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Laryngeal Metathesis in Saraiki Language

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Abstract

This study presents an analysis of synchronic metathesis in the Saraiki language based on the Optimality Theory (OT) approach. It is limited to the voiced laryngeal fricative (/ɦ/). Only voiced phonemes are the targets of /ɦ/ metathesis in Saraiki (resulting in breathy voiced consonants), while voiceless plosives are incompatible with this process. Metathesized and non-metathesized forms both occur in Saraiki. They are realized in informal and formal speech styles, respectively. This study analyses the informal speech style and identifies the reasons behind the movement of the above laryngeal fricative in phonetic optimization.

Keywords: laryngeals, formal speech, informal speech, metathesis, Optimality Theory (OT), Saraiki, speech styles, stylistic variation, synchronic variation

Introduction

Metathesis is a process in which either the linear order of sounds is changed or speakers swap two sounds when speaking quickly. The process often occurs as a historical change shaping the grammar of a language. It may also occur synchronically because of perceptual or articulatory reasons (examples from the literature are given in (1a)) and also as a synchronic process in (1b).

(1) a. e.g. Middle English bryd → Modern English bird (Ritt, 2012)
Marathi, o̰ɭ^{h}→ho̰ɭ (Blevins & Garrett, 1998)

b. e.g. Rotuman panas → pansa (Blevins & Garrett, 1998)
Balochi wapsag → waspag (Baloch et al., 2017)

Even though metathesis is not uncommon in different languages, this process received little attention in the past from linguists as compared to other phonological processes frequently discussed in the literature, such as assimilation, vowel harmony, and tone sandhi. Recently, however,

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metathesis has received more attention, focusing on the question why it occurs at all, it's diachronic and/or synchronic status, and how it should be analyzed (see e.g., Buckley, 2011; Mielke & Hume, 2001).

Why does metathesis occur? There are many types of metathesis including perceptual, co-articulatory, auditory, and compensatory metathesis (Blevins & Garrett, 2004). Perceptual metathesis occurs when a perceptually prominent feature of a phoneme, such as retroflection, rhoticity, stridency, or aspiration is required to move to a (more) prominent position. Diachronically, for instance in the development from Sanskrit to Marathi, 'duhitr' became 'd^{h}u:v' 'daughter' (it is shown below that this parallels the synchronic process in Saraiki). In Marathi, aspiration is shifted to the word initial position. Co-articulatory metathesis occurs when listeners perceive, and subsequently produce, a sequence of sounds as overlapping or switching, such as [pk] as [kp] (Blevins & Garrett, 2004), for example, in the Micronesian language Mokilese /apkas/ alternates with [akpas] 'now'. According to the above authors, this kind of metathesis normally occurs with respect to partially overlapping consonants. Auditory metathesis occurs in stop-sibilant sequences such as [sk]~[ks], where the order of the segments is relatively hard to hear. Examples of such a metathesis are commonly found in Saraiki, such as the pronunciation of /rikʃa/ as [riʃka] and in many other languages. Finally, in compensatory metathesis, weak vowels transfer their features to vowels in a strong(er) (stressed) position. Blevins and Garrett (1998) provided data from Rotuman which includes examples of compensatory metathesis[1].

In the literature, different feature models (Clements, 1985) and rule-based theories, such as Chomsky and Halle (1968) do not have a clear-cut illustration for metathesis. SPE famously resorted to transformational rules to handle this kind of process (see SPE: p. 361). On the other hand, various other approaches including Multiple Grammars Theory (Anttila, 2007), Partially Ordered Constraints (Anttila, 1997; Kiparsky, 1994), Floating Constraints (Nagy & Reynolds, 1997), Stochastic OT (Boersma, 1997;

[1]Metathesis mainly occurs because of speakers' indeterminacy about a segment's position (Hume, 2004). This also frequently happens in L2 acquisition or loanword incorporation. When a listener or L2 learner is unsure about the structure or sequence of sounds, s/he will perceive and produce it as a pattern which is not only close to the target pattern but is also attested in their native language. An example is the realization of English /gæləri/ *gallery* as Saraiki [gærli] and /desk/ as [deks.]

Boersma & Hayes, 2001), and Optimality Theory (Prince & Smolensky, 1993, 2004) treat language variations very well. The current study selected the Optimality theory approach to analyse the metathesis process in Saraiki. OT analyses metathesis in an elaborate way in the form of constraints and these constraints are universal. For instance, in Armenian, *Cr clusters are disfavoured and resolved by epenthesis and subsequent metathesis (Picard, 1989), such as [tra] as [at.ra] 'tear'. In Optimality Theory (OT), this can be analysed as the effect of a markedness constraint *Cr (in general *CC) against such clusters. Thus, languages may change marked structures to unmarked ones. As a result, certain segments are metathesized. In this study, OT approach was used to analyse the metathesis of /ɦ/ in Saraiki.

Saraiki language offers a special case of laryngeal metathesis by which the /ɦ/ sound can seemingly move into both (backward and forward) directions. Most importantly, metathesis varies in Saraiki, that is, non-metathesized forms occur in formal style (which also incorporates the written form of the language) and metathesized forms occur in informal speech (in daily conversation). Although, Saraiki is a relatively undescribed language, still one can find a body of literary prose and poetry. This study identifies the written form with formal style and spoken form with informal style, as mentioned earlier. Both styles can be analysed as interactions of a small number of natural markedness and correspondence constraints (as in Correspondence Theory (CT); see McCarthy & Prince, 1993, 1995; Prince & Smolensky, 1993). Since CT accounts for input-output relations by means of a universal set of constraints ranked in a language-specific way, it may help to understand the phenomenon of metathesis from a more general perspective. This study, therefore, also contributes to an understanding of how different speech styles are related or treated in OT.

Research Questions

The current study addresses the following research questions:

1. What is the direction of movement of laryngeal fricative in Saraiki metathesis?
2. Which position(s) in a word/syllable is/(are) most the likely target(s) of metathesis?
3. What triggers metathesis in Saraiki?

Research Objectives

The objectives of the study are as follows:

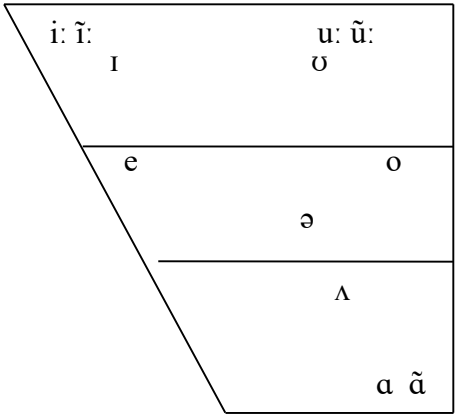
1. Find out the direction of movement of laryngeal fricative in Saraiki metathesis.
2. Identify the target landing position in word or syllable during the process of metathesis.
3. Investigate the triggers which cause metathesis.

This paper is organized as follows: Section 2 introduces Saraiki phonology briefly, Section 3 explains the research methodology and theoretical framework, Section 4 presents data analysis and discussion, and Section 5 concludes the paper.

Introduction to Saraiki Phonology

Saraiki is an Indo-Aryan language spoken in India and Pakistan (Shackle, 1976). In Pakistan, it is spoken in all four provinces with the majority of its speakers residing in southern Punjab. The language has a rich phonemic inventory (enriched with implosives) and a large number of breathy voiced consonants. Six dialects of Saraiki can be distinguished. The current study focused on the central dialect spoken in the northeren parts of Dera Ghazi khan, Bahawalpur, and Multan. This dialect has 49 consonants and 12 vowels. The Saraiki phonemic inventory is given below in (2) and (3).

(2) Saraiki Vowel Inventory



Vocalic Inventory of Saraiki Language

The vocalic chart of Saraiki language shows the oral nasal contrast of cardinal vowels. Saraiki also shows a contrast of long and short vowels.

(3) Saraiki Consonant System

	Labial	Labio-dental	Dental and alveolar	Retroflex	Palatal	Velar	Glottal
Plosive/ affricates	p b pʰ bʱ		t̪ d̪ t̪ʰ d̪ʱ	ʈ ɖ ʈʰ ɖʱ	ʧ ʤ[2] ʧʰ ʤʱ	k g kʰ gʱ	
Implosive	ɓ		ɗ		ʄ	ɠ	
Nasal	m mʱ		n nʱ	ɳ ɳʱ	ɲ ɲʱ	ŋ	
Tap or flap			ɾ ɾʱ	ɽ ɽʱ			
Fricative		f	s z		ʃ	x ɣ	ɦ
Approximant		ʋʱ ʋ	l lʱ		j		

As the consonant chart shows, Saraiki presents a six-way laryngeal contrast for the stop series, namely plain voiceless, plain voiced, aspirated voiceless, voiced aspirated (often called breathy voiced), and implosive-explosive. Almost all sonorants also show a plain-breathy contrast. It is crucial to note that no lexeme (word) starts with breathy sonorant phonemes in Saraiki.

Syllable Structure

A wide variety of syllable structures is acceptable in Saraiki. In monosyllabic words, syllables of up to CCVCC complexity are acceptable. Trisyllabic and longer words that sometimes show a trill, which is the only consonant that can be syllabic, are also attested (Atta, 2019; Atta et al., 2022). Trill is an allophone of flap or tap (see consonant chart above) and is realized after dental plosives. Syllable structures strictly follow the sonority principle; however, some exceptions are also noted. No word in Saraiki starts with a breathy sonorant including nasals, approximants, rhotic consonants, and laterals. Similarly, only labial (m) and alveolar (n) nasals occur on every position (onset, coda) of the word, while other nasals (palatal velar and retroflex) are never observed at the word initial position. These sounds often occur word medially or finally. Moreover, clusters on margins

[2] Nihalani, (1995). uses the symbols [c ɟ cʰ ɟʱ] for palatal plosives in Sindhi (an Indo-Aryan language), but Hussain, (2018). argues that in Indo-Iranian languages 'palatals are the only stop series that are produced as postalveolar affricates' and thus transcribes them as [ʧ ʧh ʤ ʤɦ]. In this article, we follow Hussain (2018: 286).

are only limited to CC, while CCC occurs word medially and is split by word boundary as in C.CC.

Research Methodology

Saraiki metathesis is unique because it involves different kinds of segments. The most common type of metathesis and the one analysed here involves the voiced glottal fricative /ɦ/[3], although liquids and obstruents can also undergo the process in specific circumstances. It is interesting to note that the Saraiki language only has a voiced segment /ɦ/ and lacks the voiceless laryngeal fricative /h/ (see consonant chart above). Data for this research was collected from daily conversations and from the native speakers of Saraiki language. The current authors themselves are the native speakers of Saraiki language.

In Saraiki, metathesis often occurs in informal speech. In fact, the process is so frequent that sometimes speakers are confused about the "official/formal"[4] and the metathesized form of words. In this process, [ɦ] in syllable-final position moves either towards the left or the right position within the word. Often it moves over one segment, although in some cases this movement can also be observed over two segments. An important point is that laryngeal fricative only targets *voiced phonemes* and changes them into voiced aspirated segments. If there is no suitable landing environment, [ɦ] tends to retain its position but never moves towards voiceless consonants (although voiceless aspirated consonants are allowed in the language, see the consonant chart above). In the case of verbs, the transposition of [ɦ] most often occurs after adding a suffix. The preferred direction of movement seems to be rightward, although leftward displacement of [ɦ] also occurs. The data is categorized from formal to informal speech style into three steps: (4a) shows the rightward movement of [ɦ], (4b) presents the leftward movement of the laryngeal fricative, and (4c) presents the rightward direction of [ɦ] movement but after adding suffixes. The root words in these examples have [ɦ] on the coda position, such as "koɦ" which

[3] Metathesis of laryngeal segments also occurs in other languages "such as Rendille Hume, E. (1997). Towards an Explanation of Consonant/Consonant Metathesis. Ms, The Ohio State University. In., Blangoa Hock, H. H. (1985). Regular metathesis. Linguistics, 23(4), 529-546. , and Hungarian, Pawnee and Basa Hume, E. (2004). The indeterminacy/attestation model of metathesis. Language, 80(2), 203-237. ", etc).

4 Here, an "official" form of Saraiki refers to the formal/written literature (such as prose and poetry).

moves to the suffix 'ʋẽ.ɖɑ' (as given in 4c) and becomes the secondary articulation of the neighboring sound. The fact of interest is that both forms are acceptable in the same language, albeit in different speech styles. Informal data is taken from the daily conversation of native speakers.

(1) a. Formal/written Informal/spoken

ʈaɦ.li	ʈɑ.lʱi	'a tree'
ʋaɦ.ɽɑ	ʋɑ.ɽʱɑ	'calf'
rəɦ.ʋɑ	rə.ʋʱɑ	'plant'
ʤaɦ.ɳɑ̃	ʤɑ.ɳʱɑ	'ornament'
rʌɦ.mẽ	ra.mʱẽ	'a name' (oblique case)
niːɦ.ɽẽ	niː.ɽʱẽ	'channels'(plural, oblique case)

b.

ũn.ɦẽ	ɦũ.nẽ	'their'
ũn.ɦɑ.lɑ	ɦũ.nɑ.lɑ	'summer'
ũɦ.ɖɑ	ɦũɖɑ	'his/her'
ɓil.ɦɑ	ɓi.lʱɑ	'have a seat'
pʌnj.ɦɑ	pʌn.jʱɑ	'fifty'

c.

koɦ.ʋẽ.ɖɑ	ku.ʋʱẽ.ɖɑ	'slaughter' (causative case)
rəɦ.ʋẽ.ɖɑ	rə.ʋʱẽ.ɖɑ	'cultivation'
ləɦ.ʋẽ.ɖɑ	lə.ʋʱẽ.ɖɑ	'put off' (causative case)

It is assumed that the formal speech style provides the basic (input) form and the informal speech style is derived from this form. However, from the point of view of O T, different speech styles are assumed to have different constraint hierarchies. Nevertheless, it would be very interesting to know how OT handles such issues if a single language has different speech styles or a mixture of two speech styles, since OT suggests one constraint ranking for one language or style. As it was discussed earlier, Saraiki has a literary body of prose and poetry. So, the informal speech style was considered as the output and analysed under OT.

Theoretical Framework

Prince and Smolensky (1993) introduced the Optimality Theory (OT), which is intended as a theory not only of phonology but also of linguistics in general. This approach is currently the mainstream theory in phonology and, therefore, deserves attention. OT is fundamentally different from previous 'rule-based' approaches (Chomsky & Halle, 1968) and other generative approaches, since it is exclusively based on 'constraints' (not

rules). OT is still a generative theory in its sense since it compares the 'underlying form' and 'surface form' in order to decide the correct output form. However, OT is a surface-based theory because it evaluates surface forms (and not underlying forms) based on constraints. This is exactly what is needed for the analysis of Saraiki metathesis. OT is grounded in faithfulness on the one hand and in well-formedness or markedness on the other hand (more on these terms below). Both of these concepts play an important role in the grammars of languages as opposing forces that serve the needs of both speakers and listeners (see also (van de Weijer, 2014, 2017)). As mentioned above, other phonological theories also strive to express universal generalizations. However, OT does this in a special way. It suggests that constraints themselves are universal (they hold for all languages) but their hierarchy in different languages is different.

OT embraces two types of universal constraint families, namely markedness and faithfulness. The concept of markedness is ambiguous (see also (Haspelmath, 2006), as it is a relative concept rather than an absolute one. It does not rule out particular segments or structures; rather, it identifies some segments and structures as more "marked" (more difficult to pronounce or hear or less frequent) than others. Like other constraints in OT, markedness constraints are universal and innate and are re-ranked within the existing system. In contrast to markedness, languages have another set of constraints which aim to preserve faithfulness. These constraints favour identical (or, if that is impossible, then similar) input and output forms to preserve lexical contrast. OT presents an explicit account of the elements in the grammar of a language (in terms of universal constraints), as well as an account of the differences between languages (the language-particular constraint hierarchy). Although, only two main families of constraints are involved, the theory is powerful enough to cover many aspects of language, especially in phonology. In the section below, data is analysed within the framework of OT.

Data Analysis

How is metathesis motivated? In (4), a laryngeal consonant moves towards either right or left, although always to an onset position. The first three examples in '4b' indicate that /ɦ/ skips over two segments in order to fill the empty onset position. However, these four examples do not follow the general pattern of metathesis as other examples do, clearly instructing that

the language prefers onset to coda at any cost. In other words, in optimality terms, this could be motivated by a constraint disallowing coda /ɦ/.

(2) Coda-Cond * ɦ] ("no syllable-final laryngeal fricative")

The constraint in (5) is natural. It holds for many other languages, for instance, laryngeal fricative is avoided in the coda position in English.

The alternative to pronouncing coda /ɦ/ is either delete the sound or to move it to a neighbouring consonant, where it is realised as a breathy voiced consonant which exists independently in the language (see consonant chart below). The breathy voiced consonants can be pronounced as either a cluster or as a single segment, since languages do not contrast these two possibilities in general (Kehrein & Golston, 2004). For Saraiki, it is assumed that these consonants are pronounced as single segments. Hence, a constraint that rules out complex segments is also assumed and stated below.

(3) *ComplexBreath * "no breathy voiced clusters or segments"

In forms that do not show metathesis, the constraint in (6) is high-ranked. In forms with breathy consonants, the constraint in (6) is violated and thus, has to be ranked lower. In other words, in syllables with a laryngeal coda, constraint (5) is violated. While, in words with a breathy cluster, constraint (6) is violated. Hence, one constraint is higher ranked for the formal style of Saraiki but the other is preferred for informal speech.

(**4**) Ranking for formal and informal speech

input: /ʊɑɦɽɑ /	Coda-Cond	*ComplexBreath
☞ [ʊɑɦ.ɽɑ]	*	
☞ [ʊɑ.ɽʱɑ]		*
[ʊʱɑ.ɽɑ]		*

In informal speech style, /ɦ/ moves to become a secondary articulation on a nearby segment. The question remains why [ʊʱɑ.ɽɑ] is not a possible output in (7). In this candidate, the input /ɦ/ needs to skip across the vowel to the onset position. This never happens and, therefore, a constraint that forbids this articulation is assumed (see below). In other words, a cluster comprising a consonant plus /ɦ/ can be realized in either order, consistent with Kehrein and Golston (2004).

(5) NoSkipping "/ɦ/ cannot cross a vowel"

This is also a natural constraint, since in most languages neither consonants nor vowels can be skipped. It is because the concept of metathesis is defined as the swapping of the CC or CV segment. A more technically adept formulation is also possible, involving a violation of contiguity and linearity (Kager, 2004), although the informal constraint is acceptable for the time being. Consider the examples in (4b), which show leftward movement of /ɦ/. In some examples, it skips over a vowel to satisfy the onset[5]. Moreover, it provides onsets to onsetless syllables which indicates that ONSET is a high-ranked constraint. In OT, it is expressed as follows:

(6) Onset ("syllables must have an onset")

This is also a universal constraint and followed by almost all languages of the world, for instance, Dutch has an enpenthetic /ʔ/ in onset position even though this sound is banned in the language (Anttila, 2007). Constraint (9) is satisfied in many cases but in some examples, it is also violated in formal speech. The hierarchy of these constraints is given in the table below.

(7) Metathesis for Onset of Syllables

input: /un.ɦɑ.lɑ/		Onset	NoSkipping
☞	[un.ɦɑ.lɑ]	*	
☞	[ɦun.ɑ.lɑ]		**

Saraiki language mostly prefers onset rather than onsetless syllables, therefore, ONSET is ranked high. Hence, [ɦ] moves towards voiced onsets but never towards the word initial onset. The second candidate incurrs one violation mark of the constraint 'NoSkipping', as the laryngeal fricative moves over two segments (one vowel) to fill the empty slot of the onset. Although, the violation of both of these constraints is acceptable in different speech styles but more than one violation of a single constraint is not acceptable. The question remains whether the movement of [ɦ] is limited to the word medial position. Here, it is answered with the help of two examples: 'ʊɑɦ.ɽɑ~ʊɑ.ɽʱɑ and 'un.ɦɑ.lɑ~ɦun.ɑ.lɑ'. If [ɦ] can move towards either direction and skip over a vowel then it needs to be answered why does it not land on the word initial onset in the first example. In the second

[5]One important point regarding this movement is that such examples are limited and may be these are the only examples in which laryngeal fricative moves to provide an onset to the onsetless syllable.

example, [ɦ] moves towards the onset and is not limited to the word medial position. Instead, it can move in either direction. The fact that [ɦ] only moves to the word initial onset if its position is empty but never towards the already present onsets is interesting. The favorite landing position of [ɦ] is voiced phonemes but never towards sonorants in word initial position. In OT, this is motivated as follows:

(8) *SONasp.Wordinitially "breathy sonorants are not allowed word initially"

Since voiceless or aspirated sonorants are very rare in the language, a prohibition against them is not particularly surprising. However, if this constraint is high-ranked, then words in which metathesis plays no role are also predicted to not allow breathy sonorants in word initial position. This prediction is correct for Saraiki, since all aspirated sonorants appear in medial or final position. Notably, Saraiki has a large number of lexical items with breathy voiced consonants as onsets. Likewise, in Saraiki, a voiceless consonant with a breathy release never occurs. In OT, this situation is motivated as follows:

(9) $*\underset{o}{C}^{ɦ}$ ("Voiceless consonant with breathy release are prohibited")

The above constraint is seemingly categorically marked in the language, as no word in both formal and informal styles is supposed to have such a sound. Another difference between formal and metathesized/informal speech style is the presence (versus the absence) of the clusters of laryngeal fricatives and a voiced phoneme, respectively. Generally, OT has the markedness constraint *COMPLEX to rally against such clusters. For the time being, this is specified as a constraint against clusters with /ɦ/ and a voiced phoneme in Saraiki.

(10) *Complexɦc/cɦ ("avoid cluster of Cɦ/ɦC")

Several repairing strategies, such as deletion, insertion, merging, and movement of sounds can satisfy this constraint. However, there are three possible and most common ways employed for this purpose, namely deletion, insertion, and movement to satisfy the markedness constraint. Three faithfulness constraints, which militate against deletion, movement of laryngeal consonant, and insertion are given below in (14), (15), and (16), respectively.

(11) MAX-IO "no deletion"

(12) Linearity (“no metathesis”)

(13) DEP-IO (“no insertion”)

The constraint in (14) is high ranked in both styles as there is no deletion. In the rest of the cases, where consonants change their positions, (15) is violated. The constraint DEP-IO is also high ranked as no insertion is noted in the output. All the above discussed constraints are conventional in both formal and informal speech styles. Interestingly, not all these constraints are equally important in all categories of data, some constraints might be higher in one category and low in other category. This controversy creates a problem for OT, which suggests that one variety of a language has one constraint hierarchy. The concept of different constraints rankings in one language has been discussed(Anttila, 2007). To resolve this problem, different constraints rankings for different speech styles have been proposed (see also van Oostendorp, 1998). The output or the metathesized form of the above data under OT has been analysed as the constraint ranking of language /becomes explicit from the data of formal speech. The analysis of informal speech makes it clear which is why these changes are noticed and equally acceptable in Saraiki language.

Since there is a difference between formal and informal speech styles and informal speech is thought of as more “unmarked” intuitively, so markedness constraints would be expected to be ranked higher. This is exactly what the current study found to be the case in Saraiki. The constraint *Complexɦc/cɦ is higher ranked in informal speech than in formal speech. The key point is that in almost all cases of informal speech (except in (4c)) *ComplexBreath plays a crucial role. In the table below, an example of informal speech from (4b) is reflected.

(14) Regressive movement of ɦ for Onset requirements

Input/ũn.ɦa.la/	*SONasp.Wordinitially	*Complexɦc/cɦ	Onset	MAX-IO	*ComplexBreath	NO Skipping	Linearity
☞ ɦũ.na.la						*	**
ũn.ɦa.la		*!	*				
ũ.n^{ɦ}a.la			*!		*		
ũn.a.la			*!	*			

***SONasp.Wordinitially>*Complexɦc/cɦ> Onset> MAX-IO> *ComplexBreath> NO Skipping> Linearity**

A piece of evidence that distinguishes the optimal candidate from the input is the presence of onset and the absence of complex clusters. The winner candidate has the onset and violates two low ranked constraints, whereas the second candidate incurs the violation of a high ranked constraint that allows no cluster of Cɦ or ɦC. The remaining candidates are ruled out as they violate high ranked constraints ONSET and MAX-IO, respectively. Before taking this constraint hierarchy as a representation of informal speech, another example is presented from category (4a) in the table below.

(15) Progressive movement of ɦ to avoid coda

Input /ʋaɦ.ɽa/	*SONasp. Wordinitially	*Complex ɦc/cɦ	Onset	MAX-IO	*ComplexBreath	*Skipping	Linearity
☞ ʋa.ɽʱa					*		*
ʋaɦ.ɽa		*!					
ʋʱa.ɽa	*!				*	*	**
ʋa.ɽa				*!			

The optimal candidate satisfies all the high ranked constraints in the above table, while other contenders violate one or two high ranked constraints. The candidate [ʋʱa.ɽa] in Table (18) confirms the bidirectional movement of /ɦ/ but is not a winner candidate. It indicates that the constraint '*SonAsp.Wordinitially' is categorically marked and strictly followed in all cases. A similar situation is noted in English where no English word begins with [ʒ] (although there might be some loanwords in English such as 'genre' that begin with this sound) and velar nasal consonants. Moreover, in Urdu (an Indo-Aryan language), retroflex /ɽ/ never occurs at the word initial position. It shows that this constraint ranks equally high in both formal and informal speech styles. Now, assume the constraint ranking for all categories (except 4c which shows a different behaviour in informal speech) by adding a categorical constraint that represents informal speech in the subsequent table.

(16) Detailed constraint ranking

Input /ʈaɦ.li/	*SonAspWord initially	*Complex ɦc/cɦ	Onset	Coda-Cond	MAX-IO	NO Skipping	*Complex Breath	Linearity
☞ ʈa.lʱi							*	*
☹ ʈʱa.li						*	*	**
ʈa.liɦ				*!				**

Input /ʈaɦ.li/	*SonAspWord initially	*Complex ɦc/cɦ	Onset	Coda-Cond	MAX-IO	NO Skipping	*Complex Breath	Linearity
Input /oɦ.d̪a/		*!						
☞ ɦo.d̪a						*	*	*
o.d̪ʱa			*!				*	
Input /rəɦ.ʋẽ.d̪a/		*						
☞rə.ʋʱẽ.d̪a							*	*
rʱə.ʋẽ.d̪a	*!					*	*	**

***SONasp.Wordinitially >*Complexɦcɦ > Onset > Coda-cond > MAX-IO > NO Skipping >*ComplexBreath > Linearity**

The above constraint ranking helps to select the optimal candidate from all the three categories and the remaining participants are excluded because of one or more violations of high ranked constraints. Among all, one contender [ʈʱɑ.li] in the above table is neither accepted nor rejected, although it violates none of the high ranked constraints. This point also clarifies why only a voiced phoneme is compatible for the landing of voiced glottal fricative. The examples listed below, in which /ɦ/ retains its position if the only choice of a landing site are voiceless stops and opt voiced in case of both, comprise the evidence for the above contention.

(17) kəpɑɦ *kʱəpɑ/*kəpʱɑ ‘cotton’
gɑɦ.kẽ *gɑkʱẽ /gʱɑkẽ ‘customers’
mu.ʈɑɦ.rɑ muʈɑrʱɑ/*muʈʱɑrɑ ‘rod’
kuʈi:ɦɽẽ kuʈi:ɽʱẽ/*kuʈʱi:ɽẽ ‘dogs’
kəʈiɦre kəʈirʱe/ *kʱəʈire/ kəʈʱire ‘witness box’

The voiceless segments following/preceding the glottal fricative (/ɦ/) are not allowed to land. Hence, the question arises why voiced phonemes in metathesized form are accaptable for landing /ɦ/ and the voiceless ones are not? This is because the combination of [-voice] and [+voice] is not allowed in Saraiki, since segmnets are either voiced (/gʱ/) or voiceless (/kʰ/). The consonant /kʱ/ is such a sound having both features (/k/ voiceless and /ɦ/ voiced); therefore, it is not a part of the Saraiki language inventory. It is not only absent in Saraiki but also rarely found in other world languages. Only two languages, namely Javanese and Changchow, apparently have this phoneme (Maddieson, 1984).

(18) Examples of progressive movement of ɦ towards

Input /ʈɑɦ.li/	*SonAsp. Wordinitially	*$_{o}C^{ɦ}$	*Complex ɦc/cɦ	Onset	Coda-Cond	MAX-IO	*Complex Breath	NO Skipping	Linearity
ʈɑɦ.li			*!						
☞ ʈɑ.l^{ɦ}i							*		*
ʈ^{ɦ}ɑ.li		*!							**
ɑ.liɦ					*!			*	**
ʈɑ.li						*!			
Input /oɦ.ɖɑ/			*!						
☞ ɦo.ɖɑ							*	*	**
o.ɖɑ						*!			
o.ɖ^{ɦ}ɑ				*!					
Input /rəɦ.ʋẽ.ɖɑ/			*!						
☞rə.ʋ^{ɦ}ẽ.ɖɑ							*		*
r^{ɦ}ə.ʋẽ.ɖɑ	*!						*	*	**

Although Saraiki has aspirated phonemes but there exists a clear cut difference between /k^{h}/ and /$k^{ɦ}$/. The segment /k^{h}/ is voiceless aspirated, while /$k^{ɦ}$/ is a voiceless plosive with a breathy release. Here, another constraint '***$_{o}$C^{ɦ}**' plays a key role and answers why voiceless plosives block the movement of the laryngeal fricative and why voiced phonemes are compatible for their landing. The situation is expounded in the table above.

Consequently, the above analysis presumes a constraint hierarchy for the informal speech of all categories. In the above table, the constraints *SonAsp.Wordinitially and *$_{o}$C^{ɦ} are categorically marked in language. Therefore, no candidate from both formal and informal speech styles violates them. On the contrary, the last three constraints are ranked low. Therefore, their violation is acceptable. Thus, no winner violates any high ranked constraint in the above table.

(19) OT Grammar: Informal Speech Style

***SonAsp.Wordinitially > *$_{o}$C^{ɦ} >*Complexɦc/cɦ >Onset > Coda-Cond > Max-IO >*ComplexBreath > NO Skipping > Linearity**

The above hierarchy helps to find the winners in informal speech; however, this ranking yields some contradictory results for the language itself. This is because some constraints such as *SonAsp.Wordinitially and *$_{o}$C^{ɦ} are categorically high ranked in the language, while others such as *Complexɦc/cɦ are violated in the overall situation in informal speech. Likewise, the low ranked constraint *ComplexBreath beats with the structure allowed in formal speech. The conflict between '*ComplexBreath' and '*Complexɦc/cɦ' is strongly noted in the above discussion in both formal and informal speech styles. If the two constraints are in conflict and either of them may win at the evaluation time, then both have a winning probability of 50% (Anttila, 2007). However, optionality is gradient for speakers. Hence, one form may occur in 80% of cases and the other in 20% of cases (Boersma, 1997). Interestingly, in this situation, both these constraints show markedness and are part of the Saraiki grammar (constraints are universal in classical OT). Although, they differ strongly for the two speech styles. For the current data, preference is given to '*Complexɦc/cɦ' over '*ComplexBreath' in informal speech style. However, at the same time, the language allows breathy consonants in grammar (as discussed earlier). This is the key point which drives metathesis in informal speech. Yet, the answer to 'why' metathesis occurs

still remains elusive. If the OT grammar of informal speech is investigated, all the high ranked constraints are marked (except Max-IO) and related to the marked structure of either sounds or syllables. The markedness constraints presume that the difference between the two forms (formal and informal) involves a structural change. One involves marked structure, while other involves unmarked structure. However, the problem is that no word in unmetathesized form has an ill-formed structure regarding syllables and clusters. Since informal speech is relatively unmarked, therefore, some marked structures are deformed or unmarked.

In Saraiki, /ɦ/ is an unstable sound. For instance, in English, /r/ is intrusive and deleted in different words (in different situations). A similar kind of situation in Saraiki is depicted with the instability and bidirectional movement of /ɦ/ (see the data above). In English, the instability of [r] is related to structural changes (lenition or strong phonological positions) or to perceptual reasons. However, presumably for Saraiki, the movement of /ɦ/ occurs because of its weak phonological place or position in the word, where its presence in not audible. Therefore, /ɦ/ changes its place phonologically and enhances its presence phonetically (in the appropriate context). The same process is also noted in English where glottal fricative is prohibited in the coda position because this position is perceptually weak. It makes it clear that for the sake of phonetic optimization, structural changes happen in informal speech style in Saraiki. For these structural changes, /ɦ/ is the easiest target. It may be compared to 'r-metathesis in English' discussed by Czaplicki (2013). In English, according to Czaplicki, the behavior of [r] shows signs of instability (it is deleted, inserted, and moves towards left or right).

r-metathesis in English (Czaplicki, 2013)

Old English	Middle English	Modern English
bridd, bird	bryd, byrd	bird
drit,	dirt	dirt
fresc, fersc	fersch, fresch	fresh

Often, metathesis occurs to make the segments perceptually salient, as stated by Hume. This fact is also noted in Saraiki. According to Wright (2001), there are some segments which are inherently salient as fricatives. Contrarily, some contexts provide better perceptual cues than others. In Saraiki metathesis, both segments and context are involved, that is, /ɦ/ needs

context for its better perceptual cues. Being a placeless consonant, it is essential for /ɦ/ to have a strong context and position. Therefore, in all cases, either /ɦ/ moves or it already occupies a prominent position in a word. However, its perceptual cues become more protuberant when it becomes a secondary articulation of a nearby consonant (towards right or left), which has a strong position. Ohala (1993) named this phenomenon as 'perceptual hypercorrection', indicating that speakers avoid difficult structures to follow easy ones, unconsciously. It is debatable whether the structure '*ComplexBreath' is easier for Saraiki speakers as compared to the structure '*Complexɦc/cɦ'. If this prediction is true, then it must hold in all cases where ɦc/cɦ structure exists. However, other cases where the laryngeal fricative retains its position or is deleted do not confirm the above prediction.

Such predictions and discussions lead toward a new perspective that this phenomenon is not a metathesis at all; rather, the laryngeal fricative is used as a variant (as a segment or secondary articulator) in Saraiki. Such variations can be studied from different social perspectives including sex, age, and social status (Anttila, 1997). In the situation where it becomes the secondary articulation of a nearby segment, these two forms (complex breath and complex cluster) are not differentiated for the speakers. The fact that no minimal pair is found in the language constitutes the evidence. Without feeling any remarkable difference, native speakers sometimes produce these either as a cluster or as a single segment or as a combination of both. Therefore, this variant behaves differently in different situations without losing the meanings of words.

Formal speech depicts the grammar of the language which gives preference to preserving the maximal structure of words. However, it does not mean that high-ranked constraints are always strictly followed in every speech style, for example, *ComplexBreath indicates that the language does not allow breathy voiced sounds at all. Instead, it is a matter of preference and the frequency of occurrence. It is a fact that the frequency of occurrence of sounds, words, and combination of sounds is related to speaker/listener's sensitivity Ohala (1993).

Conclusion

In this article, metathesis in Saraiki was explored but the process was limited to the synchronic movement of the voiced laryngeal fricative. In

synchronic metathesis, only voiced phonemes are the target of /ɦ/, while voiceless plosives are not a possible landing site. Interestingly, no metathesis occurs in the laryngeal fricative movement; rather, speakers unconcsiously use both forms without any possibility of semantic loss or change. Future research with respect to other languages is needed to validate this finding.

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