

# Broken Plurals in Urdu: An OT Analysis

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## Abstract

The study documents the morphological processes involved in the broken plural system of Urdu words. The pluralization system of Urdu is introduced briefly, however, a detailed investigation of morphological complexities of broken plural is given. The study reveals that Urdu has two types of plurals: Sound Plurals and Broken Plurals. Sound plurals are devised by attaching the suffixes to the stem, and this is a native pattern. Some of the native and borrowed suffixes are enlisted which are used as plural markers. Both native and borrowed suffixes can be used with native words as well as loan words. Two processes, in fact, are involved in the formation of Urdu plurals: morphological process and phonological process. Morphological process attaches the plural marker to the stem while phonological process makes the devised form pronounceable by deleting or alternating the vowel segments and by re-syllabifying the plural form. The broken plurals, a pattern borrowed from Arabic, are formed by inserting the plural markers: infixes, circumfixes and transfixes, and by modification of the stem.

This study is in sharp contrast to Hardie's (2004) claim that only suffixes are involved in the inflectional morphology of Urdu. The formation of broken plurals through infixes, circumfixes and transfixes presents another case, different from regular plurals by only suffixes. Prince & Smolensky's (1993) Optimality Theory (OT) has been utilized to analyze the complexities of broken plurals.

**Keywords:** Urdu Pluralization System, Broken Plurals, Plural Markers, Optimality Theory

## 01. Introduction

The present paper intends to unearth the morphological processes involved in the formation of Urdu broken plurals. To cope up with the morphological complexities of broken plurals, OT (Optimality Theory), introduced by Prince & Smolensky (1993), is used as a theoretical framework. The pluralization system of Urdu is introduced briefly, but the main focus remains restricted to investigating the morphological complexities of broken plurals. Furthermore, the phonological features, necessary to explain morphology of broken plurals, are also highlighted. Besides, the underlying constraints of Urdu broken plural marking are brought forth, and their hierarchical ranking is also illustrated. In addition, the present work is a theoretical addition to the findings of Islam (2011) and Schmidt (1999). Schmidt (1999) discusses some of the Urdu plural markers, but does not touch the broken plurals at all. Islam (2011) introduces the broken plurals briefly, but does not provide evidence for the morphological processes involved in the formation of Urdu broken plurals. Furthermore, the present work is in sharp contrast to Hardie's (2004, p. 35) claim that "Urdu inflection is based on suffixation..." It presents evidence that infixation, transfixation and circumfixation also show inflectional processes in plural marking.

The study starts by offering an overview of the plural system of Urdu in the light of previous studies. It, then, discusses the sound and broken plurals of Urdu. Then, it introduces the Optimality Theory, and brings forth the underlying constraints involved in broken plural marking. Further, the hierarchical ranking of the constraints is discussed, and finally, data are analyzed under the framework of OT.

The following section provides brief introduction of Urdu pluralization system.

## 02. Urdu Pluralization System

The pluralization (in Urdu) is an inflectional morphological process, because inflectional morphology is responsible to keep the category/class of the word unchanged during pluralization process (Booij, 2012; Bauer, 2003; Islam, 2011). Plural word is just the different form of the singular word. Urdu, like many world languages, has two numbers i.e. singular and plural (Islam, 2011; Schmidt, 1999; Bhatia & Koul, 2000; Barz, 1977; Bailey, 1950), and in exceptional cases the borrowed dual plurals from Arabic can be observed such as *valqān* 'parents', but these borrowed dual plurals are too little to regard them a third number in Urdu. Affixation is responsible for plural marking. Nevertheless, no prefix is involved in Urdu plural marking. Mostly, suffixes are used for pluralization as in *kitāb-ān* 'books', *-ān* is a suffix used as a plural marker in this example. Many infixes also function as plural markers as in *imāḍ-a-ris* 'religious seminaries', *-a-* is an infix used as plural marker in this example. Meftah<sup>1</sup> and Neme<sup>2</sup> have

<sup>1</sup>May 03, 2015-email correspondence with Dr. Gaber Gaber Meftah

<sup>2</sup>May 02, 2015-email correspondence with Dr. Alexix Amid Neme

also confirmed that *-a-* is an infix functions as a plural morpheme. Infix is an affix which breaks the stem into two parts and is inserted in the middle of it and re-forms the word (Richards & Schmidt, 2013). Some circumfixes can also be traced out in Urdu which function as plural markers as in *a-yūni-ja:* ‘the rich persons’ (Singular: *yūnī* ‘rich’), *a-ja:* is a circumfix used in this example. Circumfix is an affix in two parts, which attach to the root from different sides at the same time (Bauer, 2003; McCarthy, 2002). It functions as a unit. Some transfixes also functions as plural markers as in *a-fd3-a-r* ‘trees’. Transfix is an affix (vowel morphemes can only be used as transfix) which is inserted into the stem. Hardie (2004) claims that only suffixes show inflection in Urdu, but the evidence from infixes, transfixes and circumfixes in plural marking shows a sharp contrast to his claim.

Islam (2011) documents three sources of Urdu vocabulary: Native Urdu words, Persian loan words and Arabic loan words. He further goes on to say that these three types of vocabulary, behaves in a different way from each other. Not only, vocabulary is borrowed from Persian and Arabic but plural markers are also borrowed from these languages. From his findings, it can be determined that (three types of) Urdu nouns show different types of plural markers. Native Urdu plural markers can be attached with the native singular nouns as well as with the borrowed nouns from other languages such as: *mæz-æ* ‘tables’, *kṭab-æ* ‘books’ and *bok-æ* ‘books’. *-æ* is a native plural marker and attached with the native noun *mæz*, with Arabic loan noun *kṭab* and with English loan noun *bok*. Similarly, borrowed plural markers can also be used with native nouns as well as borrowed nouns such as *səḍq-aṭ* ‘alms’, *bay-aṭ* ‘gardens’ and *kḥəndr-aṭ* ‘ruins’. The borrowed *-aṭ* is Persian suffix as well as Arabic, and it is used with Arabic loan word *səḍq*, Persian loan word *bay* and native word *kḥəndər* to make their plurals<sup>3</sup>.

The next section provides a gist of Urdu plural markers.

### 2.1. Urdu Plural Markers

Urdu has a strong influence of Arabic and Persian (Islam, 2011), and along with borrowed vocabulary, it has also borrowed a lot of affixes from these languages. It has three types of plural markers: native, Arabic and Persian markers (ibid). The borrowed plural markers have been nativized, and so this section provides an account for plural markers with disregard to their source language.

The following table provides a glimpse of Urdu plural markers:

**Table 1: Urdu Plural Markers**

S. No.	Plural Markers	Examples		Singular Meaning
		Singular	Plural	
1	<i>ϕ</i>	<i>tʃaṅḍi</i>	<i>tʃaṅḍi</i>	Silver
2	<i>-æ</i>	<i>tʃaṅga</i>	<i>tʃaṅg-æ</i>	Cart
3	<i>-~</i>	<i>tʃiṭja</i>	<i>tʃiṭja-~</i>	Sparrow
4	<i>-jā</i>	<i>tʃarpai</i>	<i>tʃarpai-jā</i>	Cot
5	<i>-æ</i>	<i>əḍa</i>	<i>əḍa-æ</i>	Manner/style
6	<i>-gan</i>	<i>bəṅḍa</i>	<i>bəṅḍə-gan</i>	Human

<sup>3</sup>Data are taken from the online dictionary CLE (Centre for Language Engineering). It can be retrieved at <http://182.180.102.251:8081/oud/default.aspx>.

7	-اٹ	səval	səval-اٹ	Question
8	-ان	bəraqdər	bəraqdər-an	Brother
9	-دزات	məsala	məsala-dzət	Spices
10	-ین	nazır	nazr-in	Watcher
11	-s	bok	bok-s	Book
12	-z	bækər	bækər-z	Baker

Many of the plural markers, especially loan markers, are discussed in detail in Islam (2011). The above table shows Urdu plural markers used as suffixes. But, as it can be seen in (1) that zero suffix (null marker) is used. It is one of the patterns in Urdu that takes no plural marker for pluralization purpose. Singular and plural forms of the word are identical, but native speakers can easily identify either the word is singular or plural.

The plural marker *-jā* is in contrast with Islam (2011), he treats it as *-ijā*, but the *li* is not the part of plural marker. It is the part of the stem and even it is not syllabified with *-jā* as it can be noticed in *tfarpai-jā*. If the syllables are separated by dot (.), it becomes *tfar.pai.-jā*.

The pattern in (3) is very interesting phenomenon. The pluralization is the matter of nasalization. The nasalization  $\sim$  functions as plural morpheme as in *tfirja*  $\rightarrow$  *tfirjā*, *tfirja* is singular because plural marker  $\sim$  is absent and *tfirjā* bears the plural marker/morpheme (nasalized sound:  $\sim$ ), so it is treated as plural noun.

Mostly, the suffix is attached with the stem to make its plural form, but in some cases either the last vowel is substituted with the plural marker, or alternated with another vowel before affixation of plural marker as in *ṭanga*  $\rightarrow$  *ṭang-æ*, the last vowel */a/* is substituted with the plural marker *-æ*, and in *bəndā*  $\rightarrow$  *bəndā-gan*, the last vowel */a/* is alternated with another vowel */ə/* when the plural marker is attached to the stem. In some forms, the words ending with consonants take a vowel before the last consonant, and this vowel is deleted when a plural marker is attached to the stem as in *nazır*  $\rightarrow$  *nazr-in*, the vowel */i/* is deleted when the plural marker *-in* is attached to the stem. Actually, two processes are involved in the pluralization process of *bəndā*  $\rightarrow$  *bəndā-gan* and *nazır*  $\rightarrow$  *nazr-in*: 1) morphological process and 2) the phonological process. First, morphological process take place and it attaches the plural morpheme to the stem as *bəndā-gan* and *nazır-in*, after that phonological process take place and it replaces a vowel with another vowel as in *bəndā-gan* or deletes it from the stem as in *nazr-in*. In *bəndā-gan*, the phonological process keeps the given syllabification pattern like *bən.də.gan*, it just replace one vowel sound with another to adjust the pronunciation. But in *nazr-in*, it deletes the vowel */i/* and re-syllabifies the plural form. In *nazır*, there are two syllables i.e. *na* and *zır.lz/* is onset of the syllable *zır*, but in the plural form *naz.rin*, it becomes the coda of *naz* because of the deletion of */i/* and */r/* which is the coda in *zır* becomes onset of the *rin*. Similarly, in some other patterns, phonological process take place after the morphological process and it re-syllabifies the new word as in *əḍā-ē* and *səval-āt*. In *əḍā-ē*, the vowel */a/* in syllable *ḍā* becomes the diphthong *aē*, and in *səval-āt*, the coda */l/* splits from the syllable *val* and becomes onset of the *āt*.

Urdu, surprisingly, has borrowed not only words but plural markers from English too as it is shown in (11) and (12), but these types of structures are not used regularly in formal writings. They can only be found in informal spoken conversations, and with the names of institutions and shops etc.

Following section discusses differentiation between sound and broken plurals.

### 2.2. Sound and Broken Plurals

As discussed in the previous section that Urdu has a great influence of foreign languages, especially of Arabic, Persian and English, it has also borrowed plural marking patterns from these languages. The pluralization pattern based on suffixation is either native or Persian pattern, and the other is broken pluralization, based on infixes, transfixes or circumfixes, is borrowed from Arabic language.

Arabic has two types of plurals: sound plurals and broken plurals (Meftah, 2012), and Urdu also has the same two types of plurals as well. Sound plurals are of concatenative (ibid) type that means suffixes are attached to the stems to get the plural form such as *ṭasvīr-ā* ‘pictures’, the suffix *-ā* is attached to the stem *ṭasvīr*. All the plural patterns illustrated in Table 1 are concatenative type, and are called sound plurals.

The second type of plurals is broken plural. These are of non-concatenative type plurals (Meftah, 2012), which means that they are “formed by modifying the stem” (Neme&Laporte, 2013). The word is broken into pieces and the plural morphemes (infix or circumfix etc.) are inserted in it (Meftah, 2012) as *mās-a-dzīd*, the stem is *māsdzīd*. When this stem is broken, the plural marker *-a-* is inserted through morphological operation and then phonological operation takes place and reconstruct the word as *mās-a-dzīd*.

Surprisingly, Urdu has more than one plural forms for the same word such as the singular word *māḍrassa* can be pluralized as *māḍrass-ā*, *māḍrass-aṭ* and *māḍ-a-rīs*. *māḍrass-ā* and *māḍrass-aṭ* follow the pattern of sound plurals, and *māḍrass-ā* is formed by attaching the native suffix *-ā*, whereas, *māḍrass-aṭ* is formed by attaching the loan suffix *-aṭ*. *māḍ-a-rīs*, however, follows the pattern of broken plurals, and it is formed by inserting the infix *-a-* in the middle of the stem. The phenomenon of one word having more than one plurals by the attachment of native and borrowed suffix, and insertion of infix is, interestingly, distinctive in Urdu.

In unearthing the pluralization process, the evidence for the structure: plural of the plurals, is another surprising phenomenon. Some of the broken plural forms, can further take a plural marker e.g. *-aṭ*. For example, the broken plural of *rāsām* ‘custom’ is *rāsū:m* ‘customs’, which can be double-pluralized by adding a suffix to the stem, and the double plural is *rāsū:m-aṭ* ‘customs’. The double pluralization is called ‘the Pluralization of the plural’.

OT, a theoretic guide for the data analysis, is explained in the next section.

**03. Optimality Theory as a Theoretical Framework**

The present study is descriptive in nature, and it utilizes the Optimality Theoretic Framework, proposed by Prince & Smolensky (1993), to cope up complex morphological and phonological processes in the formation of Urdu broken plurals. OT (Optimality Theory) is a declarative theory (instead of derivational theory) because it proposes constraints-based approach instead of rule-based approach (Khan, 2013).

OT, initially, was applied in field of phonology, but recently it has been applied in the field of syntax, semantics and morphology (Khan, 2013; Meftah, 2012; Ramasamy, 2011; Kar, 2009; Coetzee, 2004). OT proposes that surface structure arises from the interaction of underlying “violable conflicting constraints” (Prince & Smolensky, 2003, 2004; Khan, 2013). Constraints are universal and can be violated, and the output structure is the ranking of constraints. The optimal structure is acceptable and all non-optimal structures are unacceptable (Grimshaw, 1997, p. 373). Constraints can have higher-ranking in one language and lower-ranking in another language. The idea of violable constraints provides OT a strong ground to deal with the complexity of linguistic item. A set of constraints is devised and these constraints are ranked in a hierarchical order starting from left and ending in the right side. But first, a set of possible output candidates is devised, and these possible output candidates are examined under the hierarchical ranking of constraints. Since, these constraints are violable, so all the candidates must violate some of the constraints. The candidate, which doesn’t violate any crucial constraint (high-ranked constraint) is the optimal or winning candidate. The winning candidate can violate some of the low-ranked constraints but not any of the crucial constraints. The loser candidates must violate at least one of the crucial constraints.

The machinery of OT can be illustrated in the following Figure:

Figure 1



GEN (Generator) and EVAL (Evaluator) are two basic tools used by OT. GEN takes the input and produces a set of logical candidates. One candidate is similar to the input and others are somehow modified. The EVAL takes the responsibility to evaluate all these generated candidates under the hierarchical ranking of the constraints. The candidate, which doesn’t commit any crucial violation is the winning candidate, and all other candidates which must violate one of the crucial constraints are losers. The winning candidate is the output structure.

**3.1. Underlying Constraints for Broken Plural Formation**

Constraints are of three types: 1) Markedness constraints, 2) Faithfulness constraints and 3) Alignment constraints. Markedness constraints take the responsibility to match the output structure with the universal tendencies (Kager, 1999). Faithfulness constraints take the responsibility to match the output structure with input structure (ibid). Alignment constraints align the affixes in the beginning, in the middle or at the end of the stem. These three types of constraints can have further sub-types.

Some of the constraints used in the formation of Urdu broken plurals are listed below:

**Transfix (A--a-):** Align left edge of the stem to the right edge of the affix A-, and align -a- in the middle of the stem such as A-/dʒ-a-r ‘trees’.

**Transfix (-o--a- -a):** Align transfix -o- -a- -a in the in the stem such as f-o-h-a-d-a ‘martyrs’.

**Transfix (-o--u-):** Align transfix -o- -u:- in the in the stem such as q-o-l-u:-b ‘hearts’.

**Infix (-a:-):** Insert the infix -a- in the middle of the stem such as mās-a:-dʒɪd ‘mosques’.

**Transfix (-a- -i:-):** Align transfix -a--i:- in the stem such as mək-a-t-i:-b ‘letters’.

**Transfix (-oq- -a:-):** Align transfix -oq- -a:- in the stem such as x-oq-d-a:-m ‘servants’.

**Circumfix (A- -ja:):** Align circumfix A- -ato the stem such as A-tqij-ja: ‘pious’.

**Transfix (A--i--a):** Align transfix A--i--a in the stem such as A-ms-i-l-a ‘examples’.

**\*Coda<sub>F</sub>:** No coda in the final syllable.

**MAX-V:** Vowels in the input must have correspondence in the output.

**MAX-C:** Consonants in the input must have correspondence in the output.

**IDENT-C:** Consonants in the input and the output must be identical.

#### 04. Data Analysis

The discussion on Urdu pluralization system has been documented in section 2. This section provides the analysis of the broken plural forms found in Urdu by utilizing the machinery of OT. From the constraints illustrated in the previous sections, following forms of the broken plurals can be induced:

Table 2: Broken Plural Forms in Urdu

S. No.	Singular	Singular Meaning	Broken Plural	Broken Plural Form
1.	fədzər	Tree	ʌfdʒar	ʌC.CaC:
2.	fəhi:d	Martyr	fəhəda	CəCaCa:
3.	qəlb	Heart	qəlu:b	CəCu:C:
4.	məsdʒɪd	Mosque	məsa:dʒɪd	CəCa:CiC:
5.	məkətəb	School	məkətɪ:b	CəCaCi:C:
6.	xəqɪm	Servant	xəqɪdɑ:m	CəCCa:C:
7.	təqɪ	Pious	təqɪja:	ʌCCiCa::
8.	mɪsɑ:l	Example	ʌmsɪlɑ	ʌCCiCa:

Only eight forms of broken plural listed above have been discovered in Urdu. OT analysis is done only for first, fourth and seventh form, because these forms can better explain the phenomenon of all the three processes: transfixation, infixation and circumfixation, involved in the production of broken plurals. In all the rest of the forms, only transfixation take place, therefore, their analyses are also similar to the first one.

OT analysis for the first form, which is representation of broken pluralization through transfixation, is offered in the following section.

#### Form 1: ʌC.CaC

To analyze this form of broken plural, consider the following example:

**Input:** dʒɪns ‘kind/wheat’

**Output:** ʌdʒnas

**Possible Candidates:** ʌdʒnas, dʒɪns, ʌdʒmasɪ

The constraints used for this analysis are as under:

**Transfix (A--a-):** Align left edge of the stem to the right edge of the affix A-, and align -a- in the middle of the stem such as A-/dʒ-a-r ‘trees’.

**IDENT-C:** Consonants in input and output must be identical.

**\*Coda<sub>F</sub>:** No coda in the final syllable.

**MAX-V:** Vowels in input must have correspondence in output.

Transfix and IDENT-C are the major constraints, because they help us achieve the optimal candidate. Transfix is utilized to insert the plural markers in the stem, while IDENT-C is used to keep the input and the output consonants

identical. \*Coda<sub>F</sub> and MAX-V are non-crucial constraints, which are also important because the optimal can violate them in order to satisfy the crucial constraints.

The ranking of the above constraints is explained below:

**Ranking of the Constraints:**

**Compare *ɔɓnas* & *ɔɓins*:**

Transfix (ɔ--ɔ) >> MAX-V, because *ɔɓins* is faithful, but *ɔɓnas* has transfix aligned.

**Compare *ɔɓnas* & *ɔɓmasi*:**

IDENT-C >> \*Coda<sub>F</sub>, because *ɔɓmasi* has no coda, but *ɔɓnas* has identical consonants to the input.

Transfix (ɔ--ɔ) = IDENT-C, because *ɔɓnas* has transfix aligned and identical consonants to the input.

Thus, the possible hierarchical ranking of the constraints is:

Transfix (ɔ--ɔ) >> MAX-V

IDENT-C >> \*Coda<sub>F</sub>

Transfix (ɔ--ɔ) = IDENT-C

Because Transfix (ɔ--ɔ) and IDENT-C are equal, it means these both constraints are greater than the rest of two constraints i.e. \*Coda<sub>F</sub> and MAX-IO. Since, we don't have evidence for the relative ranking of \*Coda<sub>F</sub> and MAX-IO, so it asserts that these two constraints are also equal in ranking.

**Tableau 1: Analysis of ɔC.CɔC Form**

Input: <i>ɔɓins</i>	Transfix (ɔ--ɔ)	IDENT-C	*Coda <sub>F</sub>	MAX-V
→ <i>ɔɓnas</i>			*	*
<i>ɔɓins</i>	*!		*	
<i>ɔɓmasi</i>		*!		*

Generator receives the input *ɔɓins*, and generates three possible constraints i.e. *ɔɓnas, ɔɓinəs, ɔɓmasi*. *ɔɓins* is faithful, and satisfies MAX-V because the vowels in input have their correspondence in the possible output (*ɔɓins*). It also satisfies one of the crucial constraints IDENT-C because all the consonants in the possible output are identical to the consonants in the input. But it violates one of the high-ranked (crucial) constraint Transfix (ɔ--ɔ). Transfix (ɔ--ɔ) demands it to align the affix that it doesn't do, and the violation of this crucial constraint kicks it out from the winning race. Despite satisfying one of the crucial constraints, IDENT-C cannot keep it in the winning race, because of the violation of one crucial constraint i.e. Transfix (ɔ--ɔ). It also violates a low-ranked constraint \*Coda<sub>F</sub>, but the violation of this low-ranked constraint doesn't have any impact to kick it out from winning the race. It is solely out because of the violation of Transfix (ɔ--ɔ).

*ɔɓmasi* satisfies \*Coda<sub>F</sub> because it does not have coda in the final syllable. It also satisfies Transfix (ɔ--ɔ), because it has an affix aligned at the right place. But, it violates the crucial constraint IDENT-C. Satisfying one low-ranked constraint, \*Coda<sub>F</sub>, and one high-ranked constraint, Transfix (ɔ--ɔ), it becomes useless with the violation of IDENT-C which lets it lose the race of being optimal candidate.

The third possible output candidate *ɔɓnas* violates \*Coda<sub>F</sub> and MAX-V. \*Coda<sub>F</sub> is violated because all the syllables in *ɔɓnas* have coda consonants. MAX-V is violated because input vowels don't have corresponding vowels in the output. It satisfies Transfix (ɔ--ɔ) and IDENT-C, which are crucial constraints and cannot be violated. Transfix (ɔ--ɔ) is satisfied because the affix is aligned, and IDENT-C is satisfied because all the consonants in output are identical to the consonants in input. Although it violates two low-ranked constraints, the violation does not let it stop to be a winning candidate, because it satisfies all the high-ranked constraints, which is the condition to be an optimal candidate. So, *ɔɓnas* is the optimal candidate.

OT analysis for fourth form, which shows broken pluralization through infixation, is presented in the following section.

**Form 4: CəCə:CɪC:**

**Input:** *məqsɪd*

**Output:** *məqa:sɪd*

**Possible Candidates:** *məqa:sɪd, məqsɪd, məqafɪda*

Following are the constraints used for this analysis.

**Infix (-a:-):** Insert the infix -a- in the middle of the stem such as *məs-a:-dʒɪd̪* ‘mosques’.

**IDENT-C:** Consonants in input and output must be identical.

**\*Coda<sub>F</sub>:** No coda in the final syllable.

**MAX-V:** Vowels in input must have correspondence in output

**Ranking of the Constraints:**

Ranking of the constraints remains same as for Tableau 1, except that Infix (-a:-) takes the place of Transfix (a- -a-).

So, possible ranking is as under:

Infix (-a:-) >> MAX-V

IDENT-C >> \*Coda<sub>F</sub>

Infix (-a:-) = IDENT-C

& \*Coda<sub>F</sub> = MAX-V

**Tableau 2: Analysis of CoCaCa**

Input: <i>məqsɪd̪</i>	Infix (-a:-)	IDENT-C	*Coda <sub>F</sub>	MAX-V
→ <i>məqa:sɪd̪</i>			*	*
<i>məqsɪd̪</i>	*!		*	
<i>məqaf̪da</i>		*!		*

*məqsɪd̪* satisfies one crucial and one non-crucial constraint. It satisfies IDENT-C, because all the consonants in this possible output are identical to their corresponding consonants in the input. It satisfies MAX-V, because all the vowels in input have their corresponding vowels in output. However, it violates \*Coda<sub>F</sub> because coda appears in the final syllable. But, in spite of satisfying one crucial constraint, there is violation of Infix (-a:-) not allowing it to be the optimal candidate. So, this is a loser candidate.

*məqf̪da*, contrary to *məqsɪd̪*, satisfies Infix (-a:-), and \*Coda<sub>F</sub>, and violates all the rest of the constraints. It violates MAX-V because the vowels in the input are missing in it. It violates IDENT-C because /f/ does not have identical consonant in the input. It satisfies \*Coda<sub>F</sub> because vowel /a/ appears at the end of last syllable. It should have been consonant to violate this constraint. It satisfies Infix (-a:-) because infix is inserted. Nevertheless, the violation of IDENT-C, a vital constraint, does not allow it to be an optimal candidate.

The optimal candidate is *məqa:sɪd̪*, because it satisfies all the crucial constraints i.e. Infix (-a:-) and IDENT-C. Infix (-a:-) is satisfied, because the affix is inserted. IDENT-C is satisfied because consonants in output and input are identical. No doubt, it violates \*Coda<sub>F</sub> and MAX-V, because the coda is absent in the last syllable, and the vowels in the input do not have their corresponding vowels in the output, but these are violable constraints. Hence, *məqa:sɪd̪* is the only optimal candidate.

Following is OT analysis for the plural which is formed through circumfixation.

**Form 7: ʌCCɪCa:**

**Input:** *ɣənĩ*

**Output:** *ʌɣnĩja*

**Possible Candidates:** *ʌɣnĩja*, *ɣənĩ*, *ɣəmĩ*

Following are the constraints used for this analysis.

**Circumfix (ʌ- -ja:):** Align circumfix ʌ- -ja to the stem such as *ʌ-tqɪj-ja:* ‘pious’.

**MAX-C:** Consonants in the input must have correspondence in the output.

**\*Coda<sub>F</sub>:** No coda in the final syllable.

**MAX-V:** Vowels in the input must have correspondence in the output.

**Ranking of the Constraints:**

**Compare ʌɣnĩja & ɣənĩ:**

Circumfix (ʌ- -ja:) >> MAX-V, because *ɣənĩ* is faithful, but *ʌɣnĩja* has circumfix aligned.

**Compare ʌɣnĩja & ɣəmĩ:**

MAX-C >> \*Coda<sub>F</sub>, because *ɣəmĩ* has no coda, but in *ʌɣnĩja*, all the consonants present in the input are also available in the output.

Circumfix ( $\lambda$ -  $-ja$ .) = MAX-C, because  $\lambda yn\tilde{ja}$  has circumfix aligned, and consonants in the input are also present in the output.

Thus, the possible hierarchical ranking of the constraints is:

Circumfix ( $\lambda$ -  $-ja$ .) >> MAX-V

MAX-C >> \*Coda<sub>F</sub>

Circumfix ( $\lambda$ -  $-ja$ .) = IDENT-C

Because Circumfix ( $\lambda$ -  $-ja$ .) and MAX-C are equal, it means these both constraints are greater than the rest of two constraints i.e. \*Coda<sub>F</sub> and MAX-IO. Since, we don't have evidence for the relative ranking of \*Coda<sub>F</sub> and MAX-IO, so it asserts that these two constraints are also equal in ranking.

**Tableau 3: Analysis  $\Delta CCrCa$ : Form**

Input: $\gamma\partial n\tilde{}$	Circumfix ( $\lambda$ - $-ja$ .)	MAX-C	*Coda <sub>F</sub>	MAX-V
$\rightarrow \lambda yn\tilde{ja}$				*
$\gamma\partial n\tilde{}$	*!			
$\gamma\partial m\tilde{}$		*!		*

In this analysis,  $\lambda yn\tilde{ja}$  is the winning candidate because it does not violate any crucial constraint i.e. Circumfix ( $\lambda$ -  $-ja$ .) and MAX-C. Circumfix ( $\lambda$ -  $-ja$ .) is satisfied, because of the alignment of the affix. It satisfies MAX-C, because all the consonants in the input are present in the output. \*Coda<sub>F</sub> is also satisfied because the last syllable does not bear any coda. MAX-V is violated because all the vowels in the input are not the part of the output, but this constraint is violable which helps the output satisfy all the crucial constraints. Therefore,  $\lambda yn\tilde{ja}$  is the winning candidate.

$\gamma\partial n\tilde{}$  is a loser candidate, because no circumfix is aligned which is a major violation. Therefore, it is non-optimal candidate.  $\gamma\partial m\tilde{}$  is also a non-winning candidate as all the vowels in the input are not present in the output. Thus, it violates the major constraints MAX-V, which is a crucial violation. It is also out from the winning race.

In all the rest of the forms, broken plurals are formed through transfixation. Therefore, their analyses are also similar to Tableaus 1. Only the form specific transfix constraint will be utilized instead of Transfix ( $\lambda$ - $a$ -).

The concluding remarks are given in the following section.

**05. Conclusion**

This paper presents the broken pluralization system of Urdu language. It also briefly introduces the pluralization system of Urdu. Urdu has two numbers: singular & plural. A small number of dual plurals have been borrowed, but they are just exceptions. Urdu has two types of plurals: Sound Plurals and Broken Plurals. This paper is in sharp contrast to Haride's (2003, p. 35) claim that Urdu inflectional morphology is based on suffixation. Evidence is brought from infixation, circumfixation and transfixation, which are used in the formation of broken plurals. OT analyses illustrate the constraints used in the formation of broken plurals, and it also provides the ranking of the constraints. \*CODA<sub>F</sub> and MAX-V are violable constraints, and are used in all the analyses, while the form-specific constraints, Circumfix and IDENT-C etc, are non-violable ones.

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