed. Given that continuous allophones of /r/ (i.e. approximants and fricatives) surface mostly in a hypoarticulated speech, we might claim that non-continuous sounds (i.e. trills and taps) are in complementary distribution with continuous sounds: the emergence of one type might depend on the articulation's accuracy rate, so we can hypothesize that sociolinguistic and psychological conditions may influence the realization of /r/ in such a way. Still, further research is needed to verify this hypothesis.

The various allophones which we have found in our corpus have been annotated following the transcription system conceived by Celata e Meluzzi (2016). Thus, according to this system, a trill will be annotated as such: 'r_c_1_r/r_a_1_f/r_c_2_l', where *r* stands for 'trill', *c* specifies the closure phase (in opposition to the aperture one), *1* points out the first stop/release phase (vibrant consonants may have up to 5 phases, or even more), while the second *r* stands for 'right' and indicates that temporal units of the rhotic segment are on the right (in opposition to *l*, on the left, *f*, both sides, *e*, no other element of the rhotic segment is present). Other manners of articulation are: approximant (a_c_1_e), fricative (f_c_1_e), tap (t_c_1_e).

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