CHAPTER TWO
LITERATURE REVIEW

2.1 Literature Review

In terms of positional asymmetry and onset-coda licensing asymmetry, there is no research work that has yet been done on a phonological process like voicing assimilation in Hugaryyah Yemeni Arabic, to the best of my knowledge. However, there are studies pertaining to positional asymmetry and onset-coda licensing patterns in other languages.

2.1.1 Positional Faithfulness Theory

This theory is one of the most successful extensions to faithfulness constraints which are relative to certain phonological positions. We can have more faithfulness on those specific positions than for others. The term is coined by Beckman (1998), who also provided many examples. The positions concerned are typically more prominent positions in the output; these prominent positions allow more complex (marked) structure than non-prominent positions. It has an effect that some marked vowels and consonants can occur in more prominent positions, but not in less prominent positions. The positional faithfulness theory (Beckman 1995, 1998) is an approach which works with OT to solve the positional neutralization’s problem (Trubetskoy, 1939). To account for positional neutralization, we have to summarize the typological asymmetry of the neutralization. One language has a contrast in all positions of a word, another language has a contrast in no positions and a language has a positional neutralization, with the contrast in a strong position only. (Beckman, 1995).
However, no language has a contrast only in weak position. Therefore, the constraints should be designed with no ranking corresponds to a language that maintains a featural contrast in only a weak position. So, we find that this theory is the solution that has been given for the problem of positional neutralization. Beckman captures different ranking of constraints to capture the asymmetrical nature of positional neutralization. No ranking of these constraints produce a language with a contrast in weak positions only. This crucial restriction on positional faithfulness constraints is only available for strong positions.

2.1.2 Positional Licensing Theory and Onset-Coda Asymmetry

In Prosodic Licensing Theory, developed by Goldsmith (1989, 1990), onset/coda asymmetry in feature distribution is captured by syllable templates that incorporate positive licensing statements. Place features are licensed only by the onset position. Coda place of articulation is permitted in the event that the place features are linked to the following onset. Onset positions admit a more marked segmental inventory than do non-onset positions, and this is investigated in many cases of positional privilege in phonology (Itô’s, 1986). On the other hand, coda consonant is less faithful to the underlying structure, and frequently undergoes neutralization, or assimilating to the following onset. Onsets permit a broader range of contrasts than codas, trigger and resist phonological processes, and these are the three aspects of positional privilege. The onset-coda asymmetry is demonstrated by voice and place assimilation in many languages. In the voice assimilation, there is the German coda neutralization of voicing, (Beckman, 1998). Regressive assimilation in polish: the voiceless obstruent is necessarily voiced when followed by a voiced obstruent (Beckman, 1998). In place assimilation, nasal
consonants in Diola Fogny assimilate place of articulation to the following obstruents and nasals (Beckman, 1998). In the case of Diola Fogny, the feature of the onset consonant is maintained, and those of the coda consonant are forfeited. The triggering is frequently ruled by prominent position and not by non-prominent position; assimilation is regressive in hetero-syllabic clusters and not progressive. This is explained in positional faithfulness analysis; the absence of progressive assimilation in hetero-syllabic clusters is because onset features must be preserved by virtue of high-ranking IDENT-ONSET (F) constraints (Lombardi, 1995a, 1996 and Padgett, 1995). So, the privileged status of onset voiced obstruent in German and Polish results from the positional constraint IDENT-ONSET (voice).

2.1.3 Steriade Cue-Based Approach

Steriade (1997) proposes a cue-based theory of neutralization contexts as an alternative to syllable-driven models, concentrating on the universal aspects of the role of phonetic context in determining laryngeal neutralization in a plosive. ‘Licensing by cue’ claims that features are licensed in some positions. These positions are only those where phonetic conditions give them strength perceptually. Consequently, the features are not licensed in those positions where they are less perceptually strong. (Steriades, 1997). That is why assimilation can be related to strength asymmetries and best characterized as a phonetic or a phonological property. Steriade (1997) argues that cross-linguistically, the prominence of one feature with the same position in many languages is not haphazard but it is licensed preferentially. So, phonetic cues are functional and responsible for the prominent features and their perception. Steriade claims that perceptual factors are
responsible for assigning a particular position strong or weak and the features are licensed in those positions where phonetic conditions make them perceptually prominent. The perception of phonological similarity is influenced by auditory factors such as the availability of cues to the relevant contrast and the perceptual factors are responsible for determining the direction of assimilation (Steriade, 2000).

This ‘perceptual cues’ is one reason out of many, in which phonology can be affected by phonetics. A lot of proposals argue that phonological distinctions are prone to neutralization in a position where their cues are not saliently perceived (Boersma, 1998, Padgett, 2002, Steriade, 1995, 1997, Zhang, 2000 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 (Benkí, 2003, Fujimura et al., 1978). Building on these observations, Steriade (2001) proposes the P-map hypothesis within the framework of OT. Different theories address this issue from various perspectives, out of which we can mention P-map Theory, (Steriade), Dispersion Theory, (Flemming) etc.

2.1.4 P-map and Strength Asymmetries:

The P-map is ‘the repository of speakers’ knowledge, rooted in observation and inference that certain contrasts are more discriminalble than others (Steriade, 2001). From this point of similarity, a faithfulness constraint ranking is projected. In the alternations, it involves different degrees of perceptibility changes, the more salient perceptible change an alternation involves, the higher-ranked faithfulness constraint it violates. For example, a voicing contrast is more saliently perceived prevocally than preconsonantally. For
instance, the contrast is more perceptible between [pa] ~ [ba] than the contrast between [apta] ~ [abta] (Steriade 1997). Based on this knowledge of similarity, the faithfulness ranking is Faith (voi)/ _ V » Faith (voi)/ _C. Therefore, a voicing contrast is more prone to neutralization in preconsonantal position than in prevocalic position (Steriade 2001). P-map projects correspondence constraints and determines their ranking. It is a set of statements about relative perceptibility of different contrasts, across the different contexts where they might occur (Steriade, 2001). The P-map theory gives less diversity than predicted by versions of OT.

2.1.5 Barnes’ Hypothesis

Barnes (2006) refers to the initial consonants and claims that initial strengthening influence always the onset consonants. This claim also supports the licensing asymmetries in the initial position (Byrd, 2000; Cho and Jun, 2000; Fougeron and Keating, 1996). Barnes declared that two positions, stressed syllable and initial syllable, undergo phonetic strength. That is why both Positional Augmentation and Positional Strength processes should select onset consonants. He assumes that word-initial vowels are characterized by greater duration. So, it is shown that the initial syllable is the strongest licensor and in charge of licensing asymmetries. It is either the phonetic factors or morphological factors that account for phonologization of the patterns.

2.1.6 Optimality Theory and Onset-Coda Licensing

A number of studies on onset coda licensing asymmetries in generative phonological studies analyse the asymmetries on the basis of positional licensing or
positional markedness statements. The two (positive and negative) licensing approaches struggle against the occurrence of marked feature in the weak position (coda position). In (1989) Ito’s negative licensing, which is performed by the Coda Cond, always prevent any feature specification in coda. In the positive licensing approach (prosodic licensing), that is developed by Goldsmith, (1990), ruling the feature distribution of in onset coda asymmetries is captured by syllable templates which combine positive and negative licensing approach.

But with optimality theory, new approaches occurred such as onset – specific faithfulness which is required to account for coda/onset asymmetries. In Optimality Theory, as explained by Beckman (1998), the two strategies that are used to account for onset/coda asymmetries, are Positional Markedness and Positional Faithfulness. Within Optimality Theory, positional faithfulness suggests that onset/coda asymmetries exist not because place features are prohibited in codas, but rather that they are preferentially preserved in onsets, and less guarded in other positions. Positional Faithfulness theory generates and explains the range of positional asymmetries attested in natural language phonology.

Then Ito’s Coda Cond is formalized by Smolensky (1995), as the local conjunction as shown below:

CODA COND

[NoCoda & *Place]

A segment that is in coda position and a bearer of place features violates the Coda Cond. OT gives the alternative proponent (positional faithfulness) that preserves the place feature in onset and this makes onset/coda asymmetries occur. The onset positions are always privileged perceptually by virtue of their release whereas the coda lacks release;
the release burst is absent and reduced which deprives it from special faithfulness properties. The high-ranking of onset faithfulness constraints permits various phonological contrasts in onset position.

2.2 Related Works

Al-suswah (1984), analysed the sound system of Thamaari Yemeni Arabic (TYA) in detail in his MA dissertation entitled "Dhamari Dialect: A Descriptive Phonological Study". He examined the syllable structure of nouns, verbs, demonstrative pronouns, relative pronouns, and adjectives and attested the phonological and phonetic aspects of the language. Al-suswah briefly investigated the voicing and unvoicing processes and pointed out that the process of voicing affects only some voiceless obstruents when they are followed by specific voiced obstruents.

E.g.,

- The voiceless sound /t/ becomes voiced when it is followed by /z, ɡ/, (ji+ (t) zawwag).
- The voiceless sound /tˤ/ becomes voiced when it is followed by /d/, (χala (tˤ) +daqqah).
- The voiceless sound /h/ becomes voiced when it comes between two vowels, (naa(h) i).

He also pointed out that the voiced sounds are devoiced when they come at the end of words (when it is not stressed, preceded by a voiced consonant or followed by a voiceless consonant).
E.g.,

- The voiced sound /d/ is devoiced when it is followed by the voiceless sounds /k,t,ɻ,s,ʃ/ within the word, as in (ji+ (d) ki), (qa(d)+tab), (qa(d)+ ɻufuħ), (qa(d)+ sawwad) and (qa(d)+ ʃāsi:r).

- The voiced sound /b/is devoiced when it is followed by the voiceless obstruent sounds /s,ʃ,t/, like (ka (b) ʃ), (ji+(b)sir).

- The voiced fricative sound /ð/ is devoiced when it is followed by the voiceless obstruent /t/, like (ji+(ð)tabih)

He discussed in general the voicing and devoicing processes and provided a lot of examples from Thamari Yemeni Arabic. It is interesting to notice that, in all the examples mentioned in his dissertation the voicing and devoicing happen regressively and not progressively. It means that only the weak positions undergo voicing assimilation in the dialect but not the strong positions such as the onset. In all the examples discussed, the voicing assimilation occurred between two obstruent consonants sharing the same place of articulation. There are a lot of similarities in the behaviour of obstruents in the voicing assimilation in Hugaryyah Yemeni Arabic and Thamaari Yemeni Arabic. He concludes that voicing assimilation mostly happens between two obstruents which share the same place of articulation and some manners. His conclusion clearly supports my findings which are discussed in chapter three.

Another thesis entitled “Assimilation in classical Arabic”, by Abdulrahman Ibrahim Alfozan (1989), examines the phenomenon of assimilation in classical Arabic. In his thesis, Alfozan goes through the definitions, aspects, direction of assimilation
(regressive or progressive or in both directions) and different types of assimilation. The main aim of his work is to discuss the sound changes in Arabic. The occurrence of the consonants with each other (in the same root) or their influence on each other when they occur adjacently, are the two main points that are discussed in the study. He proves that the behaviour of different sounds, with regard to assimilation, is not the same. He explains in detail the differences in the behaviour of different sounds and compares this with the views of the early Arabic linguists. He does not focus on voicing assimilation, but he focuses on the direction of assimilation. He proves that the direction is forward in 35 cases out of a total of 98, i. e., the direction of assimilation is more to be backward. In 42 cases out of a total of 98, assimilation is homorganical. Comparing the results of the directionality, it is clear that the strong position in the most cases is the one which controls the direction of assimilation. He examines 183 examples to see which type or types of assimilation occur more commonly than others. He concludes that when two sounds undergo assimilation, the weaker is more commonly changed to the stronger. However, what is interesting to mention here is that, he stated that the consonants assimilate to homorganic consonants more than they do to consonants articulated forward. He tested the occurrence of regressive assimilation and he noticed that it is more frequent than that of progressive assimilation. He found that the number of cases is 163 where regressive assimilation is involved, and it is in only 20 cases where progressive assimilation is involved. In fact, various segmental and positional asymmetries are clearly reflected in his investigation and results which support my study.

Abu Mansour (1996) also tested voicing assimilation in some dialects of Arabic (Daragozu, Makkah Arabic, Maltese Arabic and Sudanese Arabic), and found
out that gutturals pattern like obstruent with the exception of one guttural sound /h/ in Daragozu and Maltese Arabic. In other dialects like Sudanese, he mentioned that only pharyngeal sounds are not influenced by voicing assimilation; all other sounds of gutturals such as sonorants in the syllable coda in Makkān Arabic pattern similarly. Thus, guattural sounds make big difference in their behaviour with obstruent or sonorant from one language to another.

Beckman (1998) improved the theory of positional faithfulness which elucidates and clarifies the different kinds of positional asymmetries. Beckman debates that positional faithfulness gives a clear explanation for the attested onset/coda asymmetries which is not explained by licensing alternatives. He proves that Faithfulness to the prominent positions comes basically from the perspective of psycholinguistic properties rather than phonetic properties. Beckman (1998) proves that perceptually or psycholinguistically in prominent positions, a variety of phonological asymmetries occur. In these positions, segmental contrasts are maintained.

Frequently, segments in these prominent positions trigger assimilation processes. In the positional faithfulness theory of contrast (which is firstly applied to coda/onset asymmetries by Lombardi 1995a, b), the perceptual prominent position (onsets) are received in the form of phonological faithfulness, represented by three aspects of positional privilege: licensing of contrasts, triggering, and resistance to phonological processes (Beckman 1998). Syllable onsets differ from syllable codas in permitting a broader range of phonological features and contrasts to surface. Beckman gives examples from many languages such as German, Dutch and Catalan, in which the contrast between
voiced and voiceless obstruent is instantiated only in onset position, with coda obstruent undergoing neutralization. In Catalan there is a contrast in the language between voiced and voiceless obstruent; this contrast is neutralized in word final position, and more generally, in coda position. There is a process of voice assimilation which applies in obstruent-obstruent clusters, the voiceless obstruents surface as voiced when followed by a voiced obstruent; voiced obstruents devoice when they preceed a voiceless consonant.

Thus, the three patterns Positional privilege is evident and visible in the three aspects, in the Catalan voicing system. The first pattern is the contrast between voiced and voiceless obstruent which is neutralized in syllable coda position, the second pattern is the consonant in onset position which triggers spreading of laryngeal features and the third pattern is the fact that it is the coda consonants, rather than those in onset position which are subject to assimilation. These patterns of positional privilege show a reflection of the high-ranking positional faithfulness constraint, IDENT-ONSET (voice), (Beckman 1998). In Catalan language, the coda and onset positional assymetries resulted from the interaction of the positional and context-free faithfulness constraints with the markedness constraints which disfavour the disharmonic obstruent clusters. The high-ranking IDENT-ONSET(voice), saves obstruents in the onset position from undergoing either neutralization, (thereby permitting the full range of voicing contrasts in onset position), or assimilation, (thus generating invariant regressive assimilation).

Nadhim (2000) provides a phonological and phonetic analysis of Taizzi dialect. In his dissertation, he worked on the vowels and consonants of YA providing a comparative study of consonant clustering in YA and RP. In the analysis, however, he focuses mostly on the place of assimilation and does not give much attention to the
voicing assimilation in YA. He states that, in Arabic language, voiced to voiceless change and vice versa play only a minor role in assimilation.

Dutta (2010), adopted the hypothesis that there are asymmetric articulatory and acoustic properties in the patterning of segmental speech sounds. This patterning explains the organization of the speech sounds that follows a particular trend. Phonological processes such as: assimilation, spirantization, gemination, aspiration and h-deletion are included in his study to prove the notion of phonological strength. For example, in assimilation, segments having the same sonority value are essential for functioning voicing assimilation. Voicing assimilation is blocked between the segments of asymmetric sonority value. He proves that the constraint AGREE is stronger between constituents having same sonority value.

\[-\text{son}\] \[-\text{son}\] \text{> [son]} \text{[+son]}.

Dvořák (2010) states in his study entitled “Voicing Assimilation in Czech”, that the language has a regressive voicing assimilation in obstruent clusters, devoicing of obstruent(s) at the end of prosodic words, and no syllable-final devoicing. Obstruents behave regularly in the process of voicing assimilation, except some consonants such as \([v, r\) and \(h]\). According to Dvořák (2010), sonorants do not participate with voicing assimilation in the language. He argues that sonorants are exempt from voicing assimilation not only due to the fact of applying the constraint AGREE (LAR) to obstruents, but also according to Lombardi’s (1991) view that sonorants do not have the voicing value of a voiced obstruent. Lombardi (1991) assumes that sonorants are not marked underlyingly with \([\text{voice}]\) feature. With the existence of voiceless sonorants which is highly marked, voicing is predictable in sonorants and the feature \([\text{voice}]\) is
redundant. So, Dvořák wanted to develop the constraint IdentONSET (LAR) and replace it with IdentPRESION (LAR).

In fact, the constraint IdentONSET (LAR) accounts for the fact why voicing assimilation is always regressive except in special circumstances, (Lombardi 1996). She proves that progressive assimilation requires additional restrictions and conditions and thus requires the action of more constraints. Lombardi proposes some constraints with the framework of Optimality Theory and these constraints, (positional faithfulness and markedness), interact with each other to attest the pattern of voicing agreement in obstruent clusters.

Kabra (2011) points out, in her paper entitled ‘‘Regressive voicing assimilation in Cairene Arabic’’, that voicing contrast is licensed in obstruents in most positions, and all obstruents, with no exception, agree in voicing. In Cairene, the direction of voicing assimilation is always regressive. She examines it in the framework of Optimality Theory and concludes that adjacent obstruents which differ in underlying voicing always agree in voicing on the surface structure. Yet, what is different in her study from other studies in the literature on Arabic linguistics is that she divides the guttural sounds into two classes; one group of sounds pattern with sonorant consonants, and another undergo voicing assimilation.

Tryambak (2012), in his work ‘Positional Asymmetry and Onset Coda Licensing: Evidence from Varhadi and Marathi’, proves that a language like Marathi goes against the view of positional faithfulness and positional privilege. He gives instances of retroflexion, a progressive assimilation in Marathi, (which proves that not only the positional strength is responsible for the direction of assimilation but that segmental
internal strength also plays an important role in this process). He supports the view of positional strength asymmetry by analyzing the phonological process of deletion in Varhadi, and regressive assimilation in Marathi.

2.3 General Observations and Conclusions

In the positional faithfulness theory of contrast and neutralization, the perceptual prominence of syllable onsets is cashed out in the form of enhanced phonological faithfulness, instantiated by the three aspects of positional privilege: licensing of contrast, triggering of phonological processes, and resistance to phonological processes (Lombardi 1995, for laryngeal features). The analysis of this theory predicts that the spreading will regress from onset to coda, because the features of the onset are preferentially maintained due to the high ranking of IDENT-ONSET(voice). Both voiced and voiceless clusters are permitted with voicing crucially determined by the voicing of the onset. Nevertheless, the prevailing alternative to the positional faithfulness analysis of coda/onset asymmetries is that of positional licensing, (Itô, 1986, 1989; Goldsmith, 1989, 1990; Lombardi, 1991; Itô & Mester, 1993, 1994, 1997; Flemming, 1993; Steriade, 1995).

The positional licensing approach assumes that all phonological features must be licensed by virtue of association to some prosodic position which is a legitimate licensor. In the case of onset/coda asymmetries, the onset is the position of licensing; marked feature specifications are prohibited or severely restricted in coda position. Beckman explained two basic implementations of positional licensing theory, proposed by Itô (1986, 1989). This is summarized in table 2.1 below:
Table 2.1 The basic implementations of positional licensing theory (Source: Itô 1986, 1989)

<table>
<thead>
<tr>
<th>Negative constraint</th>
<th>Positive licensing constraint</th>
</tr>
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<tbody>
<tr>
<td>Prohibits some marked feature specification or specifications from appearing in the coda.</td>
<td>Requires that any [voice] feature which is present in coda be licensed by association to a pre-sonorant onset consonant.</td>
</tr>
<tr>
<td>Coda Condition (CODACOND)</td>
<td>Licensing configuration for [voice]</td>
</tr>
</tbody>
</table>

\[
*C\sigma
\]

\[
[\text{voice}]
\]

\[
[-\text{son}] \quad [+\text{son}]
\]

\[
\text{Voice}
\]

From this table, it is obvious that the two approaches reflect the same core notion. The Licensing theory cannot account for the pervasive regressive direction of assimilation in consonant clusters; both the positive and the negative licensing formulation require only that a [voice] feature be associated to some onset position, (Beckman, 1998). It means the source of the voice specification in question is not relevant in Licensing Theory. The differences between the two theories emerge when the focus is shifted to voice assimilation. Beckman assumes the differences through his analysis of the actual facts of Catalan language. Licensing theory cannot accurately predict the direction of assimilation; it only predicts that all disharmonic clusters surface as uniformly voiceless. Even with the addition of a directional constraint ALIGN ([voice], L, PWd, L) in Catalan language which generates the correct result, this spreading constraint does not explain why assimilation in consonant clusters is almost exclusively regressive. It only stipulates
the direction of spread. This is the big difference between positional licensing and positional faithfulness theory. Licensing theory must explain and show why the corresponding ALIGN-R constraint is rarely attested in natural language. Positional faithfulness explains why the coda obstruent is always unfaithful. This is because IDENT-ONSET (voice) outranks IDENT (voice) which reflects that onsets are held to higher standards of faithfulness than are codas. The positional faithfulness view of Beckman (1998) emphasizes upon the positions which play a crucial role in the patterning and the distribution of sounds. Strong or weak licensing capacities are realized as an inherent abstract property of a given position supplied by UG. In contrast, Steriade’s (1997) ‘Licensing by cue’ focuses more upon the perceptual cues rather than the positional privilege, and moreover, these perceptual cues are assigned a phonetic justification.