The morphophonology of A'ingae stress

A'ingae (Cofán, ISO 639-3: con) is an endangered and underdocumented language isolate with ca. 1 500 speakers across Ecuador and Colombia. The language's remarkably complex stress assignment has barely been studied by previous scholars (Borman, 1962; Fischer and Hengeveld, forthcoming; Repetti-Ludlow et al., 2019). In my presentation, I report the existence of six distinct accentual patterns associated with inflectional morphemes of the language, propose that stress assignment is determined by a combination of a typologically unattested stress rule and morphological factors, and develop a formal analysis that explains the data in a parsimonious fashion.

The complexity of A'ingae verbal morphophonology is demonstrated in the table to the right with a minimal six-tuple of pairs of inflected verbs. No two members of the six-tuple have identical stress. Each inflected verb within a pair is a stem, followed by the suffix whose accentual distinctness is to be motivated (underlined), and another suffix to the right (here, the negative -^{m}bi). The two verbs, (1) itoje and (2) áfase, were chosen to represent to two verbal classes: verbs without lexically specified stress (1), where stress is decided by other mechanisms, and irregularly stressed verbs (2), whose initial stress is lexically listed. Stress is marked with the acute accent and a color: blue if word-initial, green if stem-penultimate, orange if stem-final, and pink if post-stem.

		(1) itoje...-^{m}bi 'spin...-NEG'	(2) áfase...-^{m}bi 'slur...-NEG'
(a) -hi	'PRCM'	itoje-hí-^{m}bi	áfase-hi-^{m}bi
(b) -ʔfa$_{\text{PRE}}$	'PL'	itojé-ʔfa-^{m}bi	áfase-fa-^{m}bi
(c) -ʔʧo	'SBRD'	itóje-ʔʧo-^{m}bi	áfase-ʧo-^{m}bi
(d) -k^{h}o$_{\text{DOM}}$	'RECP'	itoje-k^{h}ó-^{m}bi	afase-k^{h}ó-^{m}bi
(e) -ʔk^{h}a$^{\text{PRE}}_{\text{DOM}}$	'DMN'	itojé-ʔk^{h}a-^{m}bi	afasé-ʔk^{h}a-^{m}bi
(f) -ʔhe$_{\text{DOM}}$	'IMPV'	itóje-ʔhe-^{m}bi	afáse-ʔhe-^{m}bi

The accentual distinctness within the group of the first three suffixes, (a) -hi, (b) -ʔfa, and (c) -ʔʧo, as well as the latter three (d) -k^{h}o, (e) -ʔk^{h}a, and (f) -ʔhe, is demonstrated by forms of (1) itoje, where each suffix within a group is seen to surface with different stress: post-stem in (1a) itoje-hí-^{m}bi and (1d) itoje-k^{h}ó-^{m}bi, stem-ultimate in (1b) itojé-ʔfa-^{m}bi and (1e) itojé-ʔk^{h}a-^{m}bi, and stem-penultimate in (1c) itóje-ʔʧo-^{m}bi and (1f) itóje-ʔhe-^{m}bi. The accentual distinctness of the two suffix groups (a-c) and (d-f) is demonstrated by forms of (2) áfase, whereby the stress in (2d-f) is like that of (1d-f), but word-initial in (2a) áfase-hi-^{m}bi, (2b) áfase-fa-^{m}bi, and (2c) áfase-ʧo-^{m}bi.

The analysis I will propose involves two steps: (i) phonological, with a typologically unattested stress rule, and (ii) morphological, with accentual specification of suffixal lexemes. Aspects of the first step will not be fully motivated in what follows. For details of the account, see Author (2019).

		(3) fet^{h}a 'open'	(4) fɨite 'help'	(5) fɨ^{n}dɨi 'sweep'
(g) -hi	'PRCM'	fet^{h}á-hi	fɨité-hi	fɨ^{n}dɨ́-hi
(h) -ʔhe	'IMPV'	fét^{h}a-ʔhe	fɨ́ite-ʔhe	fɨ^{n}dɨ́-ʔhe

Step 1. I isolate the contributions of a stress rule, which I dub the **glottal rule**: the syllable containing the second mora to the left of a glottal stop carries the primary stress. The table to the left compares stress on three stems with syllables of varied weight: a light-light (3) fet^{h}a, a heavy-light (4) fɨite, and a light-heavy (5) fɨ^{n}dɨi, with two suffixes: (g) -hi and (h) -ʔhe. The default stress is penultimate for any stem shape, as seen in forms with (g) -hi, but shifts to the syllable with the second mora before the glottal stop when one is present, as seen in forms with (h) -ʔhe. This results in stem-penultimate stress when the last syllable is light, as in (3h) fét^{h}a-ʔhe and (4h) fɨ́ite-ʔhe, and stem-ultimate stress when the last syllable is heavy, as in (5h) fɨ^{n}dɨ́-ʔhe (for an analysis of weight, see Author 2019). By attributing a part of the observed complexity to an independently motivated stress rule, my analysis will reduce the number of distinct lexical specifications needed to explain the six distinct accentual patterns to four.

Step 2. I further analyze the four suffix types as an interaction between two binary parameters that characterize each suffix: (i) **recessiveness** vs. **dominance** and (ii) **plain** vs. **prestressing**.

PARAMETER 1. Recessive suffixes (unmarked in the table) preserve their hosts' stress. Thus, any other accentual specification a recessive suffix might have will be blocked when the verb to which it attaches is lexically stressed. Dominant suffixes (DOM) delete the host's stress. If a dominant suffix lacks further accentual specification, the stress will surface as penultimate by default.

PARAMETER 2. Plain suffixes (unmarked) allow stress to be decided by other mechanisms operative in the language. Prestressing suffixes (PRE) stress the last syllable of their host (which is blocked when the prestressing suffix is recessive and the host has lexically specified stress).

Thus, a $2 \times 2 = 4$-way taxonomy of suffixes emerges: plain recessive (unmarked), plain dominant (DOM), prestressing recessive (PRE) and prestressing dominant ($^{\text{PRE}}_{\text{DOM}}$). The full morphological template of the A'ingae verb (Author, 2019) shows that plain suffixes come strictly before the prestressing ones, so parameter 2 can be thought of as a distinction between two phonological levels. Parameter 1 does not correlate with other morphological distinctions.

The precumulative (a) -hi is plain recessive. It does not make any special accentual demands on stress, so (1a) itoje-hí-ᵐbi is stressed by default on the penult. The plural (b) -ʔfa is prestressing recessive, which means that it stresses the immediately preceding syllable. As a consequence, the stress of (1b) itojé-ʔfa-ᵐbi is stem-ultimate. The subordinating (c) -ʔʧo is plain recessive, like (a) -hi, but it starts with a glottal stop, so the glottal rule takes effect. Since in (1c) itóje-ʔʧo-ᵐbi the stem-penultimate syllable contains the second mora before the glottal stop, it carries the primary stress. Due to the glottal rule, ʔ-initial plain suffixes, e.g. (c) -ʔʧo, pattern differently from non-ʔ-initial plain suffixes, e.g. (a) -hi. Prestressing suffixes do not show an analogous split, because lexically-placed stress (here, on the preceding syllable) takes precedence over phonological stress. All three of (a) -hi, (b) -ʔfa, and (c) -ʔʧo are recessive, i.e. they preserve the lexical stress of (2) áfase, which yields initial stress on all three of (2a) áfase-hi-ᵐbi, (2b) áfase-fa-ᵐbi, and (2c) áfase-ʧo-ᵐbi.

Dominant suffixes disregard any lexically specified stress of their hosts, leveling the difference between the verbal classes represented by (1) itoje and (2) áfase. Since the reciprocal (d) -kʰo is plain dominant, it gives rise to the default penultimate stress across the board: (1d) itoje-kʰó-ᵐbi and (2d) afase-kʰó-ᵐbi. The verbal diminutive (e) -ʔkʰa is prestressing dominant, placing stem-ultimate stress on (1e) itojé-ʔkʰa-ᵐbi (patterning with 1b), but also on (2e) afasé-ʔkʰa-ᵐbi. The imperfective (f) -ʔhe is plain dominant again, like (d) -kʰo, but it begins with a glottal stop. Thus, the glottal rule ends up being the decisive factor for either verb, and stress surfaces on the syllable with the second mora before the suffix, which is attested in (1f) itóje-ʔhe-ᵐbi as well as (2f) afáse-ʔhe-ᵐbi.

Formally, my analysis is carried out in the framework of Cophonology Theory, a restrictive Optimality Theoretic approach which derives variation within the grammar of one language with recourse to morphologically blind subgrammars (Anttila 1997; Orgun 1996; others), thus allowing for a parsimonious account of a complex pattern emergent from interactions between phonology and morphology. Mechanisms employed in the analysis will be further motivated by their ability to explain other morphophonological phenomena undiscussed here, such glottal stop deletion (1b-c).

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