

An acoustic study of the Turkish rhotic

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1 Introduction

The consonant inventory of Turkish contains a single rhotic phoneme canonically described as an alveolar tap (Lewis 1967:7; Göksel & Kerslake 2005:9). Turkish also possesses a lateral approximant.¹ Both of these are reportedly devoiced when occurring word-finally (Comrie 1997:885; Kornfilt 1997:487) as well as, according to Zimmer & Orgun (2009:44), preceding voiceless consonants. The rhotic is also described by many authors as being fricated; however, there are conflicting accounts in the literature as to in which positions this occurs:

- Lewis (1967:7) states that /r/ is fricated word-finally only and notes that his observations contradict Blaskovics (1964:5–10) who describes frication as occurring mainly after front vowels.
- Comrie (1997:885) describes /r/ as being fricated only when in a word-initial position.
- Yavuz & Balci (2011:25) report that /r/ is voiced and fricated initially but devoiced and finally.
- Kopkallı (1993:29) also describes as /r/ voiceless and fricated when word final.

Göksel & Kerslake (2005:9) make no comment on the frication of the rhotic in Turkish but do describe word-final /r/ as being devoiced and observe that it is 'sometimes deleted in colloquial speech' especially with the imperfective suffix /-iyor/ and the indefinite article /bir/.

This poster presents an analysis of the various realisations of the Turkish rhotic in which I attempt to resolve the conflicting accounts given above. I examine its production and investigate whether this displays systematic and predictable phonological behaviour and whether any changes in production with regard to voicing or manner of articulation are categorical or gradient in nature.

2 Data collection

The data for this study come from recordings made of 7 native Turkish speakers recruited in the Manchester area. All the consultants were in their thirties: range 31–38, mean 34. There were 5 females and 2 males. The speakers came from 6 different locations in Turkey: Ankara (2), İstanbul, Fethiye, Bursa, Denizli and Kars (see Figure 1).

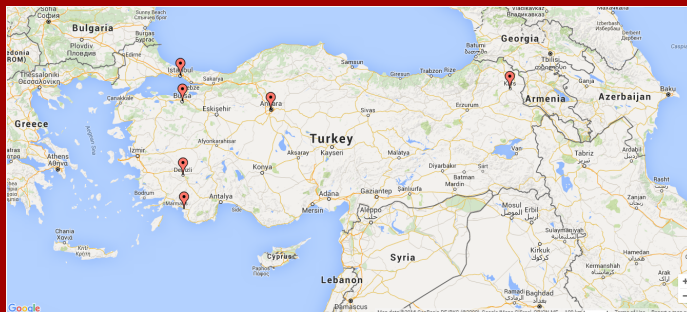


Figure 1: Hometowns of consultants in Turkey

The consultants are referred to by a two-letter code: the first letter denotes their hometown, the second their gender (with the

two females from Ankara differentiated by a number) All speakers, except KM, can be said to speak "standard Turkish".²

Each consultant was asked to read a list in which were embedded 35 words and 9 phrases containing instances of /r/ in various environments. Tokens of singleton /r/ were elicited in intervocalic, pre-consonantal, post-consonantal, word-initial and word-final positions. In consonant-adjacent contexts, tokens in both voiceless and voiced environments were collected. 4 tokens of intervocalic geminate /r/ were also elicited. All tokens were collected adjacent to both front and back vowels.³

Each token of /r/ was then coded as voiced (V), devoiced (D) or of intermediate or indeterminate voicing (I) with manner coded as tap (T), approximant (A) or fricated (F).

3 Findings

Table 1 below shows the distribution of the coded data.

	V			I			D		
	T	A	F	T	A	F	T	A	F
Word-initial	2	6	0	6	10	2	4	0	2
Inter-vocalic	8	14	0	39	2	0	16	0	0
Pre-Voiceless	0	22	0	9	2	0	10	0	0
Pre-voiced	3	37	0	7	2	0	0	0	0
Post-voiceless	2	5	0	4	1	0	8	1	0
Post-voiced	10	2	0	1	3	0	0	0	0
Word-final	0	15	0	4	9	4	2	3	97
True geminate	3	8	0	3	1	5	0	0	0

Table 1: All tokens of /r/ for all speakers

It can be seen from this that in the strongest tendency is to devoice and fricate in a word-final position. Elsewhere there is no clear overall preference as to the realisation of the rhotic (though certain speakers, e.g. FF, prefer an approximant and others, e.g. AF, a tap).

However, Table 2 shows clearly that to say that the rhotic devoices and fricates in any word-final position is an oversimplification. It can be seen that it is in fact in utterance-final position where this is overwhelming the most likely option.

	V			I			D		
	T	A	F	T	A	F	T	A	F
Inter-vocalic	0	3	0	2	1	0	1	0	0
Pre-Voiceless	0	2	0	0	3	0	0	0	0
Pre-voiced	0	4	0	0	1	0	0	0	0
Utter.-final	0	5	0	2	2	2	1	3	97
False geminate	0	1	0	0	2	2	0	0	0

Table 2: All tokens of word-final /r/ only for all speakers

This shows then that there are just two categorical variants: a devoiced fricated rhotic utterance-finally and a non-fricated rhotic elsewhere.

There is also further variation, such as the degree to which the second variant is voiced and whether the rhotic is realised as a tap or approximant. There is in fact a slight preference to use the tap pre-consonantly in all speakers (however, the coding of this

was less reliable than for either voicing or frication) and /r/ is often not segmentable from the preceding vowel.

For utterance-final /r/, there is also some phonetic variation both for individual speakers and among the entire group of consultants: the strength and duration of frication may vary. For example, both AF1 and IF exhibit rather heavy frication whereas it is much lighter for AF2, BF, DM, FF and KM, though still systematically present. This can be seen by comparing the spectrograms for AF1 and BF in Figures 2 and 3 respectively.

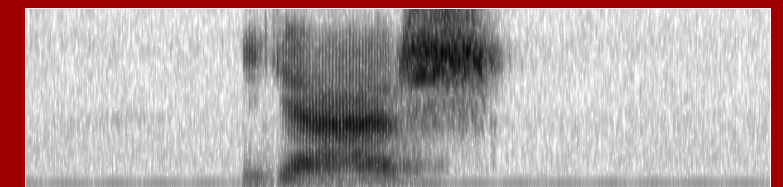


Figure 2: Spectrogram of /jer/ 'place' for AF1

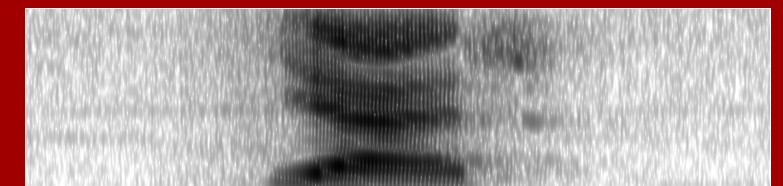


Figure 3: Spectrogram of /jer/ 'place' for BF

4 Conclusion and future work

The data collected in this study show that the Turkish rhotic phoneme has various realisations according environment but only two categorical variants: devoiced and fricated utterance-finally and non-fricated elsewhere, although it may be partially or wholly devoiced in any context (especially intervocalically). Further work can be conducted with current data, such as an investigation into finer degrees of variation of both frication and voicing. Another avenue for future research would be a study involving Ultrasound Tongue Imaging, such has been performed for Dutch (Strycharczuk & Sebregts 2013).

5 References

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¹ Though this comes in both palatalised and velarised varieties that are, broadly speaking, in complementary distribution: compare [gʲyɫ] 'rose' and [puʃ] 'stamp' (Göksel & Kerslake 2005:8–9).

² For KM, some items were omitted or altered (mainly due to unforeseen dialectal lexical differences).

³ Except for AF1 and BF, the first speakers to be consulted, for whom the word and phrases lists were slightly different.