

Final vowel alternations in Hausa verbs

A prosodic account

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Abstract EN:

Hausa is a Chadic language spoken primarily in southern Niger and northern Nigeria. Its verbs can end in up to three different final vowels. Hausa scholars analyze this ternary opposition as conditioned by the following word in the sentence. For example, the verb *say* 'to buy' ends in a long *a* when used sentence finally, in a long *e* preceding direct object clitics and in a short *i* preceding nouns: *ita cè: zân sàya*: 'that's the one I'll buy.'; *zân sàye: tà* 'I'll buy it.'; *zân sàyi rì:gâṭ* 'I'll buy the gown.' (Jaggar 2001: 213). These contexts have been termed A, B and C respectively. Other data are difficult to account for just by taking the part of speech to the right of the verb into account. Both A- and C-forms are found preceding object clauses, with some clause embedding verbs even allowing either form (f.e. *hanga:/hangi* 'to see', Furniss 1991: 97). Modal particles may intervene between a verb and a pronominal object, blocking the application of the B-form in the process. In order to derive these and other patterns better than previous syntactic approaches, I pursue the hypothesis that it is the prosodic context that determines the form of the verb's final vowel: If the verb is followed by any phonological material within the same phonological word – as is the case only with direct object clitics – it takes the B-form; if other phonological material follows the verb within the same phonological phrase, it takes the C-form; if nothing follows the verb within the same phonological phrase, the verb will be in its A-form.

Keywords: Hausa, prosodically conditioned allomorphy, verb syntax, morphosyntax-prosody interface, morphophonology

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Abstract DE:

Hausa ist eine tschadische Sprache, die hauptsächlich im Süden Nigers und im Norden Nigerias gesprochen wird. Ihre Verben können auf bis zu drei verschiedene Schlussvokale enden. Hausa-Forscher:innen analysieren diese dreigliedrige Opposition als abhängig vom folgenden Wort im Satz. Zum Beispiel endet das Verb *say* („kaufen“) auf ein langes *a*, wenn es am Satzende steht, auf ein langes *e*, wenn es einem direkten Objektklitikum vorausgeht, und auf ein kurzes *i*, wenn es einem Nomen vorausgeht: *ita cè: zân sàya* „das ist die, die ich kaufen werde“; *zân sàye: tà* „ich werde es kaufen“; *zân sàyi rì:gâṛ* „ich werde das Kleid kaufen“ (Jaggar 2001: 213). Diese Kontexte werden jeweils als A-, B- und C-Form bezeichnet.

Andere Daten lassen sich jedoch nicht allein dadurch erklären, welche Wortart rechts vom Verb steht. Sowohl A- als auch C-Formen treten vor Objektsätzen auf, und manche Verben, die Nebensätze einbetten, erlauben sogar beide Formen (z. B. *hanga:/hangɪ* „sehen“, Furniss 1991: 97). Modalpartikeln können sich zwischen ein Verb und ein pronominales Objekt schieben und so die Verwendung der B-Form verhindern.

Um diese und andere Muster besser zu erklären als frühere syntaktische Ansätze, gehe ich von der Hypothese aus, dass der prosodische Kontext die Form des Schlussvokals eines Verbs bestimmt: Wenn dem Verb innerhalb desselben phonologischen Wortes weiteres phonologisches Material folgt – was nur bei direkten Objektklitika der Fall ist – nimmt es die B-Form an; wenn anderes phonologisches Material dem Verb innerhalb derselben phonologischen Phrase folgt, nimmt es die C-Form an; und wenn dem Verb innerhalb derselben phonologischen Phrase nichts folgt, steht es in der A-Form.

Keywords: Hausa, prosodisch konditionierte Allomorphie, Verbalsyntax, Morphosyntax-Prosodie-Schnittstelle, Morphophonologie

1. Introduction⁰

Unlike many of the world's languages, Hausa verbs don't inflect for person, number or gender nor for any tense or aspect. All of these categories are instead encoded in a preverbal particle. Despite this, all Hausa verbs must still inflect via a suffix, whose form depends on i) the verb's lexical class (known as “grade”) and ii) its rightward environment.

The characterization of the contexts in grammars like Newman (2000) or Jaggar (2001) goes as follows: The A-form appears whenever the verb is not followed by another word (1a), the B-form appears when the verb is directly followed by a pronominal direct object (1b) and the C-form appears when a nominal direct object follows the verb (1c)¹. Note that monotransitive

⁰ The data is transcribed in Hausa's latin-script orthography (Boko) except for the following: Low tone is marked by a grave accent on the vowel (à), falling tone by a circumflex (â) (vowels without a diacritic are high toned), length is marked by the IPA length symbol (a:) and the tap (ɾ) is distinguished from the trill (r). The following glosses will be used throughout: 1 = first person, 2 = second person, 3 = third person, a/b/c = verb context forms A, B & C, cop = copula, cpli = completive aspect I, cplii = completive aspect II, fut = future tense, f = feminine, gr# = verb grade, l = linker, pl = plural, q = interrogative, sg = singular

¹ They also describe a D-form which appears when an indirect object follows the verb. The D-form is, however, always either syncretic with the grade's A-form or an applicative suffix has to be attached to the root, which blocks

sentences have a rigid SVO order. The subject cannot ever surface after the finite verb and the object may leave its postverbal position only via extraction due to wh-/focus-movement.

- (1) a. na: ka:mà:
 CPLI.1SG catch\GR1AB
 'I caught (it).'
- b. na: ka:mà:+shi²
 CPLI.1SG catch\GR1AB+3SG
 'I have caught it.'
- c. na: ka:mà ki:fi:
 CPLI.1SG catch\GR1C fish
 'I have caught a fish.'
- (Hayes 1990: 93, citing Kraft & Kirk-Greene 1973)

What they fail to mention is that pronominal direct objects cliticize onto the verb. As a consequence, the three contexts are prosodically distinct: When a pronominal clitic attaches to the verb, they form a single prosodic word together (1b), whereas nominal direct objects form their own prosodic word (1c). Lastly, the A-form appears whenever the verb constitutes the last word within a sentence and thus also the last phonological word within a phonological phrase (1a). This observation will build the basis for my own account, in which I will claim that the correct characterization of this environment is prosodic in nature; *pace* previous literature which makes reference to syntactic structure instead (Hayes 1990, Crysmann 2004).

2. Verb morphology

Table 1 shows the various suffixes of Hausa's finite verbs across all grades. The column “valency” indicates whether a given grade is comprised of only intransitive verbs, only transitive ones or both. In columns A, B and C you can see the different suffix forms for each grade. The many syncretic forms are indicated by leaving out the divider between the given cells.

attachment of any grade morphology. Many authors today thus reject the existence of a morphological D-form (see Abdoulaye 1992: §3 for an overview).

² I'll use a '+' instead of the usual '=' to indicate clitics in Hausa, since they behave more like a reduced form of a prosodically full element than a form that is always prosodically defective like, e.g., the English genitive 's.

grade	valency	A	B	C
0	intr., tr.	i(:?) ³	i:	i
		a:	a:	a:
		o:	o:	o:
1	intr., tr.	a:	a:	a
2	tr.	a:	e:	i
3	intr.	a		
		i		
		u		
4	intr., tr.	e:	e:	e(:)
5	tr.	aɾ	aɾ (da)	aɾ (da)
		da:	da:	da
6	intr., tr.	o:	o:	o:
7	intr.	u		

Table 1. Verb grades (adapted from Newman 2000: 628, tones omitted).

In order to provide a better overview of the relevant patterns within the paradigm, I have made three generalizations about the phonological weight of the suffix forms. The simplest one, (2a), states that the B-suffix must end in either a long vowel or a vowel followed by a consonant. These sequences are commonly referred to as “heavy rhymes”, with syllables ending in a short vowel containing “light rhymes”. Generalization (2b) works as follows: Putting all invariant grades aside – the exclusively intransitive grades 3 and 7, as well as the grades with a single form across contexts A, B and C (GR0, some of GR4 and GR5, and GR6) – we can see that the remaining grades with alternating forms all have a light C-form, whereas their A-form is heavy. These are the pairs *a* – *a:* (GR1), *i* – *a:* (GR2), *e* – *e:* (GR4), *da* – *da:* (GR5). Lastly, while light A-forms do exist, they only occur in precisely those grades that are exclusively intransitive (2c); or put differently: If a grade has transitive verbs, it will also have a heavy A-form (2c').

Taking all three generalizations together, we can say that only transitive grades with a short C-form show any alternations at all. These are verbs of grades 1 and 2, as well as some verbs of grades 4 and 5. From now on, we will only be concerned with verbs of grades 1 and 2.

- (2) a. All B-forms end in a heavy rhyme.
b. If there are any distinct forms within a grade, the A-form will be heavy, whereas the C-form will be light.

³ This form is always given as *i*, but Newman (1973: 315fn26) mentions that “In final position monosyllabic *i*-verbs [grade 0 verbs ending in *i*] tend to be pronounced with a long vowel followed by a glottal stop, e.g. [yaa kiiʔ] ‘He refused.’”. Due to this inconsistency, I’m excluding this subgrade from my analysis.

- c. Light A-forms only occur in intransitive grades.
- c'. Unless a grade only allows for intransitive verbs, the A-form will always be heavy.

3. Previous accounts

Hayes (1990) and later Crysmann (2004) gave syntactic accounts of the distribution of Hausa's grade suffixes. Hayes utilizes lexical, pre-syntactic rules that refer to syntactic phrases with a specific structure ("frames") to derive the lexical entries for the C-forms from their respective A-form (see 3). Frame 1 has the form $[_{VP} \text{ — } NP_{\text{non-pron}} \dots]$ and serves as the context for the C-form. If the syntactic structure deviates from that of frame 1, the A-form will be inserted. Hayes only acknowledges in a footnote that another frame would be needed to derive the B-form (Hayes 1990: 93fn4).

- (3) $V: \rightarrow V$ / $[_{VP} \text{ — } NP \dots]$, grades 1, 2, parts of 0, 4, 5
 $a: \rightarrow i$ / $[_{VP} \text{ — } NP \dots]$, grade 2
 $gani: \rightarrow ga$ / $[_{VP} \text{ — } NP \dots]$, 'to see'

Crysmann posits a complex, hierarchical lexical entry (a tree) which contains syntactic, semantic, morphological and phonological information. A language-specific algorithm designed within Head-Driven Phrase Structure Grammar determines which leaves of the tree are realized for a given verb in a sentence. One early split in the tree is whether a grade does alternate (specified as grades 1, 2 and 4) or not (grades 0, 3, 6 and 7). This partition doesn't follow from any grammatical properties of the grades though; it is an arbitrary specification. There is only a single phonological form listed for each of the grade suffixes. The sub-tree "reg(ularly)-alt(ernating)" is responsible for giving back the correct length. One of its daughters contains the abstract phonological pattern " $\langle \dots, C, V \rangle$ " matched to context C; the other daughter contains " $\langle \dots, C, \textcircled{1}V, \textcircled{1} \rangle$ " ("copy final vowel") matched to A and B. Both accounts treat the A-form as the default form (Hayes 1990: 94; Crysmann 2004: 22). As a consequence, they rely on arbitrary machinery to flag which grades' C-forms are shortened and whose aren't.

- (4) $ya:$ $shu:k\grave{a}/*shu:k\grave{a}:$ $kuma$ $aud\grave{u}ga:$ (Crysmann 2004: 16)
 CPLI.3SG plant\GR1C / plant\GR1AB also wheat
 'He also planted wheat.'

One kind of data for which Crysmann shows the advantage of his account over Hayes' is that of modal particles intervening between the verb and its object. Hayes' account hinges on the adjacency of verb and object, whereas in Crysmann's account, the verb suffix tracks whether the object has been extracted or not, regardless of adjacency. His example in (4) contrasts the predictions made by the two accounts. Going by Hayes, the C-form is unable to be inserted since the modal particle prevents the verb from appearing within the frame in (3); thus, it would have to be realized in the A-form. Crysmann on the other hand predicts that the C-form will be

selected just like in sentences where no modal particle intervenes since the tracking of the object is non-local. The actual Hausa data in (4) is only in accordance with Crysmann, since only the C-form *shu:kà* is grammatical. After introducing my own account in the next section, I will show more data with intervening modal particles, but this time they will pose a problem for Crysmann's account.

4. A prosodic alternative

My account differs from Hayes (1990) and Crysmann (2004) in two major ways: i) the alternations are triggered by the prosodic environment, not the syntactic one and ii) the C-form is the default form from which A and B are derived. Newman (1973) already pointed out that one can postulate C to be the underlying form with B being derived from it, since the B-form of every grade uniformly ends in a heavy syllable (recall generalization 2a), while there are both long and short C-forms. One simply has to propose a lengthening rule for all B-forms; grades with a light C will be lengthened, while lengthening applies vacuously to those with a heavy C. I further discuss vacuous lengthening in section 5. I follow Newman's reasoning and further add that the same is true for all A-forms of transitive grades (recall generalization 2c/c'). This eliminates the need for arbitrary lexical diacritics to derive which C-forms are short and which are long.

The sentences in (5) exemplify my interpretation of the phenomenon with the fully distinct grade 2 verb *say* 'to buy'. I took the data from Jaggar (2001: 213), but the prosodic chunking was done by myself based on descriptions by Inkelas et al. (1986). My hypothesis is that the grade's ending is lengthened in the following cases: i) a clitic attaches to the verb, ii) a gap is left by the direct object after the verb. Or in prosodic terms: i) if the verb's phonological word is embedded into another phonological word due to cliticization, the grade suffix is lengthened, ii) if the verb's phonological word coincides with the edge of the phonological phrase, the ending is also lengthened.⁴ The clitic induced lengthening is found with possessed nouns as well; thus it can be argued to be a general phonological rule of the language (see §5).

- (5) a. (zân ((sàye:)_ω+tà)_ω)_φ
 FUT.1SG buy\GR2B+3SG.F
 'I'll buy it.'
- b. (zân (sàyi)_ω (rì:gâr)_ω)_φ
 FUT.1SG buy\GR2C gown
 'I'll buy the gown.'

⁴ As is common practice within Prosodic Hierarchy Theory, the domain of phonological words is indicated by ω and that of phonological phrases by ϕ .

- c. (ita cè:)_φ (zân (sàya:)_ω)_φ
 3SG.F COP FUT.1SG buy\GR2A
 'that's the one I'll buy.'

(Jaggar 2001: 213, prosodic phrasing based on Inkelas et al. 1986)

Let us now look at data not discussed by either Hayes or Crysmann. There are other data with modal particles where even Crysmann's account runs into problems. As mentioned earlier, pronominal direct objects cliticize directly onto the preceding verb (as in 5a and 6a). But if a modal particle intervenes between verb and pronominal object, cliticization is blocked and a full, independent form is used instead. Unlike (4) where intervention didn't affect the form of the verb, the verb in (6b) has to occur in its C-form instead of the usual B-form (cf. 6a).

- (6) a. ya: nè:me:+tà (Newman 2000: 487)
 CPLI.3SG seek\GR2B+3SG.F
 'He sought her.'
- b. ya: nè:mi kò: ita
 CPLI.3SG seek\GR2C moreover 3SG.F
 'He moreover sought her.'

But here the reason that the C-form is selected cannot be because the cut off object is being tracked. In my account the choice of the C-form follows naturally since the introduction of the modal particle after the verb in (7a) disrupts the prosodic context to the right of the verb. The fact that the verb form in (4), repeated in (7b) including the expected prosodic context, doesn't change when the nominal object is cut off is unsurprising with regards to my hypothesis, since nominal objects never impact the verb form.

- (7) a. ...nè:mi)_ω (kò:)_ω (ita)_ω)_φ
 seek\GR2C moreover 3SG.F
- b. ...shu:kà)_ω (kuma)_ω (audùga:)_ω)_φ
 plant\GR1C also wheat
 (prosodic phrasing my own, based on Inkelas et al. 1986)

Another potential problem for Crysmann's account are sentences such as (8) where the direct object denoting a human has to be resumed by a pronoun. Crysmann's lexical entries of both A-form and B-form meet the morphosyntactic criteria. They would probably need some kind of adjustment to tip the grammar towards the selection of B. Since my account doesn't track the object and only depends on the prosodic context, it correctly predicts only the B-form in this context.

- (8) gà: ya:rinyàri dà mukà ga mùtumìn (Tuller 2015: 138)
 here girl:L.F that CPLII.1PL see man:L

dà zài àùre:+tà_i / *àùra: t_i
 that FUT.3SG marry\GR2B+3SG.F / marry\GR2A
 'Here's the girl that we saw that the man will marry.'⁵

5. Related (morpho)phonological phenomena

My claim that the uniform heaviness of the B-form comes from cliticization onto the verb is supported by a parallel lengthening process happening with possessed nouns. The possessum is followed by the so-called “linker”, an element present in most adnominal constructions. If the possessor is pronominal, reduced forms of both linker and pronoun, *+n+a:* in (9b), cliticize onto the possessum and its final vowel is lengthened. Just like with object clitics, cliticization of the linker is blocked when another word intervenes between it and the hosting head, e.g., when there are any postnominal modifiers like the demonstrative *nàn* 'this/these' or the numeral *biyu* 'two' in (9c). Note how, unlike the reduced linker in (9b), the full independent linker *na:mù* 'ours' in (9c) does not cause the vowel of the preceding word *biyu* 'two' to lengthen.

- (9) a. bà:ba Jaggat (2001: 412)
 father
- b. bà:ba:+n+a:
 father+L+1SG
 'my father'
- c. dawa:ki+n nàn biyu na:-mù Newman (2000: 371)
 horses+L these two L-1PL
 'these two horses of ours'

Not only are there no lexical items with overlong vowels, Newman (2000) shows that the sentence-final interrogative morpheme only causes short final vowels to lengthen. The objects in (10) only differ in the length of their final vowel. Since the final long vowel in *sa:bo:* 'new' in (10c) cannot be further lengthened, it sounds identical to the now lengthened *Sa:bo:* in (10b). We can thus say that the ban on overlong vowels is independent from the verbal morphophonology and that lengthening of long vowels applies vacuously.

⁵ An anonymous reviewer pointed out that the original translation 'Here's the girl that we saw the man that will marry *(her).' was incomprehensible. This is due to the common Hausaist tradition of foregoing the grammaticality of a translation in favor of translating it literally instead. By request, I have replaced Tuller's original with a more comprehensible version.

- (10) a. Sun ga Sa:bo [sa:bo] Newman (2000: 497)
 CPLI.3PL see.A Sabo
 'They saw Sabo.'
- b. Sun ga Sa:bo=μ [sa:bo:]
 CPLI.3PL see.A Sabo=Q
 'Did they see Sabo?'
- c. Sun ga sa:bo:=μ [sa:bo:] *sa:bo::
 CPLI.3PL see.A new=Q
 'Did they see a new one?'

Hausa also has a couple of irregular verb forms. Interestingly, even those irregular forms conform to my generalizations in (2). The verb *ga(n(i:))* 'to see' has a heavy B-form (*gan*), the C-form is light (*ga*) and A ends in a different heavy syllable (*gani:*). This reflects the same abstract pattern as the verbs of grade 2. For *san(i:)* 'to know' and *bar(i:)* 'to leave, to let' a similar pattern occurs, but their C-forms are heavy just like the B-form.

	A	B	C
see	gani:	gan	ga
know	sani:	san	san
leave	bari:	baɾ	baɾ

Table 2. Irregular verbs.

Since the lengthening of grade suffixes in the A-form is lexically restricted to verbs (opposed to any word in ϕ -final position), it cannot be said to be a general phonological rule of the language, but a morphophonological one. While the lengthening rules (11a-b) apply to any verb, other morphophonological rules (11c-d) exist which target individual verbs like those of table 2. The vowel change in grade 2 endings must also be lexically specified (11e-f), but their length is already accounted for by the general A- and B-rules. Why the phonologically regular B-form also participates in these lexical rules is outside the scope of this article.

- (11) a. $V \rightarrow V:$ /___)_ϕ
 b. $V \rightarrow V:$ /___)_ω
 c. $ga \rightarrow gani:$ /___)_ϕ, 'to see'
 d. $ga \rightarrow gan$ /___)_ω, 'to see'
 e. $i \rightarrow a$ /___)_ϕ, grade 2
 f. $i \rightarrow e$ /___)_ω, grade 2

6. Object clauses

Neither Hayes (1990) nor Crysmann (2004) discuss object clauses. Jaggar (2001: §13) dedicates a whole chapter of his grammar to clausal complementation, where he discusses various aspects of it, including the context forms various clause embedding verbs take. This depends in part on the structure of the object clause. Non-finite clauses, for instance, can only be embedded by verbs in the C-form (12).

- (12) a. ka: gamà karàntà littà:fì+n Jaggar (2001: 548)
 CPLI.2SG finish\GR1C read book+L
 'Have you finished reading the book?'
- b. bà sù fa:rà kò:yo+n Hausa ba
 NEG SBJV.3PL begin\GR1c learn.NMLZ+L Hausa NEG
 'They haven't started learning Hausa.'

Finite complement clauses can in principle be embedded both by verbs in their A- as well as in their C-form. To my knowledge, no author so far has given a description of, let alone an explanation, for this variation. Dimmendaal (1989) notes that whether the object clause is headed by a complementizer or not has little effect on the matrix verb's form. A few lexical restrictions exist such as the grade 2 verb *zat* 'to think' for which the combination of the A-form *zàta:* and *cê:wa:* 'that (assertive)' lead to an ungrammatical sentence.

The possibility for any embedding verb to take on the A-form is challenging to Crysmann's syntactic account, since there is no indication of a gap left by the complement. Halpern (1991) even showed that if a gap is created inside the complement via extraction of an object from the embedded clause into the matrix clause, the matrix verb *furt* 'to say' can still take either the A-form (13a) or the C-form (13b). According to Halpern, extraction marking languages like Palauan and Chamorro only allow for the extraction marking form (Hausa's A-form in Crysmann's account) in such sentences.

- (13) a. wà:ᵢ ka furtà: cê:wa: Lawàn ya: dakà: tᵢ
 who CPLII.2SG.M say\GR1AB that Lawan CPLI.3SG hit
- b. wà:ᵢ ka furtà cê:wa: Lawàn ya: dakà: tᵢ
 who CPLII.2SG.M say\GR1C that Lawan CPLI.3SG hit
 'Who did you say that [Lawan] hit?'
 Halpern (1991: 241)

My account predicts that in cases such as (13b) the (left edge of the) object clause gets prosodically phrased together with the matrix clause, while in (13a) the matrix clause including its verb and the complement clause are parsed into their own ϕ -phrases. No additional

assumptions would have to be made, but it is unclear to me from the literature whether this pairing is borne out or not. I will put these predictions to the test in future work.

7. Conclusion

In this article I gave a short overview of two previous accounts (Hayes 1990, Crysmann 2004) to derive verb ending alternations in Hausa, both of which were syntactic-lexical in nature. As an alternative, I proposed an account that is still lexical, but replaces syntactic with prosodic structure as the relevant allomorphic trigger. I drew on data that hasn't been discussed by Hayes or Crysmann to point out flaws in the syntactic approach and appeal to my prosodic alternative. To strengthen my claims about the verbal morphology, I presented a parallel process to the B-form lengthening which has already been described for possessed nouns. With the exception of the exclusively intransitive grades (which at least build a natural class), the rules I proposed apply to all grades equally, removing some arbitrary lexical specifications of the previous accounts. Since I base my account only on abstracted generalizations about Hausa's prosody, I will test in future work whether actual phonetic data matches my predictions or not.

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