On the Categorial Status of Hausa Genitive Prepositions

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1. Hausa genitive prepositions: a mixed category?

Contemporary grammars of Hausa (Newman, 2000; Jaggar, 2001) recognise three major classes within the set of prepositions: a restricted set of basic (true) prepositions, a set of complex prepositions, and a set of genitive prepositions. Among the set of 14 basic prepositions listed in Jaggar (2001), we find, inter alia, *à* 'in, at, on etc.', *dàgà* 'from', *dà* 'with', *zuwà* 'towards', *ta* 'via, by means', *bisà* 'above' and *gà/gàrē* 'by'. In general there is only very limited spatio-temporal differentiation within this set. Complex prepositions form a more extensive set, the main characteristic being their pattern of formation, involving an adverbial followed by the basic preposition *dà* 'with' or *gà*, e.g., *bāya dà* 'behind', *dàbam dà* 'different from'.

The third set of prepositions, i.e., genitive prepositions, are formed by the combination of a noun (or adverb) with the genitive linker *-n/-r*. Compared to basic prepositions, this is a fairly extensive set: Jaggar (2001) lists more than 30 members belonging to this group. Among them, a major subset serves to differentiate spatio-temporal relations, some of which are derived from nouns denoting body parts, e.g., *kâ-n* 'on top of' (< *kâi* 'head'), *bāya-n* 'behind' (< *bāyā* 'back'). Despite the fact that the morphological and semantic relatedness of genitive prepositions and the nouns they derive from is highly transparent, the base of the genitive prepositions is not necessarily identical to the corresponding noun: thus, besides full identity, we find differences with respect to both lexical tone and (final) vowel length:

(1) a. *wàje-n* 'outside' / *wajē* 'side'

    b. *cikì-n* 'inside' / *cikɪ̀* 'stomach'

(2) *bāya* 'behind' / *bāyā* 'back'

Although the etymology is of course highly suggestive, it is nevertheless not fully conclusive as to the categorial status of these items in synchronic grammar.

Morphologically, genitive prepositions are highly similar to nouns: first, inflection with the gender-differentiated genitive linker is a property shared with other nominal categories, including nouns in noun-complement and noun-possessor structures, dynamic nouns, strong verbal nouns, as well as pre-nominal adjectives. Non-nominal categories, such as verbs and true prepositions, by contrast, fail to exhibit this kind of inflectional marking. Second, pronominal complements of genitive prepositions are chosen from the possessive or genitive set, another property shared with true nominal expressions. In order to underline the apparently nominal nature of genitive prepositions, Wolff (1993) uses the term "prepositional noun" to designate this set. In this paper, I shall regard the terms "genitive preposition" and "prepositional noun" as near synonyms, the only difference being that I shall regard the former term as theory-neutral, whereas my use of "prepositional noun" shall reflect the central theoretical perspective adopted in this paper, namely that genitive prepositions are categorically nouns with the semantics of prepositions.

The main theoretical question to be addressed in this paper is how to best capture the mixed category status of genitive prepositions. This task appears to be non-trivial: if we consider them nouns, we will be able to account for their morphosyntactic properties, but category alone will not be able to capture that genitive prepositions perform similar functions to basic and complex prepositions. Furthermore, how can we distinguish genitive prepositions from other nominal elements in the language, such as verbal

nouns, common nouns, or adjectives? Conversely, if we treat them as prepositions, categorically, how can we delimit the set of lexical items undergoing genitive marking in Hausa?

Section 2 will present the main evidence for the mixed category status of these prepositions, showing that morphology, morphosyntax, and extraction favour an analysis in terms of nouns, whereas their functional status as two-place modifiers militates in favour of a prepositional analysis.

In Section 3, I shall first discuss why standard categorial decomposition into [±N, ±V] features fails to provide the necessary generalisations for Hausa, and suggest that decomposition should better be performed along the category/function divide. Building on the proposal by Pollard and Sag (1994) that adjuncts select the heads they combine with via a syntactic feature MOD, I shall suggest that the mixed category status of "genitive prepositions" can be modelled by analysing them as complement-taking nouns which are inherent adjuncts, thereby capturing their nominal behaviour with respect to genitive marking and stranding (internal syntax), as well as their (functional) similarity to prepositions (external syntax). The analysis proposed here is part of a computational HPSG of Hausa (`http://hag.delph-in.net`).

2. Properties of "genitive prepositions"

2.1. Nominal properties

The most fundamental observation regarding the nominal nature of genitive preposition pertains to the fact that the genitive linker that is morphophonologically attached to them reflects the inherent gender of its host, not of the host's complement.[1]

(3) a. gàba   -n ƙōfà̀
           in.front.of.M L.M door.F

           'in front of the door'

    b. mū nề kàma -r jūji   -n dūniyằ
           1P COP like.F L.F rubbish heap.M L.M earth

          'We are like the filth of the earth.'   1 Cor 4,13

    c. kàrē   tàmka -r wannàn
           dog.M like   L.F this

          'a dog like this one'   (Newman, 2000)

While, again, this property is shared with nominal heads inflected with the linker, the remarkable fact about it here is that inherent gender is universally considered to be a canonical property of nouns, but certainly not of prepositions (Corbett, 2006).

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[1]The bound linker is probably best understood as an inflectional affix, rather than a clitic. Apart from the fact that the linker expresses an inherent morphological property of its host, the most compelling piece of evidence is that it does not alternate with the free linker.

i.   ciki -n gidā / *ciki na gidā
     inside L.M house   inside L.M house

     'inside the house'

This failure to alternate with free form *na/ta* is also shared by other categories, e.g. adjectives, verbal nouns, and dynamic nouns.

ii.   sunằ   sàye -n gōrò   / *sunằ sàyē na gōrò
     3P.CNT buy L.M colanut 3P.CNT buy L.M colanut

     'They are buying colanut.'

iii. ƙàzāmi -n ɓērā / *ƙàzāmī na ɓērā
     dirty   L.M rat   dirty   L.M rat

     'dirty rat'

See Crysmann (2011) for additional morphological arguments against a clitic analysis of the bound linker.

The morphosyntactic distribution of the linker displays some further parallelism to clearly nominal categories. Affixation of the linker is obligatory, if the complement of the preposition is realised in situ, but illicit otherwise.

(4) ƙàrƙashi *(-n) tēbùr
     below.M L.M table.M

     'in front of the door'

Thus, if a genitive preposition is used adverbially, i.e., without a syntactic complement, no linker may be attached.

(5) sun   kōmằ bāya (*-n)
     3P.CPL return behind

     'They went behind.'   (Jaggar, 2009)

Likewise, if the complement of the genitive preposition has been extracted, use of the linker is equally impossible.

(6) àdakằ mukàn   sâ kuɗi-n-mù ciki (*-n)
     box   1pl.HAB put money-L-1p inside

     'It's inside a box we usually put our money.'   (Jaggar, 2001)

This morphosyntactic pattern is fully parallel to that of other complement-taking nominal expressions, like dynamic nouns and strong verbal nouns. Again, the linker is mandatory with in situ complements, but illicit in case of intransitive use or extraction:

(7) a. kanằ   màganà *(-r) littāfî.
        2SM.CONT talking.F L.F book.M

        'You are talking about the book.'

     b. kanằ   màganằ
        2SM.CONT talking.F

        'You are talking.'

     c. Ìnā   littāfìn   dà kakằ   màganằ ∅ ?
        where book.DEF REL 2SM.CONT talking

        'Where's the book you're talking about?'   (Jaggar, 2001)

As argued for in Crysmann (2005), inflectional marking for in situ complements is a systematic property of Hausa morphosyntax, independent of concrete morphological exponence. As illustrated below, the syntactic conditions triggering the alternation in Hausa verbs display a structurally parallel pattern, with the presence of in situ objects being morphologically distinguished on the governing verb, inter alia, by final vowel length alternation.[2]

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[2]See Hayes (1990) for a surface-phonological approach, as well as the counter-evidence provided in Crysmann (2005). In essence, surface adjacency has been shown to be neither a necessary nor a sufficient criterion to determine morphosyntactic marking: on the one hand, surface intervention of discourse particles does not block marking for in-situ direct objects, on the other hand, oblique NPs fail to trigger marking, whether adjacent or not, as witnessed by extraction with double object constructions.

i. Bintà tā   ɗarà   Kànde tsāwō
    Binta 3.S.F.COMPL slightly.exceed.C Kande height

    'It's Kande who is slightly taller than Binta.'   (Newman, 2000)

ii. Kànde cề   Bintà ta   ɗarằ   tsāwō
    Kande STAB Binta 3.S.F.COMPL slightly.exceed.A/ height

    'It's Kande who is slightly taller than Binta.'   (Newman, 2000)

(8) a. kā   karàntà littāfì.
        2SM.CPL read   book.M

        'You have read the book.'

     b. kā   karàntā
        2SM.CPL read

        'You read (it).'

     c. Ìnā littāfìn   dà ka   karàntā ∅ ?
        where book.DEF REL 2SM.CPL read

        'Where's the book you've read?'

Pronominal realisation of the complement of genitive prepositions provides additional evidence in favour of the categorial status *noun*: just like nouns and verbal nouns, the pronominal affixes found with genitive prepositions are taken from the possessive or genitive set.

(9) bāya -n -sà
     behind L 3.S.M

     'behind him/it'

This contrasts quite sharply with true prepositions, which take free form pronominal objects from the independent set[3].

(10) a. dàgà ita
        from 3.S.F

        'from her/it'   (Newman, 2000)

     b. dà shī
        with 3.S.M

        'with him/it'

In sum, the morphological properties of genitive prepositions suggest that genitive prepositions are nouns, both because of their similarity to other nominal categories and because of their dissimilarity to true prepositions.

2.2. Prepositional properties

Despite their obvious morphosyntactic differences, genitive prepositions display a good deal of functional similarity with true prepositions: first and foremost, regardless of their morphosyntax, members of both classes have the semantic status of a two-place, typically intersective modifiers. Moreover, there is no systematic difference as to the potential attachment sites: semantic compatibility provided, both genitive and true prepositions can modify individuals or events. Syntactically, phrases headed by either type of preposition adjoin in post-head position, which is in accordance with other adjuncts in Hausa and general SVO order.

In addition to their use as modifiers, members from either set can be used predicatively:

(11) sunà̃   [dàgà Kanò̀] / [ciki -n gàrī]
     3P.CONT from Kano / in   L town

     'They are from Kano / in town.'

Finally, as shown by Jaggar (2009), both true and genitive prepositions may take sentential complements, i.e., they can be used as subordinating conjunctions.

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[3]Among these, there is exactly one exception, namely the preposition *gà/gàrē*, which takes (bound) accusative pronominal affixes.

(12) a. zân   zō   bāya -n sun   tāshì
          1S.FUT come after -L 3P.CPL leave

          'I will come after they have left.'   (Jaggar, 2009)

      b. Dàgà nā   cê̂ 'yằyằ dai?' sai ya   tāsō   minì̀
          from 1S.CPL say how   then then 3S.CPL attack 1SM.IO

          'Just because I said "how's it going" he attacked me.'   (Jaggar, 2009)

Thus, from a syntacto-semantic point of view we are dealing with a more or less homogeneous class, despite the clear morpho-syntactic differences.

2.3. Extraction

The syntax of extraction appears to further underline the mixed category status of genitive prepositions. From among the three patterns found in extraction (pied-piping, resumption, stranding), two are shared with (sub)classes of true prepositions (pied-piping, resumption), whereas stranding is reserved for genitive prepositions.

With respect to extraction, the first subclass to be considered are basic locative prepositions, like *à* 'at' and *dàgà* 'from'. Here, pied-piping is the only option (13a), while both resumptive pronoun strategies (13b) as well as true stranding (13c) are ruled out.

(13) a. à Kanồ akà   hàifē   nì
          at Kano 4.CPL give.birth 1S.DO

          'It was in Kano I was born'   (Jaggar, 2001)

      b. * Kanồ akà   hàifē   nì   à shī
          Kano 4.CPL give.birth 1S.DO at 3S.M

      c. * Kanồ akà   hàifē   nì   à ∅
          Kano 4.CPL give.birth 1S.DO at

Most other true prepositions permit resumption (14b) in addition to pied-piping (14a). However, true stranding with a phonetically empty gap (14c) is still illicit with these prepositions.

(14) a. dà   sàndā sukà   dồkē shì
          with stick 3P.CPL beat 3S.DO

          'It was a stick they beat him with.'   (Jaggar, 2001)

      b. sàndā sukà   dồkē shì   dà   ita
          stick 3P.CPL beat 3S.DO with 3S.F

          'It was a stick they beat him with.'   (Jaggar, 2001)

      c. * sàndā sukà   dồkē shì   dà   ∅
          stick 3P.CPL beat 3S.DO with

          'It was a stick they beat him with.'

Genitive prepositions are the only type of preposition that can undergo all three extraction strategies: pied-piping (15a), like all other prepositions, as well as resumption (15b) and stranding (15c).

(15) a. ciki -n àdakằ mukàn   sâ kuɗi-n-mù
          inside L box   1pl.HAB put money-L-1p

          'It's inside a box we usually put our money.'   (Jaggar, 2001)

      b. àdakằ mukàn   sâ kuɗi-n-mù ciki -n -tà
          box   1pl.HAB put money-L-1p inside L 3S.F

          'It's inside a box we usually put our money.'

c. àdakằ mukàn   sâ kuɗi-n-mù   ciki   ∅
    box   1pl.HAB put money-L-1p inside

'It's inside a box we usually put our money.'   (Jaggar, 2001)

Again, we find that genitive prepositions both share properties with other prepositions, in the sense that they undergo adjunct extraction involving pied-piping, while at the same time the possibility of stranding suggests that they form a separate syntactic class.

Before we move on to the formal analysis of Hausa prepositions, let me briefly take stock of what we have established so far: from a functional point of view, genitive prepositions behave like prepositions, sharing the semantics and external syntax of two-place modifiers, including adjunct extraction. From a categorial point of view, genitive prepositions are nominal, not only in terms of their morphology, but also in terms of their internal syntax.

3. Decomposing Hausa categories

In the previous section we have observed that the class of lexical items undergoing genitive marking in Hausa cuts across several traditional categories, such as nouns, adjectives, strong verbal nouns, and most notably prepositions. An obvious route to explore is to see whether the classical decomposition of basic categories into nominal and verbal features (Chomsky, 1972; Gazdar et al., 1985) might provide the necessary level of generalisation. Upon further scrutiny, however, it becomes apparent that pure underspecification of categorial features fails to delineate the class of genitive-marked categories: Both verbal ([+V]) categories, like adjectives, and non-verbal ([−V]) categories, like nouns and genitive prepositions, may undergo genitive marking. Conversely, both categories also contain lexical items that fail to exhibit genitive marking altogether, e.g., verbs ([+V]) and true prepositions ([−V]). Similarly, the class of non-nominal categories ([−N]), as standardly conceived, contains some members, namely genitive prepositions, which do undergo genitive marking, but otherwise mainly consists of parts-of-speech for which such marking is unavailable, e.g., verbs and true prepositions. The only category that does a fair job approximating the class of genitive-marked items is [+N]: while all members of this category (nouns, adjectives, dynamic nouns, strong verbal nouns) can indeed be inflected with the genitive marker, genitive prepositions happen to be the only lexical class outside this category that nevertheless features genitival inflection.

In principle, there are two possible solutions available here: either, we may conclude that syntactic category has no direct bearing on morphological class membership in Hausa and that we need to postulate a notion of morphological category distinct from syntactic category, or else we need to reassess the assignment of lexical items to basic categories. Given that the first option is both methodologically and empirically undesirable — besides the unnecessary duplication of categorial representations, genitive prepositions are also syntactically distinct from true prepositions —, I shall argue instead that genitive prepositions in Hausa are indeed nouns. Their functional similarity to standard prepositions, however, will be captured in terms of their inherent modifier status. In the remainder of this paper, the notion of genitive prepositions or "prepositional nouns" as a hybrid lexical class will be made precise.

3.1. Outline of the analysis

The analysis I am going to propose is formulated within the framework of Head-driven Phrase Structure Grammar (HPSG; Pollard and Sag, 1994), a unification-based lexicalist theory of grammar. In HPSG, adjuncts select the heads they combine with via a head feature MOD, specifying syntacto-semantic properties of their attachment site. Parts of speech that can function as modifiers specify a non-empty MOD value, whereas the MOD value of non-modifier categories is undefined. In Head-Adjunct structures, the MOD-value of the adjunct is equated with the syntacto-semantic description of the head, thereby enforcing any selectional restrictions.

The current take on prepositional nouns essentially boils down to a decoupling of parts-of-speech, modelled as types of HEAD values (e.g., *noun, verb, prep*), from inherent modifier status, represented by a non-empty MOD specification. While reference to the MOD value will enable us to treat both

true and genitive prepositions as a natural class, the nominal properties of genitive prepositions will be captured by assigning them to the part-of-speech (HEAD value) *noun*.
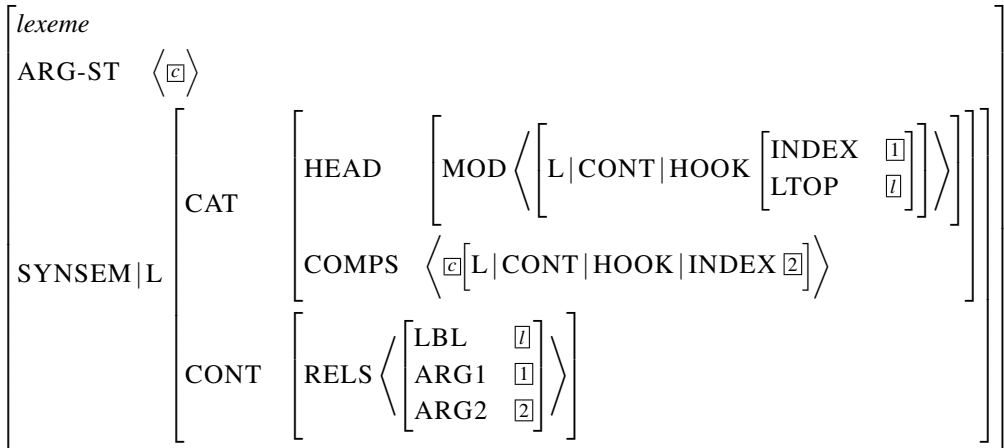
This section will be organised as follows: First, I shall provide a formal treatment of the common properties of functional prepositions, encompassing both true and genitive prepositions: in particular, this will include a specification of inherent modifier semantics, as well as selectional properties towards their syntactic attachment site (external syntax). In a next step, I shall discuss the categorial status of both types of preposition and show how the decomposition into HEAD and MOD values enables us to differentiate between true and genitive prepositions on the one hand, and between prepositional nouns and true nouns on the other. Following a treatment of the morphosyntax of genitive marking that builds crucially on recent work on Hausa direct object marking (Crysmann, 2005, 2011), I shall finally discuss how the categorial decomposition suggested here lends itself quite naturally to an account of the syntax of extraction.

3.2. Functional prepositions as inherent two-place modifiers

In our discussion of true vs. genitive prepositions, we have observed that the functional or syntacto-semantic similarity of these two classes is apparently independent of their differences in morphosyntactic behaviour. Therefore, I shall start with a description of the shared properties of what I shall call "functional prepositions", capturing both semantics and external syntactic properties. In essence, members of either class are two-place intersective modifiers, syntactically attached to the semantically modified head.

Using Minimal Recursion Semantics (Copestake et al., 2005) as our meaning representation language, these shared properties can be captured by the following lexical type from which both true prepositions and prepositional nouns inherit:

(16)   *bin-mod-lex* →

$$
\begin{bmatrix}
\textit{lexeme} \\
\text{ARG-ST} \quad \left\langle \boxed{c} \right\rangle \\
\text{SYNSEM|L} \begin{bmatrix}
\text{CAT} \begin{bmatrix}
\text{HEAD} \begin{bmatrix} \text{MOD} \left\langle \begin{bmatrix} \text{L|CONT|HOOK} \begin{bmatrix} \text{INDEX} & \boxed{1} \\ \text{LTOP} & \boxed{l} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix} \\
\text{COMPS} \quad \left\langle \boxed{c} \left[\text{L|CONT|HOOK|INDEX} \boxed{2} \right] \right\rangle
\end{bmatrix} \\
\text{CONT} \begin{bmatrix} \text{RELS} \left\langle \begin{bmatrix} \text{LBL} & \boxed{l} \\ \text{ARG1} & \boxed{1} \\ \text{ARG2} & \boxed{2} \end{bmatrix} \right\rangle \end{bmatrix}
\end{bmatrix}
\end{bmatrix}
$$

As depicted by the constraint above, binary modifiers establish a two-place semantic relation between the semantic contribution of their internal complement (selected via COMPS) and that of the head they select for (via MOD). Once the binary modifier is combined with its complement, the subcategorisation requirement on COMPS is unified with the properties of the actual complement, resulting in an equation of the complement's index with the ARG2 role of the binary modifier, by virtue of the HPSG Valence Principle (Pollard and Sag, 1994). Likewise, once the phrase headed by the binary modifier is attached to a nominal or verbal projection, the Head-Adjunct Schema will equate the modifier's MOD value with the syntacto-semantic description of the head (its SYNSEM), thereby binding the modifiee's INDEX to the ARG1 role of the modifier.

Based on this standard HPSG treatment of modifiers, I shall propose that true prepositions and prepositional nouns are mainly differentiated in terms of their basic category, captured in terms of HPSG's HEAD value: while true prepositions (*basic-prep-lex*) are assigned the head type *prep*, prepositional nouns (*gen-prep-lex*) are classified as *noun*. Both types of lexical categories, however, inherit from the type *bin-mod-lex*, thereby capturing shared syntacto-semantic-properties.

(17) *basic-prep-lex* → *bin-mod-lex* ∧ $\left[\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\quad \left[\text{HEAD}\quad \textit{prep}\right]\right]$

(18) *gen-prep-lex* → *bin-mod-lex* ∧ $\left[\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\quad \left[\text{HEAD}\quad \textit{noun}\right]\right]$

Nouns and strong verbal nouns which do not function as inherent modifiers, by contrast, are differentiated from prepositional nouns not in terms of basic category, but in terms of their MOD value:

(19) *basic-noun-lex* → $\left[\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\quad \left[\text{HEAD}\quad \left[\begin{array}{l}\textit{noun}\\ \text{MOD}\quad \langle\,\rangle\end{array}\right]\right]\right]$

3.3. The morphosyntax of prepositional nouns

Inflection with the gender-differentiated genitive linker is probably the most salient nominal feature of prepositional nouns. Recall from our previous discussion that its presence and shape are conditioned by three properties: first, the categorial status of the morphological host (*noun*), the inherent gender of the host word, and finally, the presence of an *in situ* direct object complement. As I have argued in previous work (Crysmann, 2005), inflectional marking for local realisation of complements is a systematic property of the language: while morphological exponents may vary, the structural conditions are highly parallel between members of the two major lexical categories, namely verbs and nouns.[4]

Given that, in HPSG, locally realised complements correspond to a valence on the head's COMPS list, we can model the morphological introduction of the linker by means of a lexical rule. As stated below, application of the rule is conditioned on the presence of an element on COMPS marked with structural case, i.e., a direct object valency:

(20) $\left[\begin{array}{ll}\text{PHON} & \boxed{p}\\[4pt] \text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT} & \left[\begin{array}{ll}\text{HEAD} & \left[\begin{array}{l}\textit{noun}\\ \text{AGR}\quad \left[\begin{array}{ll}\text{NUM} & \textit{sg}\\ \text{GEND} & \textit{f}\end{array}\right]\end{array}\right]\\[12pt] \text{COMPS} & \left\langle\left[\text{CASE}\quad \textit{struc}\right]\right\rangle\end{array}\right]\end{array}\right] \mapsto \left[\text{PHON}\quad \boxed{p}\oplus\langle\text{r}\rangle\right]$

Note further that the rule, as given here, generalises across all nominal categories: i.e., whenever a noun subcategorises for a direct object, it gets inflected with the genitive linker. This gives not only the desired results for genitive prepositions, but for other nominal categories as well, such as strong verbal nouns of transitive verbs, or transitive dynamic nouns.

Besides transitive use, where the linker is obligatory, genitive prepositions can also be used adverbially, or intransitively (cf. Jaggar, 2009). If used in this way, no linker may be present.

Again, this behaviour is literally identical to strong verbal nouns and dynamic nouns, as well as structurally parallel to verbs: as argued by Jaggar (2001) and Tuller (1986), Hausa transitives permit free argument drop with non-human direct objects, resulting in specific pronominal interpretation of the unrealised argument. This systematic alternation of Hausa transitives can be modelled straightforwardly by means of an optional lexical rule which takes as its input a transitive lexical entry and returns an entry where the direct object valency has been suppressed.

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[4]In the following discussion I shall focus on the parallelism of prepositional nouns with dynamic nouns and strong verbal nouns. See Crysmann (2011) for a unified treatment of pre-nominal adjectives and possessed nouns.

$$(21)\quad \begin{bmatrix} \text{SYNSEM}\,|\,\text{L} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{COMPS} \left\langle \text{L} \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} noun \\ \text{CASE} & struc \end{bmatrix} \end{bmatrix} \\ \text{CONT} & \begin{bmatrix} \text{RELS} \left\langle \boxed{p} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle \oplus \boxed{c} \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \text{RELS} & \boxed{r} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

$$\mapsto \begin{bmatrix} \text{SYNSEM}\,|\,\text{LOC} \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{COMPS} & \boxed{c} \end{bmatrix} \\ \text{CONT} & \begin{bmatrix} \text{RELS} & \boxed{r} \oplus \left\langle \boxed{p} \begin{bmatrix} \text{PRED} & pron\text{-}rel \\ \text{ARG0} & \begin{bmatrix} \text{SORT} & inanim \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

If we model argument drop as lexical valence reduction, it is clear that the removal of the subcategorisation requirement for a direct object will actually bleed the morphological introduction of the linker, deriving the absence of direct object marking, and more specifically genitive marking with intransitives.

Note further that none of the rules are specific to genitive prepositions: rather their applicability to prepositional nouns follows entirely from their being nouns taking direct object complements, a property shared with other nominal expressions featuring the same morphosyntactic alternations.

3.4. Extraction

Probably the most compelling observation concerning prepositional nouns and true preposition is that both form a natural class as far as extraction of the entire adjunct is concerned, yet differ radically with respect to the extractability of their complements. As we will see shortly, the fact that prepositional nouns pattern with other nominal categories such as strong verbal nouns and dynamic nouns in terms of complement extraction and with prepositional phrases in terms of adjunct extraction will again be related to their hybrid categorial nature, namely that of inherently modifying nouns.[5]

The standard approach to complement extraction in HPSG is lexical (cf. Pollard and Sag, 1994, chap. 9). In essence, rather than postulating a syntactic trace that inserts local information into the non-local SLASH feature, introduction of a SLASH dependency is performed directly on the governing head. One way to model this is by means of the application of a lexical rule[6]: as detailed below, the requirement for a local complement is removed from the COMPS list, and the LOCAL value of this complement is inserted into the non-local feature SLASH instead, to be bound by a filler further up the tree.

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[5]For the purposes of this paper, I shall focus on extraction proper, leaving aside resumptive pronouns. See, however, Crysmann (2012) for an analysis of resumption in Hausa.

[6]See, however, Ginzburg and Sag (2001) for a proposal using argument realisation principles instead of valence-reducing lexical rules.

$$(22) \quad \begin{bmatrix} \text{ARG-ST} & \langle \dots \boxed{c} \dots \rangle \\[4pt] \text{SYNSEM} & \begin{bmatrix} \text{LOC} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & noun \vee verb \\ \text{COMPS} & \boxed{1} \oplus \boxed{c} \begin{bmatrix} \text{LOC} & \boxed{l} \\ \text{NLOC|SLASH} & \{\boxed{l}\} \end{bmatrix} \oplus \boxed{2} \end{bmatrix} \end{bmatrix} \\[4pt] \text{NLOC} & \begin{bmatrix} \text{SLASH} & \boxed{s} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

$$\mapsto \begin{bmatrix} \text{SYNSEM} & \begin{bmatrix} \text{LOC} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{COMPS} & \boxed{1} \oplus \boxed{2} \end{bmatrix} \end{bmatrix} \\[4pt] \text{NLOC} & \begin{bmatrix} \text{SLASH} & \boxed{s} \cup \{\boxed{l}\} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

If we assume now that application of the complement extraction lexical rule is restricted to nouns and verbs in Hausa, we can derive that stranding should be possible with prepositional nouns (being nouns), but unavailable for true prepositions. Furthermore, the valence-reducing effect of rule application predicts the absence of the linker, since the major precondition for genitive marking, a direct object valency on COMPS, has been removed (cf. Crysmann, 2005).

In contrast to complement extraction, adjunct extraction is currently regarded as a syntactic operation within HPSG. As argued at length in Levine (2003), lexical introduction of SLASH values for adjuncts will not be able to provide the right semantics with adjunct extraction applying to coordinated events: in sentences like the one below, lexical adjunct extraction can only account for the (dispreferred) distributive reading, but not for the cumulative reading.

(23) In how many seconds flat did Robin find a chair, sit down and whip off her logging boots? (Levine, 2003)

Syntactic introduction of adjunct extraction, however, has no difficulty deriving either reading, since semantic attachment will be determined directly by syntactic scope.

Following Levine (2003), I shall assume a unary syntactic rule that inserts a non-local SLASH dependency, restricting the filler to modify the extraction site via its MOD value.

$$(24) \quad \begin{bmatrix} \text{SYNSEM} & \begin{bmatrix} \text{LOC} & \boxed{l} \\[4pt] \text{NLOC} & \begin{bmatrix} \text{SLASH} & \boxed{s} \cup \left\{ \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{MOD} & \langle \boxed{m} \rangle \end{bmatrix} \\ \text{SUBJ} & \langle \rangle \\ \text{COMPS} & \langle \rangle \end{bmatrix} \end{bmatrix} \right\} \end{bmatrix} \end{bmatrix} \\[4pt] \text{DTRS} & \left\langle \begin{bmatrix} \text{SYNSEM} & \boxed{m} \begin{bmatrix} \text{LOC} & \boxed{l} \\ \text{NLOC} & \begin{bmatrix} \text{SLASH} & \boxed{s} \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

Since the syntactic adjunct extraction rule is formulated in terms of modifier status alone, it should in principle apply to all kinds of modifiers, independent of the modifier's category. As a result, the general possibility for adjuncts to extract will derive that both true preposition and prepositional nouns may be pied-piped along with their complements.

In sum, once we analyse genitive prepositions as inherently two-place modifiers of category *noun*, their syntactic and morphosyntactic properties are accounted in a rather straightforward way on the basis of independently required morphosyntactic rules and general principles of grammar.

4. Conclusion

In this paper, I have argued that the mixed properties of genitive prepositions in Hausa can be accounted for in terms of categorial decomposition, where basic part-of-speech captures syntactic and morphosyntactic properties shared with nouns, while the syntacto-semantic similarity to true prepositions is established by their status as inherently two-place modifiers. The categorial decomposition suggested here captures quite directly the basic intuition that genitive prepositions, or prepositional nouns, constitute a "transitional category" (Newman, 2000). Finally, we have seen that HPSG's notion of syntactic categories as complex feature structures consisting of intrinsic part-of-speech and combinatorial properties lends itself quite naturally to an analysis of mixed categories.

References

Chomsky, Noam A. 1972. *Studies on Semantics in Generative Grammar*, Chapter Remarks on Nominalization, pages 11–66. The Hague: Mouton.

Copestake, Ann, Flickinger, Dan, Pollard, Carl and Sag, Ivan. 2005. Minimal Recursion Semantics: an introduction. *Research on Language and Computation* 3(4), 281–332.

Corbett, Greville. 2006. *Agreement*. Cambridge: Cambridge UP.

Crysmann, Berthold. 2005. An Inflectional Approach to Hausa Final Vowel Shortening. In Geert Booij and Jaap van Marle (eds.), *Yearbook of Morphology 2004*, pages 73–112, Kluwer.

Crysmann, Berthold. 2011. A unified account of Hausa genitive constructions. In Philippe de Groote, Markus Egg and Laura Kallmeyer (eds.), *Formal Grammar. 14th International Conference, FG 2009, Bordeaux, France, July 25-26, 2009, Revised Selected Papers*, volume 5591 of *Lecture Notes in Computer Science*, Springer.

Crysmann, Berthold. 2012. Resumption and Island-hood in Hausa. In Philippe de Groote and Mark-Jan Nederhof (eds.), *Formal Grammar. 15th and 16th International Conference on Formal Grammar, FG 2010 Copenhagen, Denmark, August 2010, FG 2011 Lubljana, Slovenia, August 2011*, volume 7395 of *Lecture Notes in Computer Science*, Springer.

Gazdar, Gerald, Klein, Ewan, Pullum, Geoffrey K. and Sag, Ivan. 1985. *Generalized Phrase Structure Grammar*. Oxford: Basil Blackwell.

Ginzburg, Jonathan and Sag, Ivan. 2001. *Interrogative Investigations: the Form, Meaning and Use of English Interrogatives*. Stanford: CSLI publications.

Hayes, Bruce. 1990. Precompiled Phrasal Phonology. In Sharon Inkelas and Draga Zec (eds.), *The Phonology-Syntax Connection*, pages 85–108, University of Chicago Press.

Jaggar, Philip. 2001. *Hausa*. Amsterdam: John Benjamins.

Jaggar, Philip. 2009. Why don't we simplify the grammar of Hausa and classify 'after/behind' in 'after class/after he arrives/he is behind' as prepositions? Paper presented at the Fifth Biennial International Colloquium on Chadic Languages, University of Leipzig, June 10–14, 2009.

Levine, Robert D. 2003. Adjunct valents: cumulative scoping adverbial constructions and impossible descriptions. In Jongbok Kim and Stephen Wechsler (eds.), *The Proceedings of the 9th International Conference on Head-Driven Phrase Structure Grammar*, pages 209–232, Stanford: CSLI Publications.

Newman, Paul. 2000. *The Hausa Language. An Encyclopedic Reference Grammar*. New Haven, CT: Yale University Press.

Pollard, Carl and Sag, Ivan. 1994. *Head–Driven Phrase Structure Grammar*. Stanford: CSLI and University of Chicago Press.

Tuller, Laurice A. 1986. *Bijective Relations in Universal Grammar and the Syntax of Hausa*. Ph. D.thesis, UCLA, Ann Arbor.

Wolff, Ekkehard. 1993. *Referenzgrammatik des Hausa*. Münster: LIT.

Selected Proceedings of the 41st Annual Conference on African Linguistics: African Languages in Contact

edited by Bruce Connell and Nicholas Rolle

Cascadilla Proceedings Project   Somerville, MA   2012

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This paper can be cited as:

Crysmann, Berthold. 2012. On the Categorial Status of Hausa Genitive Prepositions. In *Selected Proceedings of the 41st Annual Conference on African Linguistics*, ed. Bruce Connell and Nicholas Rolle, 29-39. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #2734.