Getting your gutturals out of the mind:
An assessment of the role of phonology in the patterns of historical gutturals in Modern Hebrew

Ignacio L. Montoya, CUNY Graduate Center

In traditional accounts of Hebrew morphology, the primary basis of word formation is an underlying consonantal root that combines with an underlying vocalic pattern and prosodic template that together carry inflectional and derivational information. However, many words in Modern Hebrew containing reflexes of historical gutturals (*ʔ*, *h,* *ʕ* and *ħ*) deviate from the canonical form with regard to syllable structure, the tri-consonantal root, and the vocalic/prosodic pattern (see Illustrations). These deviations can be characterized as deletion, vowel epenthesis, and vowel lowering, suggesting that the exceptional words can be explained via phonological effects, as has been proposed by proposed by previous accounts.

Two early generative treatments posit underlying abstractness to account for the behavior of these words. In one case the historical gutturals that do not appear on the surface are posited as abstract underlying segments (Bar-Lev 1977); in the other, sounds that are phonetically identical on the surface have different lexical specifications (e.g., the two [χ] sounds in the minimal pairs in the Illustrations are both underlyingly /χ/ but with only one specified to trigger vowel epenthesis) (Bolozky 1978). A more recent account that uses the analytical tools of Optimality Theory (OT) challenges the abstractness of the earlier generative accounts (Faust 2005). A significant limitation of that study, though, is the fact that it deals with only two of the four historical gutturals and only two of the three root positions in which the historical gutturals appear, thereby sidestepping the problem of opacity.

The present paper begins by expanding on both the generative and OT treatments by proposing a more comprehensive array of ordered rules and ranked constraints than is found in previous accounts. The paper then addresses some of the shortcomings of those treatments, including the abstractness of the generative account, the difficulty with opacity in the OT account, and theory-internal issues, using an Evolutionary Phonology (EP) framework. By exploring multiple sources of explanation for these patterns – phonetic and historical factors, external factors such as language contact and prescriptive norms, and analogical change (Blevins 2004) – we can assess the extent to which the tools of phonology are appropriate for explaining patterns involving the modern reflexes of the gutturals.

The source of vowel lowering and epenthesis is posited to be the effects of the relatively high F_1 associated with gutturals. This paper proposes that these phonetic effects became the phonological processes observed in Tiberian Hebrew (McCarthy 1994), the predecessor of Modern Hebrew. The non-recovery of the gutturals during the revival of Hebrew as a spoken language in the late 1800s (Sáenz-Badillos 1993) can be understood by the fact that the primary languages of many of the revivalists did not have /ħ/ or /ʕ/ in their inventories (Zuckermann 2009); the recovery of the guttural effects on the surrounding vowels can be accounted for by the orthographic system, which continues to reflect these effects. After considering non-phonological sources of explanation for vowel lowering and epenthesis, deletion alone is left as a strictly phonological process.

This paper proposes that the synchronic effects associated with vowel lowering and epenthesis should be explored using the tools of morphology rather than those of phonology. The patterns associated with historical gutturals resemble deviations from the canonical structure exhibited by other Modern Hebrew words with “defective roots” and can thus be explained in a similar manner: via diacritics (in a morpheme-based model) or the extension of word schemes (in a word-based model).

The present analysis thus allows for a more parsimonious phonology in that many aspects of the patterns of historical gutturals can be explained by appealing to extra-linguistic factors. In addition, this account also addresses observed variation and makes predictions about sound change. The findings of this paper,

especially when taken in conjunction with the behavior of "defective roots," have further implications for the question of whether the Semitic root system is best addressed using the traditional non-concatenative morphological approach described above or an approach that is linear (Bat-El 2003).

Illustrations (all taken from first conjugation class, binyan *pa'al*)

Deviations characterized in terms of syllables, roots, patterns:

canonical, C_1o.ˈC_2eC_3 PRES.SG.MASC	deviant syllable structure	deviation from triconsonantal root	deviant vocalic/prosodic pattern
[go.ˈdel] 'he grows' [lo.ˈmed] 'he learns' [ko.ˈtev] 'he writes' [xo.ˈʃev] 'he thinks'	[go.ˈel] 'he redeems' [mo.ˈt͡se] 'he finds' [ʃo.ˈme.a] 'he hears' [ʃo.ˈle.aχ] ' he sends'	[goel] 'he redeems' [mot͡se] 'he finds' [ʃomea] 'he hears'	[ʃomea] 'he hears' [ʃoleaχ] ' he sends'

canonical, tiC_1.ˈC_2o.C_3 FUT.2SG.MASC	deviant vocalic/prosodic pattern and syllable structure
[tiʃ.ˈmoʁ] 'you will guard'	[taa.ˈmod] 'you will stand' [ti.ˈgal] 'you will redeem'

Minimal pairs:

[t͡soʁeaχ] 'he laughs'	[t͡soʁeχ] 'he consumes'

Deviations characterized in terms of phonological processes:

canonical, C_1oC_2eC_3 PRES.SG.MASC	deletion	vowel epenthesis	vowel epenthesis, deletion
[godel] 'he grows' [lomed] 'he learns'	[goel] 'he redeems' [kore] 'he reads'	[ʃoleaχ] ' he sends'	[ʃomea] 'he hears'

canonical, tiC_1C_2oC_3 FUT.2SG.MASC	vowel lowering, deletion
[tiʃmor] 'you will guard'	[tamod] 'you will stand' [tigal] 'you will redeem'

References:

Bar-Lev, Z. (1977). Natural-Abstract Hebrew Phonology. *Folia Linguistica, XI, 3 (4)*, 259-272.

Bat-El, O. (2003). Semitic verb structure within a universal perspective. In J. Shimron (Ed.), *Language processing and language acquisition in a root-based morphology* (29–59). Amsterdam: John Benjamins.

Blevins, J. (2004). *Evolutionary phonology: The emergence of sounds patterns*. Cambridge: Cambridge University Press.

Bolozky, S. (1978). Some aspects of Modern Hebrew phonology. In R.A. Berman (Ed.), *Modern Hebrew Structure* (11-67). Tel Aviv: University Publishing Projects.

Faust, N. (2005). *The fate of Hebrew gutturals* (MA thesis, Tel Aviv University).

McCarthy, J. (1994). The phonetics and phonology of Semitic pharyngeals. In P. Keating (Ed.), *Papers in Laboratory Phonology* 3 (191-233). Cambridge: Cambridge University Press.

Sáenz-Badillos, A. (1993). *A history of the Hebrew language* (John Elwolde, Trans.). Cambridge: Cambridge University Press. (Original work published 1988).

Zuckermann, G. (2009). Hybridity versus revivability: Multiple causation, forms and patterns. *Journal of Language Contact, Varia 2*, 40-67.