Stress and cyclicity in Hittite and its diachronic development

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This paper is concerned with the interaction of stress and vowel length in Hittite (Anatolian, Indo-European) and its historical background. Stress is not directly marked in the Hittite cuneiform script, but there is general agreement that it is closely correlated with vowel length, which is marked: long vowels may exhibit "plene spelling" (*V̄*); short vowels do not (Melchert 1994, Kimball 1999, Kloekhorst 2008, 2014, i.a.). This close correlation is evident especially from quantitative alternations like (1), which reflect inflectional stress shifts well-known from Vedic Sanskrit and other ancient Indo-European languages and thus thought to be inherited from Proto-Indo-European (PIE) into Hittite:

(1) a. H *pātuš* 'feet' ∼ *patān* 'of the feet'
[pá̲:t-os] [pa̲t-á:n]

b. H *dā̲tti* 'you take' ∼ *dattēni* 'y'all take'
[tá̲:-t:i] [ta̲-t:é:ni]

These alternations can be straightforwardly attributed to a phonological process shortening unstressed long vowels (/V:/ → [V]; cf. Hoffner & Melchert 2024: 33–4). Problematic for this analysis, however, are words that contain multiple long vowels, one or more of which must occur outside the locus of primary stress, e.g., H *iwārwaȳer* 'they bestowed a dowry', *kūšāta* 'bride price'. I show that that this phenomenon is confined to denominal and deverbal derivatives (i.e., not deradical), and the "extra" long vowels in these words — some of which have previously suspected as being "analogical" — have a principled distribution: (i) they occur only when they are long(/stressed) in the word's morphological base (cf. *iwāru–* 'dowry'; *kūša–* 'bride'); and (ii) they occur regularly in such words. I therefore propose that the "extra" long vowels were a consequence of CYCLICITY (Bermúdez-Otero 2011, Kiparsky 2015, i.a.): the derived forms preserve the primary stress of their base as secondary stress, resulting in underapplication of vowel shortening. This analysis is represented informally in (2):

(2) a. CYCLE 1: /iwá:r-u/ → /|iwá:ru|-Ø/ → [iwá:ru] (*iwāru*) 'dowry'
b. CYCLE 2: /|iwá:ru|-á:i-er/ → [iwà:rw-á:j-er] (*iwārwāer*) 'they bestowed a dowry'

The (novel) assumption of secondary stress in Hittite is *prima facie* plausible, since the relevant vowel is orthographically marked for the same phonetic property (i.e., increased duration) as vowels that bear primary stress. This analysis is also typologically well-supported, having close analogue in Present-Day (American) English, where derived nominalizations cyclically preserve the stress of their base in the same way, e.g., in (3a) (cf. Hayes 1982, Pater 2000,Bermúdez-Otero 2012, i.a.); this blocks the "*abracadabra*-rule," which normally assigns stress to the first of three pretonic light syllables, e.g., in (3b):

(3) a. *imágine* ⇒ *imàginátion* (ˣ*i̲maginátion*) b. *a̲bracadábra*

Finally, I turn to the diachronic development of the Hittite situation, proposing a historical link between the underapplication of vowel shortening in Hittite and of pretonic vowel deletion in PIE (Yates 2022, 2023, 2025). A regular phonological process deleting pretonic non-high vowels is securely reconstructible in PIE deradical formations, e.g., in (4a), but also its systematic underapplication in denominal derivation, e.g., in (4b). I propose that secondary-stressed long vowels are the Hittite reflex of PIE vowels preserved cyclically from their base, and tentatively suggest on the basis of the Hittite facts that audible secondary stress may also have been a PIE feature (viz., despite the lack of evidence for secondary stress elsewhere in IE).

(4) a. PIE */g^{wʰ}en-énti/ → *[g^{wʰ}n-énti] > Ved. *ghnánti*, H *kunanzi* ([k^{w}n-ánt͡si]) 'they kill'
b. PIE *|néw-o-m| → *[néw-o-m] > Hitt. *nēwan* ([né:wa-n]), Ved. *návam*, Gk. *néon* 'new'
⇒ */|néw-o|-éh$_2$-ei/ → *[ne̲w-áh$_2$-ei] >(>) Hitt. *newaḫḫi* ([nèw-áχ:-i]); Lat. *(re)novat* 'renews'