Iterativity in Abkhaz Stress

Andrew M. Wolfe, Harvard University
May 2000

0   Abstract

Abkhaz's lexical stress system uses an algorithm first stated by Dybo 1977 which gives word stress to the leftmost accented syllable not followed by another accented syllable. This has found expression in derivationalist frameworks in terms of an iterative left-to-right deletion of stress clash. Optimality Theory does not permit such processes. After surveying the facts of the language and reviewing Alderete 1999's useful framework for analyzing cyclic stress effects in OT, the paper attempts systematically to check alternative venues for an analysis of these Abkhaz stress facts. In the end, none is found. Abkhaz joins Itelmen (Bobaljik 1997) in the file of "problem languages" for OT theories of stress.

1   The problem: a survey of the Abkhaz data

In Abkhaz, a language of the Northwest Caucasian group spoken in Abkhazia and Turkey, accent is a memorized quality of individual morphemes. This places Abkhaz within the class of "free stress" languages with Sanskrit (Halle and Kiparsky 1977, 1981, Kiparsky 1973, 1982, Halle and Vergnaud 1987, Halle 1997), Russian (ibid.; also Melvold 1990, Revithiadou 1999), Cupeño (Hill and Hill 1968, Alderete 1997, 1999), Greek, and Salish (Revithiadou 1999), as opposed to the "fixed stress" systems of French, Pintupi, Arabic, Seminole, Indonesian, and myriad others, in which stress is predictable given certain universal parametric settings.[1]

The numerous complexities of the Abkhaz stress system long puzzled Caucasologists until the influential breakthrough analysis of Dybo 1977, which was further systematized in a thorough treatment by Spruit 1985. Dybo's thesis, which has influenced all subsequent generative analyses of Abkhaz stress that I know of, can be stated as in (1) (from Spruit 1985; cf. Hewitt 1979, 1989, Trigo 1992, Kathman 1992, 1993, 1994):

(1) <u>Dybo's Rule</u>: Primary word stress falls on the leftmost accented syllable that is followed by an unaccented syllable or word edge. If there is no accent in the word, stress falls on the last syllable of the word.

Later generative treatments by Kathman 1992, 1993, 1994 and Trigo 1992 tidy up Dybo's Rule using the notion of stress clash deletion on the metrical grid. Where Dybo and Spruit's statement of the rule involves two environments—i.e., "…accented syllable followed by an unaccented syllable *or* word edge"—a clash deletion analysis uses only one: "…accented syllable not followed by another accented syllable." Clash deletion then can be primitively formalized as in (2):[2]

---

[1] Since fixed stress systems are not the focus of this paper, these settings (encompassing subjects such as syllable weight, iambic versus trochaic systems, edge-marking, and iterative foot construction) will not be discussed here in detail. The interested reader is referred to Halle and Vergnaud 1987, Idsardi 1992, Halle and Idsardi 1995, and Hayes 1995 for some approaches to fixed stress systems.

[2] I have kept formal machinery such as bracketing to a minimum here in order to be as theory-neutral as possible within a metrical grid framework.

(2) Clash deletion:

    * → Ø / _ * (Line 1)
    Iterative
    Direction: L→R

Iterativity and left-to-right directionality play a crucial role in forms such as those in (3). Here we see the basic distinction between accented and unaccented monosyllabic verbal roots in the infinitive. The root appears between two accented affixes, /a̱-/,[3] the definite article, and /-ra̱/, the *masdar* or infinitival suffix.

(3) Abkhaz monosyllabic infinitives

		stressed			*unstressed*	
a.	a̱-pa̱-rá	to pleat		á-pa-ra	to jump
b.	a̱-ya̱-rá	to lie down		á-fa-ra	to eat
c.	a̱-ca̱-rá	to go		á-ta-ra	to give

The difference in the derivations of [a̱-pa̱-rá] 'to pleat' [á-pa-ra] 'to jump' is given in (4).[4]

---

[3] Here and elsewhere in the paper I use an underline to indicate lexical accent. Further notes on transcription: I have chosen to break with the Latin transcription tradition of Spruit 1985 and others in which ejection is marked with an apostrophe, palatalization with a straight apostrophe ', and stress with an acute accent on the vowel, among other things. My transcription system is found in grey in the chart below, next to Spruit's (in white) for comparison:

	voiceless stop		ejective stop		voiced stop		voiceless fricative		voiced fricative	
labial	p	p	p'	p'	b	b	f	f	v	v
dental	t	t	t'	t'	d	d				
labialized dental	tʷ	t°	tʷ'	t°'	dʷ	d°				
alveolar	c	c	c'	c'	dz	ʒ	s	s	z	z
labialized alveolar	cʷ	c°	cʷ'	c°'	dzʷ	ʒ°	sʷ	s°	zʷ	z°
alveopalatal	tɕ	č'	tɕ'	č''	dʐ	ǯ'	sʸ	š'	ʐ	ž'
palatal	č	č	č'	č'	dž	ǯ	š	š	ž	ž
fronted velar	kʸ	k'	kʸ'	k''	gʸ	g'	xʸ	x'	γʸ	γ'
velar	k	k	k'	k'	g	g	x	x	γ	γ

Other symbols include, for the uvular series, q' qʸ' qʷ' not q' q'' q'°; for the laryngeal series, h hʷ yʷ not h h° y°; w, y, n, l, r, a, and ə remain the same.

[4] As before, formalisms have been minimized in this diagram in the interest of clarity and ecumenicalism.

(4) Sample derivations involving iterative stress clash

a) a-pa-rá 'to pleat'

```
                                                              *
  *   *   *                      *   *                        *      Line 1
  *   *   *   clash deletion 1   *   *   *   clash deletion 2  *  *  *   Line 0
  a-pa-ra         →             a-pa-ra        →            a-pa-ra
```

b) á-pa-ra 'to jump'

```
                                 *                 Line 2
  *       *                      *       *         Line 1
  *   *   *      heads left      *   *   *         Line 0
  a-pa-ra          →           a-pa-ra
```

Left-headedness is restricted to Line 1 in this analysis, however, because as shown in (5), in the absence of underlying stressed morphemes, default stress falls on the final syllable.

(5) Default rightmost accent

root	gloss	definite	indefinite
a) bax^w	rock	á-bax^w	bax^{w}ə́-k'
b) madza	secret	á-madza	madzá-k'
c) c^{w}ə	ox	á-c^{w}ə-γra	c^{w}ə-γrá-k'
γra	pied		

Line 0, then, is right-headed. Note, however, that Abkhaz is not simply a case of what Zoll 1997 labels "conflicting directionality," in which the left-most heavy syllable or, in the absence of heavy syllables, the right-most light syllable takes the stress.[5] Traditional stress theories have long accounted for this phenomenon in languages such as Eastern Cheremis (Kiparsky 1973, from Itkonen 1955) and Selkup (Halle and Clements 1983, Zoll 1997; see also the list of conflicting directionality languages in Hayes 1995: 296) by positing opposite parametric settings for Heads on Lines 0 and 1. Alternatively, Zoll suggests conjoining a markedness constraint on accented light syllables with an alignment constraint requiring marked segments to appear at a given word edge. In this analysis, the resultant constraint, which aligns accented light syllables to one edge, is then ranked above another more general stress alignment constraint which takes stress to the opposite edge.

   Neither of these, however, works for Abkhaz without some mechanism for clash deletion. Left-headedness on Line 1 correctly produces á-pa-ra but also yields the incorrect *á-pa-ra; conversely, right-headedness on Line 1 accurately generates a-pa-rá but gives the wrong stress with *a-pa-rá. If Line 1 stress is the result of a general constraint in Zoll's framework, the problem remains: Whether that constraint aligns unmarked stress to the left or to the right, it too will choose the wrong candidate for one of the a-pa-rá / á-pa-ra pair. Crucially, an unqualified constraint against stress clash—i.e., one lacking iterativity—

---

[5] The reverse of this system also counts as a case of conflicting directionality: rightmost heavy syllable else leftmost light syllable.

does not remedy the situation, as is demonstrated in the tableau in (6), where a ban on stress clash is roughly formulated as NoCLASH, which bans two adjacent asterisks on Line 1.

(6) Failure of NoCLASH

a-pa-ra	NoCLASH (Line 1)	MAX *[6]	LEFTMOST[7]

*
  * * *
  * *
a)   á-pa-ra
	!		

*
  *   *
  * *
b)☞a-pa-rá
		*	*!

*
  *   *
  * *
c) ●á-pa-ra
		*	

Since NoCLASH is blind to the means of repair, it has no way of distinguishing between outputs (6b) and (6c). The decision is then passed to LEFTMOST, which favors the incorrect output (6c).

How, if at all, can we reanalyze the Abkhaz stress data in such a way that the constraints select (6b) without the use of iterativity? While iterativity poses no problems for the derivationalist, it threatens the very heart of parallel optimality theoretical frameworks. Even in versions of optimality theory which allow levels[8] (e.g., Orgun 1996b, Kiparsky 2000), ideally the levels posited fall out from independently motivated domains such as stem, word, and phrase. Any counterexamples must therefore be rigorously scrutinized.

Such an investigation is the essential task of this paper. Salient features of the Dybo-Trigo-Kathman analysis are systematically tested and alternative hypotheses evaluated. The aim is to see, first, if the iterativity might be kept but grounded in morphological levels; and second, barring that, if the problem could be reformulated in terms not of syllabic or grid adjacency but of morphological prominence, along the lines of some of the most recent work on lexical accent in OT, Alderete 1999. The paper is laid out as follows: Section 2 reviews the basic premises of Alderete 1999; section 3 outlines some background on Abkhaz phonology and morphology; section 4 investigates the two inquiries just delineated; in section 5, I offer conclusions.

---

[6] MAX is not entirely appropriate here, given that (by assumption) no asterisks are present in the UR. Without going into the formalism of accent in the UR, I will simply use MAX as shorthand here to ban the failure of stressed moras to project a Line 1 asterisk.
[7] After Prince and Smolensky 1993.
[8] I mean the term "level" here in the most general sense, whether temporal or simply in morphological terms.

2   Alderete 1999: tools for analyzing lexical stress

Cyclic effects have been the target of much recent research in Optimality Theory (e.g. Orgun 1994, 1996a, 1996b, Benua 1995, 1997, Kenstowicz 1996, Alderete 1999, Revithiadou 1999, Kiparsky 2000, inter alia). I will focus on one of the most recent, Alderete 1999, because it most specifically addresses the question of cyclic *stress,* rather than cyclicity in general, and because, consequently, it provides the most comprehensive, explicit, and useful tools for the analysis of morphologically conditioned lexical stress patterns.[9] In this section I will attempt a summary of the main points of his framework.

Alderete 1999 makes a distinction between root-controlled accent (RCA) and affix-controlled accent (ACA) systems. In root-controlled systems, the root gets the accent if it is underlyingly accented, and if not, the interaction of various affixal accentual patterns determines the word stress; with affix-controlled accent, by contrast, the affix affects the root regardless of its status as stressed or unstressed.

ACA effects subsume three phenomena. (1) *Dominant* morphemes delete the accent of the base, (2) *pre-* and *post-accentuation* adds an accent to the base, and (3) *shift* compels the base accent to migrate. Each results from its own Transderivational Anti-Faithfulness (TAF) constraint, the inverse of the Faithfulness constraints MAX-PROM, DEP-PROM, and NO-FLOP-PROM which when undominated *block* deletion, addition, and shift of accent, respectively. TAF constraints ¬OO-MAX-PROM, ¬OO-DEP-PROM, and ¬OO-NO-FLOP-PROM *force* those changes in the base accent. ACA effects share the next five common characteristics, according to Alderete:

(7) Characteristics of ACA (Alderete 1999: 225)

      a. <u>Lexically idiosyncratic</u>: the application of affix-controlled processes is unpredictable and must be specified in the lexical entry of individual morphemes.

      b. <u>Morphologically triggered</u>: affix-controlled processes correlate with the application of a morphological process.

      c. <u>Base-mutating</u>: affix-controlled processes affect the base of a morphological process.

      d. <u>Grammar dependent</u>: the output of an affix-controlled accentual process may be predicted by independently attested grammar of accent.

      e. <u>Subject to locality requirements</u>: in some affix-controlled processes, the target of the process must be 'close enough' to the triggering morpheme.

---

[9] While Revithiadou 1999 also focuses exclusively on cyclic stress, her theory achieves, at least in my understanding, relatively poor results on the Abkhaz facts and so I have not bothered to expound her theory in much detail here. She contends, against Alderete 1999 and others, that in the case of a contest among lexical stresses, it is not the *root* but the morphosyntactic *head*—whatever determines the grammatical category of the word—that wins. In Abkhaz, as will become clear, this is a difficult proposition to maintain; one must, for instance, posit in many cases that an oblique [something missing here] such as the dative construction determining the grammatical category of the verb. Revithiadou allows for some systems to be morphology-dependent but not head-dominant, such as Spanish and Pashto. Perhaps Abkhaz is one such system.

RCA results from the general ranking ROOTFAITH >> AFFIXFAITH, which when EDGEMOST is added to it produces the following factorial typology (taken from Alderete 1999: 90):

(8) Factorial Typology with Decisive EDGEMOST Constraint

$$\text{(A)} \gg \text{Max-Prom}_{\text{Root}} \gg \text{(B)} \gg \text{Max-Prom}_{\text{Affix}} \gg \text{(C)}$$
$$\uparrow \qquad\qquad\qquad\qquad \uparrow \qquad\qquad\qquad\qquad \uparrow$$
$$\text{EDGEMOST} \qquad\qquad \text{EDGEMOST} \qquad\qquad \text{EDGEMOST}$$
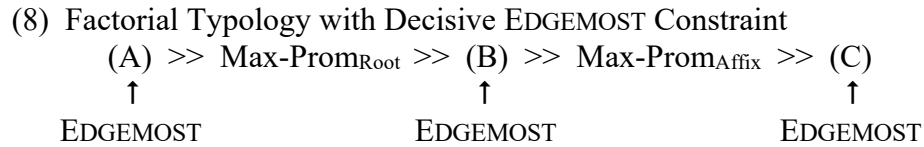
(9) Grammars Resulting from Factorial Typology

  Grammar A: accent is delimitative (always coincides with a designated edge) in all contexts; accent is not contrastive.
  Grammar B: accent is contrastive in roots, but delimitative in words with unaccented roots. In words with more than one accented root, the edgemost (i.e., closest to a designated edge) accented root wins.
  Grammar C: accent is contrastive in roots and affixes, but a root accent takes precedence over an affix accent. In words with more than one accented morpheme of the same morphological class, the edgemost accent wins. In words with no accented morphemes, accent is delimitative.

One other significant aspect of Alderete's system (although it is not unique to his; cf., for example, Orgun 1996b) is his loosening of the condition that inputs to Output-Output evaluations must be full phonological words, as was the case in previous work by, e.g., Kenstowicz 1996. Outputs are instead evaluated with respect to a base which is a substring of another output, rather than that entire output (see Alderete 1997b for the principle of Base Optimization and how exactly the base is chosen).

3   Introduction to aspects of Abkhaz phonology and morphology
Some background on Abkhaz will be helpful to understand the analyses advanced below.

3.1   Vowels
Abkhaz is traditionally said to have two vowels, [a] and [ə]. Schwa in turn comes in two varieties, automatic and non-automatic. Automatic, or epenthetic, schwa breaks up either CCC clusters between the first two consonants, or final CS clusters (S for sonorant).[10] Non-automatic schwa is usually stressed, but can be accented without stress, as in for instance the definite form of [sʷapə́dʐap-k'] 'vegetation,' which is [á-sʷapə̱dʐap] 'the vegetation.' The schwa which was stressed in the indefinite form does not take word stress in the definite form but it does not delete because of its lexical accent.

Because schwa is predictable from stress and phonotactics, some researchers have chosen to exclude it from the underlying representation. On this analysis, the lexicon stores only a string of C's and a's, with accentual markings; accented C's who remain accented after clash deletion are given a schwa on which to realize their accent. One problem with

---

[10] This actually seems to be somewhat of a simplification of the automatic schwa facts, but an exact statement of the rules for automatic schwa is not at issue here.

this analysis is that it cannot capture the generalization that pre-vocalic (i.e., before [a]) C never carries its own accent. In some way which must be encoded in the theory, such consonants are "taken" as onsets and cannot factor into stress phenomena. This robust fact is impossible to account for in a system where accent is said to be randomly (from the lexicon) distributed across Cs and a's. Additionally, Vaux (personal communication) has found two minimal pairs (one near minimal) in the speech of Mr. Zihni Sener, a speaker of the Cwyzhy dialect:[11] á-mc' 'fly' vs. á-məc 'lie' and a-ššə-rá 'get warm' vs. a-šəšə-rá 'retaliate, mourn.' For these reasons, an underlying schwa is preferable. To explore the effect this shift would have on transcriptions and on the phonology as a whole, however, lies beyond the scope of this paper, so I have chosen to follow the orthographical conventions of previous authors in this respect.

3.2   Morphology

3.2.1   Nominal

The noun can incorporate various different elements into its phonological word, in the following order:

>   (10) definite – numeral – noun – adjective – plural – indefinite

As seen in (5) above, the definite article is the accented a- prefix. The numerals are all unaccented, since in definite constructions with a numeral (a-#-√-k'), the definite article always gets the word stress. Adjectives are optionally compounded to their head nouns. Otherwise, both noun and adjective take a separate plural marker (and their own accent). The plural morpheme is accented: /-kʷa/.   The indefinite marker consists of a final –k', but in cases of default stress (see below) optionally takes its own schwa: -k'ə́. There is additionally a human plural marker, cʷa, which can take the place of or precede the general plural marker. Because of its limited range, it will not be included here, along with a handful of other restricted plural morphemes (cf. Hewitt 1989:44).

3.2.2   Verbal

Verbal morphology is considerably more complex than nominal morphology.   Its schematic runs something like what we see in (11) (from Kathman 1993). Abkhaz is an ergative-absolutive language, with absolutive agreement with subjects of intransitive verbs and objects of transitive verbs, and ergative agreement with subjects of transitive verbs. In traditional accounts, these have been dubbed "Column I" and "Column III" pronouns due to their position in the verb. "Column II" pronouns mark agreement with the indirect object, as well as with certain postpositional objects. Most of these morphemes are unaccented, except the dative, where the reverse is true.

>   (11) absolutive – direction – dative – preverb – ergative – negative – causative –
>   root – tense/aspect

>   (12) the pronominal "columns"

---

[11] Abzhui is the standard, literary dialect on which the other articles are based.

	Absolutive	Dative	Ergative
1sg	s-	s-	s-/z-
2sg, masc	w-	w-	w-
2sg. fem	b-	b-	b-
3sg. masc	d-	y-	y-
3sg. fem	d-	l-	l-
3sg. nonhuman	y-/Ø	a-/Ø	a-/na-
1pl	h-	h-	h-/aa-
2pl	šʷ-	šʷ-	šʷ-/žʷ-
3pl	y-/Ø	r-	r-
Relative	y-	z-	z-
Reciprocal		ay-	

It is noteworthy that the Dative and Ergative markers are in almost all cases identical save with regard to stress, the only exceptions being 1sg, 3sg nonhuman, 1pl, and 2pl. Of those four exceptions, three of them have to do with a voicing rule: Ergative markers assimilate in voicing to following voiced obstruents, while their dative counterparts do not. In the closely related language Abaza, where the indirect object evidences an incorporated 'to' postposition after the Column II pronoun, no distinction needs to be made between the Dative and Ergative markers (O'Herin 1995); Datives fall into a more general class of incorporated postpositions with Ergative agreement. A similar line of analysis might be pursued for Abkhaz, where a subsegmental postposition could induce stress on the ergative marker and possibly even block voicing assimilation (although the formalism of this would certainly need some investigation). This would carry the added advantage of avoiding the postulation of another functional head in addition to the CP-AbsP-TP-ErgP-V^{max} O'Herin holds to for Abaza. The third person singular nonhuman forms would still require some stipulation, however.

A preverb, or "orientational preverb" (Hewitt 1989), usually expresses some sort of locative oblique function. A verb which takes a preverb never occurs without one, but which one it binds to can differ, and many preverbs can likewise attach to various verbs (while some are quite specific). In this way it is possible to discern the accentual class of verbal roots, using the accented preverb as a diagnostic: [a-ta-xa-rá] 'to remain in,' [a-tá-la-ra] 'to go into it,' [á-va-xa-ra] 'to remain next to,' and [á-va-la-ra] 'to go next to' show the four possible patterns of accentuation for monosyllabic preverb plus verb pairs.

Directional prefixes l(a)- 'downwards,' yʷ(a)- 'upwards,' n(a)- 'thither,' aa- 'hither,' as well as negative m-, are all said to behave as typically unaccented, with exceptions which will be discussed in the next section. Relative and Reciprocal datives seem to be postaccenting (Kathman 1993).

4 Systematic attempts at reanalysis
4.1 Could independently motivated levels replace the need for iterativity?
If our goal is to eliminate iterativity, it would be felicitous to find that some of the domains of the iterations follow independently motivated morphological boundaries. This is actually the case for some of the examples, it turns out, but not for all.

Trigo 1992 adduces support for a major boundary directly following verbal and nominal roots separating them from suffixes (usually tense or aspect) in the case of verbs

and from adjectives in compound in the case of nouns. While Abkhaz has no direct corollary of it, she argues, the closely related language Abaza demonstrates a process of monophthongization which applies only across major boundaries—word (13a), enclitic (13b), and syntactic infix (13c,d) boundaries—and not across affix boundaries (13e,f) or morpheme-internally (13g). If this can then serve as any kind of diagnostic, then the fact that monophthongization *does* occur between a verb and its suffixes (13h, i) indicates that a strong boundary exists there as well.

(13) Abaza monophthongization (from Trigo 1992: 210)

a) sará # y – s – cʷə́b
     [i:]
                                           'it belongs to me'
   1SG # 3SGIRRABS-1SGERG-belong

b) yčə́ = y yáhʷa = y
              [i:]
                                  '[his horse and] [his sword and]'
   his-horse = and   his-sword = and

c) y – atá = y – ba –x –d
          [i:]
                                'he saw it again'
   3SGIRRABS-again=3SGERG-see-REP-DECL

d) d – an – bá = y – ba
             [i:]
                                'when did he see him'
   3SGRATABS-when-ques=3SGRATERG-see

e) y – r – á – y – hʷ = d
                *[i:]
                                'he told them'
   3SGIRRABS-1PLRATERG-PREV-3SGRATERG-tell-decl.

f) y – qá – y – dzʸ = d
          *[i:]
                                'he raised it'
   1SGABS-PREVERB-3SGRATERG-raise=DECL

g) d – s – áy –hʷahʷ = d
              *[i:]
                                'he greeted me'
   3SGRATABS-1SGDAT-POSTPOSITION-greet=DECL

h) y   –   s   –   bá = w – n
                          [u:]
                                              'I used to see it'

    3SGIRRABS-1SGERG-see=dyn-habitual

i) y   –   z   –   bá = yd
                          [i:]
                                              'I see it'

    3SGIRRABS-1SGERG-see=DECL

Further evidence for the boundary's existence in Abkhaz, Trigo notes, comes from the placement of automatic schwa: CCC clusters regularly escape epenthesis if the first two belong to the root and the last belongs to the suffix (e.g., yə-z-və́-s-x=da 'from next to whom did I take it?').

    In her analysis, this boundary also serves to block the rightward movement of default accent. In the form [(X) s-q'a-lá=x-ša-ma] 1SABS-PREVERB-become-AGAIN-FUT-Q 'will I become (X) again?' all of the syllables are unaccented, but the stress moves only as far as the right edge of the root and will not pass the boundary to its right. This is true even when a stressed element appears among the suffixes not adjacent to the root: [(X) s-q'a-lá=x-w<u>a</u>-ma] 1SABS-PREVERB-become-AGAIN-DYN-Q 'do I become (X) again?' Importantly, though, after default stress if an accented suffix appears, clash deletion still applies, as shown by [(X) s-q'a-la=wá-ma] 1SABS-PREVERB-become-DYN-Q 'do I become (X)?' (*[s-q'a-lá=w<u>a</u>-ma]).

    Trigo extends this to the noun phrase as well. With the disyllabic unstressed noun /cha/ 'bridge' at the root, default stress gets assigned to /ha/ before compounded and affixal accents are computed: chá=zʷ-k' 'an old bridge' (*cha=zʷə́-k', *cha=zʷ-k'ə́); chá=zʷ-kʷa-k' 'old bridges' (*cha=zʷ-kʷá-k'). This gives an explanatorily adequate account to something which Spruit simply stipulates in his analysis. In Spruit's description, where D stands for dominant or accented, R for recessive or unaccented, and I for Indifferent, bisyllabic patterns DD, DR, and RI followed by monosyllabic adjectives D and R yields six outcomes, all of which are predicted by Spruit:

    (14) some (informal) derivations from Spruit 1985's system
    a. DD + D = RRD
    b. DD + R = RDR
    c. DR + D = DRR
    d. DR + R = DRR
    e. RI[12] + D = RRD
    f. RI + R = RRD or RDR

_____

[12] He uses RI for RD and RR because with the prefixation of <u>a</u>- and the suffixation of –k' nothing distinguishes the two types of roots.

In order to get the outcome RDR for (14f), Spruit states that in this situation, RI roots behaves like RD, whereas with other prefixes and suffixes, it acts as an RR.[13] Trigo's analysis elegantly explains RI roots' otherwise puzzling alternation between RR and RD.

Although Trigo does not go this far with her notion of the strong boundary, it is a natural extension to suggest that that same boundary also divides nominal roots from the plural suffix, and verbal roots from the *masdar* suffix. This would eliminate probably the two most common sources of iterative clash deletion in Abkhaz, namely constructions of the forms a-la-kʷá 'the dog-s' and a-pa-rá 'to pleat.'

Further examples do present themselves, however, in both the nominal and verbal paradigms. In the nominal paradigm, nouns of the form labá-k' 'a stick' / a-labá 'the stick' still necessitate iterativity. While it is true that the argument for positing an accent on the first syllable of laba is theoretical (it never surfaces, but appears there solely to block the appearance of a-'s accent), as we shall see in the next section, removing this seemingly unnecessary piece of the puzzle proves more difficult than one would expect, and makes incorrect predictions about longer nouns.

As for the verbal morphology, cases of three consecutive accents arise from various circumstances:

(15) three consecutive accents in verbal morphology
a) y   –   sǝ – fyʷǝ́ = da
    RELABS 1SDAT smell   who
     Who smelled at me?

b) yǝ –   s – ná –   ta = da
    RELABS 1SDAT 3SGIRRERG give   WHO
    Whom did it give me?

c) y   –   a   –   bá = da
    RELABS 3SGIRRERG see   WHO
    Whom did it see?

d) y   –   k'a – na – cá = ma
    3SGIRRABS down 3SGIRRERG drive   Q
    Did it drive it down?

e) a – hʷaza – rá   f) a – ta – xx = rá
   to crawl   to run into

g) a – yʷna – xa = rá   h) a – yʷna – xx = rá
   to remain in   to run into (a lodging)

No straightforward splicing of these, keeping the basic mechanism of left-to-right clash intact and simply dividing the word into levels, will suffice. For (15a), we would be forced

---

[13] More specifically, where an RD root with -k' would likely produce *only* chá-k' 'a bridge,' an RR root such as cha is allows for *either* chá-k' *or* cha-k'ǝ́.

to add an extra boundary between the Dative and the root. (15b) would put that boundary between the Dative and the Ergative marker, but to the contrary (15c) and (15d) require that it go between the Ergative marker and the root. Solutions must be sought elsewhere.

4.2 Might the mechanism of stress clash be recast in cyclic or other terms?

In the last section, it was shown to be inadequate to maintain the mechanism of stress clash and divide the repetitions of clash deletion along morphological boundaries, because the various cases of multiple stress clash deletion did not agree on where to put such a boundary. The next logical test is the actual mechanism of stress clash. What if clash were posed in terms of root versus affix rather than syllabic adjacency? This section will explore that possibility in terms of Alderete's RCA.

　　　　We have already seen reason to doubt that stress clash is entirely based on adjacency. As was hinted in the last section, Spruit's ideal four-way DD/DR/RD/RR classification is less than ideal. First, Trigo 1992's hypothesis about strong boundaries in Abkhaz showed that RD and RR were in fact both RR. Second, it seems undesirable in a stress system to have two lexical accents on two syllables, especially when one of them never surfaces. It would be much more natural to convert DD to RD, RR and RD to RR, and retain DR as DR, producing a three-way contrast: unaccented, accent on σ_1, and accent on σ_2. Under this analysis, the accent of nouns like labá-k' 'a stick' and dágʷa-k' 'a deaf person' is retained with the prefixation of á- because it is root accent in a system where ROOTFAITH >> AFFIXFAITH. The accent of madzá-k' 'a secret' is not original to the root; when á- is added, it finds no opposition from ROOTFAITH and so it is free to surface.

(16)　　　　If Abkhaz is RCA…

a.　a-laba 'the stick' → a-labá

a-laba	ROOTFAITH	AFFIXFAITH
☞ a-labá		*
á-laba	*!	

b.　a-dagʷa 'the deaf person' → a-dágʷa

a-dagʷa	ROOTFAITH	AFFIXFAITH
☞ a-dágʷa		*
á-dagʷa	*!	

c.　a-madza 'the secret' → á-madza

a-madza	ROOTFAITH	AFFIXFAITH
a-madzá	*!	*
☞ á-madza		

d.　laba-k' 'a dog' → labá-k'
e.　dagʷa-k' 'a deaf person' → dágʷa-k'
f.　madza-k' 'a secret' → madzá-k'

At first blush, there is another factor which might seem to hint in this direction. The largest body of evidence which does not fit into Dybo's paradigm concerns unstressed monomoraic verbal roots. Before such roots, typically unstressed absolute,[14] negative,[15] and directional[16] markers become stressed.

(17) Extrametricality in Abkhaz verbs

a. sə́ - pa - ma
   1SABS jump Q
   'Did I jump?'

b. yə́ - pa - ša - ma
   3SABS jump FUT   Q
   'Will he jump?'

c. s - mə́ - pa - y
   1SABS NEG jump Q
   'Didn't I jump?'

d. d   - ná   - pa - ma
   3SGRATABS THITHER jump Q
   'Did he jump (thither)?'

Trigo attributes these to default stress with final extrametricality, but one can conceive of a reanalysis in which default accentuation fails to apply not because of extrametricality but because the negative, directional, and absolute morphemes are underlyingly accented. The lack of accent on the root then allows these to surface.

The extrametricality facts are complicated, however, by a failure to apply, (1) with bimoraic roots [s-azʷə́=ma] 1SGABS-grow old=Q, (2) when Ergative markers are affixed to the root (perhaps they are very close phonologically, as may have been shown by the Ergative voicing assimilation rule) [də-s-fá=ma] 3SGRATABS-1SERG-eat=Q 'Did I eat him?', and (3) when preverbs are affixed to the root [s-q'a-lá=ma] 1SABS-PREVERB-become=Q 'Did I become?' Trigo suggests for her extrametricality rule that the root gains minimal word status from the affixation of Ergative marker and preverb, and that once the root is minimally a word it is no longer left extrametrical. Besides the imprecision of the notion "minimal word" in a system where the correlated term "foot" seems to have very

---

[14] Since absolute markers are in initial position, we know them to be unstressed not because of their effects on preceding vowels but primarily because before other unstressed elements such as direction, ergative, negative, or unstressed preverb, absolute markers do not receive stress.
[15] Kathman cites [yə́-m-ca̱=da] "Who didn't go?" and [d-á-m-ba̱-y] "Didn't it see him?" to demonstrate the unaccented nature of the negative morpheme. For a good discussion of the negative as an infix, see Trigo 1992: 218-23.
[16] Directional markers both fail to accent before unaccented affixes and allow accented affixes immediately prior to them.

little meaning, this analysis suffers from lack of clarity in why the application of extrametricality should depend on the concept of minimal words in the first place.[17]

RCA does little better, however. If such markers as the Absolutive really are underlyingly stressed, then why should that not surface similarly with a disyllabic verbal root? If, to take another tack, the verb's lack of accent is protected by OO-DEP-PROM$_{ROOT}$, then nothing explains why disyllabic roots would be less protective of their lack of accent than monosyllabic roots.

That aside, a root-controlled accent analysis of Abkhaz runs into other problems. The first one involves the prefixation of numbers. As mentioned in section 3.2.2 above, numbers in Abkhaz prefix to the root, and require the addition of the indefinite suffix –k'. They are all unaccented, which is confirmed by the fact that the definite article when it precedes the number will without exception take word stress (e.g., á-yʷ-la-k' 'the two dog-s'). The trick to selecting this form then would lie in pacifying MAX-PROM$_{ROOT}$ so that the accent of á- can surface with word stress. The only way to achieve this is by marking the number morphemes as dominant unaccented (affix-controlled). This will block root stress from being expressed and free the leftmost accented a- to take the accent for the word.

While this holds for the definite forms, , it fails for the indefinite forms, because the numerals do not, in fact, destroy root stress, as shown by yʷ-lá-k' 'two dogs.' If the stress of the base had been eliminated, default stress with the –k' morpheme in Abkhaz always would allow two optional pronunciations: yʷ-lá-k', and yʷ-la-k'ə́. As is, only yʷ-lá-k' is allowed, suggesting that the accent on lá is original and not default. Additionally, classifying the numbers as ACA would seem to threaten Alderete's criterion of lexical idiosyncrasy.

A much bigger hurdle appears in longer words. The system being explored here, based on our typology of disyllabic nouns, allows two kinds of non-initial accent in nouns: default, and dominant. The dominant, underlying, sort does not allow a- to show its accent; the default allows a- to take its accent but its unmarked place is the right edge.
The middle ground—an unpredictable, root accent which the a- still supplants—cannot exist. Spruit, however, gives two counterexamples of unanalyzable nouns that fall into this class:

(18)   a. á-mansʷala 'the adroit one' vs. mansʷála-k' 'an adroit person'
        b. á- sʷapədzap 'the vegetation' vs. sʷapə́dzap-k' 'vegetation'

This evidence proves our restrictive scheme of (16) to have been *too* restrictive. If these accents are truly root prominences, then they should surface despite the á-; if they are truly default accents, they should be word-final. Since neither of these holds true, our schema fails.

If RCA tactics do not seem to be working, will ACA? One might suggest that MAX-PROM$_{AFFIX}$ for á- is ranked above MAX-PROM$_{ROOT}$, such that á- is *always* stressed, except

---

[17] If this "minimal word" hypothesis were in some way meaningful and could serve as the domain of a phonological rule, however, it has the possibility of shedding light on questions from the last section. If there were a domain which *either* included the ergative *or* the preverb, and only in case of a monosyllabic unaccented verbal root, it would solve the iterativity problems of examples (15a-d) above. See Orgun 1994, 1996a for an argument from Uighur about the necessity of making the number of morphological levels relative to the form, which might be a helpful premise if one were to pursue this line of inquiry. Nonetheless, examples (e-h) would still remain.

where an outranking NoCLASH constraint prevents it, in which case one would hope to make the resulting form delete the offending affixal accent and not the base accent. Unfortunately, however, this creates a ranking paradox. In order for clash deletion to favor deleting the affix as a repair strategy, MAX-PROM$_{ROOT}$ must be higher ranked than MAX-PROM$_{AFFIX}$, and we have just proposed the opposite ranking.

5   Conclusion

Iterative left-to-right clash deletion combined with a general LEFTMOST parameter creates serious problems for most if not all versions of Optimality Theory. This paper has demonstrated by exploring various lines of reasoning that the Abkhaz facts are recalcitrant to many analyses which use even some of the most advanced tools for describing lexical stress systems in OT to date. We reviewed much of the work done on Abkhaz and then tried to pick apart the notion "iterative clash deletion," answering the following questions: If we keep clash deletion as a local phenomenon, is it possible to ground the domain of each iteration in independently motivated morphological boundaries? Then if we reject clash deletion as a strictly local phenomenon, will the morphologically-based RCA and ACA tools suffice to categorize the same alternations?

  To each of these questions we have responded in the negative, first because only one stable and independent boundary, not two, showed itself; second because getting the word stress on the definite affix in cases like á-y^w-l<u>a</u>-k' 'the two dogs" when ROOTFAITH >> AFFIXFAITH involves erasing the root accent, and numerals do not do that (if it could it would be a strange case of ACA); because such a system cannot produce the proper distribution of accent in four-syllable words.

REFERENCES

Alderete, John. 1997a. Prosodic faithfulness in Cupeño. ms, University of Massachusetts, Amherst. [To appear in *Natural Language and Linguistic Theory*.]

Alderete, John. 1997b. Multiple Correspondence and Base Optimization. Poster presented at Maryland Mayfest/Hopkins Optimality Workshop.

Alderete, John. 1999. Morphologically governed accent in Optimality Theory. Ph.D. dissertation, University of Massachusetts, Amherst.

Benua, Laura. 1995. Identity effects in morphological truncation. In Jill Beckman, Laura Welsh Dickey, and Suzanne Urbanczyk (eds.), *Papers in Optimality Theory.* University of Massachusetts Occasional Papers in Linguistics 18: 77-136. Amherst: GLSA.

Benua, Laura. 1997. Transderivational Identity: Phonological relations between words. Ph.D. dissertation, University of Massachusetts, Amherst.

Bobaljik, Jonathan David. 1997. Mostly predictable: Cyclicity and the distribution of schwa in Itelmen. To appear in *Proceedings of WECOL 1996*, University of California, Santa Cruz.

Dybo, V. 1977. Zapadnokavkazskaja akcentnaja sistema i problema ee proisxozhdenija. In Konferencia Nostraticheskie jazyki i nostraticheskoe jazykoznanie, Tezisy doladov, 41-45.

Halle, Morris. 1997. On stress and accent in Indo-European. *Language* 73, 275-313.

Halle, Morris, and G. N. Clements. 1983. *Problem Book in Phonology*. Cambridge, MA: MIT Press.

Halle, Morris, and William J. Idsardi. 1995. "General properties of stress and metrical structure." In J.A. Goldsmith (ed.), *The Handbook of Phonological Theory*, 403-443. Cambridge, MA: Basil Blackwell.

Halle, Morris, and Paul Kiparsky. 1977. "Towards a reconstruction of the Indo-European accent," in L. Hyman (ed.), *Studies in Stress and Accent* [*Southern California Occasional Papers in Linguistics* 4], 209-238. University of Southern California.

Halle, Morris, and Paul Kiparsky. 1981. Internal constituent structure and accent in Russian words. *Folia Slavica,* 128-153.

Halle, Morris, and Jean-Roger Vergnaud. 1987. *An Essay on Stress*. Cambridge, MA: MIT Press.

Hewitt, B. George. 1979. *Abkhaz*. Lingua Descriptive Series, Vol. 2. Amsterdam: North-Holland Publishing Company.

Hewitt, B. George. 1989. "Abkhaz," in B. George Hewitt (ed.), *The Indigenous Languages of the Caucasus, Vol. 2: The North West Caucasian Languages*, 38-88. Delmar, NY: Caravan Books.

Hill, Jane, and Kenneth Hill. 1968. Stress in Cupan (Uto-Aztecan) languages. *International Journal of American Linguistics* 34, 233-241.

Idsardi, William J. 1992. The Computation of Prosody. Ph.D. Dissertation, Massachusetts Institute of Technology.

Kathman, David. 1992. "Stress and accent in Abkhaz." In Germán Westphal et al. (eds.), *ESCOL '91: Proceedings of the Eighth Eastern States Conference on Linguistics*, 210-221.

Kathman, David. 1993. "Abkhaz stress and morphological templates." Paper presented at the Eighth Biennial Non-Slavic Languages Conference, May 1993; to appear in the proceedings.

Kathman, David. 1994. Floating grids and the independence of metrical structure. ms, University of Chicago.

Kenstowicz, Michael. 1996. Base-identity and uniform exponence: Alternatives to cyclicity. In Jacques Durand and Bernard Laks (eds.), *Current Trends in Phonology: Models and Methods,* Vol. 1, 363-93. European Studies Research Institute (ERSI), University of Salford, Salford, Manchester, UK.

Kiparsky, Paul. 1973. The inflectional accent of Indo-European. *Language* 63, 463-497.

Kiparsky, Paul. 1982. The lexical phonology of Vedic accent. ms, Stanford University, California.

Kiparsky, Paul. 2000. Opacity and cyclicity. *The Linguistic Review* 17.

Melvold, J. 1990. Structure and stress in the phonology of Russian. Ph.D. dissertation, Massachusetts Institute of Technology.

O'Herin, Brian. 1995. Case and agreement in Abaza. Ph.D. dissertation, University of California, Santa Cruz.

Orgun, Cemil Orhan. 1994. Monotonic Cyclicity. ms, U.C. Berkeley. [ROA 123-0496]

Orgun, Cemil Orhan. 1996a. Sign-based morphology: a declarative theory of phonology-morphology interleaving. ms, U.C. San Diego. [ROA 122-0496]

Orgun, Cemil Orhan. 1996b. Sign-based morphology and phonology with special attention to Optimality Theory. Ph.D. dissertation, University of California, Berkeley.

Prince, Alan, and Paul Smolensky. 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. ms., Rutgers University and University of Colorado and Boulder. [Forthcoming MIT Press]

Revithiadou, Anthoula. 1999. Headmost accent wins. Ph.D. dissertation, Leiden University.

Spruit, Arie. 1985. Stress in Abkhaz. *Studio Caucasica* 6, 31-81.

Trigo, Loren. 1992. "Abkhaz Stress Shift," in George Hewitt (ed.), *Caucasian Perspectives*. Unterschleissheim/München: Lincom Europa.

Zoll, Cheryl. 1997. Conflicting directionality. *Phonology* 14.2, 263-286. [ROA 151-10962]