CHAPTER THREE

POSITIONAL LICENSING AND SEGMENTAL ASYMMETRIES: EVIDENCE FROM HUGARIYYAH YEMENI ARABIC (HYA)

3.1 Introduction

In this chapter, an attempt is made to explain the notion of positional asymmetry in terms of phonological strength, licensing and positional privilege through the process of voicing assimilation attested in Hugariyyah Yemeni Arabic (HYA). This study is a supporting evidence for the generally accepted claim of positional faithfulness to the onset, (Lombardi, 1995, Beckman, 1998 and Steriade, 1997 and 2009.)

In HYA, the onset saliency is a phonological reflex of the contrast asymmetry and the speaker’s knowledge of contrast of similarity, (c.f. Casali, 1997, Steriade, 1997, Beckman, 1999, Lombardi, 2001) by reference to perceptibility differences. The studies conducted by Casali (1997), and Steriade (1997) show that the contrastive obstruent in the coda is more likely to be the target of neutralization than is the obstruent in the onset. Beckman (1998) assumes that either perceptually or psycholinguistically, segments which occur in prominent/strong positions exhibit a variety of phonological asymmetries. He proved that in these positions, the segmental/featural contrasts are often kept without change and are frequently triggered phonological processes. The segment in strong position resists alternation but in weak positions targets for alternation. Steriade (1997) argues for ‘’licensing by Cue’’.
She argues that the positions where phonological contrasts are licensed or neutralized are defined by reference to scales of perceptibility and the maintenance of voicing contrast in prevocalic positions is a function of higher perceptibility acoustically signalled by greater transitional cues from C to V while voicing neutralization in pre-consonantal positions is a reflex of poorer contextual cues from C to C. The conclusion is that phonological contrast is preserved where the cues to the contrast are better.

Steriade (2001) correlates the likelihood of phonological alternation with the perceptibility of the phonological change in the P-map hypothesis. The more similar two elements are in the P-map, the less perceptible a change between them will be and hence the more likely the phonological alternation is to take place. This notion captures the insight that phonological contrast is more likely to be neutralized when it is less perceptible and hence less distinct (Kawahara 2006). In recent years, there has been a huge interest in the articulatory and perceptual constraints in speech pattern. For instance, Steriade (1993), building on Ohala (1981), and Kingston (1985), claims that phonological contrasts are neutralized in environments with poor perceptual cues and it is maintained in perceptually salient contexts. This ‘perceptual cues’ is one reason of many, in which phonology can be affected by phonetics.

Moreover, it is argued that phonological distinctions are prone to neutralization in a position where their cues are not saliently perceived (Boersma, 1998, Jun, 2004, Padgett, 2002, Steriade, 1995 among many others). Voice distinctions, for instance, are often neutralized in codas, correlating with the fact that perceptual cues for voice distinctions are not salient in codas, (Fujimura et al., 1978, Jun, 2004). Building on these observations, Steriade (2001) proposes the P-map hypothesis within the framework of
OT. Put in theory-neutral terms, the gist of the P-map hypothesis is that an alternation that involves a less perceptible change is more likely to occur than an alternation that involves a more perceptible change. The voicing assimilation in HYA shows that voicing obstruent is more apparently found in a cluster sharing the same place of articulation than in that of a different place of articulation.

This asymmetry in obstruent (voicing / not voicing) requires faithfulness constraints. Voicing contrast is more perceptible in two different places of articulation than the same place of articulation. Just as preconsonantal voicing is more prone to neutralization because of its lower salience, obstruent voicing in the same place of articulation can be neutralized because its cues are not saliently perceived (Beckman 1998). Neutralization patterns in phonology are closely tied to phonetic perceptibility and effectively I am going to address this issue in this chapter. Here, the phonological pattern of the [+voice] feature in the HYA voicing assimilation is described in an explicit manner in the backdrop of the OT constraints (Prince & Smolensky 1993).

3.2 Assimilation from the perspective of Positional Faithfulness Theory

Assimilation processes may behave differently in different languages. What is true of some languages may not be true of some other languages. For instance, although Arabic and Hebrew belong to the same family (viz Semitic), they behave somewhat differently when it comes to assimilation. Thus, in spite of the observation that these two languages have the same morphemes [min] ‘from’ and [b\'ayt] ‘house’, when these words are adjacent partial assimilation takes place in Arabic to yield [mimbayt] while total assimilation is attested in Hebrew to produce [mibbayt] (Gleason 1961, Alfozan 1989). Assimilation can be analyzed from the perspective of positional faithfulness theory.
Segments appearing in privileged positions frequently function as the trigger of phonological processes such as vowel harmony, place assimilation, laryngeal feature crosslinguistically found in consonant clusters comprising of a coda and a following assimilation and dissimilation of various sorts. Positional triggering is onset, which generally includes the instances of place assimilation (Steriade, 1982).

Beckman (1998) argues that

In onset coda asymmetries the phonological asymmetries give show that the segments in prominent positions resist alternation. This reflects that the resistance and the phonological contrasts are maintained in prominent positions which take priority in perception and processing. So, coda is unfaithfulness to underlying structure and undergoing assimilation to a following strong licensors onset.

3.3 Arabic language (Yemeni Arabic dialect)

Standard Arabic is an official language used in many countries. Different dialects are descended from standard language and spoken in many different Arab countries, most commonly throughout Northern Africa and the Middle Eastern nations. Unfortunately, no specific references or written forms are existed to reflect dialects; there are limited numbers of literary forms like poetry and short stories, but not of all the dialects.

The basic origin and influence in framing these dialects was the language which is originally spoken in the region, i.e. the Standard Arabic (henceforth SA). Almost the Arab people can identify the areas from where any speaker comes, by his dialect’s speech pattern.
Yemeni Arabic (YA) is spoken as a mother tongue in most parts of Yemen, except in the eastern province of Mahra and on the island of Soqotra. Yemeni Arabic can also be divided into various dialects, with distinct vocabulary and phonology. The main dialects spoken in Yemen are San’ani, Taizzi, Adani, Tihami, and Hadhrammi (Watson, 1999). These main dialects are different in their phonological and morphological representations. Most of the dialects are named after the areas where they are spoken. For example, Taizzi dialect is spoken in Taiz city, and so on. Yemeni Arabic, like many other Arabic languages, is characterized by a limited vocalic system and a rich consonantal system (c.f. Watson, 1999). In most of the dialects, six vowels (short and long) are attested in the orthography and two diphthongs which are a combination of a consonant and vowel. As for the consonantal system, the sounds are classified based on the place and manner of articulation and are marked by a rich inventory of emphatics and guttural consonants.

3.3.1 Taizzi Dialect (Hugariyyah Variety)

Taiz city is the most populated city in Yemen with this population speaking different varieties/sub-dialects, such as Hujarija, SharSab, Maawijah, the old Taiz, and s’abir.

Hugariyyah Variety is the largest region of Taiz. Sultan (2015), a researcher at the Center for Studies and Research, has described Hugariyya Variety as ‘The Brain of Taiz’ and ‘the heart of Yemen’. Hugariyyah dialect in turn has a lot of sub-varieties such as; Ashamayatayn, Waasir, Ma’aaafir, Aalnashamah, Gabal habashi, Shargab (which is the
researcher’s mother tongue) and Haifaa. They are all similar to each other with minor

3.3.2 Consonant Sounds in HYA

Among the twenty eight consonants in Modern Standard Arabic, HYA has
maintained twenty six consonants, with the sound /dˤ/ being lost and the sound /dʒ/ being
replaced with the sound /ɡ/. Table 3.1 illustrates consonant inventory of HYA, classified
by place, manner and phonation type, (i.e. voiced vs. voiceless).

Table 3.1 Consonant inventory of HYA.

<table>
<thead>
<tr>
<th></th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Post-alveolar</th>
<th>Velar</th>
<th>Uvular</th>
<th>Pharyngeal</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plosive</strong></td>
<td>Voiced</td>
<td>b</td>
<td>d</td>
<td>g</td>
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<td></td>
<td>Voiceless</td>
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<tr>
<td></td>
<td><strong>Emphatic</strong> (pharyngeal) (vd)</td>
<td>tˤ</td>
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<tr>
<td><strong>Fricative</strong></td>
<td>Voiced</td>
<td>δ</td>
<td>z</td>
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<td></td>
<td>Voiceless</td>
<td>F</td>
<td>o</td>
<td>ʃ</td>
<td>x</td>
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<td>h</td>
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<tr>
<td></td>
<td><strong>Emphatic</strong> (pharyngeal) (vl)</td>
<td>dˤ</td>
<td>ʃ</td>
<td>sˤ</td>
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<td></td>
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<tr>
<td><strong>Nasal</strong></td>
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<tr>
<td><strong>Lateral</strong></td>
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<tr>
<td><strong>Approximant</strong></td>
<td>w</td>
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<td>j</td>
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<td><strong>Trill</strong></td>
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<td>r</td>
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</tbody>
</table>

The consonant inventory of HYA is exactly the same like that of Taizi Yemeni Arabic
(c.f. Nadhim, 2000). It is worth mentioning that emphatics are based on their both place
and manner of articulation, not like other consonants which are based on their place.
These emphatic coronals have a primary, (in the coronal region), and secondary, (in the pharynx) articulation. The Emphatics are phonemes in the language, and they are not allophones of the non-emphatic coronals.

3.3.3 Emphatics and Gutturals in HYA

SA has four problematic emphatic sounds (/sˤ/, /dˤ/, /ðˤ/ and /tˤ/). These sounds are problematic because studies find that their secondary articulation is phonetically disputed and phonologically grouped with the rest of Arabic guttural (McCarthy, 1994, Bin-Muqbil, 2006). Moreover, their articulation is different, different regions of the pharynx are evolved (McCarthy, 1994). Acoustical analysis on Jordanian Arabic shows that emphatics sounds are grouped with guttural sounds (Zawaydeh, 1999). The analysis is based on the fact that emphatics have a constriction in the pharynx except for laryngeals. Zawaydeh (1999) based her analysis on the common acoustic cue, high F1, which is the same in emphatics and gutturals. In this study, I will show the phonological behaviour of Arabic emphatics and gutturals and support the claim that Arabic emphatics can phonologically be treated like gutturals.

3.3.4 Vowel Sounds in HYA

HYA has an inventory of ten vowels (five short vowels and five long ones) in addition to two diphthongs which are a combination of a vowel and an approximant viz /vowel+j/ and /vowel+w/. The short vowels attested in HYA are [i, u, e, o, a] as in [ki.la:b] ‘dogs’, [qu.ra:] ‘villages’, [qesm] ‘department’, [qol] ‘Say imp. m. sg.’ and [harf] ‘letter’. The long vowels are counterparts of the short ones, i.e. [i:, u:, e:, o:, a:] as in [fi:l] ‘elephant’, [ru:h] ‘Go imp. m. sg.’, [se:f] ‘sword’, [oo:r] ‘a bull’ and [ha:t] ‘Give imp. m. sg.’.
However, the diphthongs [aj] and [aw] are merely allophones of the long sounds [e:] and [o:] respectively which are used by some speakers of HYA. In other words, some speakers tend to use the siphthongs [aj] and [aw] in place of the long vowels [e:] and [o:]. Therefore, for such speakers, the examples [se:f] ‘sword’ and [ œː:r] ‘a bull’ mentioned above will be pronounced as [sajf] and [œawr] respectively.

3.3.5 The Syllable in HYA

According to Kiparsky (2002), Arabic dialects are divided into three groups: VC-dialects, C-dialects and CV dialects. Samadi (2011) argues that Taizi Yemeni Arabic is a CV-dialect, citing much evidence from the dialect and since HYA is a sub-dialect of Taizi Yemeni Arabic, we consider it to be a CV-dialect too. Kiparsky (2002) assumes that CV-dialects allow the phrase final CC clusters and these clusters can be broken up by an epenthetic vowel under certain conditions. CV-dialects always retain CCiC- yiktibu. The High vowel deletion (the one that occurs after the medial geminates) is one of the processes that are common in the VC-and C-dialects, but in CV-dialects the vowel is retained (/yikallimu/). In fact, the coda is optional rather than obligatory in HYA and in Arabic in general. Table 3.2 shows the syllable pattern that occurs in the dialect.
Table 3.2 Syllable patterns of HYA

<table>
<thead>
<tr>
<th>Syllable</th>
<th>Pattern</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV</td>
<td>qa.lam</td>
<td>‘pen’</td>
</tr>
<tr>
<td>CVV</td>
<td>wa:.hed</td>
<td>‘one no.’</td>
</tr>
<tr>
<td>CVC</td>
<td>mak.tab</td>
<td>‘office’</td>
</tr>
<tr>
<td>CVCC</td>
<td>harf</td>
<td>‘letter’</td>
</tr>
<tr>
<td>CVVC</td>
<td>su:q</td>
<td>‘souk’</td>
</tr>
</tbody>
</table>

3.3.6 HYA Prefix [ta/ti]

When either the prefix [ta] of the second person (singular or plural) or the prefix [ti] of the third person feminine singular is concatenated to the beginning of a C-initial verb and this prefix is in turn preceded by a vowel-final word / prefix, the vowel of the prefix [ta/ti] deletes, the remaining [t] re-syllabifies as coda to the preceding vowel-final syllable and then assimilates the voice feature from the initial voiced consonant of the following verb.

3.1 Examples

/ta/ + alveolar obstruent sounds

/ba +ta+du:r/ → [bad.du:r] ‘it f. will rotate’

/ma +ta+zi:d +ʃ/ → [mad.zi:dʃ] ‘it f. does not increase’

/ma +ta+tˤi:r +ʃ/ → [mad.tˤi:rʃ] ‘it f. does not fly’

/uxtì +ta+ðawwib/ → [uxt.tid.ðaw.wib] ‘my sister is melting (something)’

/ummi +ti+dawir +uh/ → [um.mi.daw.wi.ruh] ‘my mother is looking for it m.’

If the either prefix /ta or ti/ is utterance-initial, preceded by a closed syllable or followed by a CC-initial verb, deletion as well as assimilation are blocked because the deletion
would result in word-initial double consonantal cluster, which is not allowed in HYA, as in:

/ta+duːr/ → [ta.duːr], *[dduːr] ‘it f. rotates’

/ma +ta+drus +ʃ/ → [ma.tad.roʃf], *[mad.droʃf] ‘study’

/ummak + tu+dawwir +uh/ → [ʔum.mak.tu.daw.wi.roh] ‘your m. sg. mother is looking for it m.’

/ta+tˤruʃ/ → [tatˤruʃ] ‘she vomits’

### 3.2 Examples

/ta & ti/ + sonorant sounds

/ba +ta+naːm/ → [bat.naːm] ‘she will sleep’

/ma +ta+ruːh+ʃ/ → [mat.ruːhʃ] ‘Do not go imp. m. sg.’

/saːli ti+lawwin/ → [saː.lit.law.wen] ‘Saali is colouring (something)’

/arwa ti+wasˤsil/ → [ʔar.wat.wasˤ.sil] ‘Arwa delivers (something)’

In the examples (3.2), no assimilation takes place with sonorants. Elgadi (1986) and Abdunnabi (2000) claim that the imperfective prefix /t/ does not assimilate to nasals. However, in the examples above, assimilation is blocked not only with nasals but also with all sonorant sounds.
3.3.7 Voicing Contrasts in HYA

HYA allows voicing contrasts at word-initial position (e.g. [ti:n] ‘figs’ vs. di:n “religion”), in word-final position (e.g. [bas] ‘enough’ vs. [baz] ‘fabric’), between vowels (e.g. [fâkîr]’think imp. m.sg.’ vs. [fâqgîr] ‘blew up imp.m.sg.’) and before sonorant consonants (e.g. [ʔakl] ‘food’ vs. [ʔagl] ‘for’).

Notice the following examples where the clusters always maintain their underlying voice value on the surface both in word-final and intervocalic positions, the underlying value of the consonants surfaces in other templatic realizations of the stem, where a vowel breaks up the cluster.

3.3 Examples

[naq’d] ‘criticism’ (noun) [naqad] (verb) ‘he criticized’
[naqṣî]’decrease’ (noun) [naqasî] (verb) ‘it decreased’
[raːsam.na]’our drawing’ (noun) [raːsam.na] (verb) ‘we drew’
[zaɾ.ʕa.na] ‘our plants’ (noun) [zaɾ.ʕa.na] (verb) ‘we planted’

The clusters in the above examples are broken up by a syllable boundary where the first consonant syllabifies as a coda to the first syllable whereas the second consonant provides an onset to the second syllable. The evidence for this syllabification comes from the absence of any word-initial complex onsets, the restriction of complex codas to phrase-final position. So, HYA allows voicing contrasts in word-initial, word-final as well as intervocalic positions in consonant clusters.
3.4 Voicing Assimilation and the Privative Feature

The process of voicing assimilation can be explained in the framework of privative feature, as proposed by (Steriade, 1987, Clements, 1987 and Lombardi, 1991). This privative feature comes from the transparency of certain segments with respect to phonological rules and the negative value of a feature does not figure in phonological rule or constraints. The basic assumption in Lombardi's theory is basically considered the [voice] as a privative feature; the voiceless obstruent has no specification for voice and, therefore, has no ranking for laryngeal features. The Voice Constraint states; in languages that have neutralization, [voice] is only licensed in an obstruent if it stands before a [+son] segment in the same syllable (Lombardi, 1991).

Figure 3.1 The diagram of the Voice constraint (source: Lombardi, 1991).

The Voice Constraint

So, there is no reference to the value [-voice]. Voicelessness is the result of the delinking of an unlicensed laryngeal node. In HYA, adjacent obstruents agree in voice (in some conditions), the first member assimilates the value of the feature [voice] of that of the second, as shown in examples 3.4:
3.4 Examples

/baz sa:mi/   [bas.sa:mi]       "he took Sami"
/raqad ta:mir/ [raqatta:mer]    "Taamir slept"
/oala:θ+ðuru:s/ [øa.lað.ðu.ru:s]"three molars"

Delinking of the unlicensed [voice] node according to the Voice Constraint gives the actual form. This process can be represented in autosegmental framework:

Figure 3.2 The diagram of the unlicensed [voice] node in HYA

The rule that spreads [voice] from a licensed [-son.] to an unlicensed [-son.] accounts for the underlying representation of figure 3.3, where [voice] is linked to the obstruent [d] since it is before [+son] sound. Syllable final [t] is not licensed for [voice] according to the Voice Constraint.

Figure 3.3 The diagram of the Syllable final [t], which is not licensed for [voice] in HYA
The [voice] spreads from [d] to the unmarked [t], giving a syllable-final voiced obstruent [d]. That is, [voice] is licensed in [t] because of its association with [d] which is in the right position to bear [voice]. In other words, the [voice] associated to [t] is already licensed by virtue of its being linked to [d].

3.5 Positional Asymmetry and Regressive Voicing Assimilation in HYA

HYA exhibits the instance of regressive voicing assimilation, where adjacent obstruent sounds agree in their specification for the laryngeal features and the last segment in the cluster is the one which determines the voicing of the cluster. The main reason for assimilation is the homogeneity between the assimilated sounds. They resemble and sympathize each other either in place of articulation or manner of articulation in addition to features. In Arabic language, in general, it has been proved that the process of assimilation happens for three reasons, the first is similarity and the second is homogeneity and the third is approximation (Al-marsafi, 1982).

- The first cause is the meeting of two similar sounds in manner and place of articulation
- The second cause is when having two homogeneous letters that are similar in place of articulation but different in manner.
- The third cause after assimilation is approximation.

Now in table 3.3, the segments in the coda position agree in terms of feature [voice] with the following obstruent in the onset position and the voicing happen between two similar
sounds in manner and place of articulation as a result from the homogeneity between them in place and manner of articulation (partial assimilation) (Al-marsafi 1982).

Table 3.3 Examples of the cases where regressive voicing assimilation occurs in HYA:

<table>
<thead>
<tr>
<th>Regressive voicing obstruent assimilation</th>
<th>Regressive voicing obstruent assimilation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C1→voicing</strong></td>
<td><strong>C2→voiceless</strong></td>
</tr>
<tr>
<td>/t/ → [d] / (d, ð', t', ð, z)</td>
<td>/ð/ → [t] / (t, s, ð, t')</td>
</tr>
<tr>
<td>Coronal</td>
<td>Coronal</td>
</tr>
<tr>
<td>/madrasat+zajnab/ → [mad.ra.sad.zaj.nab]</td>
<td>/raqad+ oawa:ni/ → [raq.at.oa.wa:.ni]</td>
</tr>
</tbody>
</table>

| /s/ → [z] / (d, z, ð, ð')                     | /z/ → [s] / (t, s, ð', ð) |
| /bas+zaffa/ → [baz.za.ffã]                        | /azi:z+tas:ba:n/ → [ʔa.zis.ta:.ba:n] |
| /bas+dallu:ð-ah/ → [baz.dal.lu:.ðah]              | /sazi:z+sarah / → [ʔa.zis.sa.rah]     |
| /s'/ → [z] / (z, ð, ð')                          | /sazi:z+øallu:/ → [ʔa.zis.øal.loh]    |
| /na:qi:si+zajn/ → [na:qi.zajn]                   | /ð/ → [t , o,f] / (t, s, ð, ð')       |
| /qas+ ðajluh/ → [qaz.ðaj.lu:h]                   | /ʔalað+tabbu:lah/ → [ʔa.lat.tab.bu:.lah] |
|                                                   | /ʔuð+ oawmah/ → [ʔu.oaw.mah]           |
|                                                   | /ʔuð+ fu:fu:h/ → [ʔu.o:fu:.foh]        |
As we have seen in all the examples above, obstruents behave regularly with regards to the process of voicing assimilation. Voiced obstruents change into unvoiced if they precede unvoiced obstruents; and obstruent turns into voiced if they precede voiced obstruents. The voiceless obstruent in the coda position takes on the voicing feature from the followed voiced obstruent in onset position. Thus, all obstruents in the onset positions retain their feature (voice) and the coda obstruents assimilate to the following onset losing their feature. The onset saliency in Hugariyyah obstruent assimilation supports the accepted principle of positional faithfulness (Casali, 1998; Beckman, 1998 and
Lombardi, 1999) which claims that preservation of phonological features may differ in different prosodic positions.

Positional faithfulness claims that, given a phonotactic constraint that creates conflict by requiring unfaithfulness in a string, the conflict is resolved by imposing faithfulness to a stronger, more prominent position, such as in favour of word-initial over word-final position, syllable-initial over syllable-final position, and morphologically, in favour of root over affix. As a sequence, neutralization takes place in the initial position of a prosodic domain such as the onset or word-initial position. Such illustrations support the onset coda debate and serves as a clear instance of onset coda licensing and positional asymmetry in the distribution of the segments. The cross-linguistic observation that the direction of assimilation is normally regressive (Jun, 1995, Beckman, 1998, Lombardi, 1999) bears testimony to the hypothesis that onsets are licensed and stronger and resist alternation as compared to coda. In regressive assimilation, at the interface of segments in coda position and segments in onset position, codas undergo alternation owing to their positional weakness and markedness whereas segments in onset position resist and trigger alternation because they possess more positional privilege and strength than segments in coda position. So, it is clear that all the segments in the onset position trigger the process of regressive assimilation and the feature [voice] is maintained in the onset position, not in the coda position which assimilates to the feature of the following onset. Obstruent regressive assimilation supports the claim of positional faithfulness, by preserving a phonological feature in the word initial position and targeting the word final obstruent as a less faithful position. In regressive assimilation, codas are prone to
alternation whereas onsets resist and trigger alternation due to the strength that the onset segments have.

Jeffery Steele (2005) supports the view saying that, cross-linguistically, prosodically strong positions, including onsets and stressed syllables, may license a wider range of segmental contrasts e.g. (voicing) than relatively weaker positions, such as codas and unstressed syllables. Nooteboom (1981) also supports the view that word onsets should be more resistant to phonological change than word endings. Alsaidat (2011) gives evidence for positional asymmetry which can be noticed in the following examples of Irbid Urban Arabic language (IUAL), a variety of Jordanian Arabic spoken in the city of Irbid located at the northern part of Jordan.

3.5 Examples

/bari:d ta:ri:xî/ [bari:t.ta:ri:.xî] ‘historical mail’
/muθallaθ dâhabi/ [muθal.laθ.dâ.ha.bi] ‘gold triangle’
/fu:la:ð ūmi:n/ [fu:.la:ð.ûmi:n] ‘expensive steel’
/ki:s za.tu:n/ [ki:.z.za.tu:n] ‘a bag of olives’
/muːz su:ri/ [mu:su:.ri] ‘Syrian banana’
/saratrzymać kursi/ [sa.rak.kur.si] ‘lighten the chair’
/miːliθ ūa:di/ [mi:.liθ.ûa:.di] ‘normal salt’
/balaʕ habba/ [ba.lah.hab.ba] ‘swallow the pill’

These examples undergo voicing and devoicing regressive assimilation which are neutralized in the coda position. The licensing analysis of Lombardi (1991, 1995) goes
some way towards explaining the dominance of laryngeal contrasts in the onset over those in the coda. However, the segment in coda position does not always assimilate the segment in the onset position in voicing. As we notice in the examples in 3.3 above. The phonological process of voicing assimilation occurs between two segments sharing the same place of articulation. When these sounds do not share the same place, voicing assimilation is blocked as in the following examples.

### 3.6 Examples

/ʔant+bahrir / → [ʔant.bah rer] ‘you (m.sg) open your eyes wide’
/xaraq +qablak /→ [xa.raq.qab.lak] ‘he went before you (m.sg)’
/sˤu:ratik+zift/ → [sˤu:.ra.tik.zeft] ‘you look bad’
/liʔb+ xabi:s/ → [liʔb.xa.bi:s] ‘bad playing’
/raqad+ fa:rihi:luh/ → [ra.qad.fá:ri:hi:.loh] ‘he slept; look after him (imp.m.sg)’
/ hawwiz+ka/ → [haw.wez.ka] ‘stay away from the road’
/bahø+batˤiːʔ / → [bahø.ba.tˤiːʔ] ‘slow search’
/madrasat+gama:l /→ [mad.ra.sat.qa.ma:l] ‘Gameel’s School’
/qult+ þassa:n/ → [qult.þas.sa:n] ‘you said Ghassan’
/qult+bak fi/ → [qult.bak.fi] ‘I thought you have a problem’
/xajnah+zallag / → [xaj.na.zal.lag] ‘maybe it is finished’
/fakluh+ baθiːr/ → [fak.luh.baθiːr] ‘he looks disgusting’
/taknuq ʕanta/ → [tak.nog.ʕant] ‘you (m.sg) are pampering’
/?ʔtasraḥ +ʔanta/ → [ʔʔtas.raḥ.ʔant] ‘you (m.sg) will go’
/zallag+haʃuːʔ / → [zal.lag.haʃuːʔ] ‘he finished gossiping’
The two segments in the onset and the coda positions have different places of articulation; hence, there is no progressive nor regressive voicing assimilation. Thus, voicing assimilation happens only between two consonants of the same place of articulation. Even if the cluster is (fricative–fricative) or (stop – stop) with different place of articulation, assimilation is blocked. Hence, sharing the same place of articulation is more effective than sharing the same manner of articulation.

3.6 Regressive voicing assimilation and Gutturals

Generally, any analysis of assimilation in Arabic is not complete without examining the behaviour of the group of sounds known as gutturals. These include the pharyngeals /ʕ/ and /h/ which are produced “in the middle of the throat”, the uvulars /x/ and /ʁ/ produced in the pharyngeal cavity region nearest to the tongue, and the laryngeals /h/ and /ʔ/ produced “at the back of the throat” (McCarthy, 1991). The pharyngeals, laryngeals, and sometimes the uvulars are treated as a unique class. HYA has inherited and retained all the above sounds from standard Arabic. Yet, they exhibit a different pattern with respect to RAV.

3.7 Examples of the voiced pharyngeal consonant sound /ʕ/

/fazaʕtuh/ → [fa.zaʕ.toh] ‘you (m.sg) scared him’
/mufʕa:rif/ → [muʃʕa:.ref] ‘I don’t know’
/kulʕa:di/ → [kolʕa:.di] ‘eat normally’
/samiʕ hanu:n/ → [sa.miʔ.ha.nu:n] ‘Sameeʔ is kind’
The voiced pharyngeal sound /ʕ/ is neutralizing in coda position when followed by the voiceless fricative sound /ħ/ which has the same place of articulation. So, it is prone to assimilation when it is followed by a fricative sound sharing the same place of articulation. The voiceless pharyngeal sound /ħ/ assimilates only to the following sound /ʕ/.

3.8 Examples of the voiceless pharyngeal consonant sound /ħ/

/masah ʕajnuh/ → [ma.saʕ.ʕaj.noh] ‘he wiped his eyes’
/ðˤajjaʕ haja.tuh/ → [ðˤaj.jaʕ.haja.toh] ‘he ruined his life’
/alsˤamʔala/ → [ʔasˤ.samʔ.alaʔ] ‘The glue is good’
/ʔaðˤha/ → [ʔað.ʔa] ‘Aladha Eid’
/ðˤabbaʔbi/ → [ðˤab.baʔ.bi] ‘he made me upset’

3.9 Examples of the pharyngeal uvulars sounds /χ/, /ʁ/

/wasaχ + ruba:r/ → [was.saχ.ru.ba:r] ‘dirty dust’
/baðaχ+ hari:b/ → [ba.ðaχ.ha.ri:b] ‘strange richness’
/sˤamχ+ajbah/ → [sˤ胺χ.ʔaj.bah] ‘bad glue’
/wasasχ +gami:l/ → [was.ʔay.ʔa.mi:l] ‘he made Gameel dirty’
/baχ+dalaʔ/ → [ba.ʔa.dalʔ] ‘he sprayed little’

The sounds /χ/ and /ʁ/ trigger the process of voicing whenever they are in a position where voice is licensed, the onset position. The voiceless obstruent uvular sound /x/ assimilates to the following onset with only the voiced sound /ʁ/ and vice versa because they are the only fricative sounds that are sharing uvular place of articulation. There is no change
with the rest of the other obstruent sounds. It should be noticed, here, that the contrast between the voiced and voiceless obstruent is neutralized in coda position.

This is supporting the claim that positional asymmetry is instrumental in the functioning of the segmental distribution. Clusters that are sharing the same place of articulation are homogeneous for [voice] and will be preferred over clusters that do not agree in voicing. The right most obstruent is the one which determines the voice value of the entire cluster.

3.10 Examples of the voiceless laryngeal sound /h/ word-Internally and across two words

- Within a word
  
  /tahdir/ → [tah.der] ‘she is talking’
  
  /mahzu:mah/ → [mah.zu:.mah] ‘defeated f’
  
  /basaqhom/ → [ba.saq.hom] ‘he cut them m. off’
  
  /zawaghom/ → [zaw.wag.hom] ‘he married them m.’

- Across words
  
  /kinnuh + gami:l/ → [kin.no.ga.mi:l] ‘it should be Gameel’
  
  /kalimuh+binafsak/ → [ka.li.mo.bi.naf.sak] ‘tell him by yourself’
  
  /qalluh+ʕajb/ → [qal.lo.ʕajb] ‘he said shame on him shame’
  
  /sˤu:ratuh+ʔa:jib/ → [sˤu:.ra.to.ʔa:.jeb] ‘he seems to be absent’
  
  /ʔatzawag+ha:lah / → [ʔa.zaw.wag.ha:.lah] ‘he marriad Haalah’
As we can see in the examples above, no voicing assimilation affects the sound /h/ in the coda position word-internally. Across word boundaries, the /h/ sound is deleted when it occurs word-finally followed by another word irrespective of the sound that the following word starts with, (i.e. even if the following word starts with a voiced obstruent or sonorant sound). When the sound /h/ occurs in the onset position preceded by a voiced sound, no voicing or deletion takes place both word-internally and across words as in:

/ʔatzawag+haːlah/  →  [ʔad.za.wag.haː.lah]  ‘he married Haalah’
/zallag+hom/  →  [zal.lag.hom]  ‘he finished them m.’

In general, /h/ is a perceptually weak sound, and it is subject to deletion in many languages. HYA deletes /h/ in two cases (1) in the coda position across word boundaries and (2) when it occurs word-finally followed by the negative suffix -ʃ as in:

/ma+raːh+ahʃ/+  →  [ma.raː.haʃ]  ‘she did not go’

The asymmetric behavioural pattern that /h/ is displayed in HYA strengthens the notion of phonological strength.

3.11 Examples of the voiceless laryngeal glottal stop sound /ʔ/

/sabaʔ+bakah/  →  [sa.ba.ba.ka]  ‘Saba cried’
/hazʔ+ajwah/  →  [haz.aj.wah]  ‘he nodded his head’
/saʕ+abuːh/  →  [sa.ʕa.buːh]  ‘like his father’
/baʕ+ahluh/  →  [ba.ʕa.ḥ.ə.lu]  ‘he cheated his family’
In the above examples, it is a process of deletion. The glottal /ʔ/ was attested in all prosodic positions in classical Arabic and it is known as *hamza*. This sound in most of Yemeni dialects is deleted. Thus, gutturals behave like obstruent, with the exception of the sound /h/ and /ʔ/. So, the two guttural sounds /h/ and /ʔ/ are not affected by voicing assimilation but the rest behaves like obstruent.

3.7 Regressive Voicing Assimilation and the Behaviour of Sonorants

So far, we have seen that obstruents in HYA consistently neutralize in syllable-final position. Besides, a voiced obstruent spreads its voice to the preceding consonant creating a voiced cluster. However, this consistency ceases when either member of the cluster is a sonorant. The examples below show that sonorants do not participate in neutralization. A sonorant does not neutralize in syllable-final position and does not spread [voice]. Sonorant consonants are often neutral with respect to voicing assimilation. In addition, obstruents do not neutralize in syllable. Whenever voiceless obstruent is followed by nasal, liquids and glides, there is no assimilation in terms of voice.

3.12 Examples:

- t → /t/ ___(n,m,l,j,r,w)

/ʃilaːt+nuːr/ → [ʃi.lat.nu:r] ‘Nour’s coterie’
/ʃilaːt+muna/ → [ʃi.lat.mu.-na] ‘Muna’s coterie’
/zaːxiɾ+tamiːm/ → [zaː.xiɾ.ta.miːm] ‘put Tamiim aside’
/maw+tuxabbir/→  [maw.tu.xab.ber]’what are you saying?’
/maw+tahdir/→  [maw.tah.der] ‘what are you talking?’
/jillat+lami:s/→  [jil.lat.la.mi:s] ‘Lamiis’ coterie’
/madrasat+ja:fiṣ/→  [mad.ra.sat.ja:.feʃ]’Yaaﬁṣ’s school’
/madrasat+ra:giḥ/→  [mad.ra.sat.ra:.geh] ‘Raagih’s school’
/madrasat+wali:d /→  [mad.ra.sat.wa.li:d]’Waleed’s school’

•  t⁵→/t̞/ ____( n,m,l,j,r,w)

/rabat⁶+nu:r/→  [ra.bat⁶.nu:r] ‘he tied Nour’
/warrat⁶+ra:giḥ /→  [war.rat⁶+ra:.giḥ] ‘he embroiledRaagi h’
/rabat⁶+muna/→  [ra.bat⁶mu.na] ‘he tied Muna’
/rabat⁶+lama/→  [ra.bat⁶la.ma] ‘he tied Lama’
/baqat⁶+jaddoh/→  [ba.qat⁶.jad.doh] ‘he cut his hand’
/rabat⁶+wali:d/→  [ra.bat⁶.wa.li:d] ‘he tied Waleed’

•  k  →/k/ ____( n,m,l,j,r,w)

/misk+nu:r/→  [mesk.nu:r] ‘Nour’s fragrance’
/za:xir+kari:m/ →  [za:.xer ka.ri:m] ‘put Kareem aside’
/jakrifak+miltªa:m/ →  [jak.ri.fak.mil.ªa:m] ‘I will slap you’
/misik+lama/→  [mi.sek.la.ma] ‘he caught Lama’
/masak+jaddih/→  [ma.sak.jad.deh] ‘he caught her hand’
/masak+wali:d/ → [ma.sak.wa.li:d]‘he caught Waleed’

• /s/ → /s/ (n,m,l,j,r,w)

/na:s+min/ → [na.s.min] ‘people from..’
/za:xir+malih/ → [za.xir.ma.leh] ‘go away!’
/gilis+lamma əah.hi:n/ → [gi.les.lam.ma.əah.hi:n] ‘he sat till now’
/la:his+wala:+χabar/ → [la.his.wa.la.χa.bar] ‘no news at all’
/anna:s+na:mu/ → [ʔan.na.s.na.mu] ‘people slept’
/anna:s+raqadu:/ → [ʔan.na.s.ra.qa.du] ‘people slept’

• sˤ → /s/ (n,m,l,j,r,w)

/ba:qusˤ+lisa:nak/ → [ba.:qo:sˤ li.sa:nak]‘i will cut your tongue’
/baqsˤ+na:mi/s/ → [baq:sˤ na.mes] ‘mosquito bite’
/baqasˤ+ra:mi/ → [baq:sˤ ra.mi] ‘he pinched Raami’
/baqasˤ+jaduh/ → [baq:sˤ ja.doh]‘he pinched his hand’
/na:qisˤ+wa:hid/ → [na.qisˤ wa.hıd] ‘one is missing’
/alba:sˤ+malja:n/ → [ʔal.ba.sˤmal.ja:n]‘the bus is full’

• o → /o/ (n,m,l,j,r,w)

/ʔa:o+ niha:l/ → [ʔa.ʔa.o.ni.ha:l] ‘Nihaal’s furniture’
/baħo+ majda:ni/ → [ba.ʔo.maj.dɐ.ni] ‘field research’
/əlaːə+ rummaːnaːt/ → [əa.laː.rum.maːnaːt] ‘three pomegranates’

/əlaːə+wurud/ → [əa.laː.wu.ruːd] ‘three flowers’

/əlaːə+jaddaːt/ → [əa.laː.ja.d.daːt] ‘three hands’

- *q→/q /____(n,m,l,j,r,w)*

/saraq+ nihaːl/ → [sa.raq.ni.haːl] ‘he stole Nihaal’

/saraq+ munaː/ → [sa.raq.mu.na] ‘he stole Muna’

/saraq+ rummaːnah/ → [sa.raq.rum.maːnah] ‘he stole a pomegranate’

/saraq+waliːd/ → [sa.raq.wa.liːd] ‘he stole(something from)Waleed’

/saraq+jusraː/ → [sa.raq.jus.ra] ‘he stole(something from)Yusra’

/alsar:iq+jiftaːgiʃ/ → [ʔas.saː.req.jif.ta.ɡiʃ] ‘a thief is coward’

/qaːl+qaː.huʔaw.nah/ → [qaːl qaː.huʔaw.nah] ‘he said he is already here’

- *h→/h/____(n,m,l,j,r,w)*

/maːdah+naf.suh/ → /ma.dah.naf.soh/ ‘he praised himself’

/garəh+munaː/ → [ɡa.rah.mu.na] ‘he hurted Muna’

/lamaːh+lajlaː/ → [la.mah.laj.laː] ‘he took a glimpse of Lajlah’

/samaːh+rabbannuː/ → [sa.maːh.rab.ban.noh] ‘Samaah brought him up’

/saːmih+waliːd/ → [saːme.h.wa.liːd] ‘forgive Waleed’

/samiːh+jinsaː/ → [sa.miːh.jin.saː] ‘Samiih forgets’
• $\chi \rightarrow /\chi/ (n,m,l,j,r,w)$

/qa:l+$\chi$ajnah/$\rightarrow$ [qa:l.$\chi$ajnah]‘he said maybe ’
/fasax+$\chi$lawnuh/$\rightarrow$ [fasax.$\chi$lawnuh]‘its color faded ’
/nasa+$\chi$+mugallad/$\rightarrow$ [na.$\chi$.mu.gal.lad] ‘he copied a file’
/masax+$\chi$+wali:d/$\rightarrow$ [ma.$\chi$.wa.li:d] ‘he spoiled Waleed’
/masax+$\chi$+jusra/$\rightarrow$ [ma.$\chi$.jus.ra]‘he spoiled Yusra’
/man+$\chi$ama$/\rightarrow$ [man.$\chi$.ma$]$ ‘whom did he throw?’
/nasa+$\chi$+risa:lalh/$\rightarrow$ [na.$\chi$.ri.sa:.lah] ‘he copied a thesis’

• $f\rightarrow /\phi/(n,m,l,j,r,w)$

/mif+nabi:lah/$\rightarrow$ [mif.nabi:lah]‘it is not Nabeelah’
/allawn+fama:t/$\rightarrow$ [?]allawn.f.a.ma.t]‘the color is bad’
/muf+ma$sak$/\rightarrow$ [muʃ.$\chi$.ma$]$ ‘I am not with you’
/majankiraf+malih/$\rightarrow$ [ma.$\chi$.an.ki.rakf.$\chi$.ma.le]‘butI will not deny you’
/al$\alpha$f+$\chi$+wasi$\chi$/\rightarrow$ [?]al$\alpha$f.$\chi$.wa.se$\chi$]‘the gauze is dirty’
/muf+la:mi$\chi$/\rightarrow$ [muʃ.$\chi$.la:.me$\chi$]‘it is not shining’
/al$\alpha$f+$\chi$+rimmah/$\rightarrow$ [?]al$\alpha$f.$\chi$.rim.mah]‘the gauze is dirty’
/lif+jistanna?/$\rightarrow$ [liʃ.jis.tan.na?] ‘why is he waiting?’
• f → /f/ (n,m,l,j,r,w)

/kajf+na:mu/ → [kajf.na:.mu] ‘how did they sleep?’
/allawn+fasay / → [ʔal.lawn.fa.say] ‘the color faded’
/maw+fi/ → [maw.fi] ‘what is there?’
/kajf+wali:d/ → [kajf.wa.li:d] ‘how is Waliid’
/kajf+jinsa/ → [kajf.jin.sa] ‘how does he forget’
/kajf+maja/ → [kajf.ma.ja] ‘how did he walk?’
/kajf+ra:qih/ → [kajf.ra:.qeh]‘how is Raagih?’
/kajf+lami:s/ → [kajf.la.mi:s]‘how is Lamiis?’

In the above data RAV is blocked between segments of asymmetric sonority value. RAV is realized between the segments which share the same sonority value and that is why AGREE constraint is ranked higher. AGREE is stronger between constraints of similar sonority value (Dutta, 2011). So, sonorants act as unspecified for [voice].It is discussed by Lombardi (1991), that sonorants act as unspecified for [voice]. Sonorants do not participate either in the (lexical) neutralization or spread of [voice], and in certain languages they are transparent to the spread of [voice].HYA sonorants do not have a Laryngeal node and thus they fail to spread [voice] to a preceding obstruent.

3.8 Voicing Assimilation in Homorganic Obstruent Consonants

Since the vocal folds are a completely independent articulator, it seems strange that it should depend on place identity for having voicing assimilation. Why should voicing
assimilation be restricted to same-place obstruents and why are different-place obstruents more resistant to RAV. The feature that is focused exclusively on is assimilation of voicing, which is the most common feature to assimilate between adjacent consonants.

Generally, languages often impose conditions on assimilation that appear to be independent of the specification of the assimilatory feature on the relevant adjacent segments. RAV is often limited to clusters of obstruent (Lombardi, 1999), place assimilation is often limited to nasal consonant clusters (Jun, 2004), and palatalization is often limited to non-labial consonants. In the obstruent-cluster voicing case, the condition appears to reduce to a general condition of similarity between the trigger and the target of assimilation; the more similar two segments are, the more likely they are to assimilate.

Table 3.4 Examples which show the effect of the degree of similarity in obstruent cluster in HYA

<table>
<thead>
<tr>
<th>Examples</th>
<th>The result</th>
</tr>
</thead>
<tbody>
<tr>
<td>/madrasat+žajnab/ → [mad.ra.sad.zaj.nab]</td>
<td>Partial assimilation</td>
</tr>
<tr>
<td>/madrasat+δama:r/ → [mad.ra.sad.δa.ma:r]</td>
<td></td>
</tr>
<tr>
<td>/alaḏ+s'ajd/ → [ʔa.laо.s'ajd]</td>
<td></td>
</tr>
<tr>
<td>/wasax+ʁuba:r/ → [wa.sas.ʁu.bа:r]</td>
<td>Total assimilation</td>
</tr>
<tr>
<td>/jīllat+dama:r/ → [jīl.lad.da.mа:r]</td>
<td></td>
</tr>
<tr>
<td>/χuð+оawmah/ → [χо.оaw.mah]</td>
<td></td>
</tr>
<tr>
<td>/muʃ+rssа:n/ → [muʃ.ʁas.sa:n]</td>
<td>Assimilation blocking</td>
</tr>
<tr>
<td>/ɡa:b+qalam/ → [ɡа.ɡa.lам]</td>
<td></td>
</tr>
<tr>
<td>/ʃaklik+zift/ → [ʃак.лик.зеф]</td>
<td>Assimilation blocking</td>
</tr>
</tbody>
</table>
Thus, it is obvious that, in HYA, AGREE in place is essential for voicing assimilation and the more identical the obstruent cluster are, the more likely they are to assimilate in voice. An obstruent cluster should be identical in place to have either total or partial assimilation and should be identical in place and manner to have total RAV. If the cluster members are identical only in manner, no assimilation takes place. It is interesting to notice that the emphatic sounds (tˤ, δ, sˤ) and pharyngeal sounds behave differently from non-pharyngeal obstruent sounds.

For voicing assimilation to occur, it is necessary that the cluster members be identical in place and manner: [+pharyngeal] + [-pharyngeal] or [+pharyngeal] + [+pharyngeal].

Table 3.5 some examples of [+pharyngeal] + [-pharyngeal] or [+pharyngeal] + [+pharyngeal] cluster in HYA:

<table>
<thead>
<tr>
<th>Cluster type</th>
<th>Examples</th>
<th>The result</th>
</tr>
</thead>
</table>
| **Identical in place and manner** | (d+tˤ) in /ʔahmad+tˤaːt/  
(z+sˤ) in /ʕaziːz+sˤabbanuh/  
(ʃ+h) in /samiːʃ+hunuːn/  
(h+ʃ) in /samiːh+ʃaːtabuh/  
(s+ δ) in /bas+ δˤiḥk/  
(sˤ + δ) in /naːqisˤ + δˤirs/  
(sˤ+δ) in /ʔlba:sˤ+δˤahhiːn/  
(sˤ+z) in /maqasˤ +zaːjid/ | C1 voiceless  |
| **Identical in place**    | (sˤ+d) in /ba:sˤ+dahhaːn/                                               | C1 voicing |
The voicing value of [-/+ continent pharyngeal] is not preserved in clusters across word boundaries that are sharing identical place and manner regardless of whether it originates on the first or second consonant but if the cluster members are not identical in place and manner, [-/+ continent pharyngeal] value is preserved. Why does this happen? Even when pharyngeal sounds share the place of articulation of non-pharyngeal sounds, there are complicated conditions to voicing. It is worth mentioning that, the articulation of each is slightly different. Zawaydeh’s (1999) definition of the emphatic and gutturals including the features, UVT (Upper Vocal Tract) and LVT (Lower Vocal Tract) in the place of the oral and pharyngeal features, are commonly used to denote the articulators. During the articulation of emphatic pharyngeal sounds, the tongue root touches the back of the mouth (pharynx). The emphatics share the gutturals’ primary place of articulation with their secondary place of articulation. This explains why they behave the same way like other guttural pharyngeal sounds with regard to the process of RAV. The gutturals and emphatics show the asymmetries inherent in the segmental representation.

### 3.9 Voicing Assimilation in HYA in OT Framework

There have been many linguistic analyses of RAV using the mechanisms of Optimality Theory (Prince and Smolensky and McCarthy and Prince, 1993). In the area of
phonology, OT has proved to be significant and helpful in providing a universal typology across the world languages. The theory introduces constraints and constraint ranking instead of rules or rule ordering and some of these constraints behave in a conflicting manner because satisfying one constraint will lead to violation of the other. So, the constraint which are almost the same in all languages, have to be re-ranked according to the language system and rules. In Yemeni Arabic Dialect the voicing assimilation might have a different order of constraints or constraint ranking from other languages in the world. These constraints conditioning assimilation processes or their ranking might be different from one Yemeni dialect to another as well.

3.10 OT analysis

To analyze laryngeal assimilation within Optimality Theory (Prince & Smolensky, 1993), we will find that Laryngeal features are often restricted in coda position; the constraints restrict features from appearing in coda position whether these constraints are negative, (as in Ito, 1986) or positive, (as in Lombardi, 1991, 1995a). In HYA, the voicing assimilation pattern shows that a segment in an onset in a pre-sonorant position retains its underlying specifications for voice. This can be presented by the positional faithfulness constraint (Ident Onst Lar) proposed by Beckman (1997) and adopted by Lombardi (1999) in her analysis of voice assimilation in obstruent clusters. We will use this constraint and the constraint IDENT (Lar). The constraint IDENT (Lar) requires that input and output segments have the same laryngeal specification. These two constraints reflecting the direction of voicing assimilation are defined below:
• Ident(voice)/Onset-IO: Onsets should be faithful to underlying laryngeal specification
• Ident(voice)-IO: Consonants should be faithful to underlying laryngeal specification

Tableau 3.1 Direction of obstructed voicing assimilation in HYA

<table>
<thead>
<tr>
<th>Input: /raqad+ta:mir/</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ئراق.تامير</td>
<td></td>
<td>*(t)</td>
</tr>
<tr>
<td>b. رق.تامير</td>
<td>*(t)!</td>
<td>*(t)</td>
</tr>
</tbody>
</table>

Candidate a. is the optimal one because it satisfies the highest constraint in the hierarchy, Ident(voice)/Onset-IO. This constraint must be inviolate because the direction of assimilation is always regressive in the dialect. Candidate b. is ruled out for having an onset that is not faithful to its input, hence, violating the highest constraint in the hierarchy.

In the above tableau, however, having only two faithfulness constraints and no markedness constraint, a fully faithful candidate c.[ra.qad.ta:.mir], for instance, would have won the competition even over candidate a. for satisfying all constraints. Hence, it would have been selected as optimal. Therefore, a markedness constraint prohibiting such candidates in the surface has to be introduced.

3.10.1 Non-emphatic [-pharyngeal] obstruents in HYA

In all the examples we have discussed so far, local assimilation process occur where two adjacent obstruent agree in their specification for the laryngeal feature. The consonant
cluster members must be identical in place (i.e., Agree in place). The following constraint, which I proposed, is similar to the general constraint, ‘AGREE’, but with a little change.

This constraint is:

\[ *[-\text{phar}, \alpha\text{Place}, \beta\text{Voice}][-\text{phar}, \alpha\text{Place}, -\beta\text{Voice}] \]

Do not have adjacent obstruent sounds ([son][son]) at the same place of articulation ([\alpha\text{Place}] [\alpha\text{Place}]) with opposing values for voicing ([\beta\text{Voice}][-\beta\text{Voice}]). This constraint correctly predicts the result we get in the case of HYA obstruent voicing regressive assimilation (emphatic and non-emphatic consonant).

The significance of [\alpha\text{Place}] in the constraint is to ensure that it only applies to segments which bear the same place of articulation. The notation for distinct places would, thus, be [\alpha\text{Place}][\beta\text{Place}]. The same goes for voicing. Different variable is used just to indicate that the two values are not dependent on one another. Since voicing is a binary feature, [\beta\text{Voice}][-\beta\text{Voice}] signifies that the adjacent segments have opposite values for voice.

\[ *[-\text{phar}, \alpha\text{Place}, \beta\text{Voice}][-\text{phar}, \alpha\text{Place}, -\beta\text{Voice}], \quad \text{Ident(voice)} \quad \text{Onset-IO} \] \[ \text{Ident(voice)-IO} \]

This is shown in the following tableaux (3.2, 3.4, and 5);
Tableau 3.2 Total Regressive voicing assimilation of (voiceless stop + voiced stop) cluster

<table>
<thead>
<tr>
<th>Input: /jillat+dama:r/</th>
<th>*-phar,αPlace,βVoice][-phar,αPlace,-βVoice]</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. fil.lad.da.ma:r</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. fil.lat.ta.ma:r</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>C. fil.lat.da.ma:r</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>

Tableau 3.3 Regressive voicing assimilation of (voiced stop – voiceless stop) cluster

<table>
<thead>
<tr>
<th>Input: /raqad+ta:mir/</th>
<th>*-phar,αPlace,βVoice][-phar,αPlace,-βVoice]</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ra.qat.ta:.mer</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. ra.qad.da:.mer</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>c. raqad.ta:.mer</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>

Tableau 3.4 Regressive voicing assimilation of (voiceless fricative +voiced fricative) cluster

<table>
<thead>
<tr>
<th>Input: /bas+zaffah/</th>
<th>*-phar,αPlace,βVoice][-phar,αPlace,-βVoice]</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. baz.zaf.fa</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. bas.saf.fa</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>c. bas.zaf.fa</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>
Table 3.5 Regressive voicing assimilation of (voiced fricative + voiceless fricative) cluster

<table>
<thead>
<tr>
<th>Input: /buz+sa:mi/</th>
<th>*[- phar,αPlace,βVoice][-phar,αPlace,-βVoice]</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ṇbus.sa:.mi</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. buz.za:.mi</td>
<td></td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>c. buz.sa:.mi</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

In tableaux 2, 3, 4, 5, candidates a. are the optimal outputs because they satisfy the two high ranked constraints; *[-phar, αPlace, βVoice] [-phar, αPlace,-βVoice] and Ident (voice) Onset-IO. The obstruent clusters satisfied the high ranked constraint because they are identical in term of place. They do not violate the constraint Ident (voice) Onset-IO because the onset is always the trigger of the voicing processes. Candidates b. show the progressive direction which violates the constraint Ident (voice) Onset-IO. The candidates c. where the non-emphatic obstruent cluster are not identical in place, violate the high ranked constraint*[-phar,αPlace,βVoice][-phar,αPlace,-βVoice].

Tableau 3.6 Regressive voicing assimilation of (voiceless stop + voiced fricative) cluster

<table>
<thead>
<tr>
<th>Input: /madrasat+zajn/</th>
<th>*[- phar,αPlace,βVoice][-phar,αPlace,-βVoice]</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ṇmad.ra.sad.zajn</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. mad.ra.sat.tajn</td>
<td></td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>a. mad.ra.sat.zajn</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

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Tableau 3.7 Regressive voicing assimilation of (voiced fricative + voiceless stop) cluster

<table>
<thead>
<tr>
<th>Input: /buz+ta:mir/</th>
<th>*[- phar, αPlace, βVoice] [- phar, αPlace, -βVoice]</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. bus.ta:mer</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. buz.da:mer</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>a. buz.ta:mer</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

In tableaux 6 and 7, we have a sequence of obstruents at the same place of articulation that underlyingly disagrees in voicing and manner. The optimal candidates in the tableau are not faithful, and do not violate our markedness constraint. In OT, any change from an underlying form to the surface form involves a violation of a faithfulness constraint (IDENT) which must be forced by some higher ranked markedness (AGREE) constraint (Bakovic 2006).

The positional variant (Ident (voice)/Onset-IO) and the general variant (*[-phar, αPlace, βVoice] [-phar, αPlace, -βVoice]) do not conflict, but rather stand in a harmonic bounding relationship. And the ranking which can be gleaned from these basic examples of emphatic obstruent cluster is;

*[- phar, αPlace, βVoice] [-phar, αPlace, -βVoice] >> IDLar.

There are cases where there is no assimilation because the obstruent cluster disagrees in place. The essential standard Agree (voice) constraint will be included for these cases and

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we will see that it must be ranked below Ident (voice) since it does not force voice assimilation in the absence of place identity. This is notified in tableaux 3.8 and 3.9 below:

- The constraint hierarchy:

\[*[-phar, aPlace, βVoice][-phar,aPlace,-βVoice], Ident(voice) Onset-IO>> Ident(voice)-IO>> Agree(voice)\]

Tableau 3.8 Regressive voice assimilation blocked in the absence of place identity (voiceless stop + voiced labial)

<table>
<thead>
<tr>
<th>Input: /fil.lat.ba:sim/</th>
<th>“Agree(voice)/Place”</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident (voice)-IO</th>
<th>“Agree(voice)”</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ʃil.lat.ba:.sem</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>b. ʃil.lab.ba:.sem</td>
<td>*!</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>c. ʃil.lat.ta:.sem</td>
<td>*!</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Tableau 3.9 Regressive voice assimilation blocked in the absence of place identity (voiceless fricative + voiced labial)

<table>
<thead>
<tr>
<th>Input: /muəllao+baramu:da/</th>
<th>“Agree(voice)/Place”</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident (voice)-IO</th>
<th>“Agree(voice)”</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ʃuəuəl.lao.ba.ruəu:da</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>b. mu.oal.lab.ba.ru:.da</td>
<td>*!</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>c. mu.oal.lao.oa.ru:.da</td>
<td>*!</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
In tableau 3.8 and 3.9 above, there is a voice disagreement between emphatic obstruents. This happens always they disagree in place. In this case, the constraint Agree (voice) is ranked below Ident (voice), since the former does not force voice assimilation in the absence of place identity. This proves that in the obstruent-cluster voicing case, the general condition of similarity between the trigger and the target of assimilation: the more similar the two segments are, the more likely they are to assimilate. Sonority Similarity is an additional condition for voicing assimilation.

In HYA, voicing assimilation is blocked between segments of asymmetric sonority value (obstruent - sonorant consonant clusters). The voicing assimilation is functional among segments of the same sonority value and is blocked between segments of asymmetric sonority value. Sonorants do not neutralize in syllable-final position since the Voice Constraint applies only to the obstruent (Dutta, 2011).

The constraint [-son][-son] > [-son] [+son] which makes AGREE stronger between similar constituents that have same sonority value, has to be added for those cases of asymmetric sonority value.

*-phar, aPlace, βVoice]*-phar,aPlace,-βVoice]*-son][-son]>*-son][+son], Ident(voice)

Onset-IO>> Ident(voice)-IO>> Agree(voice)
Tableau 3.10 Obstruent voicing assimilation is blocked with sonorant

<table>
<thead>
<tr>
<th>Input: /fillat+nu:r /</th>
<th>“Agree(voice)/Place”</th>
<th>Ident (voice)/Onset-IO</th>
<th>Ident (voice)IO</th>
<th>“Agree(voice)”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*[−son, αPlace, βVoice]</td>
<td>[-son][−son] &gt; [−son] [+son]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.  ﹝fil.lat.nu:r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.  ﹝fil.lat.tu:r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.  ﹝fil.lad.nu:r</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In tableau 3.10 above, candidate a is the optimal because it satisfies all the constraints in the tableau. The surface output is fully faithful to the underlying form. It does not incur any violation against the faithfulness constraints or the markedeness ones.

3.10.2 Pharyngeal sounds in HYA:

The same conditions apply also with pharyngeal sounds (k, g, ؟, ḥ, q, χ, ṭ) and the emphatic pharyngeal sounds (tˤ, δˤ, sˤ), but not only the place in each example is essential; the manner is essential too for the voicing. These pharyngeal sounds behave differently from other obstruent sounds. The voicing value of [-+/ continent pharyngeal] sound is not preserved with a consonant that is not identical with it in place and manner. Yet, the value is preserved when the clusters are not identical. Dual articulatory sounds do not behave in the same way like other non-emphatic coronals sounds in the process of voicing assimilation. There are obvious segmental behaviour asymmetries in the process of voicing assimilation. Consequently, the following constraint must be high ranked and it has the following signification:

* [+Phar, αPlace/manner, βVoice] [-Phar, αPlace/manner, -βVoice]
“Do not have adjacent obstruents cluster of (+pharyngeal/–pharyngeal) with the same place and manner of articulation, ([αPlace/manner][αPlace/manner]), and with opposing values for voicing, ([βVoice][–βVoice]).”

*+[Phar,αPlace/manner,βVoice][–Phar,αPlace/manner,–βVoice]>> Ident(voice)-IO

Notice the tableaux (11, 12 and 13):

Tableau 3.11 Regressive voicing assimilation blocked in pharyngeal cluster:

<table>
<thead>
<tr>
<th>Input: /ʔalsamak + ʁa:li /</th>
<th>“Agree(voice)/Place”</th>
<th>“Agree(voice)/Place/manner”</th>
<th>Ident(voice)/Onset-IO</th>
<th>“Agree(voice)”</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ʔas.samak.ʁa:li</td>
<td>*[-phar,αPlace,βVoice]</td>
<td>*[+Phar,αPlace/manner,βVoice][–Phar,αPlace/manner,–βVoice]</td>
<td>Ident(voice)I O</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. ʔas.samak.ʁa:li</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. ʔas.samak.ʁa:li</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Tableau 3.12 Regressive voicing assimilation triggered by pharyngeal uvular voiced sound /ʁ/:
Tableau 3.13 Regressive voicing assimilation triggered by voiceless pharyngeal consonant sound /h/

<table>
<thead>
<tr>
<th>Input:/sa:miʔ + hanu:n/</th>
<th>“Agree(voice)/Place”</th>
<th>“Agree(voice)/Place/manner”</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)IO</th>
<th>“Agree(voice)”</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. saː miʔ ha.nu:n</td>
<td>*[−phar,αPlace,βVoice]</td>
<td>*[+Phar,αPlace/manner,βVoice]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. saː miʔ a.nu:n</td>
<td>⋆</td>
<td>*</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>c. saː miʔ ha.nu:n</td>
<td>⋆</td>
<td>⋆</td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

In tableau 3.11, there is no difference between the underlying form and the surface structure in candidate a. Candidate a. is the optimal because it violates only the lowest-ranked constraint. The two pharyngeal sounds are not identical in place and manner which is why there is no Agree in voicing. In the two tableaux 3.12 and 3.13, candidate a. is also the optimal. It shows a voicing assimilation between two segments identical in place and manner.

3.10.3 Emphatic Pharyngeal Sounds and Regressive Assimilation in HYA

The same ranking holds true:

*[-phar,αPlace,βVoice][−phar,αPlace,−βVoice], *[+Phar,αPlace/manner,βVoice][−Phar,αPlace/ manner,-βVoice], [-son][−son]>[-son] [+son], Ident(voice) Onset-IO>> Ident(voice)-IO>> Agree(voice)
The following tableaux (14 and 15) show cluster of emphatic pharyngeal sounds and non-emphatic sounds:

Tableau 3.14 Regressive voicing assimilation in (+/-pharyngeal) cluster:

<table>
<thead>
<tr>
<th>Input/maqasˤ+za:jid/</th>
<th>“Agree(voice)/Place”</th>
<th>“Agree(voice)/Place/manner”</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)IO</th>
<th>“Agree(voice)”</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ma.qaz.za:jed</td>
<td>*[phar,αPlace,βVoice]</td>
<td>*[Phar,αPlace/manner,βVoice]</td>
<td>*</td>
<td>*</td>
<td>*[sonorant, βVoice]</td>
</tr>
<tr>
<td>b. ma.qasˤ. sʔa:jed</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>![Image]</td>
</tr>
<tr>
<td>c. ma.qasˤ.za:jed</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>![Image]</td>
</tr>
</tbody>
</table>

Tableau 3.15 Regressive voicing assimilation in pharyngeal cluster:

<table>
<thead>
<tr>
<th>/na:qisˤ+ðˤirs/</th>
<th>“Agree(voice)/Place”</th>
<th>“Agree(voice)/Place/manner”</th>
<th>Ident(voice)/Onset-IO</th>
<th>Ident(voice)IO</th>
<th>“Agree(voice)”</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. na:qiz.ðˤers</td>
<td>*[phar,αPlace,βVoice]</td>
<td>*[Phar,αPlace/manner,βVoice]</td>
<td>*</td>
<td>*</td>
<td>*[sonorant, βVoice]</td>
</tr>
<tr>
<td>b. na:qis.ʔˤers</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>![Image]</td>
</tr>
<tr>
<td>c. na:qis.ðˤers</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>![Image]</td>
</tr>
</tbody>
</table>

Candidate a. is the optimal candidate in the two tableaux above. Notice that in tableau 3.15, in the input/na:qisˤ+ðˤirs/, even though the sound in the coda of the first word and the sound in the following onset are both emphatic pharyngeal sounds, there is no assimilation. This is because they are not identical in manner. The two constraints Ident (voice)-IO and Agree (voice) determine the optimal candidate because they are in conflict with the positional variant constraints. The constraint Ident (voice) Onset-IO is the one
which determines the direction of the voicing assimilation. However, the three constraints*[-phant, αPlace, βVoice][phant, αPlace, βVoice], *[+Phar, αPlace/manner, βVoice][Phar, αPlace/manner, -βVoice] and [son][son] > [son] [+son], mostly stand in a harmonic bounding relationship.

3.10.4 Glottal Sounds in HYA

There is no voicing assimilation with the sounds /h,ʔ/, within the word and across word boundaries inspite of the fact that they are identical in place. In the onset position the sounds /h/ and /ʔ/ are maintained and they are deleted in the coda position. In general, the /h/ sound is perceptually a weak sound and it is subject to deletion in many languages. The glottal sound /ʔ/ is deleted in coda positions and the vowel which precedes the deleted glottal is lengthened. It is attested in all prosodic positions in classical Arabic known as ‘hamza’. This sound in most of Yemeni dialects is deleted in coda position. Thus, the sound /h/ and /ʔ/ are not affected by voicing assimilation. The two sounds become weak when they occur in weak positions and totally disappear, but in the strong positions they are maintained intact (neither deleted nor affected by assimilation). These asymmetric behavioural patterns interpret the notion of phonological strength. The same ranking is used in the following tableau:

*[-phant, αPlace, βVoice][-phant, αPlace, -βVoice], *[+Phar, αPlace/manner, βVoice]

[-Phar, αPlace/manner, -βVoice] >> Ident (voice) Onset-IO >> Ident (voice)-IO >> Agree(voice)
Tableau 3.16 No Regressive voice assimilation triggered by the voiceless laryngeal sound /h/ (onset position)

<table>
<thead>
<tr>
<th>Input: /sabaʔ+halleh/</th>
<th>“Agree(voice)/Place”</th>
<th>“Agree(voice)/Place/manner”</th>
<th>Ident (voice)/Onset-IO</th>
<th>Ident (voice)/IO</th>
<th>“Agree(voice)”</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. sa.ba.hal.leh</td>
<td>*[-phar,αPlace,βVoice]</td>
<td>[+Phar,αPlace/manner,βVoice]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. sa.baʔ.hal.leh</td>
<td>[-phar,αPlace,βVoice]</td>
<td>[-Phar,αPlace/manner,-βVoice]</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. sa.baʔ.ʔal.leh</td>
<td></td>
<td></td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>d. sa.baʔ.hal.leh</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

Candidate a., which has satisfied all constraints in the tableau, is selected optional. No assimilation takes place, because the coda is deleted in the surface output. The sound /h/ is maintained in the onset position which supports the high ranking of the constraints Ident (voice)/Onset-IO.

The final hierarchy needed for the analysis of RAV in HYA is:

*[-phar,αPlace,βVoice][-phar,αPlace,-βVoice],* [+Phar,αPlace/manner,βVoice][-Phar,αPlace/manner,-βVoice], [-son][-son] >> [-son] [+son] >> Ident(voice) Onset-IO >> Ident(voice)-IO >> Agree(voice)
3.11 Conclusion

- In HYA most obstruent clusters undergo RAV.
- The process of RAV in HYA can be explained in the framework of privative feature, as proposed by (Steriade, 1987, Clements, 1987 and Lombardi, 1991).
- The constraint\([\text{-phar, } \alpha\text{Place}, \beta\text{Voice}]\)\([\text{-phar, } \alpha\text{Place}, \beta\text{Voice}]\) can perfectly predict the voicing pattern of the dialect.
- Sonorants do not participate in the process of voicing assimilation because voicing assimilation is functional only among segments of the same sonority value, and is blocked between segments of asymmetric sonority value.
- Voicing value of \([\text{-/+ continent}]\) pharyngeal is not preserved in clusters across word boundaries that are sharing identical place and manner, regardless of whether it originates on the first or second consonant. Yet, if the cluster members are not identical in place and manner, \([\text{-/+ continent}]\), pharyngeal value is preserved.
- Emphatics behave in the same way like other guttural pharyngeal sounds with regard to the process of voicing assimilation.
- The degree of similarity between the trigger and the target of assimilation is very effective in the process of voicing assimilation in HYA and determines partial or total assimilation: the more similar two segments are, the more likely they are to assimilate.