

## Binary and unary structure in Classical Arabic metrics

Traditional and modern generative treatments of Classical Arabic meters hold that they are constructed by metra that are at heart ternary, consisting of a head (P=peg) and two other units (K=cord). These can be shifted around into the so-called circle system created by Al-Khalīl ibn Ahmad of Basra (ca. 718–786) and still used in generative analyses like Maling (1973) and Fabb & Halle (2008). Here are examples.

- (1) A line of *hazaj* with nonce words

P	K	K	P	K	K	P	K	K	P	K	K
^			^			^			^		
mu.fā.ʔī.lun			mu.fā.ʔī.lun			mu.fā.ʔī.lun			mu.fā.ʔī.lun		

- (2) A half-line of *ramal* with nonce words

K	P	K	K	P	K	K	P	K
	^			^			^	
fā.ʔi.lā.tun			fā.ʔi.lā.tun			fā.ʔi.lā.tun		

Generative metrics treats the P as the head of a foot with three terminal positions; Prince (1989) argues that the apparent ternarity is actually split-binarity (*hazaj* [P[KK]] and [K[PK]] for *ramal*), i.e., a pair of elements, only one of which is itself a pair.

Golston & Riad (1997) show that Arabic meter is built instead on fully binary pairs of pairs. They do this simply by decomposing the traditional element P into the binary iambic sequence LH that it represents in texts. This reveals *hazaj* PKK as [LH][KK], with ordinary double-binarity rather than with ternary or split-binary structure; *ramal* KPK is then [KL][HK], again with binarity at both levels (a pair of prosodic pairs). The full set of classical meters is then as follows ( $\sigma$  = syllable;  $\varphi$  =  $\mu\mu$ ), with fully binary verse feet in all meters but four (grouped at the bottom, marked in red):

(3) <i>hazaj</i>	(LH)(H $\sigma$ )	(LH)(H $\sigma$ )		
<i>wāfir</i>	(LH)( $\varphi$ H)	(LH)( $\varphi$ H)	(LH)( $\varphi$ H)	
<i>kāmil</i>	( $\varphi$ H)(LH)	( $\varphi$ H)(LH)	( $\varphi$ H)(LH)	
<i>ramal</i>	( $\sigma$ L)(HH)	( $\sigma$ L)(HH)	( $\sigma$ L)(HH)	
<i>rajaz</i>	( $\sigma\sigma$ )(LH)	( $\sigma\sigma$ )(LH)	( $\sigma\sigma$ )(LH)	
<i>munsariḥ</i>	(H $\sigma$ )(LH)	(H $\sigma$ )(HL)	(H $\sigma$ )(LH)	
<i>khafīf</i>	( $\sigma$ L)(HH)	( $\sigma$ H)(LH)	( $\sigma$ L)(HH)	
<i>sarīf</i>	( $\sigma\sigma$ )(LH)	( $\sigma\sigma$ )(LH)	( $\sigma\sigma$ )(HL)	
<i>madīd</i>	( $\sigma$ H)(LH)	( $\sigma$ )(LH)	( $\sigma$ H)(LH)	
<i>mutaqārib</i>	(LH)( $\sigma$ )	(LH)( $\sigma$ )	(LH)( $\sigma$ )	(LH)( $\sigma$ )
<i>ṭawīl</i>	(LH)( $\sigma$ )	(LH)( $\sigma$ H)	(LH)( $\sigma$ )	(LH)( $\sigma$ H)
<i>basīṭ</i>	( $\sigma$ L)(HH)	( $\sigma$ )(LH)	( $\sigma$ L)(HH)	( $\sigma$ )(LH)

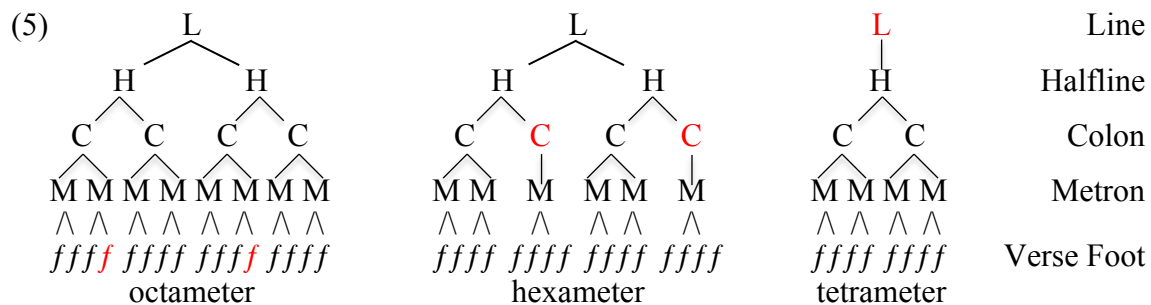
[Note that the schemata above are for half-lines, so that a full line of *hazaj* is a tetrameter, *mutaqārib*, *ṭawīl*, and *basīṭ* are octameters, and the rest are hexameters.]

We show here that the pervasive binarity of the system is shot through with violations of binarity, and in a surprisingly specific manner: while ternary units are nowhere present, we show that *every metron contains exactly one degenerate foot* (or trapped L syllable; Mester 1994), as shown below in bold. This simplifies the traditional generative observation that

every meter has a head (P or Q) This is clearly by design and not due to chance:

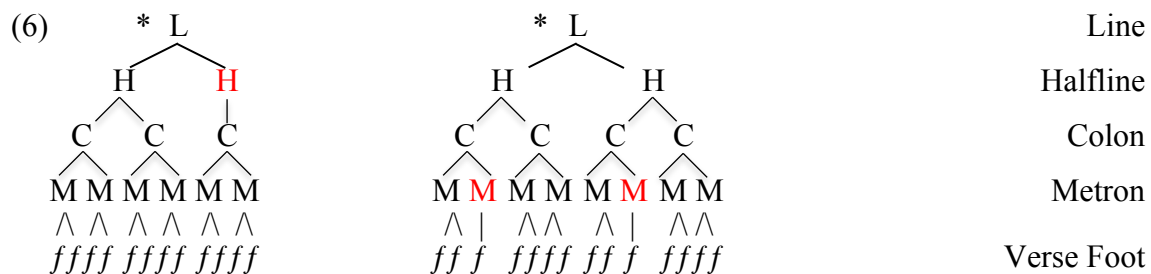
(4)	<i>hazaj</i>	(LH)(Hσ)	(LH)(Hσ)		
	<i>wāfir</i>	(LH)(φH)	(LH)(φH)	(LH)(φH)	
	<i>kāmil</i>	(φH)(LH)	(φH)(LH)	(φH)(LH)	
	<i>ramal</i>	(σL)(HH)	(σL)(HH)	(σL)(HH)	
	<i>rajaz</i>	(σσ)(LH)	(σσ)(LH)	(σσ)(LH)	
	<i>munsariḥ</i>	(Hσ)(LH)	(Hσ)(HL)	(Hσ)(LH)	
	<i>khafīf</i>	(σL)(HH)	(σH)(LH)	(σL)(HH)	
	<i>sarīf</i>	(σσ)(LH)	(σσ)(LH)	(σσ)(HL)	
	<i>madīd</i>	(σH)(LH)	(σ)(LH)	(σH)(LH)	
	<i>mutaqārib</i>	(LH)(σ)	(LH)(σ)	(LH)(σ)	(LH)(σ)
	<i>ṭawīl</i>	(LH)(σ)	(LH)(σH)	(LH)(σ)	(LH)(σH)
	<i>basīf</i>	(σL)(HH)	(σ)(LH)	(σL)(HH)	(σ)(LH)

We also show that all of the common meters have marked unary structures above the level of the trapped lights, such that *every well-attested meter in the system includes exactly one level above the metron at which binarity is systematically violated; and those levels are the line, colon, and verse foot*. Full octameters we treat as binary at each level; hexameters as having non-branching unary cola; and tetrameters as having non-branching unary lines:



From line to verse foot, no common meter is unary at more than one level: the octameters have unary verse feet (bold) but are otherwise fully binary; the hexameters have unary cola (bold) but are otherwise fully binary; the tetrameter has a unary line (bold) but is otherwise fully binary. (Only *madīd* has two unary constituents (colon and verse foot) but it accounts for only half of 1% of the ancient corpus).

The types of meter Arabic allows are also significantly constrained by the fact that it allowed no unary half-lines or metra.



These new observations about what constrains Arabic metrics bring a great deal of symmetry to the system that has not been shown before. Given that meter involves the prosodic hierarchy (Hayes 1988, 1989), the unary and binary patterning here have consequences for prosody generally.