DEGLOTTALIZATION IN MEHRI

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1. INTRODUCTION[1]

Goals

- Present the phonology of the "emphatic" consonants in Mehri (Modern South Arabian), including recent acoustic data (Watson and Bellem 2010, 2011)
- Argue that the emphatics are underlyingly ejective and are predictably deglottalized due to articulatory and perceptual factors
- Propose that the synchronic alternation in the realization of the glottalic feature is a function of the diachronic loss of the feature (deglottalization)
- Develop an Optimality Theoretic analysis of this deglottalization

Outline of Presentation

- (§2)   Problem overview, data, and proposal
- (§3)   Analysis of deglottalization
- (§4)   Framing the analysis in Optimality Theory
- (§5)   Deglottalization as a diachronic process
- (§6)   Conclusion

II. THE PROBLEM

2.1 "Emphatic" Semitic consonants

- Traditional label given to a class of consonants by Semiticists
- Emphatics vary in place, manner, and voicing but tend to behave as a natural class (McCarthy 1994)
- Pharyngealized in Arabic; glottalized in EthioSemitic

2.2 Emphatic consonants in Mehri

Mehri = Modern South Arabian

- Unwritten, spoken in southern Arabian peninsula
- Dialect differences in Omani and Yemeni Mehri
    - This project discusses Mehri generally, but will make note when data is unique to one dialect

/t', ð', s', ʃ, ɬ, k'/

- Vary in place, manner, and (possibly) voicing
- Behave as a natural class (Watson and Bellem 2010)
    - Do not geminate (similar to voiced obstruents)
    - Backing effect on succeeding vowels (similar to pharyngeals and velars)

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(1) Consonant Inventory of Mehri

	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Palatal	Velar	Pharyn-geal	Glottal
Plosive	b		t d t'				k g k'		ʔ
Nasal	m		n						
Tap			ɾ						
Fricative		f	θ ð ð'	s z s'	ʃ ʒ ʃ'		x ɣ	ħ ʕ	h
Affricate			dʒ						
Lateral Fricative			ɬ	ɬ'					
Approximate	(w)					j	(w)		
Lateral approximant			l						

Chart constructed from Watson (2012), Rubin (2010) and Simeone-Senelle (2011).

- Traditionally described as ejective by modern linguists beginning with Johnstone (1970)
- Johnstone (1975) describes the Mehri emphatics as ejectives that are weaker than the ejectives in EthioSemitic (Amharic)
- Simeone-Senelle states that the degree of glottalization varies by dialect and position of the consonant in the word (1997)
  o In the Mehri dialect of Qishn, the glottalization is not complete and the emphatics are realized as creaky voice or voiced
- Voicing = uncertain
  o "partially voiced" (Johnstone 1975)
  o "variable degrees of voicing" (W&B 2010)
  o the phoneme /ð'/ is sometimes transcribed as /θ'/ (Simeone-Senelle 1997, 2011; Rubin 2010)
- These descriptions are based on impressionistic evidence

2.3 Adding Watson and Bellem's data
- Recent acoustic data (W&B 2010, 2011) has suggested that these segments are not always ejective
- According to their data, /k'/ is ejective in all environments, while the coronal emphatics are ejective pre-pausally, but generally not word-initially or word-medially:

(2) a. /t'ajɾ/   [tajɾ]   "bird"
    b. /aʃ'o:baʕ/   [aʃo:baʕ]   "fingers"
    c. /ɬi:wo:t'/   [ɬi:wo:t']   "fire"
    d. /k'an:ət/   [k'an:ət^h]   "small"
    e. /ɬ'a/   [ɬa]   "name of letter ɬ'"
                                         (Watson and Bellem 2010)

- The coronal plosive is the most unpredictable in its glottalic feature.

- o   In Omani Mehri, the /t'/ is ejective in word-initial position and some intervocalic positions (Watson 2012)
- /s'/ and /ʃ/ can also be realized in Omani Mehri as the ejective affricate /ts'/ and /tʃ'/, respectively, in word-initial or final positions.
- When not ejective, the coronal emphatics are generally pharyngealized and sometimes voiced
- W&B use their acoustic data to argue that the Mehri emphatics have been consistently misanalyzed as ejective in the previous literature

Proposal:
The Mehri emphatics are underlyingly ejective ([CG] feature) but can surface as deglottalized in predictable phonological environments.
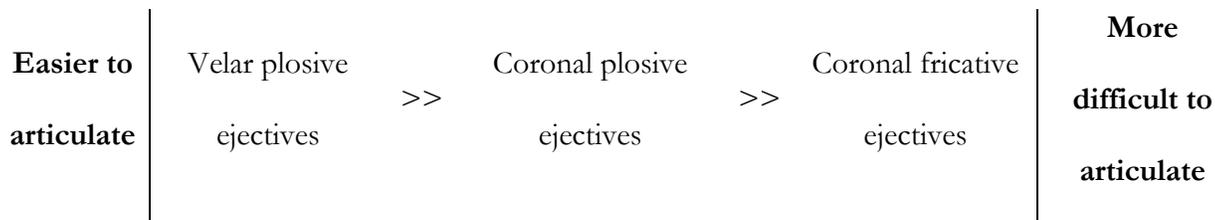
III. ANALYSIS
A successful analysis of the deglottalization in Mehri must incorporate both place/manner of articulation of the consonant and the position of the consonant within the utterance.

3.1 Articulatory factors in deglottalization: place/manner
- Velar ejectives are less marked than coronal ejectives because it is easier to raise air pressure in a smaller supralaryngeal cavity (Zsiga 2013 and others)
    - o   *Crosslinguistic evidence:* Tigre, Zayse, and South Avar demonstrate deglottalization in coronal ejectives (Fallon 2002)
    - o   Fallon (2002) proposes a coronal place specification to account for the deglottalization of Tigre coronal ejectives while maintaining the velar ejective
- Ejective stops are less marked than ejective fricatives because it is difficult to increase air pressure in the vocal tract while simultaneously allowing air to flow out of the mouth (Howe and Pulleyblank 2001, and others)
    - o   *Crosslinguistic evidence:* EthioSemitic languages tend to affricate their fricative ejectives (Shosten 2011)
- With the Mehri emphatic inventory, then, a rudimentary articulatory markedness scale would look as follows:

(3) Markedness scale of Mehri emphatics

Easier to **articulate**	Velar plosive ejectives	>>	Coronal plosive ejectives	>>	Coronal fricative ejectives	**More** **difficult to** **articulate**

- This scale mirrors the observed deglottalization in Mehri: the velar plosive is most likely to be glottalic, followed by the coronal plosive, and finally the coronal fricatives
- Thus the ejectives are predictably deglottalized along a markedness scale

We can now account for the place/manner of articulation of the emphatics, but what about their position within the utterance?

3.2 Distribution of ejectives within the utterance
Pre-pausal is the only consistently ejective position for the emphatics in Mehri. Why?
- Not syllabic: crosslinguistic dispreference for ejective codas (H&P 2001)

3.2.1 Pre-pausal glottalization?
- W&B credit pre-pausal glottalization as the motivation for the emphatics being ejective in these environments.
- But – not satisfactory to add a (marked) glottalic feature
- Cannot account for 2c and 2d, repeated here:

> (2) Watson and Bellem (2010, 2011)
>> c. /ɬiːwoːtʼ/ [ɬiːwoːtʼ] "fire"
>> d. /kʼanːət/ [kʼanːətʰ] "small"

- If we assume that there is no constricted glottis feature on the coronal stop in (2c) (resulting in /ɬiːwoːt/) then we cannot account for why [ɬiːwoːtʼ] ends in an ejective but [kʼanːətʰ] ends in aspiration

3.2.2 Perceptual factors
Proposal: Perceptual factors cause the emphatics to remain ejective pre-pausally
- Licensing by cue (Steriade 1997): phonological features are maintained in contexts with more robust perceptual cues
- Emphatics in Mehri cannot deglottalize pre-pausally because the ejective feature is more salient in these contexts
  - *Crosslinguistic evidence:* The pre-pausal context has proven variable across language communities with respect to English coronal stop deletion, even to the extent that pre-pausal contexts are less likely to favor deletion than pre-vocalic contexts (see CSD literature, particularly Guy 2010)

3.3 Interim Conclusion
The ejective/not ejective alternation of the emphatics in Mehri can be accounted for by analyzing the emphatics as having an underlying ejective [CG] feature that is lost in predictable, well-attested environments.

IV. AN OPTIMALITY THEORETIC APPROACH
Having accounting for the synchronic alternation I will now propose an Optimality Theoretic analysis that can capture these generalizations in a formal framework.

4.1 Identifying the constraints
- First, a faithfulness constraint:

> (4) MAX[CG] (H&P 2001)[2]
> "if there is a feature [constricted glottis] in the input, then there is a feature [constricted glottis] in the output."

- For the alternation to occur, this constraint must be ranked against the markedness constraint *[CG] "specifications of the feature [constricted glottis] are prohibited" (H&P 2001)

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[2] H&P 2001 proposed this faithfulness constraint in their analysis of ejectives in Nuu-chah-nulth (2001).

- However, as noted in §3, some segments are more marked in their glottalic features than others, and thus *[CG] alone is not sufficient
- I propose separate *[CG] constraints based on place and manner of articulation:

  (5) *[CG]FRICATIVE
       "Specifications of the feature [constricted glottis] are prohibited in fricatives."
  (6) *[CG]CORONAL
       "Specifications of the feature [constricted glottis] are prohibited in coronals."

- These constraints are in addition to *[CG] proposed by H&P (2001)

4.2 Word-initial and word-medial emphatics
- Ranking of the relative *[CG] constraints higher than MAX[CG] will allow word-initial and word-medial emphatics to lose their [CG] feature, while the velar emphatic will remain ejective:

(7) Tableau of *k'an:ət,* "small"

/k'an:ət/	*[CG]FRICATIVE	*[CG]CORONAL	MAX[CG]	*[CG]
☞k'an:ət				*
kan:ət			*!	

(8) Tableau of *t'ajr,* "bird"

/t'ajr/	*[CG]FRICATIVE	*[CG]CORONAL	MAX[CG]	*[CG]
☞tajr			*	
t'ajr		*!		*

(9) Tableau of *ɬ'a:,* "name of the letter [ɬ']"

/ɬ'a:/	*[CG]FRICATIVE	*[CG]CORONAL	MAX[CG]	*[CG]
ɬ'a:	*!	*		*
☞ɬa:			*	

(10) Tableau of *aʃˀo:baʕ,* "fingers"

/aʃˀo:baʕ/	*[CG]FRICATIVE	*[CG]CORONAL	MAX[CG]	*[CG]
☞aʃo:baʕ			*	
aʃˀo:baʕ	*!	*		*

- While in the above data the relative ranking of *[CG]FRICATIVE and *[CG]CORONAL is not significant, keeping these constraints separate will allow us to account for some dialects (Omani Mehri) that maintain a coronal plosive ejective but not a coronal fricative ejective.
  - o In these cases, the MAX[CG] would be ranked between *[CG]FRICATIVE and *[CG]CORONAL

4.2.2 Pre-pausal ejectives
- To account for the retention of the [CG] feature pre-pausally, we need an additional faithfulness constraint:

> (11) MAX[CG] PRE-PAUSE[3]
> > "if there is a feature [constricted glottis] in pre-pausal context in the input, then there is a feature [constricted glottis] in pre-pausal context in the output."

- This will be highly ranked to ensure that all pre-pausal emphatics are realized as ejectives.

> (12) Tableau of *ɬi:wo:tˀ,* "fire"

/ɬi:wo:tˀ/	MAX[CG]PRE-PAUSE	*[CG]FRICATIVE	*[CG]CORONAL	MAX[CG]	*[CG]
☞ ɬi:wo:tˀ			*		*
ɬi:wo:t	*!			*	

- The addition of a highly-ranked MAX[CG]PRE-PAUSE can successfully account for the retention of the [CG] feature in / ɬi:wo:tˀ/.
- This analysis of retaining the [CG] feature pre-pausally is preferable to an analysis of pre-pausal glottalization, as adding such a marked feature would both add markedness and violate faithfulness in the output

V. DEGLOTTALIZATION AS A DIACHRONIC PROCESS
It is worthwhile to consider if the deglottalization of the Mehri ejectives is indicative of a systematic, diachronic deglottalization taking place in Mehri.

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[3] Modified from MAX PRE-PAUSE (Coetzee and Kawahara 2011).

- Such an analysis may explain the differing descriptive accounts of the Mehri emphatics beginning with Johnstone (1970)
- Deglottalization as a diachronic process is attested in many languages and language families, including Omotic, Cushitic, Egyptian, Caucasian, and various languages of the Americas (Fallon 2002)

5.1 Within the Semitic family
- Before Johnstone (1970), the EthioSemitic languages were considered to be the only Semitic languages whose emphatics were realized as ejective, purportedly as a result of language contact with the Cushitic languages (Simeone-Senelle 1997, 2011, W&B 2010)
  - The discovery of Modern South Arabian ejectives through a wrench in this assumption
- More recently, Proto-Semitic phonology has been reconstructed to include the emphatics as ejective (see Dolgopolsky 1977, Fallon 2002, among others)
  - Such a reconstruction predicts diachronic deglottalization as a familiar process in Semitic, as the majority of modern Semitic languages do not have emphatic ejectives
- Thus diachronic deglottalization across the Semitic language family remains an interesting research question, and Mehri (and the other Modern South Arabian languages) may provide insight into this process

5.2 Deglottalization as constraint demotion
The OT analysis presented in §4 lends itself easily to a diachronic approach:
- *Theoretical assumption:* language change is the result of constraint demotion, and constraint demotion results in variation (Kostakis 2010)
- *Proposal:* Diachronic deglottalization in Mehri is due to a demotion of the faithfulness constraint, MAX[CG]. A possible previous (historical) constraint ranking, then, would be:

    (13) Possible historical Mehri constraint ranking

    MAX[CG]PRE-PAUSE, MAX[CG] >> *[CG],*[CG]FRICATIVE, *[CG]CORONAL

- In the ranking above, all emphatics will surface as ejectives.
- I propose MAX[CG] is currently being demoted, and will eventually be ranked lower than the *[CG] constraints. MAX[CG]PRE-PAUSE may also demote, which would predict that the ejective feature will eventually be lost entirely in Mehri.
- Further acoustic data from younger and older Mehri speakers would be needed to test this prediction

VI. CONCLUSION AND FUTURE RESEARCH
The above analysis accounts for W&B's acoustic data of the Mehri emphatics and reconciles it with previous phonological descriptions of the emphatics in Mehri. I have laid out formalized, falsifiable predictions that can provide clarity to an otherwise confusing issue in the Mehri literature.
- Further acoustic data is necessary to confirm these predictions.
- The Mehri data can also contribute to the literature on ejectives in general, particularly glottalic cues in pre-pausal contexts.
- The analysis of Mehri emphatics as underlying ejective has broader implications for the phonological development of the Semitic language family.

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