

Incongruent analogy in Dinka vowel grades

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Inflectional morphology in Dinka (West Nilotic, Nilo-Saharan) relies heavily on stem-vowel alternations, termed *grades 1, 2 and 3* by Andersen (1993). The verb ‘call’, with stem vowel /ɔ/, illustrates the typical pattern: grade 1 has the

lexically basic vowel, grade 2 is lengthened, and 3 has a vowel quality alternation (lowering) in addition to lengthening. But the stem vowel /a/, as in ‘cook’, is a systematic exception: it shows a vowel quality alternation in grade 2 (raising and fronting), and none in grade 3. Andersen (1990, 2017) attributes both patterns to compensatory lengthening and umlaut triggered by suffixes that have since been lost: in particular, grade 3 was triggered by a low vowel suffix, and grade 2 by a non-low vowel suffix. While this reconstruction is well supported for the grade 3 alternation, we argue that the grade 2 alternation in *a*-stems like ‘cook’ could not have been the result of regular sound change, because (i) no other stem vowel is affected, and (ii) no trace of the alternation is found in closely-related Nuer, whose stem-vowel alternations otherwise closely align with those of Dinka (Reid 2019). Instead, we argue that the grade 2 alternation in *a*-stems is an analogical extension of the alternation found with the other stem vowels, though surprisingly, the result was an entirely different pattern of alternation.

Focussing here on the verbal system, we show how this aberrant alternation came about, and why only Dinka was affected, but not Nuer. Two background points are crucial to this account:

1. Root vowels occur in two morphologically opposed sets, ‘modal grade’ and ‘breathy grade’, which cross-cut the grade 1/2/3 distinction. This opposition is phonologically manifested by phonation type (modal vs. breathy voice), and in some cases also by vowel height, e.g. Dinka transitive **cɔɔl** vs. benefactive **cɔɔl** ‘call’.
2. Verbal stems may be lexically short (stem vowel of one mora) or long (two moras); lengthening involves adding one mora.

The change in Dinka originated in lexically short stems. Stage I shows the initial reflexes of lowering umlaut in grade 3. The modal grade vowel /a/ is unaffected, because it is already as low as it can be, but its breathy grade equivalent /ɛ/ is

lowered to /ɛ/ in grade 3. (This reflects the current state of Nuer, except that it has the vowel /ɛ/ in place of /ɛ/.) In Stage II, the phonological distinction in Dinka between short /a/ and /ɛ/ (both modal and breathy) is regularly neutralized. In Stage III, the alternation found in the breathy grade is extended by analogy to the modal grade, by replacing long /a/ with /ɛ/ in grade 2 contexts. This was made possible because a systematic alternation between breathy /ɛ/ and modal /ɛ/ already existed in other parts of the stem-vowel system, as the grade 3 alternant of stem vowels /ɛ/ and /e/. A comparable analogical extension could not occur in Nuer, because breathy /ɛ/ has no counterpart among the modal vowels, aside from /a/. In Stage IV, this alternation pattern was extended from short modal grade stems to long modal grade stems. Crucially, this was only manifested in grade 2 contexts: the phonological ambiguity of grade 1 /a|ɛ/ meant that this was enough to bring the two patterns into alignment. (Long breathy grade stems play no role in this account, for the simple reason that there are none: they have merged with stems in /ɛ/; Andersen 1993). Thus the reason why the analogical extension of stem-vowel alternations in Dinka has resulted in a seemingly incongruent pattern is that it has been channelled through the bottleneck of certain phonological peculiarities. This shows how the generalization of a morphological pattern can be sensitive to the properties of the individual links in the chain of analogical extension.

Keywords: morphology, inflection, analogy, stem alternations, Nilotic

	Dinka (Agar dialect)		Nuer (Lou dialect)	
	‘call’	‘cook’	‘call’	‘cook’
unmarked (grade 1)	cɔɔl	t̪aal	cóɔl	t̪áal
3SG (grade 2)	cɔɔɔl	t̪éɛl	cóɔɔl-é	t̪áaal-é
1SG (grade 3)	càaal	t̪àaal	cóaaal-á	t̪áaal-á

	Stage I		Stage II		Stage III		Stage IV	
	mo.	br.	mo.	br.	mo.	br.	short	long
grade 1	a	ɛ	a ɛ	a ɛ	a ɛ	a ɛ	a ɛ	aa
grade 2	aa	ɛɛ	ɛɛ	ɛɛ	ɛɛ	ɛɛ	ɛɛ	*aaa → ɛɛɛ
grade 3	aa	ɛɛ	aa	ɛɛ	aa	ɛɛ	aa	aaa

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