

## EPENTHESIS IN URDU

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### ABSTRACT

*The motivation of this research is epenthesis, an important Urdu phonological phenomenon. Presently, this work deals with the phonological rules for understanding the role of epenthesis and re-syllabification in Urdu content words, at larger scale, in speech of Pakistani Urdu speakers. The 10 hours audio-corpus has become the source of motivation for the current study due to its multiple pronunciations (Farooq & Mumtaz, 2016), (Farooq & Mahmood, 2020). That annotated speech data has multiple information i.e., same parts-of speech (POS), spellings and meanings but different pronunciations which ultimately becomes the cause of re-syllabification at different places and contexts. Therefore, that annotated speech corpus is used as baseline of this research (Mumtaz, et al., 2014), (Habib, Hijab, Hussain, & Adeeba, 2014) but the selected words' list includes only those words which have different pronunciations occurred due to the epenthesis. Later this list has been shared and asked to record by 29 native Urdu speakers in Pakistan. Thus, data analysis has confirmed different reasons for causing epenthesis in Urdu; (i) contextual variations, (ii) inter-speaker variations, (iii) stress variations, (iv) multilingual effect, etc. All these variations become the reasons for alternative pronunciations. It is also confirmed that alternative pronunciations are present in the speech data of all speakers but a speaker can use a single pronunciation at a time. Therefore, all different pronunciations have attained the status of alternative pronunciations (Farooq & Mumtaz, 2016) in Pakistani Urdu.*

**Keywords:** epenthesis, re-syllabification, content words, alternative pronunciation

### 1. Introduction

Urdu language belongs to the Indo-Aryan group of languages. It has almost 100 million speakers around the world therefore has multiple pronunciations and accents. Urdu is esteemed more than any other native language because it is our national and official language but most importantly a 'lingua franca' in Pakistan (Farooq, 2015). Currently, the word re-syllabification has been reported and analyzed in Urdu speech for finding out the reasons of multiple pronunciations of Urdu vocabulary. These words or tokens have same parts of speech, spellings and meanings but with different transcriptions. For example, a word غسل (bath or taking bath /xosl/) (Urdu Lughat: Tarixi Usul Per, 2013) has another pronunciation i.e., /xosəl/ but is equally comprehensible by all native Urdu speakers in Pakistan. Therefore, the motivation of the current study is the investigation of phonological reasons behind the epenthesis in content words.

In phonetics and phonology, epenthesis means an insertion of an extra sound in already existed phonetic form. But linguists have claimed, vowel epenthesis is more random than consonants, thus motivated to make consonant contrasts more prominent and distinct than before (Nordquist, 2019). Phonological rules are the information of all possible combinations of

phonemes in a given language which deal with the alternative pronunciations of a word (Odden, 2005). So, phonological rules concern with the words' morphology and morpheme combinations to form meaningful words (Jehsen, 2004). Different researches have reported the inevitable occurrences of phonological variations in the speech of native speakers (John, NA) which ultimately become the reason of restructuring and re-syllabification of vocabulary. But the re-syllabification may cause confusion among non-native speakers. Therefore, 10 hours speech corpus of one professional female speaker has been used as a reference point for initiating this research. Afterwards, this wordlist is reused for recording and collecting speech data from 29 more native Urdu speakers. Consequently, this study is done to find out possible reasons for epenthesis in Urdu vocabulary. Thus, phoneme insertion (Farooq & Mumtaz, 2016), (Hussain, 2005) has been used to explain this research. These phonological variations cause epenthesis and re-syllabification for the alternative pronunciation(s) of the surface forms of already existed phonetic-scripts of Urdu vocabulary. Therefore, a backend strategy is investigated for resolving the issues of multiple pronunciations for non-native speakers. So, the context dependent variations have only catered in this research.

This paper has proposed Urdu phonological rules for epenthesis and re-syllabification of Urdu vocabulary in connected speech. The remaining paper is arranged accordingly; (i) a report on the literature review of phonological rules of epenthesis and re-syllabification rules of different languages are discussed in the second section, (ii) third section is about the experimental methodology, (iii) fourth section is about data analysis and results, (iv) fifth section concludes the proposed phonological rules for epenthesis in Urdu speech, (v) future discussion is presented in section 6 while (vi) section 7 acknowledges the contributions of research participants.

## 2. Literature review

This research deals with the phonological rules for epenthesis and re-syllabification of Urdu vocabulary. In phonetics and phonology, the insertion of a vowel in a word for breaking consonant cluster is called epenthesis (Williamson, 2016). Epenthesis means insertion of one or more than one extra sounds in a word (Dictionary.com, 2020) with no relevance in the existed lexical form (Morley, 2018). But linguists have claimed that vowels have random tendency to occur than consonants therefore motivate consonant contrasts to be more prominent than before (Nordquist, 2019) (Hall N. , NA). The previous studies have confirmed the alternative pronunciations of words in a language due to the native language effect after considering phonological rules of different languages (Finch, 2000) e.g., English, Russian, Japanese, Czech, Hungarian, Setswana, Dutch, Finish, and Shona (Panevov & Hana, 2010). According to American National Standards Institute (ANSI), the voice quality depends on the habitual variations of the vocal apparatus of a speaker which causes multiple pronunciations and accent variations based on momentary actions of speech segments (Kreiman, Jody; Sidtis, Diana Vanlancker; Gerratt, Bruce, 2014). Each language has indifferent phonemic inventory (Jehsen, 2004) but may lose their phonemic features in connected speech (Roach, 2009) due to the complex phonological rules (Hall, 2005). Moreover, Vander has highlighted the importance of; (i) speakers' acoustic behavior and (ii) language change variations due to phonological rules (Hulst H. V., 1979). According to Sound Change Theory (SCT), multiple pronunciations and re-syllabifications are inevitable speech features in connected speech (Ohala, 1980) due to inherent variations of "non-programmed features" to articulate an alternative pronunciation (John, NA),

(Odden, 2005). But these phonemic features are not sufficient (Hall, 2005) because auditory transcription cannot duplicate human speech with traditional phonetic symbols for identifying multiple pronunciations of a word. Therefore, the multiple pronunciations and restructuring have been catered in “phonetic grammar” of a language (Odden, 2005) after considering its phonological rules. Though, there are number of phonological rules which cause restructuring and re-syllabifications (Finch, 2000) but this research will only analyze epenthesis in Urdu vocabulary.

### **2.1. Multiple pronunciations and re-syllabification caused with epenthesis**

The phonemic insertion in a syllable or a word is also called epenthesis (Mendoza, N.A.). There are different factors to cause epenthesis in connected speech but among them two are most important i.e., (i) language attitude of speakers (Hulst H. V., 1979) and (ii) speech articulation time (Panevov & Hana, 2010). Various types of epenthesis have been reported in different languages. For example, Turkish language has claimed the breakage of consonant cluster both at onset and coda positions (Hulst & Weijer, N.A.). In Armenian English speech articulation, the consonantal cluster breakage has been observed at word initial position. Lomongo language has reported /j/ insertion especially in compound words (Odden, 2005).

### **2.2. Urdu phonological rules for re-syllabification and multiple pronunciations**

Number of researches has reported different phonological rules in Urdu connected speech but only at segmental level e.g., (i) assimilation of bilabial, velar and nasal consonants in different contexts, (ii) deletion of glottal fricative /h/ (Hussain, 2005), (iii) deletion of glottal stop /ʔ/ (Nawaz, N.A.), and (iv) epenthesis of /ə/ in consonant clusters (Akram, 2002). However, a recent research has claimed that segmental features are not enough to explain multiple pronunciations. Therefore, it has reported different phonological factors to cater multiple pronunciations in connected Urdu speech i.e. glottalization, stress alternation, individual segmental features, contextual effect of phonemes in connected speech and restructuring of syllables (Farooq & Mumtaz, 2016). Therefore, the phenomenon of epenthesis and re-syllabification has been investigated in Urdu speech of 29 more Urdu speakers in order to confirm multiple pronunciations of Urdu vocabulary. Methodology and data analysis have been discussed in the subsequent sections.

## **3. Methodology**

Currently, Urdu phonological rules have been reported to cater epenthesis and multiple pronunciations in the connected speech of 30 native Urdu speakers in Pakistan. The objective of this study is to identify phonological reasons for epenthesis in Urdu vocabulary which may cause multiple pronunciations. Therefore, 10 hours Urdu recordings of one female speaker has been analyzed as a pilot test to identify the multiple pronunciations. The identified multiple pronunciation words have been confirmed in Urdu speech of 29 male-female Urdu speakers. They have claimed Urdu as their first language and selected conveniently from different public sector universities of Pakistan. Their age is between the range of 18-25 years and they have completed their undergraduate level of education. The speech data has been recorded at 8 KHz in an echoic chamber within PRAAT software. Speech segmentation and annotation has been done at different tiers by using Case Insensitive Speech Assessment Phonetic Alphabets (CISAMPA) in PRAAT (Mumtaz, et al., 2014). The results of data analysis are reported in section 4 for

removing confusions. The results confirm the reasons for the epenthesis and multiple pronunciations which are either based on speaker dependent variations or contextual variations.

#### 4. Results

Epenthesis and multiple pronunciations of Urdu vocabulary is the main objective of this research. Therefore, a wordlist of 10 hours speech of one female speaker corpus is used for initiatory research. After considering the scope of the research, only those duplicated words have been used which may appear due to epenthesis. These duplicates have given information about the multiple instances of Urdu vocabulary with similar spellings. This list also contains the information about; (i) transcriptions, (ii) POS tags, (iii) syllables' count, (iv) stress variation and (v) file IDs. There are different reasons for the mismatches of Urdu word duplicates. It may be of; (i) errors in annotation, (ii) homographs, (iii) homophones, (iv) variation in the stress patterns of duplicates, and (v) alternative pronunciations as well as transcription. According to the research demand; first three types are ignored but only fourth and fifth categories are considered for the confirmation of epenthesis in Urdu vocabulary. The standard transcription is consulted with "Urdu Lughat: Tarixi Usuul Per" (Urdu Lughat: Tarixi Usuul Per, 2013) and English meanings of duplicates are incorporated with the consultation of Oxford Urdu-English Dictionary (Parekh, 2013). The data analysis and results of duplicates are reported in the table 1;

**Table 1**

<b>Epenthesis In Monosyllabic Words</b>		
<b>before /l/</b>	<b>before /r/</b>	<b>before /s/ or /z/</b>
210	200	223
105	105	106
107	105	105

*Note:* **TW** = Total words, **ST** = standard Transcription, **AP** = alternative pronunciations

Later, for the confirmation of suggested variations, 29 male-female Urdu speakers are selected conveniently from public sector universities of Pakistan. They have at least completed their higher secondary school education. Results have confirmed the presence of epenthesis and alternative pronunciations in Urdu speech of 29 Urdu speakers of public sector universities in Pakistan. The current work is based on a hypothesis that epenthesis directly influence re-syllabification therefore known as major cause of multiple pronunciations in Urdu speech of Pakistani Urdu speakers. This wordlist is recorded after embedding in different sentences for avoiding stress, boundary effect and confirming contextual effect. Subsequently, the results have confirmed alternative pronunciations of the given wordlist. This collected data also has same spellings and, parts-of-speech, but with different stress patterns and transcriptions which become the reasons of epenthesis and multiple pronunciations. These multiple instances have been entered in an excel log-sheet for reconfirmation in order to avoid inconsistency and human errors in annotation. Log-sheet also saves the time by making record of each alternative pronunciation with specific file ID. Then, multiple pronunciations have been used only after consulting annotation errors. Alternative pronunciations may occur due to phonemic epenthesis by causing re-syllabifications of Urdu unique tokens. These multiple pronunciations give broader perspective to reach a conclusive decision about the epenthesis and re-syllabification of Urdu

vocabulary. This study will ultimately relax the concept of mispronunciations by accepting the alternative pronunciations as alternative variety. Results of data analysis are given in table 2 for making clarity about the context dependent or speaker dependent variations.

**Table 2**

<b>Epenthesis in Monosyllabic Words</b>			
	<b>before /l/</b>	<b>before /r/</b>	<b>before /s/ or /z/</b>
<b>SP 1</b>	17	25	15
<b>SP2</b>	19	18	25
<b>SP3</b>	23	22	22
<b>SP4</b>	20	22	12
<b>SP5</b>	23	23	24
<b>SP6</b>	22	22	14
<b>SP7</b>	19	24	18
<b>SP8</b>	19	23	19
<b>SP9</b>	20	25	14
<b>SP1 0</b>	20	22	12
<b>SP1 1</b>	23	23	24
<b>SP1 2</b>	14	10	14
<b>SP1 3</b>	15	13	11
<b>SP1 4</b>	20	22	12
<b>SP1 5</b>	23	23	24
<b>SP1 6</b>	14	10	14
<b>SP1 7</b>	15	13	11
<b>SP1 8</b>	20	22	21
<b>SP1 9</b>	23	23	13
<b>SP2 0</b>	16	18	22
<b>SP2 1</b>	17	10	11
<b>SP2 2</b>	11	16	19
<b>SP2</b>	23	17	10

3			
SP2 4	19	18	25
SP2 5	10	11	16
SP2 6	23	15	13
SP2 7	22	11	16
SP2 8	23	15	13
SP2 9	19	18	25
SP3 0	17	21	19

## 5. Data analysis and discussion

Urdu phonological rules have suggested epenthesis and re-syllabification with sound change rules. Epenthesis is one of the primary reasons for multiple pronunciations of already existed phonetic scripts of different surface forms. The results have confirmed three main causes for re-syllabification and multiple pronunciations of Urdu vocabulary. Those are: (i) phonemic Alternation, epenthesis and ellipsis but currently, this study will only deal with the epenthesis.

### 5.1. Epenthesis and multiple pronunciations in Urdu

The insertion of a phoneme in a word is called epenthesis (Farooq & Mumtaz, 2016), (Mendoza, Phonological Progresses, N.A.). The phonemic insertion converts a single syllable word in to a disyllabic word, a disyllabic in to a tri-syllabic and vice versa (Farooq & Mahmood, 2020). Different factors have been reported to cause segment insertion or epenthesis; among them the delayed time of articulation of speech organs is a primary reason (Panevov & Hana, 2010). On the other hand, speakers' language attitude is secondary reason which may occur due to over-generalization and hypercorrection (Hulst H. V., 1979). In Urdu speech corpus of thirty speakers, phonemic epenthesis has been observed in monosyllabic words. Especially, short vowels' insertion (/ə/ and /ɪ/) is common in word final consonant clusters. Eventually, vocalic epenthesis increases the number of syllables and re-syllabification in a word which become the reason of multiple pronunciations. A syllable is morphophonemic unit of a word (Chomsky & Halle, 1968) which creates linear connections in the string of phonemes in a fluent speech (Akram, 2002). For instance, the word قبر (grave) has two alternative pronunciations i.e., /qəbr/ a standard pronunciation while /qəbər/ as an alternative pronunciation with the re-syllabification of consonant cluster by inserting /ə/ vowel. In Urdu, phonemic epenthesis is not a random phenomenon but a systematic process which fulfills the following conditions;

1. In Urdu connected speech, short vowel /ə/ insertion has been observed in consonant clusters at coda position.
2. Epenthesis occurs in three different phonemic contexts i.e.,
  - i. If a consonant comes before a liquid sound /r/ or /l/ e.g.,

- a. Before /r/ i.e., جبر (cruelty /dʒəbr/) as /dʒəbər/, ذكر (account/talk /zɪkr/) as /zɪkər/, عصر (time period /əsɪr/) as /əsər/, قبر (grave /qəbr/) as /qəbər/, كفر (unbelief /kʊfr/) as /kʊfər/, قدر (value /qədr/) as /qədrər/ جبر (cruelty /dʒəbr/) as /dʒəbər/, and
- b. Before /l/ i.e., اصل (original /əsl/) as /əsəl/, فصل (fields /fəsl/) as /fəsəl/, مثل (example /mɪsl/) as /mɪsəl/, فضل (bounty /fəzl/) as /fəzəl/, عقل (wisdom /əql/) as /əqəl/, عدل (justice /ədl/) as /ədləl/ and follows the subsequent re-syllabification rule;

$$\phi \rightarrow \text{ə}/[+\text{cont.}] \left[ \begin{array}{l} \text{-syll.} \\ +\text{son.} \\ +\text{liquid} \end{array} \right]$$

- ii. If a liquid consonant comes before a bilabial nasal phoneme /m/. For example, word علم (education /ɪlm/) is alternatively pronounced as /ɪləm/ and كرم (fate /kərm/) is also pronounced as /kərəm/, جرم (sin /dʒɜrm/) as /dʒɜrəm/, قسم (kind /qɪsm/) as /qɪsəm/, حكم (order /hʊkm/) as /hʊkəm/ after re-syllabification. The phonological rule can be written as;

$$\phi \rightarrow \text{ə} / \left[ \begin{array}{l} \text{-syll.} \\ +\text{cont.} \\ +\text{son.} \\ +\text{liquid} \end{array} \right] \left[ \begin{array}{l} \text{-syll.} \\ +\text{son.} \\ +\text{bilabial} \\ +\text{nasal} \end{array} \right]$$

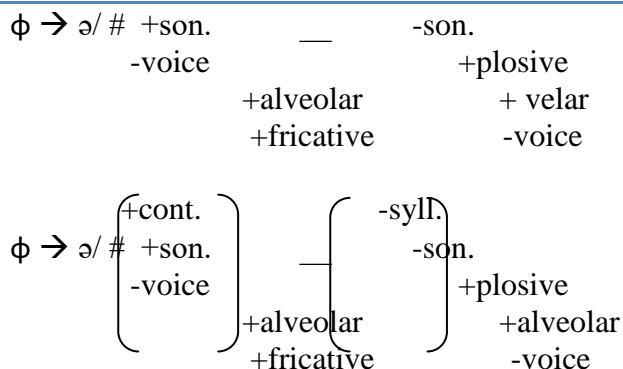
- iii. If consonant comes prior to an alveolar fricative consonant /s/ or /z/, there occurs short vowel epenthesis. Epenthesis appears after breaking consonant cluster at coda position which causes re-syllabification. For example,

- a. Before voiceless alveolar fricative /s/ i.e., حبس (congestion /həbs/) has another alternative pronunciation /hə.bəs/
- b. Before voiced alveolar fricative /z/ i.e., اخذ (extract /əxz/) is also pronounced /ə.xəz/, قرض (loan /qərz/) as /qə.rəz/, قبض (constipation /qəbz/) as /qəb.rəz/, لفظ (word /ləfz/) as /ləf.rəz/. The phonological rule can be written as;

$$\phi \rightarrow \text{ə}/[+\text{cont.}] \left[ \begin{array}{l} \text{-syll.} \\ +\text{cor.} \\ +\text{alveolar} \\ +\text{fricative} \end{array} \right]$$

3. Onset consonant cluster breakage is observed only in English loan words. Pakistani Urdu speakers break the /sk/ and /st/ consonant clusters if occur at onset position e.g., in words; school, scale, scribble, scrap, scratch, score, schedule, stair, street, step, etc.

$$\left[ \begin{array}{l} +\text{cont.} \\ 458 \end{array} \right] \quad \left[ \begin{array}{l} \text{-syll.} \end{array} \right]$$



4. Consonant epenthesis is observed only in English loan words by substituting diphthong with a vowel and consonant e.g., in words; shower, tower, etc.

## 6. Conclusion and future discussion

Finally, the speech analysis of Urdu corpus has confirmed the epenthesis and multiple pronunciations in Urdu vocabulary. The results have also confirmed Urdu phonological rules at larger scale. All the above mentioned rules have been confirmed after collecting the consent of native Urdu speakers in Pakistan. (i) Epenthesis is observed only in open class words i.e. nouns, adjectives, verbs, etc. (ii) Stressed articulation triggers epenthesis and re-syllabification of Urdu vocabulary. Moreover, (iii) epenthesis occurs in consonant clusters at coda position in Urdu vocabulary. (iv) It is also observed at onset position but only in English loan words. Presently, dictionaries only incorporate morphological information but phonological information is not the part of any dictionary which should be incorporated in new dictionaries in order to cater alternative pronunciations of Urdu vocabulary.

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