An inflectional approach to Hausa Final Vowel Shortening

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1. Introduction

In this paper, I will address the phenomenon of final vowel shortening (FVS) in Hausa[1]. Based on detailed morphological evidence, I shall argue that FVS is but one exponent of a systematic morphosyntactic distinction in the language. Given the systematicity of the distinction together with the diversity of exponence, I shall conclude that a treatment in terms of inflectional morphology is to be preferred over Hayes (1990)'s analysis as Precompiled Phrasal Phonology (PPP). The morphological view will furthermore enable us to connect the Hausa data to a typologically well-established inflectional category, namely marking of the mode of argument realisation, a perspective that will deepen our understanding of Hausa syntax and morphology.

The paper is organised as follows: after a brief introduction to the basic pattern and a discussion of Hayes' account in terms of phrasal allomorphy, I shall present additional data to the effect that FVS cannot be singled out as an isolated allomorphic process. Rather, we shall see that vowel length alternation is subject to close interaction with Hausa stem morphology. Moreover, under a broader empirical perspective, the two-fold length distinction will turn out to be only one of many patterns in which an underlyingly tripartite distinction is morphologically neutralised.

Next, I shall submit Hayes's surface-oriented adjacency requirement — a necessary criterion for precompiled phonologies — to some further scrutiny and show that Hausa provides a body of evidence against such a surface-oriented view, supporting instead an analysis in terms of argument structure and lexicalised trace-less extraction. In section 4, I shall connect Hausa to strikingly similar phenomena in Chamorro and French, all displaying morphological sensitivity to extraction contexts (Bouma et al., 2001). Furthermore, we shall see that Hausa already provides independent evidence for its membership in the typological class of extraction-marking languages. Section 5 provides a formal analysis in terms of realisational morphology, implemented in Head-driven Phrase Structure Grammar (HPSG).

1.1. HAUSA FINAL VOWEL SHORTENING (FVS): THE BASIC PATTERN

Since Parsons (1960), Hausa verbs are classified into a system of lexical stem classes, standardly referred to as grades (but see also Newman 2000 for a recent synopsis of the Hausa grade system). In its initial form, the grade system consisted of 7 grades, out of which the first 3 stem classes (Grade 1, 2, 3) are considered primary, whereas grades 4–7 are called secondary or derived. Stem classes are primarily defined in terms of morphophonological properties, namely the quality and length of the stem-final vowel, together with the stem's tonal pattern. For example, in their citation form (A-form), regular grade 1 verbs are characterised by a H-L(-H) tone pattern, and end in a long *-a:*, regular grade 6 verbs have a H tone and a final long *-o:* etc. (See table 1 for details on all grades). Additional lexico-semantic properties are sometimes attached with a certain grade, most notably with secondary grades: grade 6 stems ("ventive") is mostly used to denote distance from the speaker and/or movement toward the speaker, grade 5 is used for causatives or to transitivise an otherwise intransitive stem, while, e.g. grade 4 is often used to signal the totality of an action. Grades are also associated with prototypical valence properties: thus, grades 3 and 7 are exclusively intransitive, with grade 7 being a productive class for the expression of medio-passives, whereas grade 2 consists exclusively of transitives. Stems in the remaining grades 1, 4, and 6 can be either transitive or intransitive, although, according to Newman (2000), grade 1 should be regarded as a mainly transitive grade. The forms of the seven major grades are summarised in the table in (1) below, adapted from Newman (2000, p. 628).[2]

(1)

Grade	A-form		B-form		C-form	
1 (tr/intr)	-a:	H-L(-H)	-a:	H-L(-H)	-a	H-L(-L)
2 (tr)	-a:	L-H(-L)	-e:	L-H	-i	L-H
3 (intr)	-a	L-H(-L)	—	—	—	—
4 (tr/intr)	-e:	H-L(-H)	-e:	H-L(-H)	-e	H-L(-L)
					-e:	H-L(-H)
5 (caus/tr)	-aɾ̃	H	-aɾ̃ [dà]	H	-aɾ̃ [dà]	H
			-she:	H		
			∅	H		
6 (tr/intr)	-o:	H	-o:	H	-o:	H
7 (intr)	-u	L-H	—	—	—	—

As depicted in the table above, each grade is further subdivided into three forms (or frames), which correspond to the morpho-syntactic environments in which a stem form can be used. As a curt characterisation, the C form is used before direct object NPs, the B form before direct object pronominals, and the A form, the citation form, is used, whenever a direct object is either absent or extracted.

Now, it is a well-known fact about Hausa that verb forms in some of these grades, most notably grades 1 and 2, undergo shortening[3] of the final vowel, when followed by an overt full NP direct object: “A verb-final long vowel is shortened immediately before an object NP” (Hayes, 1990, p. 87).

(2) a. Na: ka:m**à** ki:fi: (H:93)
1.S.CMPL.ABS catch.V.Gr1.C fish
‘I caught fish.’

b. Na: ka:m**à:** (H:93)
1.S.CMPL.ABS catch.V.Gr1.A
‘I caught (it).’

c. Na: ka:m**à:** shi.(H:93)
1.S.CMPL.ABS catch.V.Gr1.B him
‘I caught it.’

d. Na: ka:m**à:** wà Mu:sa: ki:fi: (H:93)
1.S.CMPL.ABS catch.V.Gr1.D(=A) for Musa fish
‘I caught fish for Musa.’

e. ki:fîn dà na ka:m**à:**
fish.DEF COMP 1.S.CMPL.ABS catch.V.Gr1.A
‘The fish I caught’

The data in (2) illustrate the basic pattern with the regular grade 1 verb *ka:mà(:)* ‘to catch’: if the direct object NP is right-adjacent to the verb, as in (2a), the verb’s final vowel is short. Hausaists standardly refer to this syntactic context and the form used there as the C-frame or C-form, respectively.

If the direct object is unexpressed (=A-frame; see (2b)) or realised as a pronominal clitic or affix[4] (=B-frame; see (2c)), no shortening can be observed in grade 1. The same holds, if an indirect object intervenes (=D-frame[5]; (2d)), or if the direct object is extracted (=A-frame; (2e)).

In spite of the apparent sensitivity to phrase-structural context, Hayes (1990), however, argues that the rule of Final Vowel Shortening must apply in the lexicon, since it interacts with other lexical-phonological rules of the language, such as low-tone raising (Leben, 1971).[6] Low Tone Raising applies to heavy final syllables, realising an underlying L as H, if preceded by another L. FVS can bleed Low Tone Raising, as witnessed by the following trisyllabic grade 1 verb:

(3) a. Na: karànt**a:**.
1.S.CMPL.ABS read.V.Gr1.A
‘I read.’

b. Na: karànt**a:** shi.
1.S.CMPL.ABS read.V.Gr1.B it
‘I read it.’

c. Na: karàntà litta:fìi.
1.S.CMPL.ABS read.V.Gr1.C book
'I read the book.'

Besides interaction with other lexical-phonological rules, the shape of the pre-NP direct object form (or C-form) is not always fully predictable: some verbs, e.g., *gani:* 'see' or *bari:* 'leave', feature idiosyncratic C-forms, viz. *ga* or *bar*, respectively.

With a large number of stems, i.e. those in grade 2, shortening is accompanied by segmental change of the final vowel, which is *-i* in the C-form, *-e:* in the B-form, preceding pronominal direct objects, and *-a:* elsewhere (A-form).

(4) a. Na: sày**a:**. (H:94)
1.S.CMPL.ABS buy.V.Gr2.A
'I bought.'

b. Na: sày**e:** shì.
1.S.CMPL.ABS buy.V.Gr2.B him
'I bought it.'

c. Na: sày**i** àbinci. (H:94)
1.S.CMPL.ABS buy.V.Gr2.C food
'I bought food.'

Finally, in grade 2 one can find a few irregular A-forms (Newman, 2000, p. 637), characterised by an exceptional tonal pattern (H-L instead of L-H) and/or segmental changes, e.g. *dì:bà: (A), dè:be: (B), dè:bi (C)* 'dip out, take'.

1.2. PRECOMPILED PHRASAL PHONOLOGY (PPP; Hayes, 1990)

In order to reconcile the apparent sensitivity of the FVS phonological rule to phrase-structural contexts with basic tenets of both Prosodic Hierarchy Theory (Selkirk, 1986; Nespor and Vogel, 1982; Nespor and Vogel, 1986; Hayes, 1989) and the *Principle of Phonology-free Syntax* (Pullum and Zwicky, 1988), he proposes to preserve the restrictiveness of the indirect approach to phonology-syntax interaction offered by the theory of prosodic domains and complement it with what he calls Precompilation Theory (or Precompiled Phrasal Phonology; PPP), a kind of "phrasal allomorphy" (Hayes, 1989, p. 92) reminiscent of Zwicky (1985)'s *Shape Conditions*.

He suggests that alternations such as Hausa FVS are allomorphic in nature, and should be derived in the lexicon. Sensitivity to syntactic context, however, is captured by means of "phonological instantiation frames": in essence, the allomorphic variant is diacritically marked for a specific insertion context, and selection of a particular allomorph is handled by lexical insertion, subject to the Elsewhere Condition (Anderson, 1969; Kiparsky, 1973).

(5) *Hausa shortening*:
V: → V / [... _]$_{[Frame1]}$ (H:94)

(6) *Frame 1*:
/ [$_{VP}$ _ NP ...], NP non-pronominal (H:93)

(7) *Hausa raising*:
a → i / [... _]$_{[GradeII\&Frame1]}$ (H:94)

In the concrete case at hand, a (lexical) shortening rule (5) derives the C-form allomorph and diacritically annotates it with a reference to a particular phonological instantiation frame, as given in (6) above. Other morphophonological rules can make reference to this insertion frame as well, e.g., the grade 2 vowel raising rule in (7).

It should be clear from this very brief description that rules of allomorphy, under this approach, can make reference to heterogeneous types of information, namely morphological class, phonological shape and surface-syntactic and phrase-phonological environment. Furthermore, reference to surface context does not appear to be constrained by structural configurations, such as functor-argument relations, or even tree locality.

Although I have no reason to doubt, at least at this point, that Hayes's proposal can successfully account for the empirical patterns encountered so far, there are nevertheless theoretical and methodological issues lurking here encouraging us to explore an alternative perspective on the data: first, the instantiation frames invoked by Hayes resemble very much the subcategorisation frames of Aspects-style lexical entries. However, as we have seen above, FVS only applies in the context of direct objects *in situ*. We are thus forced to assume that these instantiation frames are not meant to be reducible to ordinary subcategorisation. Under this perspective, we are confronted with a massive duplication problem: why should a language invoke two distinct, though strikingly similar, systems of subcategorisation? Moreover, if phonological instantiation frames are considered a mode of subcategorisation in its own right, PPP blurs the distinction between lexical and prosodic phonology, in that morphophonological idiosyncrasies, which were hitherto considered unambiguous evidence in favour of lexical status, do now receive an alternative interpretation as instances of PPP.[7] As a net effect, the scope of Zwicky and Pullum (1983)'s Criterion C, which takes morphophonological idiosyncrasies as a strong indicator of affixhood, will be severely limited.

There is, however, a theoretically less harmful interpretation of Hayes's proposal, namely to assume that morphophonological alternations can (only) make reference to lexicalised syntactic context. Under this perspective, PPP will be reducible to standard notions of subcategorisation in lexicalist theories of syntax, e.g., HPSG or LFG, essentially regarding phonological alternations as an exponent of morpho-syntactic distinctions, or, in other words, as exponents of an inflectional category. It is of note that Selkirk (Hayes, 1990,

p. 106) has once proposed, in response to Hayes's proposal, to analyse all instances of precompiled phonologies as inflection. I will argue, in the subsequent sections, that an interpretation along these lines will not only provide a theoretically cleaner solution to the paradox, but that it will also provide for a better understanding of Hausa morphosyntax, both language-internally and in a broader cross-linguistic, typological context.

2. Hausa FVS: extending the empirical base

2.1. NEUTRAL PARADIGMS

The perspective on Hausa FVS assumed by Hayes is essentially that of a syntactically conditioned allomorphy, described by means of a phonological rule, i.e. as a fossilised or lexicalised version of a phrase-phonological rule (Hayes, 1990, p. 105f). This characterisation of precompiled phonology appears to me somewhat instrumental for setting apart this new device from standard notions of inflectional morphology, placing PPP half-way between true phrasal phonology and morphology. Yet, on closer inspection, this picture of a phonologically determined allomorphy seems to obscure how tightly FVS is integrated with the morphological paradigms of the language.

A first piece of evidence pointing in this direction is the fact that entire classes of verbs are exempt from the application of the shortening rule. Among the 7 Hausa grades, "grade 6 is [...] very productive and commonly used" (Newman, 2000, p. 663) indicating distance from or orientation towards the speaker. Also phonologically, verbs in this grade are highly regular, characterised by all H syllables and a final long theme vowel *-o:*.

Given Hayes's shortening rule, one would expect a short final vowel in the C-form. Yet, despite the fact that grade-6 verbs do match the structural description of the rule, no contrast in morphological expression can be observed (cf. (8)).

(8) a. ya: sa:to: jiyà. (N:662)
3.S.M.CMPL.ABS steal.V.Gr6.A yesterday
'He stole (it) yesterday.'

b. ya: sa:to: shì (N:662)
3.S.M.CMPL.ABS steal.V.Gr6.B him
'He stole it.'

c. ya: sa:to: mo:tà: (N:662)
3.S.M.CMPL.ABS steal.V.Gr6.C car
'He stole the car.'

Newman (2000, p. 662) mentions that in Western Hausa dialects, some speakers tend to shorten the final vowel in the C-form, as shown in (9). He

adds, though, that this should be regarded as an innovation by analogy with grades 1, 2, and 4. Moreover, even for these speakers, shortening appears to be subject to an additional phonological restrictions, namely the weight of the penultimate[8], a restriction that is not operative in any other grade.

(9) a. ya: karant**o** là:ba:rì: (N:662)
3.S.M.CMPL.ABS read.V.Gr6.C news
'He read the news.'

b. sun harb**o** za:kì: (N:662)
3.P.CMPL.ABS shot.V.Gr6.C lion
'They shot a lion.'

c. mun bar**o:** yâ:ra: à gida: (N:662)
1.P.CMPL.ABS leave.V.Gr6.C children at house
'We left the children at home.'

If Newman's interpretation is correct, we have good reason to question a phrase-phonological rule as the historical basis of current FVS.

Apart from grade 6, there is another set of verbs which fails to undergo FVS, all characterised by the subregular pattern *CiCa:*. Although verbs like *kiraa* 'call', given in (10), and *jiraa* 'wait' are pretty similar to grade 1 and grade 2 verbs, as far as the segmental level is concerned, still no shortening applies.

(10) ya: kir**a:** mùtûm
3.S.M.CMPL.ABS call.V.Irr.C man
'He called the man.'

Although I concur with Hayes in adopting the lexicon as the locus of rule application, I take the tight integration of this phenomenon with Hausa stem classes as an indicator of the morphological status of the alternation.

2.2. TRIPARTITE PARADIGMS

We have already mentioned in passing that shortening is not the only device by which Hausa C-forms are marked: in grade 2 shortening is accompanied by vowel change. Moreover, unlike in grade 1, not only is the C-form set apart, but rather three different situations are morphologically distinguished. Traditionally, Hausaists adopt (at least) a three-fold system to describe the verb forms in all Hausa grades. Under this perspective, the identity of A and B-forms in grade 1 can be regarded as just another instance of syncretism.

(11) a. Na: sày**a:**. (H:94)
1.S.CMPL.ABS buy.V.Gr2.A
'I bought (it).'

b. Na: sày**e:** shì.
1.S.CMPL.ABS buy.V.Gr2.B him

'I bought it.'

c. Na: sàyi àbinci. (H:94)
1.S.CMPL.ABS buy.V.Gr2.C food

'I bought food.'

d. sày**i**!
buy.V.IMP.Gr2.A (N:264)

'Buy (it)!'

e. sày**è: shi**! (N:264)
buy.V.IMP.Gr2.B

'Buy it!'

f. sàyi àbinci.
buy.V.IMP.Gr2.C food

'Buy food!'

Further evidence in favour of an essentially tripartite morphological system comes from grade 2 imperatives: here, the A-form of grade 2 verbs is identical to the C-form, displaying a short final *-i*. Selection of the C-form in the A-frame context is probably best understood as a rule of referral, since identity does not only involve selection of the final vowel, but also selection of stem form.

(12) a. ya: ɗì:bà:
3.S.M.CMPL.ABS dip.out.V.Gr2.A

'He dipped (it) out.'

b. ɗè:bi! (N:264)
dip.out.V.IMP.Gr2.A

'Dip out!'

Taking together the evidence from grades 1, 2 and 6, we can conclude that what we find in Hausa is essentially a tripartite system of morphological marking that displays different patterns of syncretism: A-B-C (grade 6), A-B vs. C (grade 1), A-C vs. B (grade 2 imperative)[9], and A vs. B vs. C (grade 2 "indicative"). These syncretisms, together with the ones involving verbal nouns to be discussed in section 2.3, are represented schematically in table (13) below.

(13)

	Patterns of syncretism			Examples		
	A-form	B-form	C-form	A-form	B-form	C-form
Grade 2	X	Y	Z	sàya:	sàye:	sàyi
Grade 1	X	X	Y	ka:mà:	ka:mà:	ka:mà
Grade 2 imp Irr. monosyllabics	X	Y	X	ɗè:bi yi	ɗè:be: yi:	ɗè:bi yi
Grade 6	X	X	X	ka:wo:	ka:wo:	ka:wo:
Grade 6 VNs Strong VNs Nouns	X	Y	Y	ka:wô:wa: kàrɓa: litta:fi:	ka:wo: kàrɓan litta:fîn	ka:wo: kàrɓan litta:fîn

The syncretism that can be observed between the A- and C-form cells in the grade 2 imperative yet again underlines the tight integration of vowel shortening with the overall morphological system: with bisyllabic grade 2 A-forms, borrowing of the C-form in an A-frame context constitutes the sole exponent of the morphological category imperative, as the typical L-initial tonal pattern of imperatives is effectively masked in this grade.

2.3. VERBAL NOUNS (GERUNDS)

Verbal inflectional categories like tense and aspect are signalled by means of discrete markers, which are often fused with exponents of subject agreement. Typically these TAM markers select a verb in its base form. Exceptional in this respect are the continuative markers (absolute/relative/negative), where a gerundive form of the verb is chosen, standardly referred to as verbal nouns in the literature (see Tuller, 1986 and Davis, 1993 for detailed discussion of the syntactic properties of verbal nouns). These verbal nouns (VNs) come in essentially two forms: a regular, or weak VN, and a strong form, which morphologically behaves more or less like a noun.

In this section, I will show that the object-sensitive alternation found with verbs carries over to non-verbal categories as well, and that, in sum, these alternations, despite clear difference in exponence, are far too pervasive to be regarded as a mere instance of allomorphy, at least not without missing a central property of Hausa morphology.

2.3.1. *Weak verbal nouns*

Verbs in grades 1, 4, 5, 6 and 7 typically choose the regular weak VN as their gerundive form (Newman, 2000, ch. 77), although some verbs in these grades also possess (alternate) strong form VNs (e.g. *dînkà:* ‘sow’ — *dînkì:* ‘sowing (m)’).

Weak VNs in the A-form are derived by suffixation of *-`wa:*. In all other forms, the weak VN is identical to the corresponding form of the base verb.

(14)

grade	form	A	B	C	D
1	V	*karànta:*	karànta: shi	karàntà	karànta:
	VN	*karàntâ:wa:*	karànta: shi	karàntà	karànta:
4	V	*rufè:*	rufè: shi	rufè(:)	rufè:
	VN	*rufè:wa:*	rufè: shi	rufè(:)	rufè:
6	V	*ka:wo:*	ka:wo: shì	ka:wo:	ka:wo:
	VN	*ka:wô:wa:*	ka:wo: shì	ka:wo:	ka:wo:

Two things are worth noticing here: First, in the context of neutralisations within a basically tripartite system, the grade 6 VN data provide the missing type of syncretism (A vs. B-C).

Second, and most importantly, overt marking of this deverbal form singles out the A-form. In contrast to the picture drawn by Hayes, where forms other than the C-form were regarded as default realisations, governed by the Elsewhere Condition, the above data appear to support the view that the A-form actually forms a natural class, comprising intransitives, suppressed direct objects, and non-locally realised direct objects.

(15) a. yanà: karàntâ:wa:
3.S.M.CONT.ABS reading.VN.Gr1.A
'he is reading it'

b. litta:fìn dà yakè: karàntâ:wa:
book.DEF.M that 3.S.M.CONT.REL reading.VN.Gr1.A
'the book he is reading'

Recall that under Hayes's account the C-frame was regarded as a special syntactic environment into which the marked, shortened allomorph could be inserted. Insertion of the unmarked, unshortened form, by contrast, was assumed to be governed by the Elsewhere condition. In other words, morphophonologically derived forms (marked forms) are inserted in marked environments, whereas morphophonologically underived (unmarked forms) are inserted into the unmarked syntactic context. If we wanted to integrate the morphology of weak VNs with Hayes's approach, we would have to assume that, even here, the C-frame is the marked environment, with the A-frame being the default. Although technically viable, such a solution would stand in sharp contradiction to what is standardly assumed as a working principle of human language, namely that zero derivation is *the* default option in the absence of any more specific marking, cf., e.g., Stump's *Identity Function Default* (Stump, 1993; Stump, 2001). Furthermore, such a solution would be highly uneconomical, owing to the fact that all other zero-marked instantiation frames, the pre-pronominal B-frame and the pre-dative D-frame, would have each to be specified to override the default as well, in identical ways. As a consequence, the generalisation that all forms other than the A-form are derived by means of the identity function will remain unexpressed.

Finally, the fact that marking of A-forms can even be attested for deverbal forms in grades that otherwise fail to mark the distinction should be taken as strong evidence both for the centrality of such an inflectional distinction and for the status of the A-form as a natural inflectional class.

2.3.2. *Strong verbal nouns*

Verbs in grade 2 and 3 typically use a subregular or irregular strong VN in the continuative. Newman (2000, ch. 77) subdivides strong VNs into two broader classes: regular stem-derived VNs, which are identical to the A-form in grade 2 and which are assigned mostly feminine gender, and base-derived VNs, which display a greater variation with respect to shape. Many grade-2 verbs, as well as verbs from other grades have an alternate base-derived VN, alongside the stem-derived or weak form. In a few cases, the irregular form has completely replaced the regular one. Although the forms of strong VNs, in particular base-derived ones, are morphologically quite heterogeneous, they all obligatorily take the "linker" *-n/-r* in the B and C-forms, thereby behaving essentially like nouns: within the NP, the head noun is suffixed with the linker preceding a pronominal or full NP complement. Choice of the linker depends on the inherent gender of the head noun or VN, i.e. *-n* for masculine and *-r* for feminine.

(16) a. ta: kàrɓ**i** kuɗì:
3.F.S.CMPL.ABS receive.V.Gr2.C money
'She received money.'

b. ta: kàrɓ**e:** shì
3.F.S.CMPL.ABS receive.V.Gr2.B him
'She received it.'

c. abîn dà ta kàrɓ**a:**
thing that 3.F.S.CMPL.REL receive.V.Gr2.A
'the thing she received'

d. ta: kàrɓ**a:**
3.F.S.CMPL.ABS receive.V.Gr2.A
'She received (it).'

(17) a. tanà: kàrɓa**n** kuɗì:
3.F.S.CONT.ABS receive.VN.M.C money
'She is receiving money.'

b. tanà: kàrɓa**n**sà
3.F.S.CONT.ABS receive.VN.M.B.POSS.M
'She is receiving it.'

c. abîn dà takè: kàrɓa:
thing.DEF.M that 3.F.S.CONT.REL receive.VN.M.A
'The thing she is receiving'

d. tanà: kàrɓa:
3.F.S.CONT.ABS receive.VN.M.A
'She is receiving it.'

(18) a. ta: karàntà litta:fi**n** Audù
3.S.F.CMPL.ABS read book.M Audu
'She read Audu's book.'

b. ta: karàntà litta:fi**n**sà
3.S.F.CMPL.ABS read book.N.M.B.POSS.M
'She read his book.'

c. Audù ne: ta karàntà litta:fi**n**sà
Audu 3.S.F.CMPL.REL read book.N.M.B.POSS.M
'It's Audu she read a book of'

d. ta: karàntà litta:fì:
3.S.F.CMPL.ABS read book.N.M.A
'She read a book.'

If we abstract away from difference in exponence — FVS and "ablaut" in (16) vs. affixation of the linker to the "nominal" forms in (17) and (18) —, we can observe that highly similar morphological distinctions, namely the marking of argument realisation modes, are operative in nominal morphology as well. Several things are important here: first, despite the difference in major morphological class, the morphosyntactic *distribution* of the A-form of strong VNs is identical, in all relevant aspects, to that of ordinary verbs, subsuming intransives, zero anaphora and extraction. Second, we again find syncretism, this time affecting frames B and C. Thus, the contrast between A and C form that is so characteristic of FVS, is replicated here by the absence vs. presence of the linker *-n/-r*.[10] Third, under the broader perspective of a basically tripartite system for marking argument realisation, Hayes (1990)'s claim that X'-categories are treated differently cannot be maintained: while this may be true, if we regard FVS as an isolated phonological process, we have established in the preceding sections that this view has a very limited explanatory potential, failing to account for the full range of variation and patterns of syncretism within the verbal paradigms. As illustrated by the data in (16–18), marking of argument realisation not only generalises from verbs to verbal nouns (17), but also to ordinary common nouns like *litta:fi:* 'book' (18). Within proper NPs, not all environments for the A-form are attested, owing to the fact that extraction out of NPs is independently ruled out in Hausa. Instead, a resumptive (affixal) pronoun must be used. Still, in intransitive contexts, the partitioning is exactly parallel to that of VNs. With verbal nouns, where this island effect is not operative, A-frame environments are exactly those found with true verbs.

SUMMARY

In this section, I have argued that Hausa FVS is but one exponent of a much more fundamental morphological distinction drawn in the language. To my mind, the alternation is far too pervasive to warrant an analysis in terms of (subregular) allomorphy, at least not without missing an important property of the language. In particular, it affects the two major open class categories of Hausa, namely verbs and nouns in a similar way. Furthermore, we have seen that opposition with respect to vowel length, which is regarded as quite fundamental in Hayes's account, is but one way an at least threefold morphological distinction is neutralised, depending on a specific morphological class. Finally, we have established, mostly on the basis of the marking of weak VNs, that the A-form must be considered a natural morphological class in Hausa, ranging over intransitives as well transitives with unexpressed or non-locally realised direct objects. On the basis of the striking similarity of the distinctions involved, together with the degree of variation found in the set of exponents, I conclude that we are dealing here with an inflectional category.

3. Adjacency

In the preceding section, I have restricted myself to a discussion of the morphological aspects of Hausa FVS and related phenomena. The proposal to regard FVS as an instance of PPP, however, was mainly motivated by an apparent surface-syntactic constraint on the alternation. In order to maintain an essentially morphological analysis of the data, it is crucial, though, to determine what exactly the morphosyntactic property is that is morphologically expressed. Consequently, I will subject the syntactic environments of the alternation to some further scrutiny, showing that (a) the apparently surface-syntactic conditioning is but an artefact of canonical Hausa word order, and (b) that exceptions to a purely surface-oriented constraint can be found which point towards argument structure as the proper representation to formulate the contextual restrictions.

3.1. INTERVENTION

3.1.1. *Indirect objects*

One of the main pieces of evidence to motivate the surface-syntactic conditioning of FVS concerns the intervention data found in ditransitives (Hayes, 1990, p. 93):

(19) Na: ka:m**à:** wà Mu:sa: ki:fi: (H:93)
1.S.CMPL.ABS catch.V.Gr1.D(=A) for Musa fish

'I caught fish for Musa.'

Here, shortening does not apply, even though *ka:ma:* does take a direct object complement (*ki:fi:*), realised in the local clause. At first blush, it appears that it is not transitivity *per se* that matters but surface adjacency of an NP complement.

However, a property of Hausa not taken into account by Hayes (1990) is the very strict word order in this language. As detailed by Newman (2000, ch. 39) (but cf. any learner's grammar of Hausa, e.g., Cowan and Schuh, 1976) the canonical position of the indirect object, be it pronominal or not, is directly after the verb. Nothing save a few very light modal particles can intervene between the verb and the indirect object marker *-wà*. Direct objects, in particular, canonically follow the indirect object. If, for reasons of prosodic weight, an indirect object must be shifted to the right, it has to be expressed by means of a prepositional phrase headed by *gà*[11]:

(20) a. ya: faɗâ: wà mutànên làba:rì: (N:468)
3.S.M.CMPL.ABS tell.V.Gr2.D(=A) men.DEF news
'He told the men the news.'

b. ya: fàɗi làba:rì: gà mutànên dà
3.S.M.CMPL.ABS tell.V.Gr2.C news to men.DEF that
sukè: goyon ba:yansà (N:468)
3.P.CONT.REL supporting him
'He told then the news to the men who were supporting him.'

In this respect, basic Hausa ditransitives are quite similar to dative shift in English, where the indirect before direct object order is equally strict.

If we assume that word order in languages such as Hausa and English is determined by an obliqueness hierarchy on the argument structure of the verb (Pollard and Sag, 1987), right dislocation of the indirect object will necessarily involve demotion to an oblique PP argument. Under this perspective, non-application of FVS with ditransitives can readily be accounted for at the level of argument structure, without any reference to surface adjacency.

In this context, it is of note that in the Kano dialect, the stranded IO marker *-wà* is lengthened whenever the IO itself is extracted. Newman (2000, p. 277) offers a potential explanation to the extent that speakers of this variety have reanalysed the almost inseparable IO marker as a verbal clitic (or rather affix [BC]).

(21) Standard Hausa

a. shi: nè: mùtumìn dà ya gayà: w**à**
he COP man that 3.S.M.CMPL.REL tell.V.Gr1.D(=A) IOM
(N:277)

'He is the man I told it to.'

b. wà: ka ji: w**à** ciwo: (N:277)
who 2.S.M.CMPL.REL feel.V.Irr.D IOM injury
'Whom did you injure?'

c. ya ji: w**à** ya:rò: ciwo: (N:277)
3.S.M.CMPL.REL feel.V.Irr.D IOM boy injury
'He injured the boy.'

(22) Kano dialect

a. shi: nè: mùtumìn dà ya gayà: w**à:**
he COP man that 3.S.M.CMPL.REL tell.V.Irr.D(=A) IOM
(N:277)

'He is the man I told it to.'

b. wà: ka ji: w**à:** ciwo: (N:277)
who 2.S.M.CMPL.REL feel.V.Irr.D IOM injury
'Whom did you injure?'

c. ya ji: w**à** ya:rò: ciwo: (N:277)
3.S.M.CMPL.REL feel.V.Irr.D IOM boy injury
'He injured the boy.'

With the IO marker being reanalysed as part of the verb, these speakers now choose short (="C form") *wà*, whenever the least oblique complement is locally realised, but lengthen it to "A-form" *-wà:*, if it is extracted. Note that presence or absence of a more oblique direct object does not have any impact on the lengthening. To summarise, these Kano dialect speakers have generalised FVS to be sensitive to the least oblique complement, regardless of function, whereas the Standard Hausa pattern can be reinterpreted in such a way that this sensitivity additionally takes into account the grammatical function of this complement.

3.1.2. *Modal particles*

With the exception of the Kano dialect data, our discussion of word order and obliqueness in the preceding section has so far not been very conclusive, only offering an alternative interpretation of the data, i.e. in terms of argument structure rather than surface adjacency.

Clear evidence against the adjacency condition[12] formulated by Hayes (1990) comes from modal particles (Schmaling, 1991; Newman, 2000). Although other modifiers cannot separate a verb from its direct object or indirect object complement (Joseph McIntyre, p.c.), modal particles can actually intervene.

(23) a. Ya: shuukà **kuma** audùga:.
he.CMPL.ABS planted.V.Gr1.C also wheat
'He also planted wheat.'

b. * Ya: shuukà: **kuma** audùga:.
he.CMPL.ABS planted.V.Gr1.A also wheat
'He also planted wheat.'

(24) a. ya: ga **kuma** irìn ka:yàyya:kîn dà
3.S.M.CMPL.ABS see.V.Irr.C also kind goods that
kè: ciki (N:331)
CONT.REL inside
'he saw also the kind of goods that were inside'

b. ta: tàmbàyi **kùwa** mà:târ (N:331)
3.S.F.CMLP.ABS ask.V.Gr2.C moreover woman
'She asked, moreover, the woman.'

What is telling about these data is that surface intervention does not affect selection of the short vowel C-form, in any of the cases. Sure, one could try and refine the phonological instantiation frames to take these elements into account, but in doing so, the adjacency-oriented precompilation approach will lose much of its appeal: as Hayes claims himself (p. 106), strict adjacency is a defining property of precompiled phonologies and not so typical of inflection. If the adjacency requirements have to be relaxed, this can be taken as indirect evidence in favour of inflectional status.

3.1.3. *Negation (Northern dialects)*
Similar evidence can be found in some Northern dialects of Hausa (Newman, 2000). In Standard Hausa, sentential negation is expressed, in most tenses, by a discontinuous negative marker *bà ... ba* where the first part immediately precedes the TAM marker (and sometimes fuses with it) and the second part is found VP-finally, either including (marked) or excluding complement sentences.

As noted by Newman (2000, p. 639), in some Northern varieties the second part of the discontinuous negation marker also appears directly after the verb, separating it from its direct object NP complement. With pronominal direct objects, such intervention is not possible, underlining the affixal status of the Hausa object pronouns (see footnote 6).

(25) Standard Hausa

a. bài hàrbi gi:wa: **ba** (N:639)
3.S.M.CMPL.NEG shoot.V.Gr2.C elephant NEG
'He didn't shoot an elephant.'

b. bài hàrbe: tà **ba** (N:639)
3.S.M.CMPL.NEG shoot.V.Gr2.B her NEG
'He didn't shoot it.'

(26) Northern dialects

a. bài hàrbi **ba** gi:wa: (N:639)
3.S.M.CMPL.NEG shoot.V.Gr2.C NEG elephant
'He didn't shoot an elephant.'

b. * bài hàrbe: **ba** tà (N:639)
3.S.M.CMPL.NEG shoot.V.Gr2.B NEG her
'He didn't shoot it.'

It should come as no surprise now that intervention, again, does not impede selection of the C-form (26). In contrast to modal particles, the marker of sentential negation cannot, under any circumstances whatsoever, be reanalysed as part of the following NP. Thus, the Kano dialect data discussed above, together with the Northern dialect data presented here reveal, even more clearly than the standard variety, that surface adjacency is not the relevant concept to address the distribution of FVS in Hausa.

3.2. DOUBLE ACCUSATIVES

The finally conclusive piece of evidence on the issue comes from verbs taking two DO complements. Although, in these constructions, both complements are realised as direct objects (27), the first DO receives special status, being the "structural" object susceptible to promotion (in grade 7; see (28)):

(27) a. Bintà ta: ɗar**à** Kànde tsawo:
Binta 3.S.F.ABS.COMPL slightly exceed.V.Gr1.C Kande height
'Binta is a little taller than Kande.'

b. an sa:kè naɗ**à** wa:nè sarki (N:686)
4.S.ABS.COMPL repeat appoint.VN.Gr1.C so-and-so emir
'They again appointed so-and-so emir.'

c. sunà: biyà**n** Mu:sa: kuɗì:
3.P.CONT.ABS pay.VN.M.C Musa money
'They paid Musa money.'

(28) a. kadà kà rò:ƙi Bàla: go:rò! (N:685)
2.S.M.NEG.SUBJ beg.V.Gr2.C Bala cola nut
'Don't ask Bala for cola nuts!'

b. Abdù ba: yà: rò:ƙuwa: go:rò à ha:lin yànzu
Abdu 3.S.M.CONT.NEG beg.VN.Gr7.A cola nut now
(N:686)

‘Abdu was asked for cola nuts.’

c. * Go:rò ba: yà: rò:ƙuwa: Abdù à ha:lin yànzu
cola nut 3.S.M.CONT.NEG beg.VN.Gr7.A Abdu now
(N:686)

However, if this first DO is extracted, as in (29)–(31), the verb (or VN) appears in its A-form, despite the presence of a right-adjacent direct object complement (Newman, 2000).

(29) a. Kànde cè: Bintà ta ɗar**à:**
Kande COP Binta 3.S.F.REL.COMPL slightly exceed.V.Gr1.A
tsawo: (N:686)
height

‘It’s Kande that Binta is little taller than.’

b. * Kànde cè: Bintà ta ɗar**à**
Kande COP Binta 3.S.F.REL.COMPL slightly exceed.V.Gr1.C
tsawo: (N:686)
height

(30) a. wândà akà sa:kè naɗà:**wa:** sarki
who.M.REL 4.S.REL.COMPL repeat appoint.VN.Gr1.A emir
(N:686)

‘whom they again appointed emir’

b. * wândà akà sa:kè naɗà sarki
who.M.REL 4.S.REL.COMPL repeat appoint.VN.Gr1.C emir
(N:686)

(31) a. su wà: kukè: biyà: kuɗîn? (N:686)
who.p 2.P.CONT.REL pay.VN.M.A money.DEF.M

‘Who are you paying the money?’

b. * su wà: kukè: biyà**n** kuɗîn? (N:686)
who.p 2.P.CONT.REL pay.VN.M.C money.DEF.M

To conclude, these facts suggest, just like the intervention data, that surface adjacency fails to capture the full range of data and that reference to a privileged argument and its mode of realisation provide a more consistent picture of the Hausa data, a solution that I will explore in more detail in the following section. Moreover, this perspective will also align more neatly with the morphological facts established in the previous section, ultimately providing a definition of the inflectional category I consider FVS to be an exponent of.

4. Modes of argument realisation and morphological marking

In the preceding sections, I have argued that FVS in Hausa is but one exponent of a highly systematic distinction drawn in the language relating to the mode of realisation of some privileged argument, viz. the direct object. In particular, we have seen that the contexts in which A, B, and C-forms appear are highly consistent, even across major categories. As such, the underlying distinction is "based on a fairly restricted set of syntactic structural relations", a property Hayes (1990, p. 106) takes as a defining property of inflectional morphology. Furthermore, the closer look at the full range of morphological alternation has revealed that, unlike Hayes's characterisation of precompiled phonology, these data do not "involve rather haphazard environments that reflect [their] origin in true phrasal phonology" (Hayes, 1990, p. 106). Moreover, the phenomena at hand are not "subject to a strict locality requirement" (Hayes, 1990, p. 106) defined in terms of surface adjacency, as claimed by Hayes. Indeed, as evidenced by the morphology of weak VNs, reference to non-local realisation is a fundamental property of the system.

In this section I will review independent evidence both from Hausa and from language typology that underlines that the approach adopted here can not only do justice to the systematicity of the phenomenon, but that it will also further our understanding of Hausa morphosyntax in a broader cross-linguistic context.

4.1. Cross-linguistic evidence

In their 2001 article, Bouma et al. propose a novel theory of extraction that operates crucially on argument structure: in this theory, which is developed within the framework of Head-driven Phrase Structure Grammar (Pollard and Sag, 1987; Pollard and Sag, 1994), both the introduction of a gap and the percolation of non-local information up the tree proceed via the argument structure of a lexical head. Thus, "information about the extracted element is locally encoded throughout the extraction path" (Bouma et al., 2001, p. 1)

What is important about this proposal in the present context, is that the authors motivate their approach on the basis of a wide range of extraction-sensitive morphological data. In particular, they discuss evidence from languages as diverse as Irish (Sells, 1984; McCloskey, 1989), Chamorro (Chung, 1998), and French (Kayne and Pollock, 1978; Kayne, 1989; Miller and Sag, 1997), all involving morphological marking of extraction contexts. The authors claim that similar evidence can be found in a number of other languages, including Palauan, Icelandic, Kikuyu, Ewe, Thompson Salish, Moore, Spanish, and Yiddish (see Bouma et al. (2001, p. 2) for references).

In Chamorro, as illustrated by the following data, verbs are morphologically marked depending on the mode of realisation of their subject, i.e. inflection signals whether or not a subject is extracted or contains a gap.

(32) Chamorro (Bouma et al., 2001, p. 27)

a. Hayi *f-um-a'gasi* i kareta
who WH.SU-wash the car
'Who washed the car?'

b. Hayi si Juan ha-sangan-i hao [*f-um-a'gasi* i kareta]
who UNM Juan tell you WH.SU-wash the car
'Who did Juan tell you washed the car?'

c. Hafa *um-istotba* hao [ni malagao'-na i lahi-mu]
what WH.SU-disturb you COMP WH.OBL-want-3SG the son-your
'What does it disturb you that your son wants?'

These data[13] show some striking similarity with what we found in Hausa: in both languages, verbal morphology is used to mark local vs. non-local realisation of some argument.

An even closer analogue to Hausa is French participle agreement (Kayne and Pollock, 1978; Kayne, 1989; Miller and Sag, 1997): when used in conjunction with the auxiliary *avoir*, past participles in this language may display agreement with the direct object. Presence vs. absence of agreement, however, depends on the way the direct object is realised: with locally realised direct object NPs, past participle is ruled out, and a default masculine singular form is selected. If, however, the direct object is extracted or realised as a pronominal affix on the auxiliary, the participle has to agree in number and gender with its direct object.

(33) a. Marie a écrit / *écrite la lettre.
Marie has written the letter
'Marie has written the letter.'

b. Marie l'a *écrit / écrite.
Marie her.DO-has written
'Marie has written it (=the letter).'

c. la lettre que Marie a *écrit / écrite.
the letter that Marie has written
'the letter that Marie wrote'

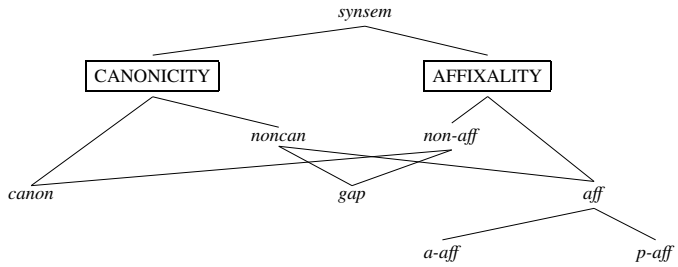
(34) a. Marie s'est coupée/*coupé.
Marie self.DO-is cut
'Marie has cut herself.'

b. Marie s'est coupé/*coupée les cheveux.
Marie self.IO-is cut the hair.DO
'Marie has cut her hair.'

c. la maison qu'il s'est construite/*construit.
the house that he self.is built
'the house he has built for himself'

Miller and Sag (1997) provide an analysis of this phenomenon in terms of argument realisation types. In HPSG (Pollard and Sag, 1994), the arguments a lexical head subcategorises for are represented on valence lists. The elements on these lists are objects of type *synsem*, i.e. they include local (and non-local) syntacto-semantic information, but neither phonology nor information about the complement's internal phrase structure. Once a head combines with a complement, the corresponding element is cancelled off, under unification, in Categorial Grammar-style fashion. Miller and Sag (1997) now propose to augment the type *synsem* into a cross-cutting hierarchy of argument realisation types, as given in (35). With a hierarchy of argument realisation types, it now becomes possible to record the mode in which a subcategorisation requirement has been satisfied. As stated by the given hierarchy of synsem types, the two modes of argument realisation that do trigger participle agreement are generalised into a common class, represented by the supertype *noncan*, for non-canonical realisation.

(35)



If a subcategorisation requirement is either morphologically satisfied (by a pronominal affix) or it is inserted into SLASH (for non-local feature percolation) the corresponding element on the argument structure is restricted to be an affixal or gap synsem, respectively. Since French auxiliary participle constructions are considered complex predicates, involving argument composition (see Abeillé and Godard, 1994, Abeillé et al., 1998 for motivation), any restriction regarding realisation type imposed on the argument structure of the auxiliary will be present on that of the participle as well, due to the formalisation of argument inheritance as structure sharing. Thus, presence vs. absence of participle agreement can be locally decided on the argument structure of the participle, depending on the realisation type of the least oblique complement: participle agreement will require this element to be a non-canonical

synsem, whereas selection of the default form will impose the restriction that this argument be of type *canon*.

If we compare now the French data with Hausa, we find that the former is actually a mirror image of the latter: while in French, presence of participle agreement morphologically expresses non-local realisation of a direct object complement[14], in Hausa, it is by-and-large local realisation of a direct object that receives morphological expression. Under this view, the role of the A-form, which is morphologically unmarked in the overwhelming majority of the cases, functions as a default form: in addition to non-local realisation, this form is used in all those cases where the distinction simply has no bearing.

4.2. Further evidence from Hausa: Marking of UDCs

Although the typological similarity between French and Hausa plays an important role in our understanding of FVS and related phenomena, it would be even more satisfying, if we could find independent language-internal evidence, showing that Hausa is really an instance of this typologically well-attested type of languages, where morphological marking of extraction or unbounded dependency constructions (UDCs) is a defining characteristic. As we will see shortly, exactly this type of evidence can in fact be found.

As we have already mentioned above, verbal inflectional categories such as marking for tense, aspect and mood are expressed, in Hausa, by a set of independent TAM markers, preceding the verb or VP. Often, these markers are fused with subject agreement and the marker of negation. Although neutralised in most tenses (including all negative "tenses"), continuative and completive aspect have two independent sets of forms, called absolutive (or general) vs. relative.

Although, in narratives, the relative completive has a secondary function for describing a series of events, in normal speech, choice between these sets is syntactically conditioned (Tuller, 1986; Davis, 1986; Newman, 2000).

(36) declaratives

a. mutà:ne: sun zo: jiyà:
people 3.P.CMPL.ABS come yesterday
'The people came yesterday.'

b. mutà:ne: sunà: zuwà:
people 3.P.CONT.ABS coming
'The people are coming.'

(37) relative clauses

a. mutà:nên dà sukà / *sun zo: jiyà:
men.DEF.P that 3.P.CMPL.REL 3.P.CMPL.ABS come yesterday
'the people who came yesterday'

b. mutà:nên dà sukè: / *sunà: zuwà:
men.DEF.P that 3.P.CONT.REL 3.P.CONT.ABS coming
'the people who are coming'

(38) wh questions

a. mè: ya / *ya: gani:
what 3.S.M.CMPL.REL 3.S.M.CMPL.ABS see
'What did he see?'

(39) topicalisation

a. Kànde cè: ta / *ta: zo:
Kande COP 3.S.F.CMPL.REL 3.S.F.CMPL.ABS come
'It's Kande who came?'

b. cikin mo:tà: ne: mukà / *mun zo:
in car COP 1.P.CMPL.REL 1.P.CMPL.ABS come
'By car we came.'

As illustrated by the data above, markers from the absolutive set are chosen in ordinary sentences without any unbounded dependencies. Once a nonlocal dependency is present, forms from the relative set must be used instead.[15]

(40) mè: sukè: fatan sun / *sukà gamà:
what 3.P.CONT.REL hoping 3.P.CMPL.ABS 3.P.CMPL.REL finish
'What did they hope they have finished?'

Although it is pretty evident that this alternation is sensitive to extraction contexts, the data in (40) reveal that selection of the relative set of TAM markers is only triggered at the point where the nonlocal dependency is bound off by a filler (Davis, 1986; Newman, 2000).

In sum, we can conclude that marking of nonlocal dependencies is a central property of Hausa morphosyntax. Marking of unbounded dependencies actually demarcates the two extreme points of a UDC, i.e. the filler and the gap: while the position of the former is morphologically signalled by the choice of TAM marker, position of the latter is marked, at least for direct objects, by selecting the A-form. [16]

5. Analysis

5.1. INGREDIENTS

The analysis I am going to propose will be developed in the framework of Head-driven Phrase Structure Grammar (HPSG; Pollard and Sag, Pollard and Sag, 1987, 1994). Within unification-based lexicalist syntactic frameworks,

such as HPSG or LFG, information about valence realisation, including introduction of an unbounded dependency, is readily available at the lexical level, either in terms of trace-less extraction (Sag and Fodor, 1994; Pollard and Sag, 1994; Bouma et al., 2001), as in HPSG, or by means of inside-out functional uncertainty (LFG; Dalrymple, 1990, Kaplan and Zaenen, 1989).

5.1.1. *The representation of unbounded dependencies*

Trace-less theories of extraction in HPSG standardly assume that gaps do not enjoy an independent representation as a phonetically empty syntactic sign, but rather assume that introduction into the non-local SLASH set is performed directly in the lexical entry of the selecting head.[17] From there it will percolate up the tree, as regulated by the Nonlocal Feature Principle (Pollard and Sag, 1994), until a suitable filler is found, and the content of SLASH is retrieved, equating the LOCAL value of the filler with an element in SLASH, which is then removed.

(41)
$$\left[\begin{array}{l}\text{SS}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{VALENCE}\,|\,\text{COMPS}\ \boxed{1}\oplus\boxed{2}\\ \text{M}\left\langle\left[\begin{array}{ll}\textit{stem}&\\ \text{SS}&\left[\text{LOC}\,|\,\text{CAT}\,|\,\text{VALENCE}\,|\,\text{COMPS}\ \boxed{1}\oplus\left\langle\left[\begin{array}{l}\text{LOC}\ \boxed{0}\\ \text{NLOC}\,|\,\text{INH}\,|\,\text{SLASH}\left\{\boxed{0}\right\}\end{array}\right]\right\rangle\oplus\boxed{2}\right]\end{array}\right]\right\rangle\end{array}\right]$$

As illustrated in (41), introduction of a dependent's LOCAL value into SLASH is typically accompanied by removing the corresponding subcategorisation requirement from the valence list (here: COMPS, a list containing subcategorisation requirements for non-subject complements) of the lexical sign. Note further that the way we have specified lexical slash introduction by means of a unary schema, slash introduction leaves a "trace" of its application on the morphologically embedded valence list, namely a dependent whose LOCAL value is token-identical to the single element in its SLASH feature. As we will see shortly, Hausa morphology will make crucial reference to such a specification, ultimately distinguishing slashed from unslashed dependents.

5.1.2. *Realisational morphology*

As to the formal treatment of morphology, I assume a variant of Koenig (1999)'s Type Underspecified Hierarchical Lexicon (TUHL), a constituent structure-based model of realisational morphology, cast in terms of monotonic multiple-inheritance hierarchies expressed as a system of conjunctive dimensions and disjunctive types.[18] What makes his system extremely useful in the domain of morphology, is that it integrates a model of lexical regularity and productivity: in TUHL, regular and productive patterns are only intensionally described by highly underspecified types, which can be dynamically combined. The set of inferable types is defined by what Koenig calls an

AND/OR network: each maximally specific type must inherit from exactly one leaf type in each dimension. Thus, in contrast to the dimensions used in the closed-world type hierarchies employed by Pollard and Sag (1987), which serve mainly expository purposes, here, they can be regarded as a generative device, constraining the dynamic inference of fully-resolved types in an open-world type hierarchy.

In the TUHL, a principled distinction is drawn between basic types, and the set of fully-resolved, inferable types. Well-formed lexeme categories, in this system, correspond to maximal, fully-resolved types. Thus, conjunctive dimensions serve the purpose of specifying which information needs to be inherited to yield a well-formed lexeme category. To give an example, consider the underspecified type hierarchy given in (42) below: any inferable subtype of *A-frame* must inherit from at least one leaf type in every dimension of this type, viz. EXPONENCE and VALENCE. As a result, the underspecified type hierarchy under *A-frame* describes a set of 6 fully resolved types obtained, by pairwise intersection (unification) of the leaf types within each dimension.

Productive morphological patterns are represented as (partially) specified rule schemata. As such, they are applicable to any morphological entities that unify with the constraints the schema imposes on its morphological daughter(s), represented on the M(ORPH) list. Thus, fully productive patterns are exclusively described in terms of their properties.

Subregularity and irregularity are captured in this system by means of pre-typing: in contrast to fully productive patterns, irregular classes are not defined intensionally by way of properties described via feature structures, but rather extensionally by means of enumerating their class members. Subregular patterns, by contrast, are defined both extensionally and intensionally, abstracting out redundant class-specific information as a property of the supertype. An example of pre-typing can be found in (44) with the irregular grade 2 stem *dî:bà:*. Such supertypes, however, only serve the purpose of a redundancy rule, i.e. no new class members can be dynamically inferred, owing simply to the fact that online type construction can only target leaf types. Thus, subregular patterns, just like irregular patterns are closed classes.

5.2. HAUSA FRAMES

As we have seen in the discussion of the empirical patterns, mode of argument realisation is a crucial underlying distinction in Hausa morphosyntax. We have also established there that, sometimes, this tripartite distinction is morphologically (partially) neutralised in various ways. Furthermore, although the syntactic environments are strikingly similar, even across major categories, morphological expression is quite heterogeneous, as far as exponence is concerned. Thus, the phenomenon at hand lends itself quite naturally to a treatment in realisational terms.

As a first step towards a formal analysis along these lines, I propose a hierarchy of morphosyntactic frames, given in (42) below, defined in terms of valence information.[19]

This hierarchy actually serves a dual purpose: first, it defines a class of morphologically relevant syntactic environments. As this hierarchy is set up as a dimension of *major*, a subtype of *word* which I take to comprise nouns and verbs, every fully type-specified lexeme from the major syntactic categories can and must be assigned (dynamically) to one of the leaf types in this dimension.

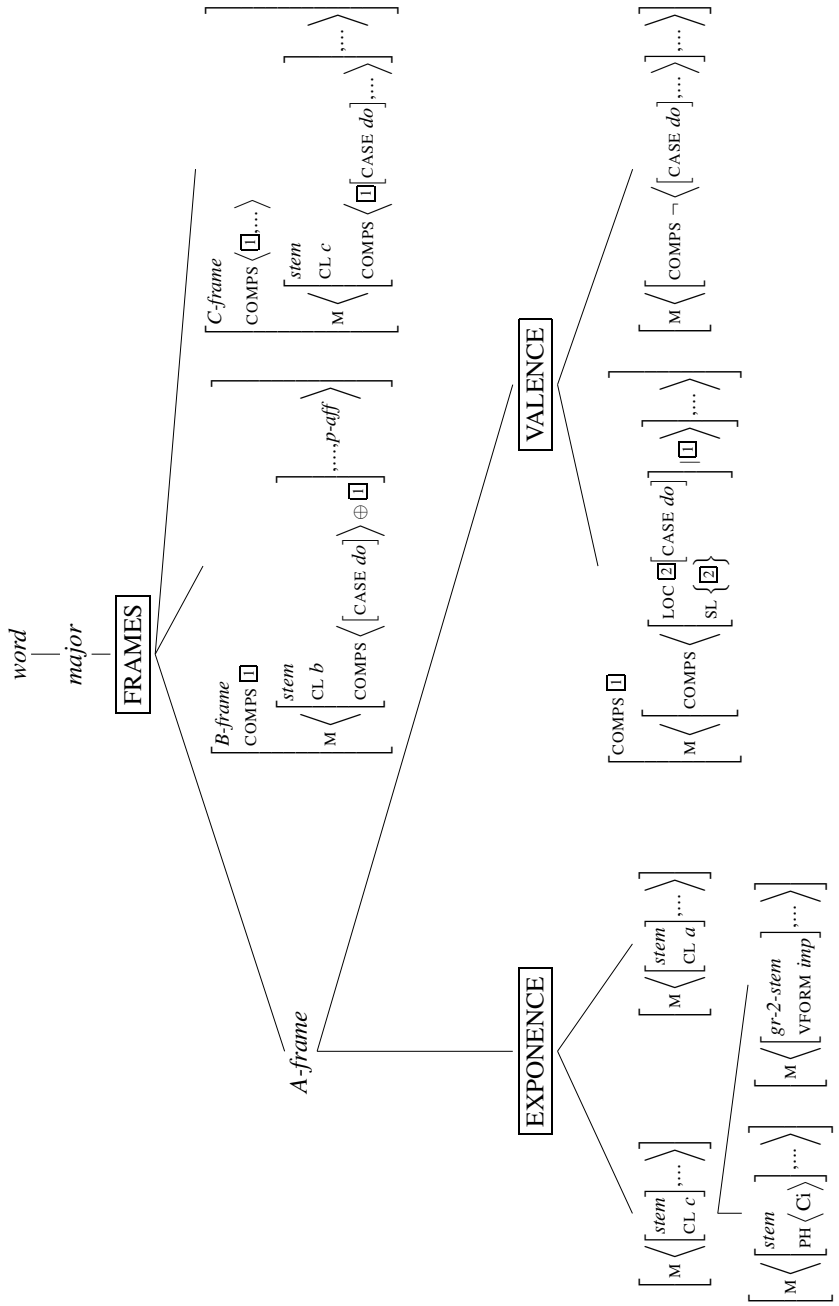
Second, and equally importantly, types in this hierarchy can be regarded as realisational schemata, pairing selection of a specific frame with a constraint on the stem class, encoded in the CL(ASS) feature.[20] Separation of the basic system of morphosyntactic divisions from stem selection enables us to formulate borrowing of stems, e.g. to capture the fact that with grade-2 verbs in the imperative, the form used for the A-frame is identical to the C-form. In a sense, the schemata defined here can be equated with paradigm functions in Stump (2001)'s Paradigm Function Morphology. Morph classes, by contrast, perform a similar function to rules of exponence.

The definition of the C and B frames is quite straightforward: the C frame is defined in terms of the mode of argument realisation of the least oblique complement, requiring this to be a direct object that has not been lexically suppressed, neither by lexical slash introduction (extraction) nor by means of affixal realisation (see below). The B frame, by contrast, captures the situation where the direct object has been expressed by a pronominal affix, reflected by the suppression of the least oblique complement, together with the presence of an exponent of pronominal affixation in the morphological structure.[21] Both schemata also place a restriction on the class of the stem they can be used with.

The definition of the A frame, however, is slightly more complex, both syntactically and morphologically. Morphologically, we can identify two patterns here: direct exponence, and a rule of referral, operative with grade 2 imperatives and a small set of monosyllabic verbs. In an independent, cross-cutting dimension, we capture the syntactic characterisation of this frame, using two leaf types: one that specifies marking of non-local realisation of a direct object complement, and another one which captures all those cases where the least oblique complement fails to be a direct object, including intransitives.

Since the syntactic patterns are defined in a dimension independent of that of exponence, every *word* belonging to the two major categories that gets dynamically assigned a subtype of *A-frame* must inherit from exactly one leaf type of every dimension of this type. Thus, we can concisely represent a whole range of patterns by means of this still rather simple two-dimensional hierarchy.

(42)


word
major
FRAMES
B-frame
COMPS 1
stem
CL b
M
COMPS
CASE do
1
...,p-aff
C-frame
COMPS 1,...
stem
CL c
M
COMPS 1
CASE do
...
A-frame
VALENCE
COMPS 1
M
COMPS
LOC 2
CASE do
SL 2
1
...
M
COMPS ¬
CASE do
...
EXPONENCE
M
stem
CL c
...
M
stem
CL a
...
M
stem
PH Ci
...
M
gr-2-stem
VFORM imp
...

5.3. HAUSA VERBAL PARADIGMS

Having now established the basic partitioning of the morphosyntactic distinction underlying Hausa inflectional marking of argument realisation, we can now proceed towards a morphological analysis of exponence and the associated patterns of neutralisation.

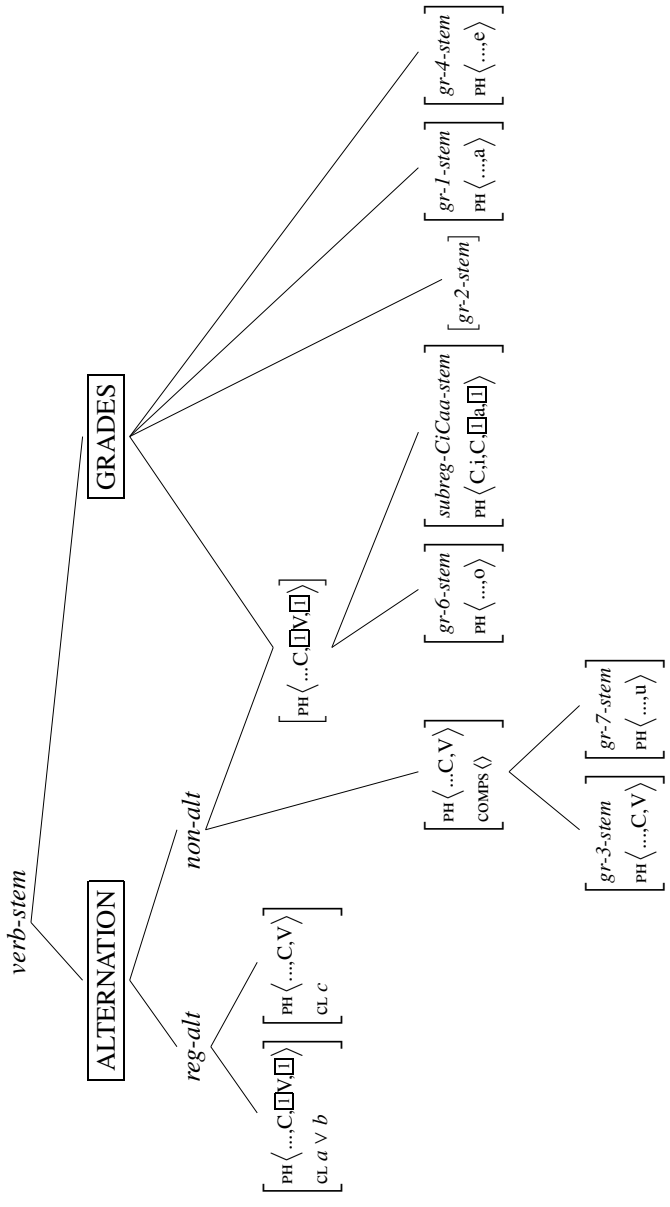
The main hierarchy of stems is given in (43). This hierarchy is partitioned into two main dimensions: the grades on the right hand side represent an abstraction of (some of) the morphological and phonological properties of verbal stems. At the leaves of the types in this dimension one will actually find the individual stem entries that are instances of these more abstract classes.

The main challenge of the morphological analysis now is to capture the regularity and productiveness of FVS despite different patterns of neutralisation: full or partial neutralisation of entire classes, as well as sporadic irregularities, regarding theme vowel or stem phonology, within an otherwise regularly alternating class. Given the productivity of the process, I would deem the use of mere redundancy rules a rather suboptimal solution.

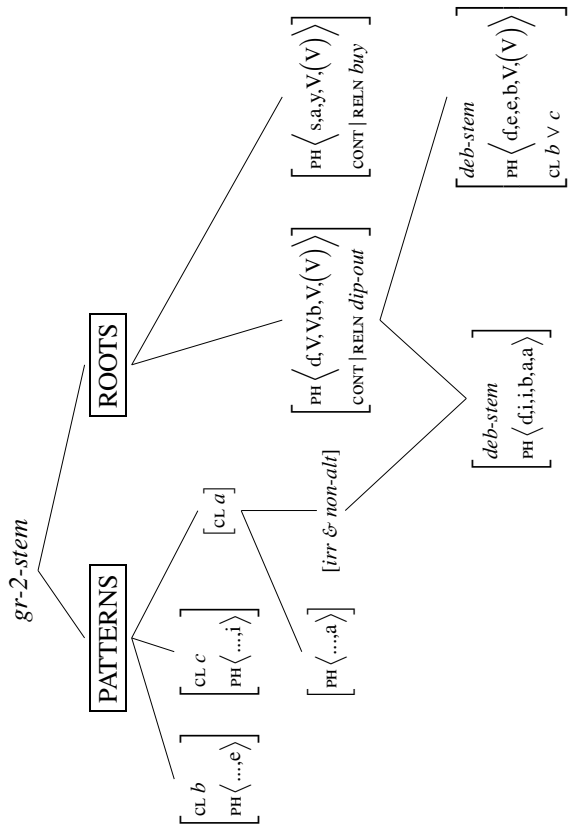
Fortunately, we can again use online type construction and abstract out the regular phonological patterns into a dimension of their own. At the top level, this dimension is divided into regularly alternating (type *reg-alt*) and non-alternating stems (*non-alt*). Entire classes that do not participate in the vowel length alternation will be pre-typed to this latter type, precluding inheritance from any other type in the ALTERNATION dimension. Apart from the neutral grade 6, the "intransitive" grades 3 and 7 are also pre-typed to this exemption type, because they uniformly end in a short theme vowel (A-form). The type *reg-alt*, however, is subdivided into two types describing *intensionally* the alternation in final vowel length. As these two types are leaf types, having no classes or instances pre-typed to them, they are available for dynamic type inference: every stem type that is not pre-typed to a type within this same dimension can be combined with any of these two types, thereby modelling the productive length alternation. As one can easily verify, this is the case for every instance of *gr-1-stem* and *gr-4-stem*, as well as most instances of *gr-2-stem*.

Now that we have seen the overall picture, let us briefly have a closer look at grade 2 (see (44)). In addition to vowel length alternation, this grade features the famous change in final vowel quality. Recall from our discussion earlier that some grade 2 verbs have irregular forms in the A-frame. Despite these sporadic exceptions, the B and C forms participate in the regular pattern of vowel length and vowel quality alternation. Again, we can abstract out this class-specific regularity by means of a two-dimensional system of patterns and roots. Just like the length alternation above, vowel quality alternation is described intensionally in terms of phonological properties. Every stem of type *gr-2-stem* that is not pre-typed to the exemption type *irr*, can and must

(43)


verb-stem
ALTERNATION
reg-alt
non-alt
GRADES
gr-4-stem
gr-1-stem
gr-2-stem
subreg-CiCaa-stem
gr-6-stem
gr-3-stem
gr-7-stem
CL a ∨ b
CL c
COMPS ⟨⟩

(44)



be intersected with one of these three leaf types to form a fully type-resolved category. Verb stems, which are partially exempt from the alternation, have their A-form pre-typed to the exemption type (itself pre-typed to *non-alt*), whereas the regularly alternating B and C-forms are still derived via type inference. Note further that the grade-2 subhierarchy only specifies vowel quality: length alternation for regular grade 2 verb stems is inferred, by means of dynamic inheritance, from the two subtype of *reg-alt*.

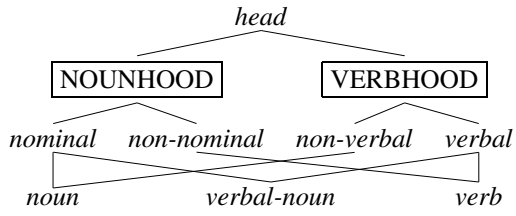
5.4. VERBAL NOUNS

With the basic morphological machinery in place, we can now go on and investigate how the system carries over from verbal to (verbal) noun inflection.

Before we can enter into a discussion of the morphology proper, a few words are due concerning the categorial status of weak and strong VNs. Based on their syntactic distribution as complements of continuative aspect markers, it is clear that both weak and strong VNs must share some syn-

tactic category that sets them apart from ordinary verbs. In this respect they also pattern with "action nouns", i.e. words like *aikì:*, which denote activities and therefore introduce an event variable, a property that makes them suitable for continuative aspect marking. Morphologically, strong VNs are clearly nouns. Weak VNs, except in the A-form, are morphologically indistinguishable from the corresponding verb form, as used, e.g., in the completive. Newman (2000) therefore concludes that only the A-form of weak VNs should be considered nominal, with all other weak forms being ordinary verbs. Although this makes sense from a purely morphological perspective, it will inevitably require syntactic selection by the continuative marker to be sensitive to the morphological distinction between weak and strong VNs, not a desirable result at all. Instead, I would like to attack this issue by means of underspecification[22], essentially a mixed category approach of the kind advanced by Malouf (2000):

(45)

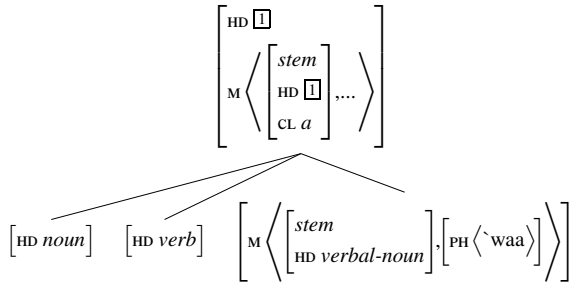


Given the hierarchy in (45), I will assume that verb stems of grades 1, 4, 5, 6 , and 7 are underspecified with respect to the distinction between VN and true verb status, i.e. they are assigned the major category *verbal*. Strong verbal nouns, however, which behave essentially like nouns, both morphologically and syntactically, are assigned the major category *noun*. Verb stems that do not have a weak VN, e.g. those in grade 2, are lexically specified as *verb*.

Continuative aspect markers will then select for a complement of type *nominal*, combining with weak and strong verbal nouns, but ruling out unambiguous verbs as their complements. Similarly, all other TAM markers will select for the type *verb*, ruling out combination with any *nominal* forms.

While underspecification of verbal stems already gives sound results in the B and C frames of verbs and weak VNs, it does not yet capture the obligatory inflection of weak VNs in the A frame. As I understand it, this obligatory marking of weak VN is an exponent of frame selection, on a par with stem class selection. It is therefore only natural to expand the type for regular A-frame stem selection in (42) to differentiate weak VN, verb and noun inflection:

(46)



As depicted by the realisational hierarchy in (46), A-frame inflection performs the required disambiguation of underspecified verbal stems: while affixation of *-`waa* will derive unambiguous verbal nouns, disambiguation to the types *noun* and *verb* will be performed by zero derivation, represented by the presence of the stem as the only element on the M(ORPH)) list.

Turning finally to strong verbal nouns, I will assume that these stems are lexically classified as unambiguous nouns. Just like other base nouns, I will assume that only the A-form is listed. B and C form stems are then derived by an inflectional schema, as given below:[23]

(47)
$$\begin{bmatrix} \text{CL } b \vee c \\ \text{M} \left\langle \begin{bmatrix} \textit{stem} \\ \text{CL } a \\ \text{HD } \textit{noun} \end{bmatrix}, \textit{poss-linker} \right\rangle \end{bmatrix}$$

The result of this rule application will then have to match the morphosyntactic constraints pertaining to frames B and C. Thus, the inflectional rule itself can be specified in a maximally general fashion, with morphosyntactic restrictions imposed on the morphological top level, i.e. feature structures of type *word*.

5.5. PRONOMINAL AFFIXATION

The last aspect of Hausa inflection for realisation mode that I will address in this paper relates to pronominal affixation. As I have hinted at in footnote 6 above, there is good reason to believe that weak pronominals in Hausa should best be analysed as pronominal affixes, modelled as lexical valence alternation in the sense of Miller and Sag (1997). Thus, akin to inflection of A form weak verbal nouns, stem selection is not the only morphological property relevant in frame B.

Thus, a straightforward way to incorporate the introduction of pronominal affix exponents is to simply expand the constraint on frame B into two realisational schemata, governing the selection of affix classes for nominal and verbal pronominal affixation.

(48) a.
$$\left[\begin{array}{l}\textit{frame-B}\\ \textsc{m}\left\langle\left[\begin{array}{l}\textit{stem}\\ \textsc{hd}\ \textit{verbal}\\ \textsc{comps}\left\langle\left[\textsc{case}\ \textit{do}\right],\ldots\right\rangle\end{array}\right],\left[\textit{do-aff}\right]\right\rangle\end{array}\right]$$

b.
$$\left[\begin{array}{l}\textit{frame-B}\\ \textsc{m}\left\langle\left[\begin{array}{l}\textit{stem}\\ \textsc{hd}\ \textit{noun}\\ \textsc{comps}\left\langle\left[\textsc{case}\ \textit{do}\right],\ldots\right\rangle\end{array}\right],\left[\textit{poss-aff}\right]\right\rangle\end{array}\right]$$

Accordingly, *frame-B* in (42) will have the two subtypes specified in (48) above, regulating the choice of markers. Restrictions pertaining to stem selection will be inherited from the supertype. As a result, nouns, including strong VNs, will be required to come already inflected with the linker.

Before we close, let me draw your attention again to the specification of *frame-B*: so far, it only pairs introduction of an pronominal affix with the suppression of the least oblique complement. Suppression of complements, however, is also a side effect of slash introduction. As specification of SLASH is crucially underspecified in the B-frame (but not in the A or C-frames), we correctly predict selection of B forms, once a resumptive pronoun strategy to extraction is adopted, as illustrated by the datum in (18) above. What is again noteworthy, is that the domains of extraction and pronominal affixation may (partially) overlap, similar to the situation found with French participle agreement (Crysmann, 2003a; Miller and Sag, 1997).

6. Conclusion

In this paper, I have argued that Hausa FVS is but one exponent of a systematic distinction drawn in Hausa morphosyntax, namely marking of argument realisation modes, ranging from direct local realisation, over pronominal affixation to extraction. This basic distinction, which has been shown to be highly characteristic of Hausa morphosyntax, receives a natural explanation, once we abandon the narrow perspective of an isolated rule of phrasal allomorphy in favour of a morphological perspective on the data, accounting for the tight integration of FVS with Hausa stem morphology, the diversity of exponence expressing the morphosyntactic distinction, as well as the class-specific and sporadic patterns of neutralisation, including rules of referral. This morphological perspective has also paved the way for a deeper understanding of Hausa morphosyntax, brought about by the connection we have established between the phenomenon at hand to the typologically well-

attested pattern of morphologically marked extraction contexts, thereby characterising Hausa as the mirror image of French.

Furthermore, we have investigated in some detail the syntactic environments defining the underlying inflectional categories and have found that simple surface-oriented adjacency requirements should be supplanted with reference to argument structure. In the formal part of the analysis, we have shown how recent developments within unification-based theories of grammar such as HPSG enable us to state the observable regularities elegantly in entirely lexical terms. Thus, lexicalist theories of grammar appear to provide a convenient basis for the expression of realisational theories of morphology.

Finally, it is worth noting that a morphological analysis is not only to be preferred on empirical and typological grounds, but that it is also advantageous for methodological reasons: besides the usual Occamian arguments, which surely apply here as well, elimination of Precompiled Phrasal Phonology from the theory of grammar will ultimately provide for a more strengthened division between phrasal and lexical phonology. This goal seems actually quite attainable, given that, for a variety of seemingly precompiled phonologies, alternative analyses in terms of an enriched theory of the prosodic hierarchy are readily available (Cowper and Rice, 1987), e.g., the Mende and Kimatuumbi data, which, alongside Hausa, have formed the empirical base of Hayes's original proposal.

Acknowledgements

I am greatly indebted to my former Hausa teacher Joseph McIntyre for helping me with various empirical issues in the initial stages of this paper. I would also like to thank the audience of the 4th Mediterranean Morphology Meeting (Catania, Sep 2003), and, in particular Bernard Fradin, Joan Mascaró, and Andrew Spencer for helpful suggestions on different aspects of the proposal. A great many thanks also go to the 4 anonymous reviewers: their comments were invaluable for clarifying and strengthening the ideas developed here.

The work presented in this article was partially supported by research grants from the German Federal Ministry of Education, Science, Research and Technology (BMBF) to the DFKI projects Quetal (FKZ 01 IW C02) and Collate (FKZ 01 IN A01 B).

Notes

[1] Hausa is a Chadic language spoken by some 30 million speakers in Northern Nigeria and bordering areas of Niger. Hausa is a tone language, featuring 3 distinct surface tones: H, L, HL (=falling). Throughout this paper I will only mark L, using a grave accent, and falling tone,

indicated by a circumflex. All syllables not marked with any diacritic are high. Vowel length, which is also distinctive, is marked by means of a colon.

The data in sections 2 and 3 of this paper are almost entirely taken from Newman's reference grammar of Hausa (Newman, 2000), marked (N:page number) and Hayes's original paper (H:page number), with glosses added by me. The Hausa data in section 4 are mainly reproduced from Davis (1986) (D).

[2] For ease of exposition, I have left out some of the minor grades, in particular grade 3a, 3b, and 0, which were not part of Parson's original system. For our purposes, intransitives are only of very limited use anyway. Grade 0 verbs are treated as irregular or subregular verbs in the context of this paper.

[3] Throughout this paper, I will use the term "shortening" as an entirely descriptive term, without attaching to it any analytical significance, except when referring to the analysis provided by Hayes (1990). This should be most evident from the formal analysis given in section 5, where the alternation is implemented as such, without implying any derivation in whatso-ever direction. Given that the direction of rule application is quite immaterial to my own approach, I have decided to use a terminology compatible with that of Hayes, describing the phenomena in relation to the citation form (A-form). Historically, as argued, e.g., in Newman (2000), it is the C-form that should be regarded as basic, with the A-form being derived, a point that has also been pointed out to me by two anonymous reviewers. It is of note, though, that Hayes (1990, p. 95) finds a lengthening rule unworkable for his account, whereas the approach advocated here is pretty neutral as to the direction of application, reducing diachronic derivation to synchronic alternation.

[4] Although it is clearly beyond the scope of this article to engage into a full-fledged discussion of the clitic vs. affix status of Hausa direct object pronominals, there is, however, initial evidence in favour of an affixal analysis: first, they show a high degree of selection towards their host (Zwicky and Pullum (1983)'s Criterion A), nothing can intervene between a direct object pronominal and its host, not even modal particles (Newman, 2000, p. 331), nor can they get fronted. Furthermore, these elements are segmentally and tonally weak, consisting of a single light (CV) syllable to which a polar tone is assigned. Choice of tone, however, does not depend on the preceding surface tone, but on the underlying tone, as detailed in the discussion of Low Tone Raising below. For the sake of this article, I conclude that an analysis of direct object pronominals as inflectional affixes is defensible on empirical grounds.

[5] For the purposes of final vowel shortening, the D-frame is quite marginal, since the forms used there are identical to the A-forms in most cases. Exceptions include grade 2 and grade 7 verbs, which display an additional "pre-dative suffix (pds)" (Newman, 2000), and some subregular monosyllabic (grade 0) verbs, which have short final vowel in A- and C-frames, but a long one in the B- and D-frames. Throughout the examples, I have glossed the D-form explicitly, indicating its identity to the A-form, whenever appropriate.

[6] Besides word-boundedness, the main reason for regarding Low Tone Raising as a lexical rule is the existence of lexical exceptions. On the basis of these exceptions, Newman (2000, p. 241f) even contests the status of Low Tone Raising as a productive synchronic rule of Hausa. See Newman and Jaggar (1989a), Newman and Jaggar (1989b), and Schuh (1989) for detailed discussion.

[7] This possibility has already been exploited by Vigário (1999) as an escape hatch to discuss away unambiguous morphophonological evidence for the affixal status of European Portuguese clitics (see Crysmann, 2003b and Luís and Spencer, 2004 for a detailed criticism of Vigário's position).

[8] For these speakers, shortening of the final *-o:* in grade 6 applies, whenever the penultimate syllable is heavy, yet fails to apply, if it is short.

[9] As pointed out to me by Joe McIntyre (p.c.), irregular monosyllabic verbs of the Ci type also display syncretism between A and C forms, e.g. *fi* 'exceed', *ci* 'eat', and *ji* 'hear'.

[10] The shortening of the final vowel here is entirely conditioned by phonotactic constraints on syllable weight, and therefore unrelated to the issue of FVS studied in this paper.

[11] Although historically, there is reason to believe that *wà* derives from *gà* (Newman, 2000, p. 276), synchronically, these two must be clearly distinguished, since *-wà*, unlike prepositions is obligatorily stranded in extraction contexts, whereas stranding is ruled out for true prepositions.

[12] Hayes mentions these facts in a footnote, casually remarking that his *Frame 1* needs to receive some refinement to take these elements into account.

[13] In the examples above, the glosses WH-SU and WH-OBJ refer to the exponent of marking wh-extraction of a subject or oblique object.

[14] See Crysmann (2003a) for a unified analysis of extraction and cliticisation in French, regarding the latter as a special (local) subcase of the former.

[15] Embedded declaratives pattern with matrix declaratives, underlining that the sensitivity involves extraction paths, not merely a filled COMP position.

[16] Within the context of long-distance extraction, marking of local vs. nonlocal realisation also receives a functional explanation: with transitives, choice of non-A forms (as witnessed by C-form *fa:tan* in (40) above) can provide a clue, during sentence processing, as to the location of the gap site.

[17] See Bouma et al. (2001) for the treatment of adjunct extraction.

[18] See also Koenig and Jurafsky (1994) for a concise introduction. For a similar approach to HPSG morphology, see Riehemann (1998).

[19] For clarity of exposition, I give a slightly simplified picture of Hausa frames here, ignoring the difference between the A and D frames used in dative environments. See, however, Newman (2000) for evidence (from grade 2) confirming a morphological perspective on the issue.

[20] This is actually a purely morphological feature. See Aronoff (1994) for justification of this notion.

[21] I assume here a variant of Koenig (1999) which reifies affixal exponents as pure-form types in the morphological structure. This move greatly facilitates the expression of morphophonological and morphotactic regularities among exponents and is mainly motivated by the study of cluster morphology. See Crysmann (2003b) for details.

[22] See Davis (1993) for a conceptionally similar, though technically slightly different proposal.

[23] Of course, this schema must be further refined to select the appropriate subtype of the linker (*-n/-r*), depending on the inherent gender of the noun.

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