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## Research Article

# Spanish and Persian's Taps and Trills: A Comparative Study

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### Abstract

This paper evaluates taps and trills [r] of Spanish and Persian languages. Taps contain one vibration while trills have several vibrations. Thus, the differences between taps and trills are related to how they are pronounced with regard to their environment and position. As the noteworthy exceptions of opposite rhotic phonemes are Spanish and Persian languages, the study work on probable differences between opposite rhotic phonemes in these two languages. Analyzing different examples from both languages, the study argues that Spanish taps and trills [r] differ in the intervocalic position within the word, while Persian taps and trills [r] don't make such differences. Moreover, the study shows that pronouncing taps and trills interchangeably alters the meaning of words in Spain, though it is not the case in Persian.

**Keywords:** Rhotic phonemes, Tap, Trill, Spanish, Persian

## I. Introduction

According to phonologists, majority of the world's languages contain at least one rhotic phoneme, though relatively few contain two or more, and even fewer oppose rhotic phonemes realized as taps/trills solely on the basis of duration: one vibration vs. several (Lipski, 2009). These differences in rhotic duration are determined by how they are pronounced in which situation. Ladefoged (2001) defined tap/flap, a consonantal sound, as "a single contraction of the muscles so that one articulator is thrown against another. It is often just a very rapid articulation of a stop" (p. 150). It is noteworthy that taps and stops are different where tap is a brief stop with no buildup of air pressure behind the place of articulation and accordingly no burst (Ladefoged & Maddieson, 1996). Moreover, Ladefoged and Maddieson (1996) stated that "taps are most typically made by a direct movement of the tongue tip to a contact location in the dental or alveolar region" (p. 231).

Tap/Flap is a momentary closure of the oral cavity. The 'tt' of 'utter' and the 'dd' of 'udder' are pronounced as a tap/flap in North American and Australian English. Table 1 shows the flap/tap consonants based on IPA:

TABLE1  
 THE INTERNATIONAL PHONETIC ALPHABET FOR CONSONANTAL TAPS/FLAPS

IPA	Description	Example			
		Language	Orthography	IPA	Meaning
ɾ	Alveolar tap	North American English	latter	/læɾə/	"latter"
ɺ	Alveolar lateral flap	Japanese	ラーメン	/la:men/	"ramen"
ɽ	Retroflex flap	Walpiri	ɖupa (?)	/ɽupa/	"windbreak"
ʋ	Labiodental flap	<u>Karang</u>		/ʋara/	"animal"

However, in describing trill features, Ladefoge and Maddieson (1996) declared that “the primary characteristic of a trill is the vibration of one speech organ against another, driven by aerodynamic conditions” (p. 217). In pronouncing trill, articulator (usually the tip of the tongue) is held in place, and the airstream causes it to vibrate. The double 'r' of Spanish 'perro' is a trill. Nevertheless, trills have many different manifestation and they are not produced as often as expected, in despite of their phonological features as trills (Lindu, 1985). In addition, Vihman (1996) stressed that in comparison with other sounds trills are acquired late in the process of language acquisition.

Anyway, the noteworthy exceptions of opposite rhotic phonemes are Spanish and Persian languages. Previous studies like Rafat (2008) have reported that whereas Persian has trills, their distributional pattern differs from Spanish. In comparison with other rhotic allophones in Spanish, the trills which appear word initially and post-consonantly are considered as the main variants (Quilis, 1993; Lewis, 2004). Fricatives in Farsi are the main variant in the latter positions (Rafat, 2008). However, trills which are surfaced intervocalically contrast with taps in

Spanish (Quilis, 1993; Blecua, 2001). The study, thus, aimed to present an overview on differences between opposite rhotic phonemes in Spanish and Persian languages.

#### A. Spanish Taps and Trills

Spanish possesses two rhotic phones as single-tap *r* and vibrated-trill *r*. Harris (1983) also refers to them as a voiced alveolar tap *r* versus an alveolar trill *r*. While trill *r* happens in word-initial and after alveolar consonants, tap *r* happens in other positions. The differences between tap and trill lay in the intervocalic position within the word, while contrast is neutralized in all other positions. Moreover, tap *r* is considered as trill *r* in post-lexical position in emphatic or careful speech. Today's studies of the intervocalic contrast have analyzed the trill either as a separate phoneme or as the geminate counterpart of the singleton tap (Bradley, 2006). According to (Bradley, 2001), some of the languages which have contrastive taps and trills make these contrasts neutral in all positions except for intervocalic positions. He mentions some of these languages which reveal this pattern, namely: Guajiro (Mansen, 1967), (Brazilian) Portuguese (Azevedo, 1981), Basque (Hualde, 1988, 1991; Saltarelli 1988), Catalan (Mascaró, 1978; Wheeler 1979; Hualde 1992), and Spanish (Harris 1983, Morales-Front 1994).

Consequently, the contrasts between taps and trills are laid only in the intervocalic position within the word, while contrast is neutralized in all other positions (Bradley, 2001). The distinction between taps and trills in Spanish is limited to intervocalic word-internal position which is consisted of less than 30 minimal pairs (Willis & Bradley, 2008). Bradley (2001, pp. 2-3) exemplifies taps/trills intervocalic contrasts in Spanish in example (1).

#### (1) Tap/trill contrast between vowels in Spanish

<i>pero</i>	<i>pero</i>
'but' 'اما'	'dog' 'سگ'

#### (2) Rhotics are neutralized to trill when they are used

- At the beginning of words (see 2a):

a. <i>rosa</i>	* <i>rosa</i> 'rose' 'رز'
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- After (alveolar) consonants which are homorganic (see 2b).

b. <i>onra</i>	* <i>onra</i>	'honor'	'افتخار'
<i>alrededor</i>	* <i>alrededor</i>	'around'	'اطراف'
<i>izrael</i>	* <i>izrael</i>	'Israel'	'اسرائيل'

(3) Bradley also states that the phonetic realization of rhotics elsewhere is neutralized with stylistically-controlled variation. Variable lenition/fortition is observed in three situations, as:

- After (non-alveolar) consonants which are heterorganic (3a):

a. presjo	~	presjo	'price'	'قیمت'
tres	~	tres	'three'	'سه'
krus	~	krus	'cross'	'تقاطع'

- Before any consonant (3b):

b. arma	~	arma	'weapon'	'سلاح'
karne	~	karne	'meat'	'گوشت'
perla	~	perla	'pearl'	'مروارید'

- And word-finally (3c):

c. amor	~	amor	'love'	'عشق'
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It is worthy of notice that while it is obligatory to put trills after other alveolar consonants (see 2b), taps or trills may also appear before other alveolar consonants, like [karne] and [perla] in (3b). Moreover, tap *r* is considered as trill *r* in post-lexical position in emphatic or careful speech. Morales-Front (1994) believes that the Spanish trill can surface in complex onsets in highly emphatic speeches, such as *jinc[r]eibles p[r]ecios!* 'incredible prices!'). Today's studies of the intervocalic contrast have analyzed the trill either as a separate phoneme or as the geminate counterpart of the singleton tap (Bradley, 2006).

The trill *r* lies in syllable-initial position after the sonorants /n/, /l/ and the fricative /s/. Examples below show the trill *r* in syllable-initial position:

#### Trill is obligatory in syllable-initial post-consonantal position

a. *[on.ra]	[on.ra]	<i>honra</i>	'honor'	'افتخار'
b. *[al.re.ðe.ðor]	[al.re.ðe.ðor]	<i>alrededor</i>	'around'	'اطراف'
c. *[iz.ra.el]	[iz.ra.el]	<i>Israel</i>	'Israel'	'اسرائیل'

As it is indicated above, trill *r* necessarily places after pause and any word-initial position at the phrasal level such as post-consonantal and post-vocalic (see below):

### Trill is obligatory in word-initial position

a. *[lro.sa]	[lro.sa]	<i>Rosa</i>	'Rose'	'رزی'
b. *[konl.ro.sa]	[konl.ro.sa]	<i>con Rosa</i>	'with Rose'	'بارز'
c. *[laI.ro.sa]	[laI.ro.sa]	<i>la rosa</i>	'the rose'	'رز'

Examples below indicate that the tap  $r$  happens as the second member of a complex onset, where the first member is an obstruent:

### Tap is obligatory after tauto-syllabic obstruents

#### a. After labials

[pre.sjo]	*[pre.sjo]	<i>precio</i>	'price'	'قیمت'
[bra.so]	*[bra.so]	<i>brazo</i>	'arm'	'بازو'
[fri.to]	*[fri.to]	<i>frito</i>	'fried'	'سرخ کرده'

#### b. After dentals

[tres]	*[tres]	<i>tres</i>	'three'	'سه'
[dra.ma]	*[dra.ma]	<i>drama</i>	'drama'	'درام'

#### c. After velars

[kre.a]	*[kre.a]	<i>crea</i>	's/he creates'	'خلق می کند'
[gri.to]	*[gri.to]	<i>grito</i>	'scream'	'جیغ'
[xrus.tʃef]	*[xrus.tʃef]	<i>Jruschef</i>	'Khrushchev'	'کروشچو'

According to Harris (1983), there is little dialectal variation in onset clusters, apart from some assibilation in /t/ + rhotic clusters in some dialects.

Examples below show that tap and trill differ in syllable onsets between vowels. As stated above, they aren't different in other positions:

### Tap and trill contrast in morpheme-internal intervocalic position

[ka.ro]	<i>caro</i>	'dear, expensive'	'عزیز، گران'	[ka.ro]	<i>carro</i>	'car'	'ماشین'
[fo.ro]	<i>foro</i>	'forum'	'انجمن'	[fo.ro]	<i>forro</i>	'lining'	'پوشش'
[pe.ro]	<i>pero</i>	'but'	'اما'	[pe.ro]	<i>perro</i>	'dog'	'سگ'

Nevertheless, the tap *r* is in casual speech replaced with the trill *r* in highly emphatic speech before consonants and pause.

### Tap varies stylistically with trill before consonants and before pause

Casual speech		Emphatic speech			
[mar.ɾes]	~	[mar.ɾes]	<i>martes</i> 'Tuesday'	'سشنبه'	
[marl]	~	[marl]	<i>mar</i>	'sea'	'دریا'

It is noticeable that when the following word begins with a vowel, neutralization to tap is necessary (word-final rhotics) (Bradley, 2006):

### Word-final trill is prohibited before a vowel-initial word

Casual speech		Emphatic speech		
[mar .βerðe]	~	[mar .βerðe]	<i>mar verde</i> 'green sea'	'دریای سبز'
[ma.r asul]		*[ma.r asul]	<i>mar azul</i> 'blue sea'	'دریای آبی'

As it is stated above, only the trill *r* appears word-initially, apart from the final segment of the previous word. In addition, either the tap *r* or trill *r* may appear word-finally, except the word begins with a vowel, in which case the trill is prohibited.

Conclusively, considering dialectal variation in Spanish taps and trills, Hualde (2005, p. 183) represented a general distribution of Spanish rhotics as follow:

- (1) a. Contrast tap / *r* / versus V\_\_V Intervocalic  
 trill /*r*/ /karo/'expensive'گران' versus /karo/ 'cart, car'ماشین' کارت,
- b. Only trill /*r*/ #\_\_ Word-initial  
 /roka/ 'rock'صخره'
- C.\_\_ After a heterosyllabic consonant  
 /alrededor/ 'around'اطراف', /enredo/ 'mess',  
 /israelita/ 'Israeli'اسرائیلی'
- c. Only tap / *r* / C\_\_ After a tautosyllabic consonant  
 (onset cluster)  
 /broma/ 'joke'جک', /gramo/ 'gram'گرم'
- V\_\_#V Word-final before a vowel

	/seramigos/ 'to be friends'	دوست بودن
d. Variable rhotic	V__C	Before a consonant
(most commonly [r])	/parte/ [parte] ~ [parte]	'part' بخش
V_#C	Word-final before a consonant	
	/serpoeta/ 'to be a poet'	شاعر بودن
	V_##	Word-final before a pause
	/ser o no ser/ 'to be or not to be'	بودن یا نبودن

Hammond (1999, 2000 a, b) declares that trills in Spanish are not produced as a trill or multiple vibrant: “when one analyzes the real surface manifestations of the intervocalic flap [P] in different Spanish dialects, it becomes clear that a neutralization of the [P] and [ρ] [*sic*] has occurred in many dialects in intervocalic environments” (Hammond 1999, p. 147). Moreover, he states that “the trilled phone [ρ] occurs systematically in normal Spanish discourse among a very small number of monolingual native speakers and that among all other monolingual speakers, [ρ] occurs only in highly affected discourse” (1999, p. 136).

### B. Persian Taps and Trills

Persian (Farsi) language which is an Indo-Iranian language includes four rhotic phones as

r = voiced trill in syllable initial position

ɾ = voiceless trill in word final position

r = voiced tap/flap intervocalically

The r-sounds are all allophones of a single phoneme. The trill r occurs elsewhere, at the beginnings of words, after a vowel and before a consonant, after a consonant and before a vowel. The voiced tap/flap r appears between vowels, and the voiceless trill ɾ appears at the ends of words. The ɾ can also be derived through the rule in (1a) as a result of the triggering constraint in (1b), while r can be resulted with the rule in (2a) and corresponding triggering limit (2b) (Samareh, 1977, 2007).

- |   |  |
|---|--|
| (1) a. $r \rightarrow \text{ɾ} / \_ \#$ | (2) a. $r \rightarrow \text{r} / \text{V} \_ \text{V}$ |
| b. *r#                                  | b. *VrV  |

If neither rule applies, then r is pronounced r, the voiced trill. Actually, the three sounds are in complementary distribution. Occurrence of rhotic is simpler in Persian than in Spanish both in position they take and in rules they obey.

### Voiced trill is elsewhere

[æ.r.teʃ]	ارتش	'army'	'ejército'
[far.si]	فارسی	'Persian'	'Persa'
[qæd.ri]	قدری	'a little bit'	'un poco'
[rah]	راه	'road'	'camino'
[riʃ]	ریش	'beard'	'barba'
[ruz]	روز	'day'	'día'

### Voiceless trill is word-finally

[a.har]	آهار	'starch'	'almidón'
[beh.tæɾ]	بهتر	'better'	'mejor'
[hærn.towɾ]	هرطور	'however'	'sin embargo'
[tʃar]	چهار	'four'	'cuatro'
[tʃe.dʒur]	چچور	'what kind'	'qué tipo'
[ʃir]	شیر	'lion'	'león'

### Voiced tap is intervocalic

[ahari]	آهاری	'starched'	'almidonado'
[bæ.ra.dæɾ]	برادر	'brother'	'hermano'
[be.rid]	برید	'go'	'ir'
[bi.ræŋg]	بیرنگ	'pale'	'pálido'
[tʃe.ra]	چرا	'why'	'por qué'
[da.rid]	دارید	'you have' (Samareh, 1977, 2007)	

In accounting for rhotic distribution in Persian, the IPA (1999) suggests that in Persian trills vary with approximants. From the other point of view, Samareh (1977) declares that alveolar fricatives appear at the beginning of words, apical flaps appear between vowels, and finally, voiceless alveolar fricatives appear word finally and before consonants. Also, Samareh (2007) suggests that trills are the underlying rhotic in Persian and that they have several allophones.

Based on Rafat (2008) taps and fricatives correlate with the individual occurrence of rhotics in the orthographic system like what we have in /arus/ 'bride'. Also, she states that trills and fricatives correlate with the orthographic diacritic for words which are arranged in pairs. The main variants consist of fricatives and approximants when they are surfaced word initially. Moreover, the fricatives approximants and taps can be regarded as the main variants when they appear post-consonantly. Finally, she realized that there are not any trills post-consonantly or in word initial positions.

As to Learning Spanish taps and trills by Persian learners, it should be noted that because the trill does not exist in Farsi word initially and post-consonantly, the trill will be regarded as a 'new' sound for Persian learners and it will be acquired by Persian learners of Spanish (Fledge, 1995). On the other hand, based Lewis (2004), post-consonantly learners will produce more trills in the following order:

following /s/ > following /l/ > following /n/

Moreover, based on Colantoni and Steele (2008), trills will be produced more in word initial position rather than post-consonantal position. As Flege (1995) suggests, when the trills are positioned in intervocalic position, assuming that the trill exists in Persian, although at a higher rate in more formal speech, it will be considered as an 'old' sound and will not cause any difficulty for Persian learners. In addition, based on Solé (2002) in comparison with word initial and post-consonantal position, trills should be favored in intervocalic position.

Generally speaking, there are various rhotic in Persian, they don't make any differences in the meaning of words, that is pronunciation of the trill *r* instead of tap *r* doesn't change the meaning of words like Spanish (e.g., *pero* /pero/ 'but' vs. *perro* /pero/ 'dog'). Unfortunately, there are not enough studies related to rhotic position in Persian. Lack of access to experimental devices also made us suffice to few researches in this field.

## II. Conclusion

A comparison of taps and trills of Spanish and Persian languages revealed appreciable differences based on [r]'s position. As it is indicated, taps and trills [r] of Spanish language are neutralized except in intervocalic position, while taps and trills [r] of Persian are neutralized everywhere. Moreover, study shows that Persian pronunciation of taps and trills instead of each other don't change the meaning of words unlike Spanish. When a Spanish speaker pronounces

caro [karo] as carro [karo], alter its meaning from 'expensive' to 'car'. Taps and trills are more variant and impressive in Spanish than in Persian language.

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