

Against the class of liquids: Evidence from English and Arabic

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Abstract

This paper aims at studying some of the problems associated with the class of sounds called liquids, with focus on the /l/ and /r/. The data primarily comes from English and Arabic. The objective of this study is to question the validity of this class by showing that there is not enough phonetic ground to group /l/ and /r/ together in the class of liquids. Evidence from several phonological processes in English such as metathesis, /t/d deletion, vowel insertion and other processes will be presented to show the different phonological behaviors of these two phonemes. A number of linguistic phenomena in Arabic will be explored to support the argument of this paper that /l/ and /r/ function differently and should consequently be members of different classes. To the same end, some of the phonotactic rules of English and Arabic regarding /l/ and /r/ will be discussed.

Key words: liquids, [±consonantal], [±continuant], phonological processes, phonotactics.

Symbols used in this paper, especially in the names of Arab authors, Arabic books and transcription of Arabic words:

1- Consonants

Symbols in Arabic	Transliteration	Symbols used in phonetic transcription
ء	'	ʔ
ع	'	f
ط	t	t
ض	dh	d
ق	q	q
ح	h	h
خ	kh	χ
غ	gh	ɣ
ظ	z	ð
ص	s	s
ش	sh	ʃ

2- Vowels

الفتحة (^) or short ا	a	a
Long ا	ā	ā
الكسرة (ˇ)	i	i
الكسرة when preceded by ي (˘)	ī	ī
الضمة (˘)	u	u
الضمة when preceded by و (˘)	ū	ū

1- Introduction

There is a reasonable body of literature on the similarities between /l/ and /r/ which justifies, in the viewpoint of some researchers, grouping them in the class called liquids. Dickey (1997), in a dissertation under the title *The Phonology of Liquids*, concludes that there are phonological grounds to group “rhotics and sonorant laterals” in one set despite rhotics’ “lack of a single defining phonetic characteristic”. The writer advocates using the feature ‘liquid’ to distinguish members of this group. Proctor (2009) presents three pieces of evidence concerning the uniform phonological behavior of liquids. Two of them address the role liquids play in syllable structure. These are: “liquids are cluster-enabling consonants” and “liquids exhibit an affinity for the nucleus”. Weijer (1995) also refers to the similar role the /r/ and /l/ play in syllables in English.

The third piece of evidence pertains to the role of liquids in phonological processes such as assimilation, dissimilation, harmonization, metathesis, merger, neutralization, and alternation (Proctor 2009). The three pieces of evidence prove, according to Proctor, the uniform function of liquids cross-linguistically.

Reyes-Rodríguez (2006) takes metathesis as a process that proves that /l/ and /r/ form a natural class. Metathesis in two Spanish dialects, in Reyes-Rodríguez’s opinion, points to “an intrinsic linguistic relationship” (p.1) that unifies liquids in several languages. The writer also notes that the two sounds are grouped together because they share a phonetic similarity, i.e., they have the same place of articulation (the alveolar ridge).

In Arabic, there are some cases in which /l/ and /r/ behave phonologically the same. Word-initial /l r n m w j/ are subject to total assimilation when they are preceded by word-final /n/. In all cases, this /n/ is deleted and the following sonorant is nasalized and geminated except when followed by /l r/ where deletion takes place, whereas nasalization does not:

/man jaʕmal/ → [maǰǰaʕmal] ‘whosoever does’

/ʔafūrun raḥīm/ → [ʔafūrun raḥīm] ‘The Oft-Forgiving, The Most Merciful’

In this paper, an attempt is made to shed light on the problems associated with grouping laterals and rhotics in the class of liquids. The evidence used in this paper comes from English and Arabic. The first problematic aspect of the class of liquids is the problem of definition. This aspect will be discussed in this section. The phonetic and phonological problems that cast doubt on the plausibility of this class will be discussed later in this paper.

As mentioned above, one of the problems of whether or not to classify /l/ and /r/ together in one class, i.e., liquids, stems from the lack of definition of the term *liquid*. Questions concerning the validity of the class ‘liquids’ have often been raised. Roach (2002), in defining this term, states that it is “an old-fashioned phonetic term that has managed to

survive to the present day despite the lack of any scientific definition of it". Akmajian et al. (2001, 78) add that 'the term *liquid* is a nontechnical, impressionistic expression indicating that the sound is 'smooth' and 'flows easily'. In a discussion of // and its classification as a liquid, Van Riper and Smith (1979, 18) asked the question "why is it called a liquid?", and their answer was: "[wi ɒnəstlɪ dɒnt nɒ]". In many of the given definitions of the term 'liquids' (Liles 1975, 213; Ladefoged 2006, 293; Wolfram & Johnson 1982, 21; Rogers 2000, 308), it is noticeable that it is often defined as a class of sounds that includes /r/ and // sounds. Ladefoged (2006, 293), for example, defines it as 'a cover term for laterals and various forms of r-sounds'. No serious attempt is made to explain what is 'liquid' in liquids and what inherently ties laterals and r-sounds so strongly together that justifies classifying them in one class.

The idea of a "smooth" sound or a sound that "flows easily", mentioned above, is vague and not good enough basis to group // and /r/ in one class since the two sounds differ even in the degree of the so-called smoothness. In addition, they share this smooth and easy flow of air with all sounds specified as [+sonorant], i.e., nasals, glides and more evidently vowels. Accordingly, the first problem encountered with regard to liquids is the absence of an expressing definition of the term 'liquid' which makes it difficult, if possible at all, to decide whether or not a sound is a member of this class. This may explain the tendency among phoneticians to rather associate // with the larger class of approximants simply because its production involves no "turbulent air stream" (Rogers 2000, 300), ostensibly ignoring the complete closure made at the centre of the tongue. As for /r/ sounds, Lindau (1980) refers to the results of a study in six languages: American English, Yoruba, French, Southern Swedish, Hausa, and Edo, that show that there is no one single parameter that characterizes either the articulation or the acoustic properties of these sounds. Instead, their status as a "phonological class is associated with complex combinations of both articulatory and acoustic parameters" (ibid.). A legitimate question to be asked here is: if rhotics can form a "phonological" natural class only on the basis of a multiplicity of "articulatory and acoustic parameters" (ibid.), how can these r-sounds form a natural class with laterals?

Such articulatory indeterminacy and vagueness associated with the term *liquid* is evidently not found with regard to other classes of sounds such as stops, in which, as the name suggests, the air is completely blocked in the oral tract; or fricatives, whose production involves making the air passage narrow enough to produce friction or hissing, and so on.

2- Evidence Against the Class of Liquids

This section will deal with a number of issues raised against the classification of liquids in one class. This first issue is an inspection of the articulatory differences between /l/ and /r/. The next issue will be primarily about the difficulties associated with establishing liquids as a natural class and the problems concerning some distinctive features of this class. This is followed by considering evidence from English that illustrates differences between the two phonemes. A treatment of some evidence drawn from Arabic will follow.

2-1 Differences in Articulation between /l/ and /r/

An issue that casts doubt on the plausibility of grouping the prototypical members of the class of liquids, i.e., /l/ and /r/, in one class pertains to basic articulatory differences in the production of the two sounds.

Analysts sometimes oversimplify the articulatory differences between [l] and [r] to the former being a lateral approximant and the latter a central one, and this, on the face of it, gives the impression that the two sounds are identical in every other aspect. In his matrix of distinctive features for sonorants, Katamba (1989, 54), for example, presents laterality as the only difference between /r/ and /l/, i.e., the former being [-lateral] and the latter being [+lateral]. However, more recent studies suggest ridding of this feature since it is “redundant and phonologically invalid” (Dickey 1997).

Viewing the difference between [l] and [r] as a difference in laterality alone does not seem to be accurate since it does not reflect the articulatory facts of the two sounds. The two so-called liquid sounds have different places of articulation. The sound [l] is normally produced at the alveolar ridge. Its articulation involves a clear contact between the tip (or blade) of the tongue and the alveolar ridge. Using Chomsky and Halle’s terminology (1968, 302), there is ‘a radical obstruction’ along the centre of the tongue which prevents the air from moving along this area, and is consequently forced to rechannel along the side(s) of the tongue. The type of air stoppage experienced during the articulation of [l] is characteristic of stops, which are normally specified [-cont]. Since the passage along the centre of the tongue is blocked and the area over the sides of the tongue is open, the air is released laterally; a feature that articulatorily distinguishes [l] from all other sounds in English and Arabic.

The retroflex [r], on the other hand, is noticeably phonetically different from [l]. As for the place of articulation, it is often, not always though, described as postalveolar (O’Connor 1991, 149; Clark and Yallop 2004, 40; Gimson 2008, 157). In Arabic, [l] is produced as an alveodental sound, whereas the retroflex /r/ is described as an alveolar one (Bishr 2000, 346,

348)¹. A similar distinction is found in Sibawayh (1999, 573), one of the most celebrated grammarians of Arabic (died in 796 AD), who described the point of /r/ articulation as being more back in the roof of the mouth than that of [l]. The relative constriction that occurs between the tip/blade of the tongue and the postalveolar area for English [r], and the rapid vibrations (of the tip) of the tongue with the rear of the alveolar ridge in Arabic [r] do not amount to a closure similar to that witnessed in the case of [l], or even to a friction. The air that accompanies [r] is allowed to flow almost freely along the centre of the tongue. In other words, since the sides of the tongue are in contact with the sides of the palate, the air is released centrally. In Kahn's view (1976, 95), this English sound in its commonly used forms in American and British English "is extremely rare among the languages of the world". He adds that it is very much like glides with features:

[-cons, +son].

Another aspect of difference between [l] and (the voiced post-alveolar approximant variation of) [r] concerns the retraction of the tongue tip, hence in the retroflexed /r/ symbolized as [ɾ] 'the tongue position [is] of hollowing and slight retroflexion of the tip' (Gimson 2008, 220). In the articulation of [l], such retroflexion is absent.

As for voicing, /l/ and /r/ are normally voiced in English and Arabic. An exception to this generalisation is when these two sounds are preceded by a fortis consonant as in the English words *play* [p^hleɪ] and *pray* [p^hɹeɪ], but this does not characterize these two sounds alone since it applies to all [+sonorant] sounds, e.g., nasals and glides, and of course vowels. In Arabic, this phenomenon of devoicing is infrequent, though not necessarily absent, due to Standard Arabic disfavoring consonants clusters. An example of this is the word فلك [fu|k] 'ship/ships'.

2-2 Problems of Liquids as a Natural Class

The differences in articulation between /l/ and /r/ referred to above lead to discussing the basis of liquids as a natural class. To decide whether or not some sounds belong to a certain natural class, it must be first found out whether these sounds are alike from a phonetic point of view. Natural classes, as the term suggests, need to "be natural, in the sense that they have a clear phonetic foundation" (Clark and Yallop 2004, 372). A similar view is expressed by Katamba (1989, 38) who adds that "Normally, sounds which are phonetically similar display similar phonological behaviour". And even if liquids are looked at as a natural class from a phonological point of view, a common phonetic ground is required:

1 - This difference in place of articulation between /l/ and /r/, by the way, is not adopted unanimously since some Arab scholars classify the two sounds as postalveolars (Alḥamad 2004, 95).

“natural phonological classes and sound changes will be definable in phonetic terms” (Kenstowicz and Kisseberth cited in Ladd 2011, 358).

This basis of natural classes is expressed by using a set of distinctive features since “one function of distinctive features is to provide a formal means of expressing the notion of a NATURAL CLASS” (Wheeler 1972, 87-102). Drawing on the brief account of the phonetic aspects of /l/ and /r/ in Arabic and English above, it can be induced that they, in general, lack the phonetic grounds that qualify them to form a natural class.

Any discussion of natural classes remains incomplete without discussing distinctive features. A natural class needs to be defined with the use of the smallest number of distinctive features possible that capture the essential and unique similarities shared by the members of this class only and to the exclusion of other sounds. Our discussion will include the features consonantal [\pm cons] and continuant [\pm cont].

First, we will discuss the disputed feature [\pm cons] since /l/ is unanimously described as [+cons], whereas the specification of /r/ as [+cons] or [-cons] remains controversial. This, of course, results from the basic articulatory difference between the two sounds: the temporary central closure in [l] and the lack of such closure in [r]. There is no doubt that [l] meets the criterion of consonants which are “produced with a radical obstruction in the midsagittal region of the vocal tract” (Chomsky and Halle 1968, 302), hence specified [+cons]. However, the sound [r] does not seem to satisfy the condition required. Nevertheless, Chomsky and Halle (302-303) classify it as [+cons] since “the raised tongue narrows the passage sufficiently to produce a consonantal obstruction”. In my opinion, this conclusion is inaccurate, and it even contradicts what the two authors themselves maintain about the obstruction that counts in the distinction between [+cons] and [-cons] sounds: “the obstruction must be at least as narrow as that found in the fricative consonants” (ibid.). Kenstowicz (1994, 37) refers to this aspect in the production of [r] noting that “no radical constriction in the supralaryngeal cavity” is materialized. In fact, what occurs in the case of the English /r/ is moving the tongue-tip into the direction of the back of the alveolar ridge/front area of the hard palate (Gimson 2008, 220). The two articulators do not touch each other or even come close enough to produce friction. These articulatory properties of this sound lead Gimson to conclude that the “voiced post-alveolar approximant [ɹ] ...is phonetically vowel-like” (ibid). Gimson’s explanation for classifying /ɹ/ as a consonant is based on its inability to occupy the nucleus of a syllable.² Kahn (1976, 95) questions the state of /r/ as a consonant and concludes that the requirements of a phonetic consonant referred to above are not met.

2- This reservation can, however, be answered if the syllabic /r/ is taken into account.

Based on the above brief descriptions of [r], this sound seems to be more phonetically akin to the sounds labeled semivowels /glides, i.e., /w j/, whose articulation is vowel-like than that of [l] sound. This seems to call for specifying /r/ as [-cons].

The other aspect in the feature inventory of /l/ that has been long disputed is whether to classify it as [+cont] or [-cont]. "In the production of continuant sounds the primary constriction in the vocal tract is not narrowed to the point where the air flow past the constriction is blocked" (Chomsky and Halle 1968, 317). Based on this definition, [r] sounds, whether approximants or fricativised, are [+cont] since their production meets the stipulation just mentioned. As for [l], Chomsky and Halle (1968, 318) acknowledge that its "characterization... in terms of the continuant-noncontinuant scale is even more complicated" than the varieties of [r]. However, it is noticed that [l] is, more often than not, classified as [+cont] (Chomsky and Halle 1968³; Katamba 1989, 54⁴; Alkhūli 1990, 43; Carr 1993, 56; Spencer 1996⁵). This seems to contradict the articulation facts of [l]: a blockage to the airstream at one point along the oral tract and an alternative free passage at another. Hints to the cases considered in *The Sound Pattern of English* (p. 318) and notes that "the morphophonemic and phonotactic evidence", concerning whether or not laterals are specified [+cont] or [-cont], "is complicated and partly contradictory". This state of affairs reflects the different phonological behaviour of /l/ in different languages. Some of the researchers above suggest relaxing Chomsky and Halle's stipulation that the blockage to the airstream be in the oral tract and propose that the condition "in the mouth" be removed.

This modification may consequently pave the way for a more inclusive definition which counts as [-cont] sound whose articulation involves "a complete closure somewhere along the main path of the air flow" (Sommerstein 1977, 103). To resolve the continuancy feature problem with regard to [l], some analysts recommend incorporating more features such as [±occlusive] and [± mid-closure] to distinguish between stops (in the traditional sense of the term) and other sounds that require some type of partial closure (ibid.). This controversy regarding the specification of /l/ as to continuity leads some writers (Sommerstein 1977; Katamba 1989; Durand 1990) to argue that /l/ alongside with affricates, nasal and oral stops should be specified as [-cont] since they "are produced with a sustained occlusion" (Durand 1990, 52).

3 - They do so, though they acknowledge that this specification of /l/ is problematic (P.318).

4 - Katamba (p. 50) strangely describes laterals together with affricates, nasals and oral stops as [-cont].

5- Again, the writer only "arbitrarily assume[s] that laterals are [+continuant]".

A good account of the dispute regarding the classification of /l/ as [+cont] or [-cont] can be found in Mielke (2004). In his dissertation on distinctive features, Mielke (p. 239) lists Jakobson, Fant & Halle (1954) and Chomsky & Halle (1968) as examples of researchers who classify the lateral liquid as [+cont]. In less than twenty years, Halle, in his work with Clements (1983, 7), changed his mind and reclassified /l/ as [-cont]. There were other proponents of this view of the continuancy aspect of /l/. Kaisse (in Mielke 2004) followed this line of controversy with regard to the continuancy specification of /l/ by conducting a survey of eleven works on phonology from 1968 to 2004 which shows “that six of them (55%) treat /l/ as [+continuant], three (36%) treat it as [-continuant], and two (18%) treat it as variable from language to language”. After a lengthy and careful examination of the role of /l/ in different phonological processes crosslinguistically, Mielke (2007:268) comes to the conclusion that the different patterning of /l/ with [+con] classes of sounds as well as [-cont] classes of sounds results from their ambiguous phonetic structure. In their articulation, lateral liquids, together with nasals for example “obstruct airflow in the mid- sagittal region of the oral tract without actually obstructing airflow enough to prevent spontaneous voicing” (p. 267). This articulatory similarity between lateral liquids and nasals leads to an acoustic resemblance “both having side cavities that generate antiformants” (ibid.). In brief, Mielke finds that the different phonological behaviour of /l/ in different languages is not unanticipated in the light of the ambiguous phonetic structure of lateral liquids. In other words, it seems that the contradicting gestures in [l]s, i.e., an occlusion and an alternative free passage, lead them to align with [-cont] sounds, which are characterized by an occlusion, as well as with [+cont] sounds whose articulation involves a free passage.

Other models have also been suggested in order to understand the different phonological roles of lateral liquids in different languages, that is, functioning like stops which are specified as [-cont.], and the role of /r/ which, in several phonological phenomena, functions like fricatives with their specification as [+cont]. Weijer (1992, 1995) proposes a model for manner representations in which the lateral consonant /l/, like stop sounds, is specified as [-cont]. However, the continuancy feature [cont] is represented differently on the feature tree: “the continuancy contrast between obstruents as well as that between liquids [is] one of [stop] vs. [cont], but in which these features appear on different tiers” (1995, 59). The model suggested is represented as follows:

<i>root</i>	<i>root</i>
[<i>cont</i>]	[<i>cont</i>]
[<i>stop</i>]	[<i>cont</i>]
<i>laterals</i>	<i>rhotics</i>

As for the applicability of the features [\pm cons] and [\pm cont] to /l/ in Arabic, the argument (on English /l/) above applies. Sībawayh (1999, 574) describes /l/ as a stop, though he concedes that it differs from other stops in the tongue does not block the airflow (completely) as happens with other stop sounds, and it also differs from fricatives in that the tip of the tongue does not move away from its position (of contact with the alveolar ridge). Ibn Jenni (1993) (d. in 1001 AD), another influential Arab classical linguist, draws attention to the two different articulatory gestures involved in the production of /l/ by discussing the Arabic /l/ in two positions in his book: once with the stops (which are specified [-cont]) (p. 7) and another time with the sounds that, according to Ibn Jenni, have continuant as well as noncontinuant characteristics (p. 61).

Compared with other types of /r/, the case of (the Arabic) trilled /r/ with regard to the feature [\pm cont] is not as straightforward. Chomsky and Halle (1968, 318) note the “interruption of the airstream during at least part of the duration of the sound”. This interruption is reflected by a short ‘vertical gap’ in the formants of the Arabic trilled /r/ (‘Al‘āni 1970, 33). This gap, which occurs once in most cases, can be explained physiologically by the tip of the tongue striking against the alveolar ridge (ibid.). However, the trill is classified as [+cont] because “the vibrations of the tongue tip ...are produced by the drop in pressure which occurs inside the passage between the tip of the tongue and palate when the air flows rapidly through it (Bernoulli effect)” (Chomsky and Halle 1986, 318). It is noteworthy to mention here that it is recommended in (Qur’anic) Arabic that the trilling aspect of Arabic /r/ should neither be exaggerated nor diminished (‘Alḥamad 2004, 130). Some scholars criticize the exaggeration of the trilling of, particularly geminated, /r/ which was noticed among the Arabs who lived in Andalusia (the southern part of Spain) (Ibn ‘Aljazari 1998, 173). Ibn ‘Aljazari’s remark, in my opinion, points to two issues. First, it indicates that the Arabic /r/ used in that area might be influenced by the strongly trilled Spanish /r/. Second, it points to the difference in the degree of trilling between the robustly trilled Spanish /r/ and the mild one of Arabic.

2-3 Phonological Evidence from English and Arabic against the Class of Liquids

The data used in this paper to argue against the class of liquids come mainly from English and Arabic. These two languages have been chosen for two main reasons. First, each belongs to a different language family. English is a descendant of the Germanic branch of the Indo-European family, whereas Arabic is part of the Semitic group of the Afro-Asiatic family. The significance of the choice stems from the fact that if evidence against the class of liquids is found in these two languages which belong to two different language families, this may lend more support to the results of this study than when conclusions are reached based on data from one or more languages belonging to the same family/ subgroup of languages.

The second reason for choosing these two languages is that they share a number of characteristics with regard to // and /r/. They have one lateral sonorant and no lateral obstruents. The lateral sound // is subject to velarisation though the contextual factors are not the same in the two languages. Each language has /r/ sound with some similarities regarding the basic phonetic realizations of this phoneme, i.e., approximants, taps and trills:

English: /ɹ/ → [ɹ], [r], [r]

Arabic: /r/ → [r] [r], [ɹ]

2-3-1 Evidence from English

In this section, several pieces of evidence from English that illustrate some phonological differences between // and /r/ are discussed: metathesis, the Scottish Vowel Length Rule, /t/ and /d/ deletion, oral stop insertion, the behavior of /r/ as a glide, and some phonotactics of English.

2-3-1-1 Metathesis

Metathesis⁶ is one of the phonological processes that point to a phonological difference between /r/ and //. Although both // and /r/ can crosslinguistically participate in metathesis, it is noticed that /r/ is preferred. Ahmadkhani (2010) lists eleven languages that metathesize /r/ (and not other liquids) with other sounds, whereas two languages only use // (and not other liquids).

Alexander (1985) mentions three types of metathesis. First, a vowel may metathesize with another vowel⁷. Second, a consonantal sound may transpose with another consonantal.

6 -The reason metathesis in English is dealt with in some details is because this process in some languages has been taken by some researchers as evidence to justify considering liquids as one class, e.g., Reyes-Rodríguez (2006).

7-Alexander redresses that this type which was first suggested by Keyser (1975) does not apply to English.

The third type which concerns us here is the ability of a consonant to exchange positions with a vowel.⁸ The consonant in the third type is /r/. Though the occurrence of the third type is described as sporadic, Alexander affirms that it is 'rule –governed'. Welna (2002) also refers to the transposition between /r/ and the adjacent vowel. This process "was usually materialised in the development of English as a shift of a prevocalic consonant to a post vocalic position or vice versa" (p. 501). Metathesis occurred to different parts of speech, as illustrated in the "nouns (OE *brid*>bird, adjectives OE *beorht* >*briht* 'bright', or verbs (OE *irnan*>*rinnan* 'run'" (ibid.). These forms are examples of a process which is described as "the most frequent type of metathetic change in English" (ibid., 502). The writer acknowledges that despite the fact that the alternation between /r/ and a vowel was common in Northumbrian Old English, a small number of OE metathetic forms can be found in Modern English. This process also took place in Middle English yielding forms that are "much more stable, retaining the metathetic form until present-day English" (ibid.).

The transposition between /r/ and an adjacent vowel is significant for three reasons. First, it involves /r/ to the exclusion of //r/. Second, the transposition between /r/ and a vowel may give an indication of a phonetic similarity between /r/ and vowels. Third, Welna (2002) points out that this type of metathesis along other metatheses, is common in all Germanic languages. Keyser (1975, 377) refers to the existence of this phenomenon in other Indo-European languages and lists a number of examples of the metathesized pattern Vr→ Rv, e.g., Proto-Slavic **orsti* >Russ. *rosti* 'grow'; >*rásti* in Serbian and *rósti* in Old Czech.

Modern English seems to still involve some traces of /r/ and vowel metathesis. Pyles and Algeo (1993, 38) list *produce* and *perform* as examples of words in which /r/ and an unstressed vowel metathesize. The first syllables of these words can be frequently heard as [pər] and [prə] respectively. It is noticed from these two examples that /r/ and the unstressed vowel do not have to occur in a certain order. In other words, for the transposition process to take place, /r/ can either precede the vowel as in *produce* or follow it as in *perform*. In my opinion, this continuous permutation process from V+ r to r +V and vice versa points to genuine resemblance between /r/ and vowels.

2-3-1-2 The Scottish Vowel Length Rule

Hewlett et al. (1999) refer to the so called Scottish Vowel Length Rule which lengthens (some) vowels in certain positions. One of these positions is before /r/. The other positions are "...in open syllables and before voiced fricatives, ...and a morpheme boundary" (p. 2157). The importance of this rule lies in involving /r/ not //r/ despite the fact that the

8 - Hogg (2011, 296) handles types 2 and 3 as the only ones that occurred in Old English.

environments in which vowel length occurs are variable. Citing R. J. Lloyd (1908), Chomsky and Halle (1968, 318) refer to one aspect of this rule to explain the phenomenon of diphthong lengthening before continuants, e.g., fricatives, and the laxing of these vowel sounds before noncontinuants, e.g., stops. In this process /r/ functions like continuants, whereas /l/ patterns with noncontinuant sounds.

2-3-1-3 /t/ and /d/ Deletion

Another process that shows differences between /l/ and /r/ is /t/ and /d/ deletion. “/r/ behaves very much like a vowel, preventing deletion, whereas its companion liquid /l/ patterns like a consonant under the same conditions” (Labov et al. 1972 cited in Horvath 1985). Labov (2008) states that a “following /l/ was associated with a much higher probability of deletion than following /r/”. If this is put together with the general conclusion that “coronal stop deletion is sharply inhibited by a following vowel, and promoted by a following obstruent” (ibid), one may appreciate the phonetic difference between /l/ and /r/; a state of affairs that may lead the two phonemes to play different phonological roles as exemplified in this process.

2-3-1-4 Vowel Insertion

Krämer (2008) studies the phenomenon of vowel insertion before /l/ and /r/. The writer refers to the possibility for a schwa to occur in the speech of some speakers of British English before intervocalic /r/, whereas the same is not possible when /l/ occurs in the same context in words of one morpheme. The discussion concludes “that schwa before liquids and schwa before *r* are in most instances not the result of the same phonological process” (p.14). It is added “that word-final schwas after high tense vowels are correspondents of underlying rhotics”(ibid.).

2-3-1-5 Oral Stop Insertion

Weijer (1995), (citing Clements (1987), includes the phonological rule of oral stop insertion that functionally unifies /l/ with (nasal) stops. Accordingly, in some dialects in English, /t/ is inserted after a nasal or a lateral⁹:

sense → *sen(t)se*

false → *fal(t)se*

9- It is noticed from the examples given that the epenthetic stop is followed by a voiceless alveolar fricative, i.e., /s/.

2-3-1-6 /r/ as a Glide

The weak stricture in /r/, compared with /l/, has led some writers to group it with glide sounds— which are sometimes called semivowels, i.e., /w/ and /j/. The term *glides* suggests that during the production of these two sounds, they "readily accommodate themselves to the position of the following vowel" (Liles 1975, 224). The semivowel label suggests that "from the standpoint of production, there is no major obstruction as there is with fricatives and other consonants" (ibid.). A similar view of the gliding nature of /w/ and /j/ is found in Gimson (2008, 224- 225). Considering the way /l w j r/ are articulated, the use of the terms *approximant*, *glide*, or *semivowel* is justified in the case of the latter three (but not [l]) since it is indicative of how the organs of speech articulate against each other; and this signals the strong articulatory similarities among them.

Veatch (2005) investigates the role of glides in the syllable acoustically and phonologically. He found that in syllables where a glide element is unequivocally present, as in the case of /y, oy, w/, /r/ cannot occur in the same syllable, and "it must go in a separate syllable. It may also be deleted, as in r-less dialects where the vowel in *hire* is a monophthong, as [ha:]". If this is related to the fact that no two glides can occur in the same syllable, it can be inferred that /r/ is a glide. Based on this, forms like 'hire' should be considered disyllabic. When the glide is not present as in "*fir, fur, her*, and unstressed *for*", postvocalic /r/ can be found in the same syllable as part of the preceding vowel. In other words, the nucleus of these syllables will be of the structure /Vr/.

As for /l/, there is no evidence that excludes it from following glides in the same syllable (Benor and Levy 2006). Based on this, there are no restrictions on the occurrence of the sequence 'Glide +' tautosyllabically as in the words 'file', 'howl' and 'gnarl'.

2-3-1-7 Differences in the Phonotactics of /l/ and /r/ in English

This section discusses the phonotactic differences between /l/ and /r/. The distribution of /l/ and /r/ is noticeably different. Generally speaking, in most varieties of British and American English, /l/ occurs syllable initially, medially and finally as in *land, filling* and *mail*. In several varieties of English, /r/ mainly occurs before a vowel. The following varieties of English: "Australian English, New Zealand English, RP, South African English, most of the accents of the North of England" (Carr 1999, 77) have /r/ mainly syllable initially or more generally before vowels as in *read*. Even in American English, a prototype of rhotic accents, "the Southern and Eastern accents of the United States" (ibid.) have a distribution of /r/ which

is similar to that of RP and similar non-rhotic accents, i.e., /r/ is absent after a vowel and syllable finally.¹⁰

As cited in Fudge (1973, 38), Swadesh (1973) refers to another difference in distribution between /l/ and /r/. The English obstruents /t d θ/ can precede /r/ in the onset of a syllable but not /l/. The English words *try*, *draw* and *throw* and the non-existence of words that begin in *[tʃ], *[dʃ] and *[θʃ] illustrate the point. Kenstowicz (1994, 257) draws attention to an interesting aspect regarding this divergence. Both /l/ and /r/ are specified [+coronal] and only /r/ accepts following sounds to share this feature with it. Another example of discrepancy in the role of /r/ and /l/ in syllable initial consonant clusters is that /r/ can take part in the following three-consonant clusters: str- as in *strong*, skr- as in *screen*. The lateral sound /l/, on the other hand, does not participate in the sequence *stl-. As for the sequence skl-, it is permissible in English as in *sclaff*, *sclera*, and *sclerous*, but the number of words in which it can occur is somewhat limited¹¹.

The retroflex /r/, as referred to by O'Connor (1991, 229), cannot occur as the first element in initial two-consonant clusters, whereas /l/ can, as in one of the two possible pronunciations of the word *lute*, i.e., [lʃu:t]. By the way, O'Connor (ibid.) and Wardhaugh (1977, 59) include *lute* as the only word in which /l/ can be the first element of a two-consonant initial cluster, but in fact the words *lubricant*, *lucid*, *ludic*, *lure*, *luminance*, *lupine*, *lucre*, among several others, all have alternative pronunciations in which /l/ is the occupant of the first slot in syllable- initial two- consonant clusters.

Apart from the word *syringe* which, according to Roach (2005, 74), can begin with the cluster /sr/¹² in the pronunciation of some speakers of English, this sequence is hardly found syllable initially in English except in words of 'foreign place names' (ibid.) of which he gives the word *Sri Lanka* as an example. Other possible words beginning with this cluster are *Sranan*, *Srebrenica* and *Srinagar*. The sequence /sl/, on the other hand, is common in English as in the words *sling*, *slake*, *slim*, and many others.

The sounds /l/ and /r/ also differ when they are followed by /ʃ/ in two-consonant clusters. While the combination /rʃ/ is not uncommon in English as attested in the words

10 - In this aspect, /r/ is obviously different from /l/ and patterns more with /w/ and /j/ which occur mainly in onsets as in *win* and *yet*, and do not occur in codas.

11 - There are eight of them according to *Longman Pronunciation Dictionary*.

12 - I have checked several pronunciation dictionaries: *English Pronouncing Dictionary* (1997), which is co-edited by Peter Roach himself, *Longman Pronunciation Dictionary* by J C Wells and some other dictionaries including American English dictionaries and none of them records the pronunciation [srɪndʒ].

shredder, shriek, shrink, /ʃ/ is very infrequent except in words of German (normally rare surnames) and of Yiddish origins such as *schlegel, schlep, and schlock*.

As for the occurrence of */l/* and */r/* finally in the syllable, again we can notice some differences in whether the sound occurs singly or part of a cluster. The first major difference is the one that distinguishes rhotic accents from non-rhotic ones. In the latter type of accents, */r/* is dropped when it occurs on its own (before a pause) or before another consonant in the coda of syllable. The sound */l/*, on the other hand, is frequent in both positions as in *steal, melt, and bulks*. In rhotic accents where */r/* is pronounced in codas, there are still some differences regarding whether each of the two sounds occurs on its own or part of a cluster. The following observations based on Hammond's tables (1999, 61-62, 66-67) illustrate some of these differences in distribution between */l/* and */r/* in consonant cluster codas. There are no words in English that end in */lg/*, whereas the sequence */rg/* is possible, though not common, as in *morgue*. Interestingly, */lr/* does not occur in codas; */rl/* does occur as in *snarl*. In three-consonant word-final clusters, */lbd/* and */lnd/* do not occur in English, whereas */rbd/* and */rnd/* occur as in *curbed* and *mourned*.

The type of vowels (and diphthongs) that follow or precede */l/* and */r/* is another indication of the difference in their distributional possibilities in English. The following is a brief summary (based on Gimson's description (1989, 243-248) of RP) that outlines the restrictions imposed on the vowels (and diphthongs) that follow */l/* and */r/*. Initial */l/* can be followed by the tense central vowel */ɜ:/* as in *lurk* [lɜ:k], whereas */r/* is not followed by such a vowel in English. There are no words in which the initial cluster */pl/* is followed by the diphthong [eə] but the sequence */plɪə/* is possible. The situation is reversed in the case of */pr/*. The initial consonant cluster */kl/* does not precede the vowel */ʊ/* but */kr/* does. English does not have items in which */kr/* precedes the vowel */ɜ:/* or the diphthong */eə/*, whereas this is a possible combination in the case of */kl/*. The difference between the two-consonant clusters */br/* and */bl/* is that the former can be followed by the lax high rounded */ʊ/* and the diphthong */ʊə/*, whereas the latter can not. Table 1, which is based on Gimson's tables (ibid.), summarizes the remaining distributional differences between two and three-consonant clusters in which */l/* and */r/* participate:

Table 1

The differences between clusters with // and clusters with /r/ with regard to the vowels and diphthongs that follow each one of them

Cluster	Vowels and diphthongs that do not follow
gl-	ʊ, ɔɪ, aʊ, ʊə
gr-	ɔɪ, eə
fr-	ɜ:, eə, ʊə
spl-	ɔɪ, ʊɪ, aʊ
spr-	ɜ:,
skl-	ɪ, æ, ʌ, ɒ, i:, ɔ:, u:, eɪ, aɪ, əʊ, aʊ
skr-	ɪə

2-3-2 Evidence from Arabic

This section discusses a number of issues that show the differences in the functional role of /r/ and // in Arabic. These include the lengthening process of some sounds in Qur'anic Arabic, *Aṭṭumṭumaniyyah* (الطمطمانية), i.e., // replacement by /m/ in some varieties of Arabic, assimilation, // and /r/ velarisation, and the frequency and phonotactics of // and /r/ in Arabic.

2-3-2-1 Length of // and /r/ in Qur'anic Arabic

In Qur'anic Arabic, there are fourteen letters that appear at the beginning of certain chapters of the Holy Qur'an. In these positions, these letters are pronounced in a special way using what is called the name of the letter. The name begins with the sound at hand followed by a vowel and one of the agreed upon consonants. For example, [s] is read as [sīn], [m] is read as [mīm], [q] is read as [qā:f], etc. It is noticed that in the recitation of the Qur'an, [l] allies with the (names of) letters whose vowels are extra lengthened: [m n s š q ʔ k q]. On the other hand, [r] is a member of a group of five letters/sounds whose vowels are not lengthened. The other sounds in this group are [h j ʔ ḥ].

2-3-2-2 *Aṭṭumṭumaniyyah*: // Replacement by /m/

The process of *Aṭṭumṭumaniyyah* is an example of //s alliance with stops. In this phenomenon which is said to characterize the speech of (originally) Yemeni tribes, // in the

definite article /ʔal/ 'the' is replaced by the (bilabial nasal) stop /m/. 'Aththa'ālibi (1994, 146), who died in 429 Hij/1037 AD, attributes it to the Yemeni tribe of Ḥimyar. 'Ashshāf'i and Shāhīn (1975) indicate that *Aṭṭumṭumaniyyah* was common in the speech of Ḥimyar and some speakers of Ṭayy'. Others attribute it to 'Al'azd. The word البر [ʔalbirr] 'piety/righteousness', for example, is pronounced as [ʔambirr]. This dialectal pronunciation was known to, and occasionally used by, speakers of Arabic as evidenced in one of Prophet Muhammad's traditions, who was himself a native speaker of a dialect that does not use this process. The examples below show that // can be replaced by /m/ regardless of the following sound:

/ʔaṣṣijām/ → /ʔamsijām/ 'the fasting'¹³

/ʔalhawāʔ/ → /ʔamhawāʔ/ 'the air'

/ʔaḍḍarb/ → /ʔamḍarb/ 'the fighting (with swords)'

/ʔaṣṣajḡ/ → /ʔamṣajḡ/ 'the old man'

It is worthy of noting that some scholars report hearing this pronunciation. Ibn Durayd (19?), who died in 933 AD, said that he heard this pronunciation from some Yemeni students in his time. 'Alhamadāni (1990), who died in 336 Hij./947 AD, said that he heard it in some dialects in the Arab Peninsula. Furthermore, /ʔam/ as a definite article is still used by some speakers of Yemeni Arabic ('Ashshāf'i and Shāhīn 1975). 'Abduṭṭwāb (1999) includes the word [mbāriḡ] (or [ʔimbāriḡ]) in Spoken Egyptian Arabic (from the standard form /ʔalbāriḡah/ 'last night') as a remnant of this process in modern Arabic. There are two points worthy of noting here. First, the pronunciation [mbāriḡ] does exist in other varieties of modern spoken Arabic, e.g., Spoken Arabic in Jordan, Syria and Lebanon. Second, there are some speakers of Jordanian Arabic for example, though not many, who pronounce this word with // [lbāriḡ] which clearly points to /ʔam/ as an alternative form of the standard and more common form of the definite article, i.e., /ʔal/.

13- It is well-known in Arabic that /l/ assimilates completely to a following [+cor] sound with the result that the latter is geminated as in, for examples, /ʔaṣṣijām' and /ʔaḍḍarb/ (cf. /ʔalhawāʔ/ and /ʔalbirr/).

2-3-2-3 Assimilation

Assimilation is another process that points to differences between /l/ and /r/. In Arabic, /l/ can assimilate completely to a following /r/, particularly when /l/ in the definite article /ʔal/ is followed by /r/ as in:

/ʔal/+ /rātīb/→[ʔarrātīb] 'the salary'

The sound /r/, on the other hand, in the opinion of many grammarians, for example (Ibn Jenni 1993, 193) does not assimilate to a following /l/. Ibn Jenni states that because of /r/'s repetitiveness, i.e., the repetitive strikes of the tip of the tongue against the alveolar ridge, it is not allowed to assimilate to a following sound for fear that assimilation may affect its completeness (ibid), which, in my opinion, may cause the loss of its identity. Ibn Assikkīt (1987, 442), who died 244 Hij./AD 858, includes /r/ among a list of five sounds, the others being /f m ɟ d l/, to which similar sounds can assimilate, but which do not assimilate to other sounds. 'Alḥamad (2011, 228) also states that as a result of /r/'s trilling nature, it does not assimilate to a following /l/. Accordingly, it is wrong for /r/ + /l/ in /mur lana/ 'order for us' to surface as [mullana].

2-3-2-4 Velarisation

Though both /l/ and /r/ are subject to velarisation or emphasis, the contexts in which emphasis takes place point to differences between the two sounds. First, the dominant allophone of /l/ is the unvelarised or non-emphatic one. A velarised /l/ occurs in a limited number of contexts. First, it occurs in the word [ʔalḷāh] 'Allah' when it is not preceded by a high front vowel (cf. [lillāh] 'for Allah'). The second, and debatable case, is when /l/ is preceded by the emphatic consonants /ṣ.t.ḏ/. It is stipulated here that /l/ be followed by a short low front vowel, and that the emphatic consonant is either followed by a short low front vowel or not separated from /l/ by any sound: /ṣ.t.ḏ + (a) + l/ + (a)/.

The dominant allophone of /r/ is the emphatic/velarised one. The sound /r/ is generally velarised except in the following cases:

a- /r/ +short front close vowel as in /rimāl/ 'grains of sand'

b- short front close vowel + /r/+ /C/ as in /mirfaq/ 'elbow'

It is stipulated ('Almar'ashi 2008, 175) that /r/ and the vowel must occur in the same word, and none of the emphatic consonants, i.e., /ḏ.ḍ.ṣ.t./ follow in the same word. 'Alḥamad (2004) includes the other partially emphatic consonants: /q χ ʕ/ in the list of post-/r/ consonants that require adding emphasis to /r/.

It is noticed that the contextual clues that require /l/ to become emphatic normally precede the lateral sound (Cantineau 1966, 67), whereas the sounds that cause emphasis/velarisation in the trill sound follow it.

2-3-2-5 The frequency and Phonotactics of /l/ and /r/

Mūsa (1978, 17), in a statistical study on the frequency of consonantal sounds in trilateral roots¹⁴, which are the most basic and most common forms in Arabic, finds that /r/ is the most common consonant in these forms followed by the nasals /m/ and /n/. He found that /r/ is the most frequently occurring sound as the second and third consonants in these trilateral forms, whereas it comes second as the first consonant in the root. The sound /l/ comes in the fourth place with similar frequency to the nasals. It is worthy of noting here that /r/ and /l/ are separated by two nasal phonemes: /m/ and /n/. The nasals which undisputedly constitute a natural class follow each other in a consecutive order, but /r/ and /l/, which are supposed to belong to one class, do not. Bishr (2000, 366) explains the occurrence of these consonantal phonemes in this order in the light of the degree of sonority these sounds have: the more sonorous the phoneme is, the more frequent it becomes in these roots.

The phonotactics of Arabic is another area which shows differences between /l/ and /r/.

Interestingly, Ibn Jenni (1993, 818) examines the phonotactic restrictions of /l/ and /r/ together with the nasal stop /n/ in one set. According to this scholar, it is permissible in Arabic for /r/ and either of /l/ or /n/ to co-occur in one word provided that /r/ is the initial consonant as in /rannah/ 'sound/ reverberation' or the first of the last two consonants as in /waral/ 'the monitor lizard'¹⁵. The word /ʔurul/, which is a name of a mountain in the Arabian Peninsula, is another example in which the sequence /r/ + /l/ is attested. This distributional pattern is not only found in Arabic when /r/ and /l/ are separated by vowels as in /waral/ and /ʔurul/, but they are also found when, in addition to the vowel, a consonant intervenes between /r/ and /l/. Examples of the latter tendency are attested in the words /raml/ 'sand' and /safardʒal/ 'quince'. Ibn Jenni's explanation for this sequence is that the 'stronger' sound normally precedes. Ibn Assarrāj (1973, 46), a predecessor of Ibn Jenni, also referred to the same reason, i.e., that /r/ is stronger than /l/, and that is why /r/ precedes it when they are contiguous in a word. It seems that strength here denotes the degree of sonority: the more sonorous sound occupies an earlier position in the word.

14 - That is, they consist of three consonants.

15- The collator of Ibn Assarrāj's book cites an example from Modern Iraqi Spoken Arabic (The speech of Takrīt area) in which the word /waral/ is pronounced as /ʔarwal/; a form which follows the restrictions of contiguous /l/ and /r/, i.e., /r/ still precedes /l/ in this word.

Another aspect of difference between // and /r/ is that the former can be affixed to different parts of speech to convey certain meanings, whereas the latter cannot. For example, // is affixed to /ðālīka/ form /ðāka/ '(the masculine demonstrative pronoun) that', the definite article in /ʔalkitāb/ 'the book' and in //i/ 'for' in /ʔalkitābu li ʔaliij 'the book is for Ali', and to the verb /jaʔlam/ 'to know' in /'lijaʔlam ʔaldʒamīʔ/ 'All must know'; /r/, on the other hand, is not attested in other than templatic morphemes.

3- Conclusion

This paper has addressed some of the problems associated with grouping // and /r/ in the class called liquids. By drawing on evidence from English and Arabic, it has attempted to show that whether this class is addressed phonetically or phonologically, it proves to be problematic. The occlusion present in // sounds and the absence of such (sustainable) occlusion in /r/ sounds, whether /r/ is an approximant or a trill, point to the lack of an essential basis for grouping the two sounds in the same natural class. The dispute over the specification of // and /r/ as [± consonantal] and [± continuant] adds to the reservations regarding grouping these sounds together. The contention is further escalated by differences between the phonological behavior of // and that of /r/. Metathesis, t/d deletion, vowel insertion, the Scottish Vowel Length Rule, and oral stop insertion are examples of processes in which English // and /r/ behave phonologically differently. In Arabic, phenomena like *Alṭumṭumaniyyah* (الطمطمانية), i. e., // replacement by the nasal stop /m/ in some varieties of Arabic, the lengthening involved in reciting the names of separate letters in the Holy Qur'an, and the velarisation of /r/ and // are instances of processes in which // and /r/ show phonological differences. Examples of the phonotactics of // and /r/ in English, and // and /r/ in Arabic are also evidence for the differences in the distributional possibilities of // and /r/.

In conclusion, it seems that the phonetic structure of // and /r/ and their phonological behavior in these two unrelated languages are not in favour of classifying them together in one class. Such classification appears to imply both oversimplification and ignorance of important phonetic and phonological facts.

ضد مجموعة الأصوات المائعة: أدلة من اللغة العربية واللغة الإنجليزية

عبدالله حامد الحجوج

ملخص

يهدف هذا البحث إلى دراسة بعض المشاكل المتعلقة بمجموعة الأصوات التي تدعى الأصوات المائعة، وتحديدًا صوتي /ل/ و /ر/. وسيكون مصدر المعلومات الأساسي في هذا البحث اللغتين العربية والإنجليزية. وغاية هذا البحث هي إثارة التساؤلات حول صحة ومصداقية هذه المجموعة الصوتية عن طريق تبيان أنه لا يوجد أساس صوتي كاف لتصنيف صوتي /ل/ و /ر/ في المجموعة الصوتية المسماة بالأصوات المائعة. وسوف يتم تقديم أدلة أخرى من خلال عمليات صوتية تشكيلية في اللغة الإنجليزية مثل القلب وحذف /ت/ و/د/ وإقحام الحركات، إضافة إلى ظواهر أخرى لتبيان السلوك الصوتي التشكيلي المختلف لكل من هذين الصوتين. كما سيتم البحث في بعض الظواهر اللغوية في اللغة العربية لدعم حجة هذا البحث بأن لصوت /ل/ و لصوت /ر/ دورين مختلفين من الناحية الصوتية التشكيلية. وعليه يجب أن ينتمي كل واحد منهما إلى مجموعة صوتية مختلفة. ولتحقيق ذات الهدف سوف يتم مناقشة بعض قيود التتابعات الصوتية الخاصة بهذين الصوتين في اللغتين العربية والإنجليزية.

كلمات مفتاحية: الأصوات المائعة، الأصوات الساكنة، الأصوات الاستمرارية، العمليات الصوتية التشكيلية، التتابعات الصوتية.

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