

## Stress and Grades in the Creek Stem: a Consequence of Cyclic Structure

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**Overview:** The Stem is roughly the domain of regular iambic stress in Creek verbs. However, a final regular stress can occur on a non-Stem syllable following the Stem. In the morphological context of “graded” (internally changed) verbs, the final Stem syllable is always heavy, and receives the final, primary regular stress; a non-Stem syllable never has regular stress in graded verbs. I propose that while non-graded verbs are built in one cycle, graded verbs are built in two cycles, which causes the final syllable always to receive stress and be heavy.

**Data—Non-Graded Verbs:** Verbs in Creek consist of the root, prefixes, inner suffixes (forming the Stem) and outer suffixes (data from Martin (2011)). The Stem is parsed into left-to-right iambic Feet: (L'L), ('H) and (L'H). Outer suffixes can be inherently either stressed or unstressed. High tone /H/ extends from the first to last regular stress, which is primary (Haas 1977). In a non-graded verb, if a Stem ends in a heavy syllable or an even sequence of light syllables, the final syllable receives the final regular stress. If a Stem in a non-graded verb ends in an odd sequence of light syllables, the first syllable in the outer suffixes receives the final regular stress.

**Table 1.** Regular Stress in Non-Graded Verbs

Input	/homp=as/ ‘eat=IMP’	/wanay=as/ ‘tie=IMP’	/a-wanay=as/ ‘to-tie=IMP’
Surface Form	[('ho <sup>H</sup> m).p=as]	[(wa.'na <sup>H</sup> ).y=as]	[(a.'wa <sup>H</sup> ).(na.'y=a <sup>H</sup> s)]
Stem Prosody	Heavy ('H)=...	Even Light (L'L)=...	Odd Light (L'L)(L='...)

**Data—Graded Verbs:** Creek verbs undergo a series of internal changes known as “grades” (Haas 1940) that affect the right edge of the Stem; grades encode the natural syntactic class of aspect. Creek has four grades: lengthened (LGR), aspirated (HGR), falling (FGR), and nasalized (NGR) (terminology from Martin 2011). LGR involves lengthening of the final Stem vowel and a right-spreading high tone /H\*/, which gets downstepped if there is a previous stress. The other three grades are mostly identical in Foot structure to LGR, but add different autosegmental content. Table (2) shows the grade system for Stems ending in a light syllable in non-graded verbs.

**Table 2.** Paradigm of Grade System

Grade	LL Stem /wanay=/	LLL Stem /a-wanay=/
No Grade	[(wa.'na <sup>H</sup> ).y=as]	[(a.'wa <sup>H</sup> ).(na.'y=a <sup>H</sup> s)]
LGR /H*/	[(wa.'na: <sup>H</sup> ).y=i <sup>H</sup> s]	[(a.'wa <sup>H</sup> ).(na: <sup>H</sup> ).y=i <sup>H</sup> s]
HGR /h/	[(wa.'na <sup>H</sup> h).y=is]	[(a.'wa <sup>H</sup> ).(na <sup>H</sup> h).y=is]
FGR /HL/	[(wa.'na: <sup>HL</sup> ).y=is]	[(a.'wa <sup>H</sup> ).(na: <sup>HL</sup> ).y=is]
NGR /~, <sup>HH+</sup> /	[(wa.'nã: <sup>HH+</sup> ).y=is]	[(a.'wa <sup>H</sup> ).(nã: <sup>HH+</sup> ).y=is]

**Generalizations:** Graded verbs display three key differences from non-graded verbs. First, a Stem-final syllable can be short in non-graded verbs, but must be long in graded verbs. Second, the final regular stress can occur outside of the Stem in non-graded verbs, but must be always Stem-final in graded verbs. Lastly, graded verbs all have autosegmental content that docks to the Stem-final syllable. The different aspectual morphemes are distinguished only by these autosegments, and have no independent morphs.

**Account:** I account for these differences between non-graded and graded verbs as a consequence of their cyclic structures: graded verbs are constructed in two cycles, while non-graded verbs are constructed in one cycle. The Stem of a graded verb thus must form a prosodically isolable intermediate representation, while the Stem of a non-graded verb is parsed together with its outer suffixes. This distinction is what allows the final regular Foot to extend beyond the Stem in non-graded verbs, but forces this Foot to be right-aligned with the Stem in graded verbs, causing

final vowel lengthening. This right-aligned iambic Foot is the head Foot in Creek, so that the final Stem syllable has primary stress in graded verbs. Primary stress attracts autosegments, certain of which (tone and nasalization) also result in vowel lengthening.

I demonstrate this account for the graded and non-graded forms of the LLL Stem /a-wanay=/. In the derivation of the graded form, /a-wanay=/ goes through a first cycle by itself (1), while in the derivation of the non-graded form, it goes through a cycle with the outer suffix /as/ (2).

(1) Graded Derivation: /a-wanay=/ → [(a.'wa<sup>H</sup>).('na:<sup>H</sup>)y]=/is/ → [(a.'wa<sup>H</sup>).('na:<sup>H</sup>).y=i<sup>H</sup>s]

(2) Non-graded Derivation: /a-wanay=as/ → [(a.'wa<sup>H</sup>).('na:<sup>H</sup>).y=a<sup>H</sup>s]

The analysis requires three constraints: FTBIN (e.g., McCarthy and Prince 1986), demanding that Feet be binary either in morae or syllables; PARSE-σ(STEM) (e.g., McCarthy and Prince 1993; see Zoll (1996) for indexing markedness constraints to privileged positions), demanding that every syllable affiliated with the Stem be parsed into a Foot; and, IDENT-V(LONG) (e.g., McCarthy 2000), demanding that input and output vowels be the same length. FTBIN and PARSE-σ(STEM) are high-ranked, eliminating candidates with ('L) Feet and unfooted Stem syllables, respectively. Low-ranked IDENT-V(LONG) eliminates the lengthening candidate in Table (3), which does not beat the other candidates on the higher-ranked constraints, but not the one in Table (4), which does so.

**Table 3.** LLL Stem, Non-Graded Verb: Stress on Outer Suffix

/LLL=L/	FTBIN	PARSE-σ(STEM)	IDENT-V(LONG)
→ (L'L)(L=L)			
(L'L)(H)=L			* W
(L'L)L=L		* W	
(L'L)(L)=L	* W		

**Table 4.** LLL Stem, Graded Verb: Stress on Lengthened Final Stem Syllable

/LLL=/	FTBIN	PARSE-σ(STEM)	IDENT-V(LONG)
→ (L'L)(H)			*
(L'L)L		* W	L
(L'L)(L)	* W		L

When the Stem is parsed in an early cycle in graded verbs, the final Stem syllable always has primary, final stress (as in Table (4)). Primary stress attracts the autosegments that encode the aspectual material associated with the grades, whose docking can result in lengthening in LL Stems.

### References

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