Redundant Features in Pulaar… and why they aren't*

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BACKGROUND

Pulaar (also Pular) is a Niger-Congo language spoken in western Africa (Mauritania, Mali, Senegal, Gambia, Guinea).

(1) Phonemic vowel inventory according to Paradis (1992)

i, iː	u, uː
ɛ, ɛː	ɔ, ɔː
a, aː	

Vowel length is phonemic, but not relevant here.

(2) Phonetic vowel inventory

i, iː	u, uː
e, eː	o, oː
ɛ, ɛː	ɔ, ɔː
a, aː	

The object of this paper is to account for the distribution of the ±ATR mid vowels within a framework of contrastive specification.

Assumptions about contrastive specification:

1. Features are assigned by the Successive Binary Algorithm proposed by Dresher (1998):
   The segmental inventory is divided into successively smaller classes—at each division, one subclass is assigned a (monovalent) feature and its complement is not. Once all segments have unique sets of specifications, feature assignment stops. This algorithm predicts that in every inventory, there will be one fully unspecified segment.

2. Redundant features are not active in the phonology.
   Strongest version: Redundant features are not present in the phonology.
   Less strong version: Redundant features are present but not active.

This contrastivist view is contra Archangeli and Pulleyblank (1994), who claim that spreading of a redundant feature is necessary to account for Pulaar.

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THE PROBLEM

In most cases, the distribution of the ±ATR mid vowels is predictable. Archangeli and Pulleyblank (drawing on Paradis's description and analysis of the Futankoore (Kaédi) dialect of Pulaar) describe the following situation: mid vowels are [+ATR] when followed by another [+ATR vowel], and [–ATR] otherwise. (High vowels are [+ATR], low /a/ is [–ATR].)

(3) The pattern

Singular	Diminutive plural	Gloss
sof-ru	ʧɔf-ɔn	'chick'
ser-du	sɛr-kɔn	'butt of a rifle'
mbeːl-u	mbɛːl-ɔn	'shadow'
dog-oː-ru	ⁿdɔg-ɔ-w-ɔn	'runner'

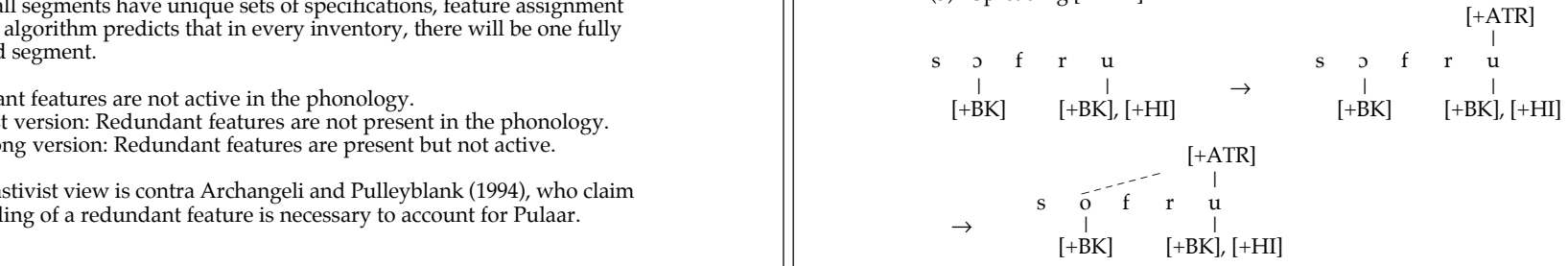
Both Paradis and Archangeli and Pulleyblank account for the pattern by spreading the (redundant) feature [+ATR] leftward from high vowels. Paradis's account is framed in Charm and Government Theory (Kaye, Lowenstamm, and Vergnaud 1985), in which features cannot be directly manipulated. I present Archangeli and Pulleyblank's account here, as it is more directly comparable to the contrastivist approach I intend to take.

(4) Underlying specifications according to Archangeli and Pulleyblank

i	u	ɛ	ɔ	a
+HI	+HI			
	+BK		+BK	
				+LO

[+ATR] is inserted on all [+HI] vowels, and spreads leftward. [+LO] blocks the spread of [+ATR].

(5) Spreading [+ATR]



The essential problem for contrastive specification and the SBA is that there are more surface contrasts than underlying ones. In some cases, this could be achieved by letting spreading create combinations of features that do not co-occur on any one segment in the underlying inventory—for instance, Coronal /i/ and Peripheral /u/ could coalesce into Coronal & Peripheral [y]. Here, however, there are not enough features around to make this work really well.

One contrastivist option: Play with the feature specifications

The SBA could assign the feature specifications in (6):

(6)

i	u	ɛ	ɔ	a
ATR	ATR			
	BK		BK	
		MID	MID	

The phonology could then spread [+ATR] leftwards onto [MID] vowels, creating a feature combination [+ATR, MID] not present in the underlying inventory. At the end of the phonology, [ATR] vowels not specified as [MID] are realized as high.

I see two main problems with this:

1. This does not explain the blocking of [+ATR] by /a/. We would expect [+ATR] to target /a/, changing it into (of all things) [i].

2. [MID] is a rather implausible feature.

A better contrastivist option: Retreat

We could adopt the less strong version of contrastivist specification, and allow redundant features to be present but inert.

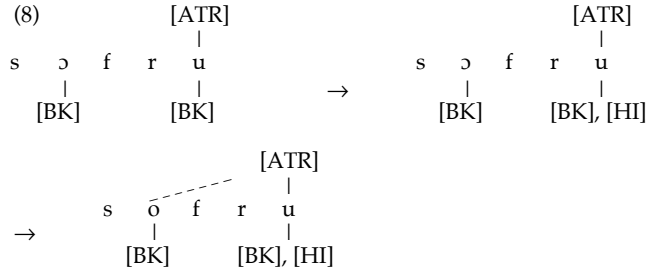
The SBA could produce (7):

(7)

i	u	ɛ	ɔ	a
ATR	ATR			
	BK		BK	
				LO

Vowel heights of non-low vowels are (redundantly) determined *before* [ATR] spreads, so that spreading does not make the mid vowels identical to the high ones:

(8)



This works, and it allows us to maintain the claim that redundant features are inactive. However, it may be possible to keep to the strongest version of the contrastivist hypothesis.

An even better contrastivist option: The data to the rescue

Paradis mentions five exceptions to the ATR pattern. Three are words:

(9)

fof	'all'
gorgiraagol	'aunt'
gorgol	'aunt' [familiar]

These could, by themselves, be ignored. The other two are suffixes:

(10)

-(g)el	diminutive singular
-(g)ol	noun class marker

ATR spreads leftward from these suffixes:

(11)

pɛmᵐbɔɔwɔ	'hairdresser'	pɛmᵐbow-el	'hairdresser' (dim.)
mbaroo-di	'lion'	baro-gel	'lion' (dim.)
hɔr-dɛ	'calabash'	kor-el	'calabash' (dim.)
		leeɓ-ol	'hair'
		comc-ol	'outfit'

Paradis explains the anomalous +ATR mid vowels as underlying sequences of a mid vowel followed by a high vowel. The high vowel spreads its ATR but then cannot be syllabified. She notes that in other dialects of Pulaar, the cognate of [fof] is sometimes [fɔf] and sometimes [fuf], suggesting that different dialects have different ways of dealing with underlying /fɔuf/.

Do the 'exceptional' forms allow us to posit an underlying seven-vowel inventory? This would permit us to retain the strongest version of the contrastivist hypothesis without resorting to a [MID] feature:

(12)

i	e	ɛ	a	ɔ	o	u
				Back	Back	Back
			Low			
ATR	ATR				ATR	ATR
High						High

With the specifications in (12), all we need say is that [ATR] spreads leftward onto non-low vowels.

Are five underlying [ATR] mid vowels enough to sustain a phonological contrast? Perhaps so—especially if two of them (the suffix vowels) are in a position to spread their [ATR] feature to other vowels. Even if there are only five underlyingly [ATR] mid vowels, there are many surface examples of [ATR] mid vowels not followed by high vowels.

The strong contrastivist position predicts that a language in which [ATR] is truly redundant should not have the harmony process described here.
In the Senegal dialect of Pulaar described by Ndiaye (1981), the distribution of ±ATR mid vowels appears to be truly predictable, and does not result from harmony. Ndiaye reports positional distribution of [ATR] for all short vowels:

(13)

/i/	[i] / _#	[ɲʌmmi] 'nourishment'
	[ɪ] / elsewhere	[gɪlɛ] 'peppers'; [ɪldɛ] 'pepper'
/e/	[ɛ] / _#	[gɪlɛ] 'peppers'; [Undɛ] 'to grind'
	[E] / #_	[Ertɛrɛ] 'peanut'
	[e] / C_C	[Ertɛrɛ] 'peanut'
/a/	[ʌ] / C_C	[dʌmʌl] 'door'
	[a] / elsewhere	[no:da] 'crocodile'
/o/	[ɔ] / C_C	[ᵐbɔddi] 'snake'
	[o] / elsewhere	[ontuma] 'at the moment'; [ma:ro] 'rice'
/u/	[U] / #_	[Undɛ] 'to grind'
	[u] / elsewhere	[puccu] 'horse'

CONCLUSION: Pulaar ATR harmony does not force us to weaken the contrastivist hypothesis.

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