

Differences between English and Arabic Syllable Problems that Face Arab students

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Abstract

The study sets out of the belief that languages build their words from a finite set of phonemic units and that all languages have constraints on the way in which these phonemes can be arranged to form syllables. So, it hypothesized that there are considerable differences in this regard between English and Arabic syllables. That is in return having an effect on students' pronunciation. Such differences are hypothesized to be negative, as Arab students' will shift the structure and constraints of the Arabic syllable to those of English. Therefore, this study tries to stands at the main similarities and differences between English and Arabic language in regards to the concept of syllable. So, it investigates the presence and/or absence of the phenomenon of shift between these two languages. That may help in shedding lights on the possible problems and/or facilities that Arab students of English may have if the shift exists. Consequently, Arab students could triumph over the phonological phonotactics in English pronunciation that stands in front of them while learning English as a foreign language. For this purpose, the study stands on the phonetic and linguistic meaning of the syllable, its constituents and structure in both languages and its phonotactic constraints as well as consonant clusters in both languages.

An account of the findings of this study is presented in the conclusions. Moreover, these findings are hoped to provide rich information to the teachers and Arab students of English as well. It might be useful in helping them to be conscious and vigilant of such phonotactics in the target language especially in their spontaneous speech. Taking these findings into consideration could help them to attain a fluent and accurate pronunciation of English.

1. Introduction

English is an Indo-European language and Arabic is Semitic. The two languages share some commonalities but differ in some others and that can result in both positive and negative shift¹ in language learning process. Arabic phonology, for example, plays an important role in the production of English phonology by Arab students. Some of the major phonological problems that Arab students encounter with English pronunciation can be attributed to the interfering effect of their mother tongue. That is why the present study comes to clarify both the similarities and differences between Arabic and English syllable. First, to identify if there is any possibility to the phenomenon of language shift; and secondly to reveal where Arab students' problem(s) may lie. In fact the significance of this study may be attributed to the fact that there have been no sufficient researches regarding Arabic phonology; especially those investigate the nature of English syllable constituents, structure and phonotactics in contrast to those of Arabic.

The concentration is chosen to be on syllable because of its importance. In phonetic and/or phonological terms the syllable is important in that it helps to make a better understanding of the functions of this unit. Some phoneticians and phonologists, like Gimson (1980:50) and Roach (2002:75) to name but a few, believe that syllable functions as the basic unit in language production and perception. It is a convenient unit in learning pronunciation; it reflects what a speaker is capable of pronouncing. Add to that, the basic function of the syllable is to regulate the ways in which lower level units (consonants and vowels)

¹*Language shift* is defined by Odlin (1989: 27) as 'the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired'.
of the phonological hierarchy can combine. Other phoneticians and phonologists treat the syllable as an abstract unit which exists at the cognitive level.

As such, it is an important unit in the organization, production, and comprehension of speech. Anyhow, it is important throughout the research to stand at the general meaning of both consonants and vowels and how their numbers differ in English from that of Arabic.

Phonetically, vowels are speech sounds formed with no obstruction to the air stream; while consonants are speech sounds formed with an obstruction. English R.P¹, the field of study, has forty-four speech sounds. They are divided into twenty vowels, twelve long and short simple vowels, in addition to eight diphthongs, and twenty-four consonants. While, standard Arabic², the field of study, has thirty-six speech sounds. They are divided into eight vowels, six long and short simple vowels, in addition to two diphthongs, and twenty-eight consonants.

2. Syllable

2.1 Phonetic and Linguistic Definitions of the Syllable

The notion of syllable is perceived differently by different scholars. However, as Gimson (1980: 56) believes, a major two-fold distinction can be made between phonetic and linguistic definitions. Phonetic definitions usually explain the syllable in terms of how it is pronounced or produced. While, linguistic definitions assume a segmental level of representation. That is, syllable is defined linguistically in term of an organization of phonemes.

Phonetically, then, the syllable can be perceived in one of two terms: either acoustically (i.e. inherent sonority), or articulatorily (i.e. muscular movements in correlation with chest pulse and/or degree of obstruction). Acoustically, a syllable is a unit of speech containing one relative

¹ R.P is that variety of English used by educated native speakers in the south east England. It is the one that is concentrated one in Iraqi University teaching (cf. Roach, 2002: 9).

² Standard Arabic is that variety of Arabic used by educated native speaker in the entire Arabic-speaking world and taught in schools to native and non-native speakers of the language(cf.Al-Ani,1970:25).

sonority peak that is preceded and/or followed by a sequence of segments with progressively decreasing sonority (Selkrik ,1984:116; Bussmann,1996: 1155; and Rubba ,2009:1; to name but a few). Sonority in a syllable increases towards the peak and decreases towards the margins. That is, it rises during the onset and falls over the rhyme (Selkrik (1984:116). Hamann& Schmitz (2005: 39ff) define sonority as the loudness of a sound, which is related to its acoustic energy relative to other sound having the same length, stress, and pitch. Basically, sounds are

described as varying in their degree of sonority on a continuous scale or a hierarchy, going from voiceless stop (the least sonorous sounds) to open vowel (the most sonorous sounds). The hierarchy of sonority can be shown as follows:

	<u>Sounds: Sonority</u>	<u>Value</u>	<u>Examples</u>
	low vowels	10	/a,
o/			
	mid vowels	9	
/e, o/			
	high vowels	8, 7	
/ I ,u/			
(Sonority hierarchy)	liquids	6	
/r,l/			
	nasals	5	
/m, n, ŋ/			
	voiced fricatives	4	
/v, , z/			
	voiceless fricatives	3	
/f, , s/			
	voiced stops	2	
/b, d, g/			
	voiceless stops	1	
/p, t, k/ (Ibid).			

In contrast, articulatorily a syllable is a sound or a short sequence of sounds that is produced by a single impulse of voice and/or a single movement of lungs initiator (one chest pulse) (Richards& Schmidt, 2002: 531; Birjandi & Nodoushan,2005: 19; and Rubba, 2009:1). This is accompanied by an uninterrupted act of exhalation. This perception, however, is considered to be wrong because it is experimentally proved that in many cases two or more syllables are pronounced within one act of exhalation. That is why it may be more acceptable to define syllable as a unit of speech which consists of a center that has no obstruction of airflow, usually a vowel, and a start or an end that has a considerable degree of obstruction to airflow and sound quieter than the center. So, from an articulatory point of view the syllable consists of a movement from an obstructed or a silent state to a comparatively open and unobstructed (vowel-like) state and then back to an obstructed or silent state (Roach,2002: 76; and Birjandi & Nodoushan ,2005: 31), this all is on one hand.

On the other hand, a group of phoneticians and phonologists, among them Gimson (1980:56), Roach (2002: 76f), Watson (2002:85f) and Birjandi & Nodoushan (2005: 32), agree that syllable linguistically means how consonants and vowels combine to form various sequences. Vowels may form a syllable on their own, or they can be the center of a syllable, preceded and/or followed by one or more consonants. So, linguistically, a syllable is a unit of speech containing one vowel either alone or surrounded by consonants in certain numbers and certain arrangements.

In short then, a syllable is a phonetic-linguistic unit of speech, for which there is no single and straightforward definition. This is due to the fact that such a definition must take into consideration a wide range of variable factors whether that of sonority peak, one chest pulse and obstruction, or as certain selections and combinations of phonemes. Generally, the study views the syllable as a group of sounds that can make up a word or part of a word in a given language. Each syllable centers on one prominent sound segment, typically a vowel, whether pure or diphthong, (but which may be a syllabic liquid or nasal), which may be preceded and/or followed by other less prominent segments, i.e., consonants and semivowels.

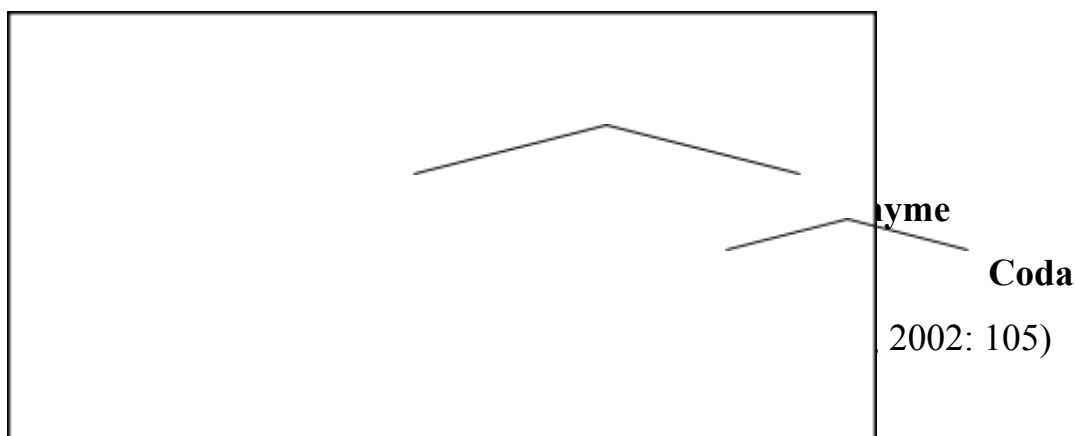
2.2 Syllable Constituents

Phonologically, it is of primordial importance to understand the structure of a syllable in its universal aspects, as well as the aspects of the languages that are object of this study. Hooper (1976: 198) points out that the syllable consists of a vocalic element, with the possibility of non-vocalic element(s) before and after it. Accordingly, a syllable contains internal segments that are consonants, as marginal constituents, and vowels, as a central constituent. Richards & Schmidt (2002: 534) state that all languages have syllables composed of consonants and vowels and that a lot of languages can have syllables of only vowels, otherwise only very few languages can have syllables and even whole words composed exclusively of consonants.

Hence, the syllable in natural languages can be divided into three subunits or constituents: **onset**, **nucleus**, and **coda**. The onset is a unit consisting of the

syllable-initial consonant or consonants. The nucleus is the peak of the syllable. It is the dominant and loudest constituent of the syllable, and it is the only unit of the syllable that is always obligatory. It typically consists of a vowel but in some languages may be a syllabic consonant as well. Consequently, it is possible to have an onsetless syllable. Finally, the coda is a unit consisting of the final consonant or consonants of the syllable. Like the onset, it is not an obligatory unit. From that all, it has been proposed that syllables are tree-like structures corresponding to various branching entities such as the onset, the nucleus and the coda. Both the nucleus and coda may themselves be branches of higher structure that is the **rhyme** (that may be all phonemes from the vowel to the end of the syllable) and the **syllable head** that associates all these constituents together (McMahon, 2002: 105; Fromkin et al, 2009: 286).

According to the onset-rhyme approach, the syllable is interpreted as a purely hierarchical and symbolic structure. A possible graphic representation of syllable constituents can be as follows:



Among the possibilities of syllable structure, the universally preferred one is CV¹. Al-Ani (1970: 78) states that such syllable type is an absolute substantive universal, and the presence of any other syllable type implies the presence of the CV syllable. Therefore, it is a typological universal and also the most basic level of an implicational hierarchy of syllable structure. According to Hooper (1976:198f), “on a universal level, the CV syllable is the optimal syllable. There is no language that does not allow a syllable type CV, and there are some languages that allow this type and no other.” She points out that there are many

other complex syllable structures besides the favored CV. There are syllable-initial and/or syllable-final consonant combinations of different lengths in different languages.

2.3 Vowelless Syllables

English among other languages² allow segments which are not traditionally classed as vowel to form the nucleus of a syllable. In English, both nasal /m, n, ŋ/ and liquid consonants /r/ and /l/ can constitute entire syllables on their own. Such syllables do not include any vowels at all, i.e. they are vowelless syllables. When these consonants function in this way, they are referred to as syllabic. So, whereas syllabic consonants are "consonants in vocalic function" or consonants behave like vowels in constituting the nucleus or center of a syllable instead of a vowel, vowelless syllables are those syllables which have a syllabic consonant in its nucleus or center, its only constituent, instead of a vowel (Bussmann, 1996: 818; and Carr, 2008: 170).

Hence, a syllabic consonant is a phonetic element that normally patterns as a consonant, but may fill a vowel slot in a syllable. Then, nasal and liquid consonants are not always syllabic. They have a dual role ¹ C stands for "Consonant" and V for "Vowel".

²Such as Sanskrit, Serbo-Croatian, and many African languages

in English, sometimes behaving non-syllabically, like phonological consonants, while at other times behaving syllabically, like phonological vowels. Notice, however, that all these nuclear consonants (nasals and liquids) are more sonorous than other consonants and in this respect are more like vowels (i.e. they are produced with spontaneous vocal folds vibration and display a vowel-like acoustic structure) than the other consonants. They arise as a consequence of a weak vowel becoming lost, and are usually indicated by placing a vertical tick under the consonant (Fromkin et al, 2007: 241f) and Waegler (2009: 220f).

In this regard it is important to know, as Roach (2002: 76) shows, that in English some syllabic consonants appear to have become practically obligatory in present-day speech (in as much as it is deemed to be a mispronunciation and

sound unacceptable to pronounce them with a preceding /ə/ vowel), while some others appears to be possible either to pronounce them as syllabic consonants or to pronounce them with a preceding vowel. The matter is more confusing because of the fact that speakers do not agree in their intuitions about whether a consonant, particularly /l/, is syllabic or not. Although, most would agree that, for example, 'cuddle' and 'cycle' are disyllabic (i.e. contain two syllables), 'cuddly' and 'cycling' are disyllabic for some people (and therefore do not contain a syllabic consonant) but for others they are trisyllabic (i.e. contain three syllable). However, standing at some of syllabic consonants rules may help in showing when they are obligatory and/or optional. Some of these rules are:

- /l/

Syllabic /l/ is perhaps the most noticeable example of English syllabic consonant. It occurs after another consonant, most often after the alveolar consonants, / t, s, z / as well as / d /. It can also follow / st / or plain / n / or / nt /. Generally, it can occur in one of two places:

1. After one or more consonant letters followed by 'le' or 'les' where it is obligatory, i.e. producing non-syllabic /l/ is considered as mispronunciation.

e.g. 'bottle' /bɒt^ll/ , 'table' /teɪb^ll/ , 'eagle' /i:gl/

2. After one or more consonant letters followed by 'al' , 'ol' or 'el' where it is optional, i.e. it is possible to produce either syllabic or non-syllabic /l/, though non-syllabic/l/ is less likely.

e.g. 'pistol' /pɪst^ll/ or /pɪstəl/, 'tunnel' /tʌn^ll/ or /tʌnəl/, 'pedal' /ped^ll/ or /pedəl/

- /r/ can also be syllabic in few cases and in most of them there are perfectly acceptable alternative pronunciations with non-syllabic /r/.

e.g. 'history' /hɪst^ll/ or /hɪstri/, 'flattery' /flæt^ll/ or /flætəri/

- /n/

Syllabic n is perhaps the most frequently found and the most important one. It occurs most common after:

1. Alveolar plosives and fricatives in word like 'tonight' /tənaɪt^ll/, threaten /θretⁿn/

2. Bilabial consonants in word like 'happen' /hæpⁿn/ , ribbon /rɪbⁿn/.

3. Velar consonants in words like 'thicken' /θɪkⁿn/, 'wagon' /weɪgⁿn/

4. Labio-dental consonants in word like 'seven'/sevŋ/, 'often' /Dfŋ/
 5. /ʃ/ in word like 'nation'/neɪʃŋ/, station steɪʃŋ/ ; but not after /l, tʃ/ or /dʒ/.
- /m and ŋ/

These two consonants can be syllabic but only when the processes of elision (loss of a sound) or assimilation (sound change due to influence of neighbouring sounds) have applied.

e.g. "Lock and key" when it is delivered quickly, it will be pronounced as /'lɒkŋ'ki:/ (Ibid, Fomkin et al(2007:286f) and Waengler (2009:220f).

Accordingly, in voweless syllables, there is no vowel, only a syllabic consonant. One may think that s/he has to produce a vowel, probably partly because there is a vowel graph in the spelling; but in fact most speakers will move straight from one consonant to the next. The reason behind such a move is that the speakers will have less difficulty when the syllabic consonants are produced. To put it clear, the tongue will have a similar posture between an obstruent and a sonorant consonant and that less difficult than having simultaneous pronunciation of two different articulators. In saying, for example 'sadden' one can notice that the blade of the tongue maintains some kind of constriction as proceed from the / d / to the / n /and that more easily than having a vowel in between. However, voweless syllables are considered as weak or unstressed syllables. They can occur only as a medial or final syllable within the word but never in word initial position (Richard &Schmidt, 2002: 530).

3. Syllable Constituents and Structure in English and Arabic

3.1 English Syllable Constituents and Structure

Given the flat syllable constituents above, English syllable can be either simple or complex. Davis (2003: 10) shows that a simple syllable is one that consists of zero or one onset consonant followed by a short vowel, which is (C) V. Anything larger is a complex syllable. Thus a complex syllable might contain a coda, for example, a CVC syllable; it might contain a diphthong or long vowel, for example, a CVV syllable; it might contain a complex onset, for example "spa" or any combination of these as in the syllable "sprints" which has both a complex onset and a complex coda.

Hence, English allows very complicated syllables. Hamann & Schmitz (2005: 35) reflects that meaning when he shows that English syllables may begin with up to three consonants maximum (as in *string* or *splash*), and occasionally end with as many as four¹ maximum (as in *prompts* or *sixths*).

However, it is important to point out that an English syllable does not always have an onset and a coda. The only obligatory constituent in the structure of English syllable is the nucleus which is mainly occupied by the vowel or in few cases by syllabic consonants (as the final [l] is in the word 'little', /n/ in 'seven'...etc which will be shown later on in this study). Syllables which contain no coda consonants are **open** (or **unchecked**) syllables. So open syllables are syllables that end in a vowel and the most common open syllable is the CV syllable. While, syllables which contain one or more coda consonants are **closed** (or **checked**) syllables. So closed syllables are syllables that have at least one consonant following the vowel. The most common closed syllable is the CVC syllable. Syllables which lack an onset consonant are said to have an empty onset (or onsetless) (Carr, 2008: 171; and Rubba, 2009: 3).

The distinction between open and closed syllables is important, as it brings to light the notion of syllable weight. The weight of the syllable is usually associated with the structure of the rhyme. Just as the branching and/or non-branching of the rhyme results in a closed and/or an open syllable, respectively, so does a branching and/or a non-branching rhyme result in a heavy and/or light syllable respectively (Ibid).

To sum up, the legal types of syllable structure in English may consist of:

a) Open syllables

V "I" /æ/

CV "me" /mi:/

CCV "spy" /spæ/

CCCV "spray" /spræ/

b) Closed syllables

VC "am" /æm/

VCC "ant" /ænt/

VCCC "ants" /ænts/

CVC "man" /mæn/

CVCC "bond" /bɒnd/

CVCCC "bands" /bændz/

CVCCCC "sixths" /sɪksθs/

CCVC "brag" /bræg/

CCVCC "brags" /brægz/

CCVCCC "plants" /plænts/

CCCVC "spring" /sprɪŋ/

CCCVCC "springs" /sprɪŋz/

CCCVCCC "splints" /splɪnts/ (Davis, 2003:11).

It is clear from this list that English has a very flexible syllable structure. There are languages at the opposite extreme that have only CV syllables.

3.2 Arabic Syllable Constituents and Structure

Comparing with the constituents and structure of English syllable, Arabic syllable can also be either simple or complex¹. Simple syllable in Arabic is the one that consists of one onset consonant followed by a short vowel, which is CV. Anything larger is a complex syllable. Thus a complex syllable might contain a coda, for example, a CVC syllable; it might contain a diphthong or long vowel, for example, a CVV syllable; it may contain a complex coda, for example, a CVCC syllable. Hence, Arabic allows minimal complexity i.e. Arabic syllables may have a coda consonant, but onsets and codas typically can only consist of a single consonant, so that these constituents themselves are never complex, though a complex coda can occur at the end of a word (Al-Ani, 1970: 78; and Abu-Chacra, 2007: 22).

So whereas in English the only obligatory constituent in the structure of the syllable is the nucleus, in Arabic it is the nucleus and the onset that are obligatory. Add to that, Waston (2002: 104) shows that the structure of Arabic syllables consists of one consonant only in the onsets. While, it ¹ Also known as short and long syllable respectively.

may consist of one or two consonants in the codas as in *bent* (girl) and *shams* (sun). That is, no syllable can start with more than one consonant phoneme such as in *kul* (all). In other words just as Arabic forbids empty onsets, it also disallows complex onsets. In fact, even those words which begin with vowels are seen to start with a consonant, which is the glottal stop. Thus, /qum/ (get up-imperative) and /ʔumm/ (mother) both have single consonant onsets. The same is with such names transliterated as "Israel", "Abraham", "Omar", "Ali" and "Abdullah", among many others, actually begin with semi-consonantal glides or with glottal or pharyngeal consonants.

Arabic has two kinds of syllable: open syllables (CV) and (CVV) - and closed syllables (CVC), and (CVCC). Every syllable begins with a consonant - or else a consonant is borrowed from a previous word through elision – especially in the case of the definite article THE *_al* (used when starting an utterance) or *_l* (when following a word), e.g. *baytu-l mudiiir* (house (of) the director). By itself, definite *mudiiir* would be pronounced /al mudi_r/. In Arabic, just as in English, the general preference is for closed syllables (Abu-Chacra,2007: 22; and Anees, 2007:162).

In addition to close and open classification of the syllable, Arabic syllables can also be classified into the three categories defined below:

A. Light syllable

1. CV /bint/ (girl)

B. Heavy syllables

2. CVV /laa/ (no)/, /baydh/ (eggs)
3. CVC *kul* (all).

C. Super heavy syllables

4. CVVC / baab / (a door), CVVC/yawm/ (day).
5. CVCC nahr/ (river).
6. CVVCC /shaabb/ (young).

Thus, syllable structure in Arabic is very regular. It is assumed that within any stretch of junctured utterance, the only admissible syllabic structures are CV, CVV, and CVC. Before a break in utterance or pause, the structures CVVC,

CVCC and CVVCC are also admitted. In other simple words, while the second, the third and the fourth patterns occur initially, medially and finally, the first pattern (CV) does not occur finally or in isolation. This is because the second element of the syllable is short vowel, which is always deleted in final position. Finally, the fifth pattern (CVCC), however, occurs only finally or in isolation (Watson, 2002:79, 101).

4. Syllable Phonotactic Constraints

In all languages there are constraints on the way in which its distinctive sound units (or phonemes) can be arranged to form syllables. These constraints are sometimes known as phonotactic or phoneme sequence constraints and they severely limit the number of syllables that would be theoretically possible if phonemes could be combined in an unconstrained way. Phonotactic constraints, then, refers to the permitted arrangement of sounds in a given language. They are rules determine which sounds are allowed or disallowed in each part of the syllable. They are language specific (Bassmann, 1990:90; Richards& Schmidt, 2002: 329; and McMahan, 2002: 106). Every language has certain constraints on positions and sequences of its sounds. English has its rules and constraints on sound combinations, sequences and clusters in its phonological system and so Arabic language do. These set of rules and constraints forms part of speaker's phonological knowledge of his or her language. The main reason behind having phonotactic constraints, as Waengler (2009: 303) sees, is to do with the limits on the talker's ability to pronounce sequences of sounds as one syllable, and the listener's perception of how many syllables s/he hears from a given sequence of phonemes.

Anyhow, phonotactic constraints can be divided into three sets in accordance with syllable constituents: constraints concerning onset, nucleus and coda (Ibid). As far as the nucleus is concerned, it has already been explained that it consists mainly of a vowel sound. English and Arabic language together present no specific constraints on the types of the vowel sound (i.e. pure (whether short or long) or diphthongs) that can occupy the nucleus. However, there are

some distributional constraints in English. For example /e, æ, D, ʌ, ʊ / cannot occur word finally, and /ʊ, ʊə / cannot occur initially.

More specific phonotactic constraints can be noticed in the onset and coda of the syllable. In this regard, it has been shown that English vary greatly from Arabic in the combinations of consonants that they allow at the beginning and end of syllables. Both English and Arabic, have virtually no restrictions on the nature of an onset or a coda consonant. Standard Arabic has none while English has a minor restriction that disallows /ŋ/¹ from surfacing in onset position, and /h/, /w/, /j/ and to a certain extent /r/ from surfacing in coda position. Generally, then, any consonant can be the sole element of the onset or coda (Carr, 2008: 130f; and Abu-Chacra, 2007: 9f). The constraints appear when there are combinations of consonants or as also known as consonant cluster¹. Phonotactic constraints impose restrictions on permissible clusters within a language. So that consonant clusters can be considered as indicators of the phonotactics of a language. Therefore, standing on such clusters both in English and Arabic helps in throwing light on such constraints in these two languages. Since Languages'

¹A sequence of two or more consonants occurring together in the same syllable which have no intervening vowel that breaks the sequence is known as a **consonant cluster** (Hamann& Schmitz,2005: 35)

phonotactics differ as to what consonant clusters they permit.

4.1 Consonant Clusters in English

As mentioned earlier, English allows a wide range of consonant clusters before and after the nucleus (also known as syllabic element). Before the vowel, the maximum number of consonants in cluster is three and after it the maximum number is four.

At the onset, when the number of consonants exceeds one, the luster becomes subject to a number of restrictions, such as the following:

...if there is a second consonant in the onset, the first must be an obstruent...(1) only stops and voiceless fricatives appear as the first member, (2) ../j/ never appears as a second member², (3) .. only /s/ may appear with /m/ or /n/, (4) /w/ never appears after bilabial consonants, or /š/ or /st/³ (5) .. /r/ never appears after /s/ or /h/, and (6) .. /l/ never appears after /t, d, š, h or sk/.

(Selkirk, 1982: 346)

These restrictions reflect the distributional and combinatorial properties of English consonants in syllable onset position.

On his part, Hamann & Schmitz (2005: 36) classifies initial two-consonant clusters into:

1. Clusters with initial /s/ plus one of a limited set of consonants that may follow, namely /p, t, k, f, m, n, l, w, j/, e.g. 'spy, storm, square, sphere, smart, etc.
2. One of /p, t, k, b, d, g, f, θ, ʃ, v, m, n, h/ plus one of /l, r, w, j/, e.g. 'play, pure, true, twice, tune, fly, fry, fuse, etc'.

Meanwhile the consonant clusters in the second category manifest the desired gradual rise in sonority¹ towards the centre of the syllable, some of the clusters in the first category do not show the same effect. For instance, in the clusters /sp-, st-, sk-/ the first element has greater sonority than the second which is nearer to the centre of the syllable. Therefore, in her model, Selkirk (1982: 347) proposes to consider these two-element

¹ Note that /ʒ/ is rare and is found in initial position only in words directly imported from French, such as /ʒigɔlɔ/ gigolo or /ʒi:g/ gigue (Gimson 1980:189).

² See English Syllable Constituents and Structure above.

³ That there exists a number of English words where /j/ is in fact the second member of the cluster, invalidates this particular collocational restriction on onsets of English syllables, e.g. 'pure' /pjʊə/, 'tune' /tju:n/, 'cute' /kju:t/, 'suit' /sju:t/, etc.

⁴ According to Selkirk (1982), who provides and supports an internally IC motivated analysis of the syllable, /s/ plus obstruent clusters "form a unit that may occupy a single obstruent slot" (p.347). Therefore, /st/ included here as a single member of an initial two-consonant cluster.

clusters as a single constituent filling a single slot so as to preserve this gradual rise in sonority before the vowel.

Initial three-consonant clusters, on the other hand, are definitely smaller than that of the previous group. The first element is always /s/ which is followed by one of the voiceless plosives /p, t, k/, followed by one of /l, r, w, j/. The possible clusters are thus /spl-, spr-, spj-, str-, stj-, skr-, skw-, skj-/(Hooper, 1976: 230).

To consider Selkirk's model that regards /s/ plus obstruent clusters as single obstruents, it may be suggested that a two consonant cluster is the only type permitted before the vowel in English syllables. So this group of clusters will preserve the sought gradual rise in sonority from the obstruent to the following liquid or glide and then to the vowel, the peak of sonority.

Restrictions of a similar kind apply to the clusters of consonants found at the end of English syllables. Some of these restrictions are stated below as presented by Selkirk (1982):

- ..if there are two consonants in the coda, the second must be an obstruent'(p.348)
- The second consonant of the coda must be a coronal²
 - ..the only tri-consonantal codas are those with /st/ (or /sθ/) in second or third place...(p.349)

In her analysis of the syllable, Selkirk (1982: 349) takes three to be the maximum number of consonants that can occur at the coda. As such, final four consonant clusters are impermissible in her analysis.

McMahon(2002:55ff) shows that final two-consonant clusters bear one of two possibility: either the nasals, /m, n, ŋ/, the lateral /l/, or the voiceless alveolar fricative /s/ followed by one of /p,t,k/, e.g. 'camp', /kæmp/, 'meant' /ment/, 'bank' /bæŋk/, 'melt' /melt/ and 'wasp' /wɒsp/, or any consonant followed by one of /s, z, t, d, θ/, with the characteristic feature that they belong to two separate meaningful morphemes. Examples of such clusters can be 'paths' /pa:θs/, 'heads' /hedz/, 'checked' /tʃekt/, 'dragged' /drægd/, 'tenth' /tenθ/, etc.

See the definitions above. ²i.e. alveolar, dental, or palato-alveolar

Three-consonant clusters also bear one of two possibility: either /l,n,ŋ/ followed by one of /p,t,k,d,f/ and one of /t,s,z, θ/; or /f,p,k/ followed by one of /θ,s/ and one of /s,t/. Examples of such clusters can be 'helped' /helpt/, 'bonds' /bɒndz/, 'banks' /bæŋks/, 'next' /nekst/, etc. Final four consonant clusters may consist of /l,m/, plus one of /f,k,p/ followed by one of /θ,t/ and /s/. Examples of such clusters can be 'prompts' /prɒmpts/, 'texts' /teksts/, 'sixths' /siks θs/, etc. (Ibid).

In similar vain, it has been believed that phonotactic restrictions in the coda in English are often (but not always) a mirror-image of those in the onset. For example, English allows /pl/ in the onset ('play') and /lp/ in the coda ('help'). But there are also many permissible coda sequences that are allowed whose mirror-image is disallowed in the onset (e.g. /mp/ as in 'lamp', but no /pm/ in the onset). Some others think that whereas it is possible to list onset clusters fairly faithfully, it is practically impossible to present coda clusters in a chart that

would allow immediate reading. Obviously, then, onset clusters do not have the same restrictions as coda clusters and vice-versa. Anyhow, more details of these constraints can be seen in a number of tables presented in Gimson (1989: 243-256).

4.2 Consonant Clusters in Arabic

It becomes oblivious that Arabic is a language which does not favour long clusters of consonants to occur in the structure of its syllables. The possible syllable structures in the language reflect clearly that it gives no space for consonant clusters, especially in initial position.

Both Al-Ani (1970: 78ff) and Watson (2002:75ff) investigate consonant clusters in Arabic, and agree that the medial consonant clusters are more abundant than the final consonant clusters. Al-Ani also provides two important charts which show the possibilities of medial and final clusters (See Al-Ani, 1970: 80ff for charts). In addition, he specifies the collocational tendencies of consonants to form medial and final clusters, which can be stated down below in the form of points:

1. /w, j, z/ form clusters with all the consonants, both medially and finally, e.g. /qawl/ (saying), /fajʃal/ (a boy's name/sword)
2. /b, f/ freely form medial and final clusters with front and back consonants¹, e.g. /kabt/ (suppression), /balda / (town), /nawfal/ (a boy's name), /lubna/; (a girl's name), etc. However, /bf, bm, fb, fm, fh/ are impossible sequences.
3. /fh/ occurs medially, and may be finally, e.g. /ʃifhu/ (describe him, imperative). The resulting cluster in this case is abutting².
4. /m/ occurs with all consonants except /f/, e.g. /nimr/ (tiger), /ħasm/ (termination), /sumna/ (fatness).
5. /n, l, r/ occur with all consonants except the impossible combinations /nr, nl, rl, ln, lr/, e.g. /bard/ (cold), /muzna/ (rain shower).
6. /k/ and /q/, /x/ and /x/ do not occur with each other.
7. /ħ/, /ʔ/ and /h/ do not occur freely with each other.

In short, Arabic language is a very restrictive in terms of its syllable structure, as the possible number of consonant cluster in both the onset and coda is far less than that of English.

This brief presentation of phonotactic constraints and consonant clusters in English and Arabic is intended to provide a ground on which to base the pronunciation difficulties the Arab students face with English consonant clusters which are consequently reflected in their production of English. That is to say, the very limited set of possible consonant cluster structures, and their types in Arabic, in addition to their relative simplicity are main reasons behind the students' mishandling of the English consonant clusters, and consequently the source of heavy accent in their pronunciation of them. Unless these phonological rules are mastered and the pronunciation of the clusters acquired, learning of English cannot be achieved completely.

5. Conclusions

The conclusions arrived at by this study satisfy the points,

Front consonants include labials, labio-dentals, dentals, alveolars, palato-alveolars. Back consonants, on the other hand, include velars, uvulars, pharyngeals, and laryngeals.

² abutting consonant is a group of consonants that is, occurring across syllables within a word, as in the /nt/ of enter, or across word boundaries, as in /ntr/ of I can't run.

previously hypothesized. As regards the first hypothesis, which is that there are considerable differences between English and Arabic syllables, the study has revealed the following differences and similarities:

A. Points of Similarities:

- The construction of a syllable is always organized around a vowel which is the nucleus. What comes before the nucleus is called onset and what follows it is called coda
- A vowel (or a syllabic consonant, in English) is an indispensable element of a syllable in both languages: if there is no vowel, there is no syllable. Therefore, the number of syllables of a word will often be the same as the number of vowel sounds (or syllabic consonants in English) it has.

- Both languages can have close and/or open syllables with a general preference for closed syllable.

B. Points of Differences

- A vowel sound in English can constitute a syllable on their own (i.e., with neither an onset nor a coda), but that is forbidden in Arabic. Arabic syllable must begin with a consonant. So whereas in English the only obligatory constituent in the structure of the syllable is the nucleus, in Arabic it is the nucleus and the onset that are obligatory.
- Arabic languages have a somewhat simpler syllable structure than English. While, Arabic does not permit more than one consonant clusters at the onset nor more than two consonant clusters at the coda. English permit three consonants to cluster in the onset and as much as four in the coda. In short, Arabic language is a very restrictive in terms of its syllable structure, as the possible number of consonant cluster in both the onset and coda is far less than that of English.
- English has a very flexible syllable structure. It has seventeen different syllable structures, in addition to voweless syllable. Syllable structure in Arabic is very regular. It has only six different syllable structures, with some restrictions on the occurrence of some of them.
- While, English language has voweless syllable, Arabic language does not have such a type of syllables.

Concerning the second hypothesis, which is that such differences are hypothesized to be negative, as Arab students' will shift the structure and constraints of the Arabic syllable to that of English, the study has revealed the main negative shift are represented by:

- An insertion to a vowel sound in accordance with the phonotactic constraints of Arabic. Speakers of Arabic language, when they come to learn English, will face a bewildering array of unfamiliar clusters both in the onset and coda of English syllables. To overcome such a difficulty, they will have a tendency to insert a vowel sound and break the clusters as in 'street, screw, spring, etc' which are most often pronounced as */sItri:t,

sIkru:, sIprɪŋg/, or by introducing a glottal stop at the beginning of the cluster which is less likely than the first possibility. They do so to harmonize with the pronunciation requirements of their own mother tongue.

- Dropping the following final English word inflection phonemes—/s, z, d, t/—from their speech in a cluster environment. This could be due to the fact that Arabic does not permit as much consonants to cluster in the coda of the syllable as English does.

Consequently, Arab students of English need to be made aware that inaccurate pronunciation of consonant clusters can lead to a lack of fluency and make their speech difficult for native speakers to understand. The native speakers may mistakenly conclude, especially with the dropping case, that the non-native speaker does not know English grammar or lacks proficiency in English. It is very helpful, therefore, if teachers are aware of such a difference between English and Arabic syllable structure. This will enable them to foresee difficulties and deal with them as they arise.

- Mispronouncing the vowelless syllables. As most Arab students avoid the production of syllabic consonants. They often precede that type of consonant with a weak vowel i.e., they make them be non-syllabic.

Arabic Learners must be alert to the presence of vowelless syllables in English. That is not only to have a natural pronunciation for most native speakers of English but also to avoid difficulty in understanding their speech. This is another reason why teachers should have a good knowledge of such phenomenon which arises from the phonological syllable structure of English and absent in Arabic. The teachers need also to show when such type of syllables is obligatory to produce and when they are optional.

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انطلقت الدراسة إيماناً بأن اللغات تبني كلماتها من عدد معين من الوحدات الصوتية، هذا و تملك كل اللغات قيود على طريقة ترتيب هذه الأصوات لتكون مقاطع. ولهذا تفترض الدراسة وجود اختلافات جوهرية بين المقطع في اللغة الانكليزية عنه في اللغة العربية. وهذا بالمقابل ذو تأثير على تلفظ الطلبة. تفترض الدراسة أن مثل هذا التأثير سيكون سلبياً، حيث سينقل الطلبة العرب قيود و تراكيب المقطع العربي للغة الانكليزية (اللغة التي يدرسونها كلغة أجنبية). و عليه فان الدراسة تحاول الوقوف على جوانب الشبه و الاختلاف في المقطع بين اللغة الانكليزية و العربية. وعليه تبحث الدراسة عن وجود أو انعدام ظاهرة الانتقال بين اللغتين. و هذا قد يساعد في تسليط الأضواء على المشاكل أو التسهيلات التي ستقابل الطلبة في حال وجود هذه الظاهرة. من اجل كل هذا الدراسة تقف على معنى المقطع فونيتيكياً ولغويًا، وعلى تراكيبه، والقيود الفونتاكتيكية، وكذلك تنال الأصوات الصحيحة في كلا اللغتين.

تعرض الخاتمة أهم الاستنتاجات التي توصلت إليها الدراسة. علاوة على ذلك تمثل هذه النتائج معلومات قيمة لكل من المدرس والطالب العربي الدارس للغة الانكليزية كلغة أجنبية بما يتعلق بالمقطع. حيث أنها ستجعلهم واعين ويقظين لهذه الاختلافات بين اللغتين حتى في كلامهم التلقائي. واخذ هذه النتائج، التي تم التوصل إليها، بعين الاعتبار تؤدي إلى الوصول للفظ طلق ودقيق للغة الانكليزية بما يتعلق بجانب الدراسة.