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Vowel Harmony in Dagbani Dialects

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Abstract

Harmony system requires that two or more not-necessarily-adjacent segments must be similar or must resemble each other with respect to some feature(s). The paper explores Dagbanli harmony system by describing how Autosegmental Representations account for harmony between a stem and a nominal suffix in a derivational process in which the domain-final /o/ is caused to change underlying root vowel /i/ from [-round] to [+round] to harmonize with the stem vowel. Further representations give accounts of the primary features which reveal that Dagbanli has bi-directional harmonic spread. The focus here is on harmonic features such as round, back as well as vowel copy. Based on the data, the paper attest that Dagbanli exhibits the canonical harmony pattern of [V_F ...V_F ...V_F...V_F] and suggests that two of the dialects deviate from this pattern. The paper concludes that while Tomosili dialect permits harmonic canonical pattern, Nayahili and Nanunli deviate by presenting polarity.

Keywords: Vowel Harmony, Rounding, Backness, Bi-Directional, Dagbanli

Introduction

In many languages across the world, there is vowel harmony. Vowels of a given domain fall within a natural group. These vowels in the group could be or not be adjacent. This means that there could be some separations in the order in which these vowels appear in a word. It is worthnoting however, that not all vowels within a language with vowel harmony may fall into this group as there are vowels termed neutral.

Rose and Walker (2011) describe harmony as the distribution of vowels in the domain of a word which are separated by consonant segment(s). This domain of a word can either be phonological or morphological depending on the language. Archangeli and Pulleyblank (2007, p.353) note that two observed conditions are attested for accounting for

harmonic systems and these are "the segments within a word must show agreement for the harmonic feature as in (1a) and the vowels within a word must show agreement for the harmonic feature as in (1b).

1. Canonical Harmony
   a. [X_f X_f X_f …X_f]
   b. [$V_{f....}$ $V_{f.....}$ $V_{f.....}$ V_f] (cf. Archangeli & Pulleyblank, 2007, p.353)

The examples in (1) show conical harmony system. Languages which exhibit such system usually have all the vowels grouped into two according to [±ATR] feature as Archangeli and Pulleyblank (2007, p.354) observed in the "Degema language". This is illustrated below:

2. Canonical Harmony in Degema

Advanced			Retracted		
[i]	u-bí-ə̃	'state of being black'	[ɪ]	á-k-ĩ	'pot'
[u]	u-pú-ə̄m	'closing'	[ʊ]	ʊ-fʊ´-ā	'state of being white'
[e]	u-dēr-ə̄m	'cooking'	[ɛ]	ɔ-dɛ́d-ɛ̄	'chief'
[o]	i-sór-ə̄	'passing liquids faeces'	[ɔ]	ʊ-bɔ´m-ām	'beating'
[ə]	o-gədəgə´	'might'	[a]	ɔ-kpakıraká	'tough'

(Archangeli & Pulleyblank, 2007, p.354)

While the standard analysis of this case is in terms of vowel-to-vowel harmony as in (1b), an alternative, consistent with Local and Lodge's (2004) analysis of Kalenjin, is that the ATR feature actually affects all segments, type (2ii). Rose and Walker (2011, p.240) observe, "harmony can apply to longer strings as vowel harmony can operate at a distance depending on how one construes intervening consonants and/or vowels that are apparently unaffected by the assimilation."

Dakubu (1997) describes a word is a structural unit for describing the vowel distribution in Dagbanli and that "no phonemic contrast can be found between [+ATR] and [-ATR] vowels." Olawsky (1999) revels that [-ATR] vowels are allophones of the [+ATR] counterparts. Inusah (2021) attest to the fact that in Dagbanli the advanced variants and the retracted variants cannot occur together in the same word. Notice that the advanced variants [i, u, e, o] surface in mostly CV stem while retracted elsewhere, this is illustrated below:

3.

Advance [+ATR]			Retracted [-ATR]		
[ì]	tí-hì	'trees'	[ɨ]	tɨm-sá	'heavy'
[u]	tú-ɾì	'insults'	[ù]	jʊ́ɾ-lɨ́m	'love'
[e]	pé-lí	'hunting'	[ɛ]	tɛ́m-lɨ̂	'filter it'
[o]	kò-ɾê	'desire'	[ɔ]	dɔ́ɾ-tɨ́	'diseases'

The data in (3) provide distribution of the vowel qualities in Dagbanli words such that it is possible to group the vowels into [+ATR] advance vowels as set I and [-ATR] retracted vowels as set II and only the vowels of one set may occur in a word.

This paper describes rounding, backing and as well as harmony for complete. The previous account of vowel harmony in Dagbanli discussed mostly rounding and tongue root harmony which are highly attested in the language, but none provided a detailed account of the other harmonic features such as backness, and complete. The paper is premised on autosegmental representations that form the backbone of traditional non-linear analyses of harmony systems and give accounts of the primary features which reveal that Dagbanli has bi-directional harmonic spread. Based on the data, the paper attests that two of the dialects deviate from the second canonical pattern(s) which states that all vowels within a word show agreement for the harmonic feature. The paper suggests that while Tomosili dialect permits harmonic canonical pattern, Nayahili and Nanunli deviates by presenting polarity and in the harmonic domain, the mid vowels surface as [+ATR] indicating a right-to-left spread of the feature [+ATR].

The data used in this paper reflect Nayahili and Nanunli dialects of Dagbanli. The primary data were collected from Tamale, Yendi and Bimbila through elicitations and observations from other speakers of Dagbanli. The secondary data were collected from the existing works on Dagbanli phonology (Hudu, 2014, Inusah, 2016). All data are presented in phonemic or phonetic transcription, not in the orthography. Tone marking is restricted to high, low and falling tones. The segmental vowel inventory of Dagbanli is presented below:

4. Dagbanli Vowels

Class I				Class II	
i	i:	u	u:	ɨ	ʊ
e	e:	o	o:	ɛ	ɔ
				a	a:

The vowels in (4) show that fourteen (14) vowels in Dagbanli. comprising long and short cross dialectally. Both the short and the long vowels are contrastive in the language as illustrated:

5.

short vowel		long vowel	
pì	'bury'	pì:	'choose'
mí	'rain'	mí:	'become sour'
tù	'insult'	tù:lì	'first'
púní	'door'	pú:ní	'inside'
kpé	'enter'	kpé:	'boil'
fé	'finger'	fè:	'scarce'
dó	'weed'	dó:	'lying posture'
báŋá	'bangle'	bá:ŋá	'praise singer'
mànì	'me'	má:ní	'okra-sg.'

Notice that what harmony is and deciding which features are harmonic are integrally connected; for instance, voicing show such behavior (Archangeli & Pulleyblank, 2007). Rose and Walker (2011) identified rounding and backness as part.

Patterns of Harmony

The strict distribution of vowels in harmonic domain makes it necessary for Dagbani vowels to be grouped into two sets with only the vowels of one set co-occurring in any given word at a time.

The language has two harmonic patterns: back harmony (which affects all vowels) and round harmony (restricted to high vowel targets). The two broad patterns of harmony are i. progressive pattern and ii. regressive pattern. The data in (6) show stem-to-suffix harmonic pattern in Dagbanli:

6. Stem-to-suffix harmonic pattern in Dagbanli (cf. Hudu 2014, p.18)

[+ATR] stems		[-ATR] stems	
pín-î	'gift.'	bɨ́n-ɨ́	'thing'
díɣí	'mirror'	dʊ́ɣɨ́	'cook'
tí-bû	'vomiting'	dá-bʊ́	'buying'
dí-hí-bû	'feeding'	dɔ́lɨ́-bʊ́	'following'
vìhì	'investigate'	gbáhɨ́	'catch'
píhígî	'postpone'	pɔ́hɨ́gɨ́	'pluck'
jíɣí	'fly'	jáɣɨ́	'jump'

The data in (6) show stem-to-suffix harmonic pattern in which harmony spreads from the stem to the suffix vowel. This section discusses the different ways in which vowel harmony for rounding, backness and complete processes operate Dagbanli.

Round Harmony

This section discusses the feature rounding harmony in Dagbanli. Dagbanli vowel segments are presented below according to the rounding feature [+round]. The vowels on the right have their tongue root pulled back in articulation which usually amounts roughly to the retracted tongue root feature specification.

7.	Unround	Unround	Round
High	i		u
	ɨ		ʊ
Non-high	e	a	o
	ɛ		ɔ

Round harmony in Dagbanli dialects may be realised as reduplicated, a condition where a new lexical item is formed by doubling an entire free morpheme (total reduplication), or part of it (partial reduplication) (Olawsky,1999), a process which is stem-controlled process targeting the vowel in the suffix as shown below:

8. Rounding harmony (cf. Hudu 2014, p.22)

a.	kpìl-lí	'round'	→	kpí-kpíl-lí	'portably round'
b.	kpán-ŋí	'wing'	→	kpɨ́ŋm-kpà-ŋí	'matured wing'
c.	bɔ́n-ŋí	'darkness'	→	bʊ́m-bɔ́ŋ	'extreme darkness
d.	pɔ́ŋɔ́	'now'	→	pʊ́m-pɔ́ŋɔ́	'right now'

The data in (8) show rounding harmony where the stem lack round vowels. It is shown in the data in (9) that the stem has [o] and in non-reduplicated forms, domain-final [o, u] are the triggers targeting a root or epenthetic vowel [ɨ].

9. Rounding harmony (cf. Hudu 2014, p.23)

tʊm-o	'messenger'	cf.	tɨm	'send'
zʊn-o	'stranger'	cf.	zɨŋ	'alienate'
te:n lʊro	'thick beard'	cf.	lɨɾɨm	'to mess up'
sʊm-o	'bosom friend'	cf.	sɨm-nima	'friend-pl.'
báhʊ-gu	'adder'	cf.	báhɨ-si	'adder-pl.'
bɨlkɔɣʊ-no	'villain'	cf.	bɨlkɔɣɨn-si	'villainy'

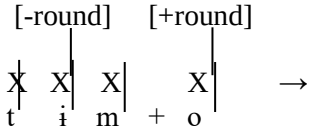
It is observed from the data in (9) that round harmony restricts triggers to the stem-final [o] or [u] and targets a stem vowel [ɨ]. Observe that in (a-f), the stem words (a, b, c) are derived from the verbs [tɨ̀m], [zɨŋ] or [laɾɨım], which provide evidence that the underlying vowel in the root is /i/. The data also show the suffix [-nima] in (9d) with /i/

has no stem-final round vowel.

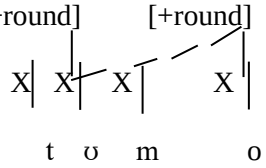
The data in (9) show that there is rounding harmony of [-ATR] rounded occurring with [+ATR] rounded in Dagbanli and its dialects, which provides some level dialectal variation in the language. The data show that in Tomosili, there is the rounding harmony of [-ATR] rounded occurring with [+ATR] unrounded in CVCV syllable while in Nayahili and Nanunli, there is the correspondence of mixed harmony. In Nayahili and Nanunli, some words such as /lɔɾ[ɨ]gí/ 'untire' and /bɔɾ[ɨ]gí/ 'lost' also show [-ATR] rounded occurring with [+ATR] unrounded in CVCVCV syllables.

In autosegmental representations, each harmonizing feature exists on its own tier, this implies that every segment in a word is represented by an association line which links it to the root node. It is observed earlier that in Dagbanli, there is harmony between a verb stem and a nominal suffix in a derivational process in which the domain-final [o] is caused to change underlying root vowel /ɨ/ from [-round] to [+round] to harmonize with the stem vowel. The process fails when the apparent opacity of the same vowel to rounding harmony surfaces in verb roots resulting in non-rounding. The data in (9) illustrate some examples of verbal noun derivation process in which /ɨ/ in the stem vowel is caused to change from [-round] to [+round] to harmonize with the nominal suffix [o] or [u] in a rounding harmonic context. This analysis is represented below:

10. Underlying form



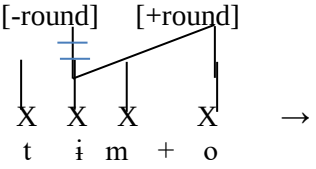
→ [+round] Left Ward Spread



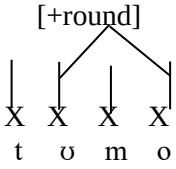
→

'semd suffix'

[-round] Delinking



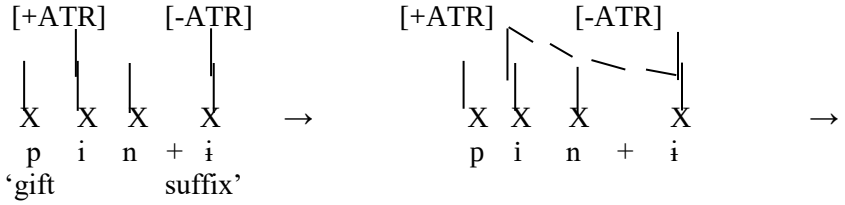
→ Output Form



'messenger'

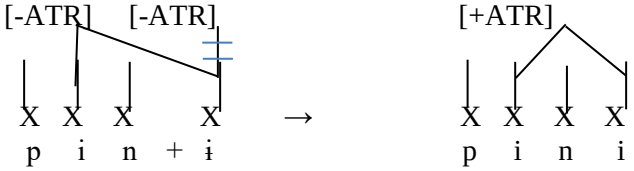
This process can also account for [+ATR] CVC stem with a number suffix [ɨ] showing a progressive harmonic process with [i] as the trigger. In this, the [+ATR] vowel in the root spreads to the [-ATR] number suffix causing it to change from [-ATR] to [+ATR] to harmonise with the suffix vowel, this is shown below:

11. Underlying form [+ATR] [-ATR] → [+ATR] Spreading [+ATR] [-ATR] →



‘gift suffix’

[-ATR] Delinking [-ATR] [-ATR] → Output Form [+ATR]



‘gift-sg’

Backness Harmony

Rose and Walker (2011:240) explain that “Backness harmony occurs in when both triggers and targets are drawn from the set of back vowels”. This phenomenon is noticed similarly in Dagbanli. Example (12) presents the back vowel qualities in Dagbanli, which maybe long or short.

12. Back vowels in Dagbanli

High		u	u:
	ʊ		
Low		o	o:
			ɔ

The long back vowel which is not included in the table is /ɔ:/; it is only prominent in Dagbanli idiophones. The back vowels in a word in Dagbanli are alike in rounding and backness, being drawn from the set of back vowels triggered by a mid-vowel. Backness harmony in Dagbanli is manifested in the stem vowel which spreads to the suffix vowel. The data below show a regressive pattern in which a final mid vowel [o] is preceded by a mid-vowel that flows from suffix-to-stem with final mid vowel as trigger.

13. Backness harmony in Dagbanli (cf. Hudu 2014, p.23)

dɔɾ-ó	'disease'	cf.	dɔɾ-tɨ́	'diseases'
mɔ̀l-ô	'announcement'	cf.	mɔ́lɨ̂	'announce'
zɔ́n-ó	'alien'	cf.	zɨŋ	'alienate'
kɔ̀ɣ-ɔ́	'antelope'	cf.	kɔ̀ɾɨ̂	'antelopess'
pa̱l-ó	'plot'	cf.	pɔ̀l-tɨ̂	'plots'
vɔ́ɣ-ó	'leaf'	cf.	vàɾɨ̂	'lesveses'
gɔ́ɾ-ó	'bed'	cf.	gáɾ-tɨ́	'beds'

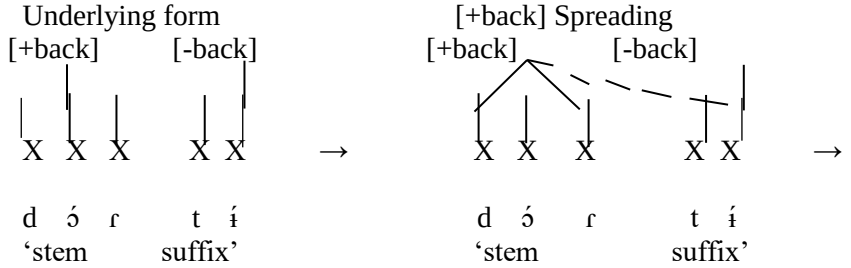
The data in (13) show backness harmony in which non-high mid vowel [o] is the trigger. As observed from the data in (13), we postulate that backness harmony in Dagbanli is regressive. When the progressive number suffix [o] is added to a stem with the feature [+back], it harmonizes with the [-ATR] and both become [+round] forcing the [-ART] stem vowel to become [-round]. On the other hand, when the suffix [-o] is attached to a stem, the process is reversed and the rounding feature is maintained. The high vowel does not only trigger round harmony but in backness harmony, it is also transparent as epenthetic [ɨ] intervening between harmonizing non-high back vowels and preserves the [-back] feature as presented in (14).

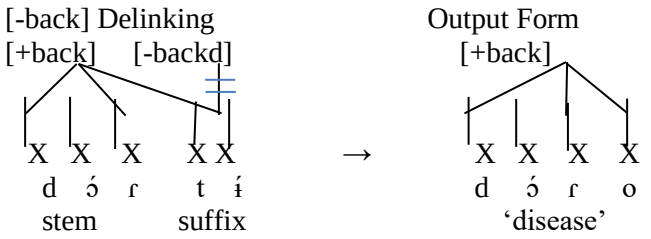
14.

bɔ́b[ɨ́]gɔ́	'crowd'	→	cf.	bɔ́b-gɔ́
lɔ́ɾ[ɨ́]gɔ́	'corner'	→	cf.	lɔ́ɾ-gɔ́
kɔ́b[ɨ́]gá	'hundread'	→	cf.	kɔ́b-gá
kɔ́b[ɨ́]gɔ́	'fearther'	→	cf.	kɔ́b-gɔ́
pɔ́h[ɨ́]gɔ́	'greeting'	→	cf.	pɔ́h-gɔ́
sɔ́ɣ[ɨ́]ló	'patience'	→	cf.	sɔ́ɣ-ló
kɔ̀l[ɨ́]gɔ́	'bag'	→	cf.	kɔ̀l-gɔ́

Similarly, autosegmental representations can be used to account for the backness harmonic feature [+back]. The construction [dɔɾ-tɨ́] represented in (13) maybe analyse to account for the back and the rounding feature which spreads from /i/ in the suffix to the stem vowel causing it to harmonise with the round vowel in the stem.

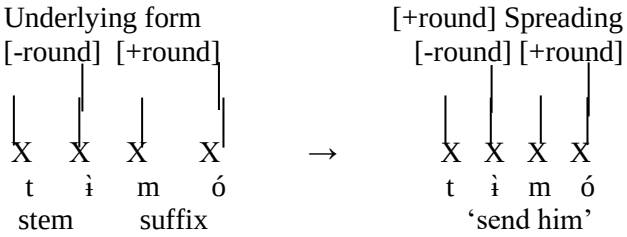
15.





Notice that both rounding harmony and backness processes are blocked in Dagbanli showing apparent opacity of the same vowel to rounding or backness harmony when it surfaces in verb stems. Rose and Walker (2011:240) observe that "early autosegmental accounts of blocking assumed that blockers are specified with the non-spreading value", for instance, [−round] or [+round] spread. [ɨ] in a verb stem is not specified for [+round] feature and therefore blocks rounding harmony when in construction with a suffix mid vowel /o/ which is specified for [+round] feature in a verb phrase structure. Rounding harmony is blocked in constructions such as [tɨm ó] 'send him/her' because of the state line the stem and the suffix as the illustrations in (16) show a situation of no rounding harmony in Dagbanli:

16.



Complete Harmony

Rose and Walker (2011:240) indicates, "it is a situation in which some harmony systems show assimilation for all vowel quality features, often referred to as vowel copy harmony." Halle (1995:26) observes that in complete harmony, "all features of a vowel spread to a preceding or following vowel without regard for the nature of the intervening consonant." This implies that a suffix vowel copies the features the stem variant across the mediating segments. Complete harmony is a cover name for vowel copy which operates across other segments (Paradis 2014). (Halle 1995:26). The stem vowel in this regard is the trigger targeting the suffix vowel.

17. Complete vowel harmony in Dagbanli

doɾ-o	'disease'	cf.	mol-o	'announcement
daŋ-a	'clan'	cf.	laŋ-a	'net'
zʊɣ-ʊ	'head'	cf.	dʊɣ-ʊ	'pot'
pin-i	'gift'	cf.	bin-i	'thing'

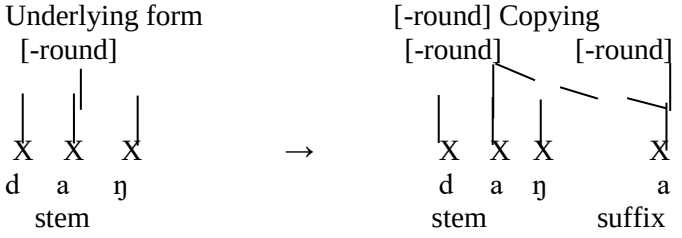
The data in (17) show vowels in Dagbanli stems which in each case spread freely across intervening consonants with the stem vowels as triggers targeting the suffix vowels. Notice that in (18), though the vowels in the stems spread across the consonants, there is no copy of the vowels and the suffix vowel is realised as mid vowels.

18. No complete harmony

koɾ-e	'desire'
ʧoɾ-e	'blow'
pal-o	'plot'
zʊn-o	'stranger'
tʊm-o	'messanger'

The complete harmony in Dagbanli as the data in (17) illustrate show progressive spread from the stem vowel to the suffix. Similarly, autosegmental representations can be used to account for the complete harmony and harmonic feature spreading.

19.



The representation in (19) accounts for the vowel feature which spreads from [a] in the stem to the suffix [a] causing it to main [-round] feature to harmonise with the vowel in the stem.

Conclusion

This paper sought to discuss harmony for round, back and vowel copy. The paper showed that harmonic processes in Dagbanli occurs bi-directionally indicating evidence of the progressive process which flows from stem-to-suffix while the regressive process flows from suffix-to-stem. The paper provides comprehensive behaviour of vowel harmony in Dagbanli relating their status in tongue root harmony and round harmony. The language makes interesting highlight of backness, complete and rounding harmony and does not only

outline the ways in which harmonic system is special but also establishes connections with autosegmental theoretical analysis.

The paper shows that the features round and back harmony are persistent patterns in Dagbanli and its dialects which have both ATR and vowel harmony system. The paper also presented a brief analysis of Dagbanli vowel harmony using autosegmental approach which accounted for the behaviour of the harmonic system of the language. The paper further suggest that Dagbanli rounding harmony process is blocked to show opacity of the same vowel to rounding harmony when it surfaces in verb roots; the low vowel [a] blocks harmony in Dagbanli within stems when it occurs at the right edge of the stem where it violates harmony with the first syllable of the root word. Also, the high vowel /i/ in a stem is not specified for [+round] feature and for that matter blocks rounding harmony when in construction with a suffix roumd vowel.

The paper concludes that backness harmony is contructed using a set of back vowels triggered by a mid-vowel and it is obvious in the stem vowel that flows to the suffix vowel showing a regressive pattern while vowel copy operates across consonants in which the stem vowel is the trigger targeting the suffix vowel. Future research on vowel harmony in Dagbanli may address other harmonic features such as nasality.

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