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Syllabification of English words when spoken in Urdu

Abstract: This paper is presented to discuss the change in the structure (syllables) of words which are inherited in Urdu from English. There are certain phenomena like epenthesis, deletion which take place when English words are spoken in Urdu due to which syllabification of words takes place with respect to Urdu rules and templates. In this paper we have analyzed and discussed the reasons which cause this Urdu syllabification to take place.

Keywords: Syllabification, Onset, Coda, Nucleus, Resyllabification, Epenthesis.

1. INTRODUCTION

Urdu is a language which has large number of words inherited from other languages like Persian, Arabic and Sanskrit. With the passage of time it went on expanding and added into its lexicon a large number of English words also. Today's Urdu contains a large number of English words.

Each language has its own phonology of syllabifying the words and hence different syllabic templates. However when some language adds some words from some different language, it also modifies the syllables of those words according to its phonology. Urdu does have its own phonological rules and hence the syllabification templates and it strongly follows them while syllabifying the words. There are basically two algorithms of syllabification

1) *Template Matching*: In template matching algorithm, the maximum available templates are matched from right to left in Urdu.
2) *Nucleus Projection*: In this algorithm all the vowels are projected as a nucleus and Maximum Onset Principle is applied until Sonority Sequence Principle is not violated.

The results obtained from second algorithm are the same as produced by first algorithm, which proves that Urdu must follow some specified templates for syllabification which are different from English templates. Hence English words are again syllabified according to the Urdu templates, when spoken in Urdu.

2. LITERATURE REVIEW

Before discussing the changes that occur in English words when spoken in Urdu, we first need to know the syllable structure of both Urdu and English. For this we need to familiarize some important terms to the reader which are used in this regard.

2.1 Syllable

Syllable is the basic unit of speech. According to Lederfoged, every single utterance of speech contains at least one syllable. It is the tendency of human behavior to break apart speech into small units. Syllable is the least unit of speech.

2.2 Syllable Structure

Every syllable consists of at least a nucleus which is a long or short vowel or it can be a diphthong. For a syllable to exist, nucleus is the minimal part. Other than vowel the syllable consists of two important components.

1) *Onset*: Onset is basically a position before vowel which is filled by consonants. There may be zero, one or more than one consonants that can fill this slot.
2) *Coda*: Coda is also a position like onset but it is after the vowel. Again the coda position can be filled by zero, one or more than one consonants.
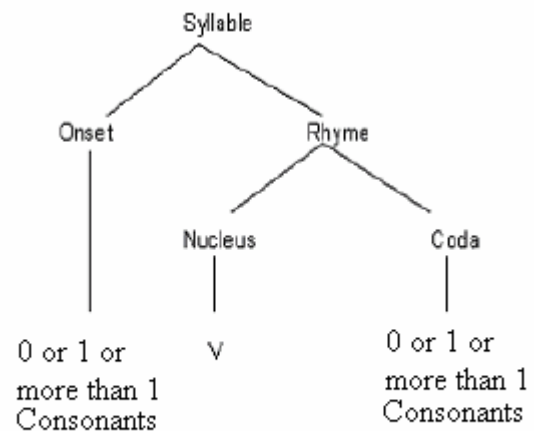

Figure 1 Syllable Structure

Urdu does not support the above syllabic model. Urdu allows 0 or 1 consonant in the onset of syllable, however, it may allow maximum of two consonants in coda position but in some specific cases. There are basically two types of syllables.

1) *Open Syllables*: Open syllables are syllables which end up with vowel.
2) *Closed Syllables*: Close syllables are which have at least one consonant following the vowel.

2.3 Syllabification Principle

There are basically two basic principles which languages normally use to syllabify the words.

1) *Sonority Sequence Principle:* Sonority is the measurement of openness of sound. Sonority Principle states, "On the onset the sonority rise towards the nucleus and falls on the coda position away from the nucleus".

2) *Maximum Onset Principle:* This principle states that languages prefer floating consonants to come at onset position rather coda position.

2.4 Syllabic Templates

Urdu contains a large number of syllabic templates that may be word initial, in the middle or at the end. These syllable templates are then used to syllabify the words. The syllabic templates can be found out by monosyllabic words but it would be better to say that templates are extracted from monosyllabic words. Given below are the templates which Urdu follows while syllabifying the words.

Table 1 Possible Syllable Templates in Urdu

Syllable Template	Allowed Word initially	Allowed Word medially	Allowed Word finally
CVC	A	A	A
CVV	A	A	A
CVCC	A	A	A
CVVC	A	A	A
CVVCC	NA	NA	A
CV	A	A	NA
V			
VC			
VV		Derived Templates	
VCC			
VVC			

A: Allowed
NA: Not Allowed

2.5 Syllabic Templates of English

Like Urdu, English has also some syllabic templates, which it follows in the syllabification of the words. Again monosyllabic words are the sources to find out the templates.
English has following syllabic templates.

Table 2 Syllabic Templates of English

Templates	Example	Transcription
V	"I"	/ɑe/
CV	"me"	/miː/
CCV	"spy"	/spɑe/
CCCV	"spray"	/spræe/
VC	"am"	/æm/
VCC	"ant"	/ænt/
VCCC	"ants"	/ænts/
CVC	"man"	/mæn/

Templates	Example	Transcription
CVCC	"bond"	/bɔnd/
CVCCC	"bands"	/bændz/
CVCCCC	"sixths"	/sɪksθs/
CCVC	"brag"	/bræg/
CCVCC	"brags"	/brægz/
CCVCCC	"plants"	/plænts/
CCCVC	"spring"	/sprɪŋ/
CCCVCC	"springs"	/sprɪŋz/
CCCVCCC	"splints"	/splɪnts/

The list of templates shows that English can have at most three consonants at the onset position and at most four consonants at the coda position. So, English syllables are very much different from Urdu syllables. When English words allowing different templates compared to Urdu are borrowed to Urdu, they are processed before adding into the language. There are basically three types of operation performed on the English words when they are borrowed into Urdu.

1) *Epenthesis:* Epenthesis is basically insertion of a phoneme according to some rules that language follow. Normally vowel and glottal stop are inserted into the English words when spoken in Urdu.

2) *Deletion:* Deletion means that some phoneme gets deleted from a word due to some rules in that language. For example in case of Urdu, glottal stops get deleted because it is difficult for native speakers of Urdu to speak glottal stop

3) *Resyllabification:* When some *Epenthesis* or *Deletion* takes place in a word then it is possible that this change may destroy the syllabic structure of that word. In order to ensure correct syllabification, the word is again syllabified. This process is called Resyllabification.

3. METHODOLOGY

In order to investigate the changes that occur in the English words while borrowing in Urdu, we took a data consisting of about eleven hundred English words from thirty five thousand words Urdu lexicon. These English words were selected from the Urdu lexicon to confirm that these words are common to both English and Urdu language. Then we found out the transcription of the words from English and Urdu dictionary and analyzed what changes are occurring in the English and Urdu transcription of the same word.

3.1 Procedure

After getting the data of eleven hundred words, common to both English and Urdu language, first we found out its English transcription from the English dictionary. Then we syllabified this English transcription by applying the two algorithms 1) *Template Matching* and 2) *Nucleus Projection*. The results were almost the same. Then we got the syllabified transcription of data from Urdu dictionary.

On this syllabified data, we applied the Epenthesis and Deletion rules which forced us to resyllabify these words. The final syllabification transcription of Urdu words was compared with the syllabified transcription of the English words.

4. RESULTS

The above experiment gave us the following results.

4.1 Two Consonant Clusters in Word Initial Position:

Our research reveals that Urdu inserts a vowel between two consonants in the onset position or in the start of the syllable in the word initial position in order to break the consonant clusters.

For example when Urdu borrows *Graph* from English, it inserts a vowel between two consonants g and r.

English Syllabification　　/ **g r æ f** /
Urdu Syllabification　　　/ **g ɘ. r a f** /

The reason for the above is that Urdu syllable templates (also given in table 1) do not allow two consonants in the onset of the syllable in the word initial position

4.1.1 Special Case

If two consonants come in the onset of the syllable in the word initial position and the starting consonant is 's' then Urdu will attach glottal stop (**?**) and 'I' before 's'.

This can be illustrated by considering the following examples:

1) English Syllabification: / **s k e I l** /
Urdu Syllabification　　　/**? I s. k e l** /

As the glottal stop is always deleted in Urdu so after resyllabification:
/**? I s. k e l** / will transform to /**I s. k e l** /

2) English Syllabification: / **s k ð r t** /
Urdu Syllabification　　　/**? I s. k ð r t** /
Urdu Resyllabification　　/ **I s. k ð r t** /

4.2 Two Consonant Clusters in Word Medial Position

If the word medial syllable contains a consonant cluster in the onset position, the consonant cluster is broken apart by the addition of a new vowel making a new syllable. For example

English Syllabification: / **p æ m. f l I t** /
Urdu Syllabification:　　/ **p ð m. f ð.l æ t**/

The reason for the above is that Urdu syllable templates (also given in table 1) do not allow two consonants in the onset of the syllable in the word medial position.

4.2.1 Special Case

If two consonants come in the onset of the syllable in the word medial position and the starting consonant of the syllable is 's' then Urdu will attach that 's' (starting consonant of the syllable in the word medial position) with the coda position of the previous syllable.

This can be illustrated by considering the following example:

English Syllabification:　　/ **e k. s p ɔ t** /
Urdu Syllabification:　　　/**? æ k s .p o r t**/
Urdu Resyllabication:　　　/ **æ k s. p o r t**/

4.3 Number of Inserted Vowels

If there are **3** consonants in the start of the syllable then the number of short vowels inserted would be **2** hence making **2** new syllables.

For example

English Syllabification:　　/ **s p r I ŋ** /
Urdu Syllabification:　　　/**? I s. p ð. r I ŋ**/
Urdu Resyllabification:　　/ **I s. p ð. r I ŋ**/

So we conclude that if there are **n** consonants in the start of the syllable then the number of short vowels inserted would be **n-1** hence making **n-1** new syllables.

4.4 Diphthongs
4.4.1 Case 1

When diphthongs (**aʊ, aɪ, ɪð. ɔɪ, ʊð, ju**) are encountered in the English words then Urdu treats them as more than one vowels and hence number of syllables of that word increases. Following examples illustrates this point:

1) English word:　　　　　**town**
English Syllabification:　/**t aʊ n**/
Urdu Syllabification:　　/**t a.? ʊ n**/
Urdu Resyllabification:　/**t a. ʊ n**/

In the above example, English syllabification of word 'town' has only one syllable as 'aʊ' is a diphthong but in Urdu it has got two syllables.

2) English word:　　　　　**type**
English Syllabification:　/**t aɪ p**/
Urdu Syllabification:　　/**t a.? ɪ p**/
Urdu Resyllabification:　/**t a. ɪ p**/

3) English word:　　　　　**clearance**
English Syllabification:　/**k l ɪ ð.rð n s** /
Urdu Syllabification:　　/**k ð. l i. æ. r ð n s** /

4) English word:　　　　　**boy**
English Syllabification:　/**bɔɪ**/
Urdu Syllabification:　/**bʊ. ɑ. e** /

In the above example, due to diphthong 'ɔɪ' in boy, Urdu has made three syllables from a single syllable word.

5) English word:　　　　　**cute**
English Syllabification:　/**k jʊ: ł**/

Urdu Syllabification: **/k ɪ. jut/**

4.4.1   Case 2

Some diphthongs (**eɪ, ðʊ, ɪð, oʊ, ðʊ, ʊð)** are treated as a single vowel in Urdu. The following example illustrates this point clearly:

1) English word: **operator**

English Syllabification: **/o. pð. r eɪ. tðr/**

Urdu Syllabification: **/ap. re. tðr /**

For more examples about the diphthongs of case 2 (see Appendix Table 3)

5. DISCUSSION

Urdu has very restricted syllabic structures. So while borrowing the words from English, it deletes or epenthesize the phonemes to meet its needs. The above experiment gave us the following results.

5.1 Two Consonant Clusters in Word Initial Position

Urdu syllable templates (also given in table 1) do not allow two consonants in the onset of the syllable in the word initial position, so, Urdu inserts a vowel between two consonants in the onset position or in the start of the syllable in the word initial position in order to break the consonant clusters. This rule can be written as:

 # CCV ➔ # CVCV   (R1)

If the first consonant is 's' then the rule R1 is modified and can be written as:

 # SCV ➔ # ISCV   (R2)

5.2 Two Consonant Clusters in Word Medial Position:

Urdu syllable templates (also given in table 1) do not allow two consonants in the onset of the syllable in the word medial position. So it inserts a vowel in between those consonants. This can be illustrated by the following rule (R3):

.CCV ➔ .CVCV   (R3)

But if the starting consonant of the syllable is 's' then Urdu will attach that 's' (starting consonant of the syllable in the word medial position) with the coda position of the previous syllable.

This can be illustrated by considering the following rule:

C. SC ➔ CS.C   (R4)

5.3 Number of Inserted Vowels

We conclude that if there are **n** consonants in the start of the syllable then the number of short vowels inserted would be **n-1** hence making **n-1** new syllables. For three consonants in the start of the syllable, the rule can be written as follows:

CCCV ➔ CVCVCV   (R5)

5.4 Vowel Description

Results show that Urdu inserts a vowel between two consonants and this vowel is always a short vowel. Urdu does not insert a long vowel between two consonants. This can be illustrated by considering the above examples.

When we tried to find out that when Urdu inserts 'ð', 'I' or ʊ (paish) then after a good research we concluded that there is not any hard and fast rule. Urdu inserts a short vowel 'ð', 'I' or ʊ randomly between the consonant clusters.

In the following first example Urdu inserts 'ð' after the labio-dental fricative 'f' and before the alveolar trill 'r' but in the second example Urdu inserts 'ɪ' after the labio-dental fricative 'f' and before the alveolar trill 'r' which clearly shows that there are no rules which Urdu obeys while inserting the short vowels.

1) English Syllabification: **/ f r e ɪ m /**

Urdu Syllabification: **/ f ð.r e m/**

2) English Syllabification: **/ f r i: /**

Urdu Syllabification: **/ f I. r i /**

Similarly, Urdu inserts a short vowel 'ð' after bilabial stop 'p' and before the alveolar trill 'r' in the following third example but in fourth example Urdu inserts a short vowel 'ɪ' between the bilabial stop 'b' and the alveolar trill 'r'.

3) English Syllabification: **/ p r ð ʊ. t e s t /**

Urdu Syllabification: **/ p ð.r o. t æ s t/**

4) English Syllabification: **/ b r ð ʊ. k ð r/**

Urdu Syllabification: **/ b ɪ. r o. k ð r/**

Urdu inserts a short vowel 'ð' after velar stop 'g' and before the alveolar trill 'r' in the following fifth example but in the sixth example Urdu inserts a short vowel 'ɪ' between the velar stop 'g' and the alveolar trill 'r'.

4) English Syllabification: **/ g r a n t /**

Urdu Syllabification: **/ g ð.r a n t/**

5) English Syllabification: **/s t e. n o .g r ð. f ɪ /**

Urdu Syllabification: **/ɪ s. t e. n o. g ɪ .r a. f i /**

So above examples clearly shows Urdu inserts the short vowels between the consonant clusters randomly.

5.4 Diphthongs

Urdu treats some diphthongs in English words as more than one vowel and hence number of syllables of that word increases. This can be represented by the following rule R6.

CVC ➔ CV.VC   (R6)

Where V on the left hand side, of above rule R6 represents a diphthong.

For some diphthongs Urdu treats them as a single vowel hence there is no increase in the number of syllables. The rule R7 of this can be written as:

CVC → CVC   **(R7)**

6. CONCLUSION

English has very flexible syllable structure as compared to Urdu. When English words are spoken in Urdu, then insertion, deletion and epenthesis takes place on these words and Urdu again syllabifies those words according to its own rules and its own templates which cause the change in the number and structure of syllables of that word. These changes are not random but there are some governing rules which cause these changes to take place. This paper is an effort to present some of those rules which cause the changes in the number and structure of English words when spoken in Urdu.

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8. APPENDIX A

The table below contains some words that were analyzed during the experiment

Table 3 Analyzed words

S. No.	English Word	English Transcription	Urdu Transcription
1.	grant	/gra:nt/	/gə. rant/
2.	fruit	/fru:t/	/fə. rut/
3.	training	/treɪ. nɪŋ/	/tə. re. nɪŋ/
4.	traffic	/træ. fɪk/	/tə. ræ. fɪk/
5.	practice	/præk. tɪs/	/pə. ræk. tɪs/
6.	free	/fri/	/fɪ. ri/
7.	Flat	/flæt/	/fə. læt/
8.	prize	/praɪz/	/pə. ra. ɪz/
9.	transport	/træn. spɔt/	/tə.rans.port/
10.	stunt	/stunt/	/ɪs. tənt/
11.	stadium	/steɪ. diəm/	/ɪs. te. dɪ. jəm/
12.	student	/stū. dənt/	/ɪs. tu. dent/
13.	stan. dard	/stæn. dəd/	/ɪs. tæn. dərd/
14.	program	/prəʊ. Græm/	/pə. ro. gə. ram/
15.	pum . flet	/pæm. f l ɪ t/	/pəm. fə. l æ t/
16.	influenza	/ɪn. flʊ. en. zə/	/ɪn. fə. lu. en. za/
17.	expose	/ɪk. spəʊz/	/æks. poz/
18.	transcribe	/træn. skraɪb/	/tə. rans. kə. ra. ɪb/
19.	express	/ɪk. spres/	/æks. pres/
20.	spirit	/spi. rit/	/ɪs. pi. rit/
21.	spring	/sprɪŋ/	/ɪs. pə. r ɪŋ/
22.	prize	/praɪz/	/pə. ra. ɪz/
23.	appoint	/ə. pɔɪnt/	/ə. pa. ɪnt/
24.	scout	/skaʊt/	/ɪs. ka. ut/
25.	time	/taɪm/	/ta. ɪm/
27.	typhoid	/taɪ. fɔɪd/	/ta. i. fa. id/
28.	clearance	/klɪə. rəns/	/kə. li. æ. rəns/
29.	nylon	/naɪ. lɒn/	/na. ɪ. lan/
30.	night	/naɪt/	/na. ɪt/
31.	glycogen	/glaɪ. kə. dz(ə)n/	/gə. la. i. ko. dzən/
32.	polka	/pəʊl. Kə/	/pol. ka/
33.	editorial	/e.dɪ. tɔ: . r ɪəl/	/æ. di. tor. jəl/
34.	road	/r əʊ d/	/rod/
35.	tour	/t ʊə r/	/tur/