

Predication and NP Structure in an Omnipredicative Language: The Case of Khoekhoe

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Proceedings of the 21st International Conference on
Head-Driven Phrase Structure Grammar

University at Buffalo

Stefan Müller (Editor)

2014

CSLI Publications

pages 238–258

<http://csli-publications.stanford.edu/HPSG/2014>

Hahn, Michael. 2014. Predication and NP Structure in an Omnipredicative Language: The Case of Khoekhoe. In Müller, Stefan (Ed.), *Proceedings of the 21st International Conference on Head-Driven Phrase Structure Grammar, University at Buffalo*, 238–258. Stanford, CA: CSLI Publications.



Abstract

We examine noun phrases and predication in Khoekhoe, a Central Khoisan language, arguing that members of all open word classes can function equally and without derivation as predicates, and that predicative use is primary and referential use is derived syntactically by relativization. We then present a formal HPSG analysis, in which members of all open word classes enter the syntax as predicates and in which all argument NPs are derived in a uniform manner as projections of pronominal elements, modified by relative clauses, building on Sag's (1997) analysis of English relative clauses. We will then argue that, additionally, DPs may project directly to clauses, yielding a second predication structure.

1 The Data

Launey (1994, 2002) has proposed the concept of *omnipredicativity*, describing languages where members of all major open word classes can function equally and without derivation as predicates, and in which the predicative use is primary and referential use is derived syntactically by relativization. Omnipredicativity is different from the lack of word classes: in Classical Nahuatl, the language studied by Launey, nouns and verbs are clearly distinguished by their morphological properties, but on the syntactic level, nouns and verbs can both be used predicatively and referentially in the same ways.

In this paper, we examine noun phrases and predication in Khoekhoe, a Khoisan language spoken in Namibia and South Africa. We show that it exhibits features typical of 'omnipredicative' languages and present a formal HPSG analysis, in which members of all open word classes enter the syntax as predicates and in which all argument NPs are derived in a uniform manner as projections of pronominal elements, modified by relative clauses. Despite the radical differences between Khoekhoe and European languages in the relevant areas, our analysis will crucially build on standard components of HPSG analyses. No special rule licensing predicative use of nouns is required, and referential use will be derived based on Sag's (1997) analysis of English relative clauses.

In Khoekhoe, there are three open word classes: verbs, nouns, and adjectives. They are clearly distinguished in morphology by the derivation morphemes applicable to them: only verbs and adjectives allow valency-changing suffixes (passive, reflexive, reciprocal, applicative, pronominal object markers). In the realm of syntax, adjectives and nouns have a fixed order within NPs: adjectives can modify

[†]I want to thank Stefan Müller, Jean-Pierre Koenig, Ray Jackendoff, Rui Chaves, Berthold Crysmann, two anonymous reviewers, and the audience of HPSG 2014 for their helpful and inspiring comments. I am also indebted to Wilfrid Haacke for kindly providing access to two of his studies and for inspiring comments and e-mail discussion. Above all, I am indebted to Gerson Topnaar, who patiently shared his language with me. Of course, I alone am responsible for the opinions, errors, and shortcomings in this paper. In particular, it should be noted that, due to time constraints, not all examples from printed sources appearing here could be checked with G.T.

nouns, but not adjectives, and nouns cannot modify adjectives. Nonetheless, the three classes show striking similarities in their syntactic behavior.

Khoekhoe is an SOV language. The V slot may be occupied by a word from any of the three open word classes: a verb (1a), an adjective (1b), or a noun (1c-d). Both common nouns (1c) and proper nouns (1d) can be used. Even deictic elements (1e-f), numerals (1g), and possessives (1h) can act as predicates. While the choice of the TAM marker depends on the predicate, the syntactic behaviour of the different predicates is entirely parallel:

- | | | | | | | | |
|--------------------------|------|-----|--------|----------------------------------|------|-----|-------|
| (1) a. saa=ts | ge | ra | khii | b. om=s | ge | (a) | kai |
| you=2MS | DECL | TAM | come | house=3FS | DECL | TAM | big |
| 'You (m.) are coming.' | | | | 'The house ¹ is big.' | | | |
| c. saa=ts | ge | (a) | gao-ao | d. saa=ts | ge | (a) | Petru |
| you=2MS | DECL | TAM | king | you=2MS | DECL | TAM | Peter |
| 'You (m.) are a king.' | | | | 'You (m.) are Peter.' | | | |
| e. om=s | ge | a | nee | f. tii=ta | ge | (a) | saa |
| house=3FS | DECL | TAM | this | I=1s | DECL | TAM | you |
| 'The house is this one.' | | | | 'I am you.' | | | |
| g. tara=di | ge | a | !nona | h. om=s | ge | a | tii |
| woman=3FS | DECL | TAM | three | house=3FS | DECL | TAM | mine |
| 'The women are three.' | | | | 'The house is mine.' | | | |

Most verbs use the 'dynamic' TAM marking pattern, while nonverbal predicates show the same 'static' TAM marking pattern as stative verbs like 'know', 'believe', 'be able', 'die', etc:

- | | | | | | | | |
|-------------|------|------------------------|--------|-------------|-------|-----|----|
| (2) a. go | khii | b. go | gao-ao | ii | c. go | ‡an | ii |
| 'came' | | 'was a king/queen' | | 'knew' | | | |
| nî | khii | nî | gao-ao | nî | ‡an | | |
| 'will come' | | 'will be a king/queen' | | 'will know' | | | |

Unlike languages like Russian and Arabic, it is not possible to simply analyze these clauses as copulative structures without overt copula. The crucial point is that the predicative element in (1c-f) is not an NP as it would occur in an argument position. In Khoekhoe, argument NPs generally end with a person-gender-number (PGN) morpheme (=ts, =ta and =s in 1), which is not found when a noun is used as a predicate. Compare the NP *gao-ao=b* in (3a-b) with the predicative noun *gao-ao* in (1c), and the NPs in (3c) with the predicative adjectives and deictics in (1):

- | | | | |
|-----------------------|------|-----|------|
| (3) a. [gao-ao=b] | ge | ra | khii |
| king=3MS | DECL | TAM | come |
| 'The king is coming.' | | | |

¹Khoekhoe NPs are not marked for definiteness and the choice of definiteness in the translations is arbitrary.

- b. tii=ta ge [gao-ao=b] !oa ra mîi
 1S=1S DECL king=3MS to TAM speak
 ‘I am speaking to the king.’
- c. [kai=b]/[||naa=b]/[saa=ts] ge ra |khii
 big=3MS/those=3MS/you=2MS DECL TAM come
 ‘the big one/those one/you are coming’

Predication and NPs structure in Khoekhoe has been studied by Wilfrid Haacke in several of his many publications on Khoekhoe, in particular Haacke (1976, 1977, 1978, 1980). In this line of work, he argued in detail that Khoekhoe NPs should be analyzed as being derived from clauses – by transformations in then common incarnations of derivational syntax, or at least diachronically. For instance, the NP *gao-ao=b* ‘the king’ is derived from the sentence

- (4) ...=b a gao-ao
 ...=3ms TAM king
 ‘he is a king’

in which the subject is realized only by a PGN clitic, which is argued to be related by some synchronic or diachronic ‘transformation’ to the final PGN marker of the argument NP *gao-ao=b* ‘the king’. In argument position, NPs could be interpreted as arising from parentheticals. For instance, (3a) could be interpreted – at least diachronically – as ‘he – he is the king – is coming’, and (3b) as ‘I am speaking to him – he is the king’. In Haacke (1992a, 194), he asks to what extent the analysis has synchronic significance and whether it can ‘be reconciled with the universals of core grammar as currently perceived’.

While we do not work in a framework assuming grammatical universals and therefore cannot presume to give an answer to the second question, we will address the first question and argue that a clausal analysis of Khoekhoe NPs is indeed very appropriate in a synchronic non-transformational grammar of Khoekhoe. More precisely, we will argue that nouns are primarily genuine predicates, just like verbs, and that argument NPs are free relative clauses. This differs somewhat from Haacke’s transformational analysis, but agrees entirely with his general claim that Khoekhoe nouns as appearing in argument positions are not primary, but are derived from clauses.

1.1 Free Relative Clauses

Our point of departure is the observation that argument NPs formally resemble free relative clauses. Khoekhoe free relative clauses consist of a clause containing a gap or resumptive pronoun, followed by a PGN marker indicating the index features of the referent of the free relative clause. The filler can be in any depth, subject to island effects when there is no resumptive. Simple examples for subject and complement relativization are provided in (5).

- (5) a. [|khii ra]=b
 come TAM=3MS
 ‘the one (m.) who is coming’
- b. [mûû=ta ra]=b
 see=1S TAM=3MS
 ‘the one (m.) I am seeing’

Hagman (1977) notes the similarity to argument NPs with noun head, but claims that the crucial difference is that relative clauses require TAM marking:

- (6) a. gao-ao a=b b. kai a=n c. ||naa a=n d. saa a=ts
 king TAM=3MS big TAM=3P those TAM=3P you TAM=2MS
 ‘the king’ ‘the big ones’ ‘those ones’ ‘you’

However, as nominal predicates can be used with a zero TAM marker (1), free relative clauses of the shape of a lexical argument NP, like *gao-ao=b* ‘one who is a king’, would be expected to exist. This suggests that argument NPs with noun heads might in fact be identical to these expected relative clauses lacking a TAM marker. We will in the following argue that this is indeed the case.

NPs looking like relative clauses without a TAM marker do not seem to show unexpected restrictions in their distribution. They can be marked for negation in a way completely parallel to predicates and relative clauses with TAM marker:

- (7) a. ||îî=b ge (a) Petru tama b. Petru tama (a)=b
 3=3MS DECL TAM Peter NEG Peter NEG TAM=3MS
 ‘He is not Peter.’ ‘one who is not Peter’
- c. ||îî=b ge ‡gae tama d. ‡gae tama=b
 3=3MS DECL smoke NEG smoke NEG=3MS
 ‘He does not smoke.’ ‘one who does not smoke’

Word Order Alternation Nonverbal predicates are also subject to the same word order alternations as verbal predicates. In particular, both may be fronted to the position immediately in front of the subject, which then can only be expressed by an enclitic PGN marker:

- (8) a. |khii=ts ge ra
 come=2MS DECL TAM
 ‘You are coming.’
- b. gao-ao=ta ge (a) c. gao-ao=b ge (a)
 king=2MS DECL TAM king=3MS DECL TAM
 ‘I am a king.’ ‘He is a king.’

Since the TAM marker *a* and to some extent also the declarative clause type marker *ge* are optional in clauses like (8b-c), this has the consequence that expressions that look like noun phrases, such as *gao-ao=b* in (8c), may constitute clauses – which is one of Haacke’s main arguments for his analysis (Haacke, 1980). This is reminiscent of the situation in Nahuatl, where a noun phrase may constitute an utterance, which Launey considers typical of ‘omnipredicative’ languages.

Nominalization Nonverbal predicates also behave like verbal predicates with respect to nominalization. Any clause can be nominalized by adding a 3FS PGN marker:

- (9) a. ||î=s go mû [khii=b go]=s=a
 3=3FS TAM see come=3MS TAM=3FS=OBL
 ‘she saw that he came’
 b. ||î=s go mû [ui=b a]=s=a
 3=3FS TAM see stone=3MS TAM=3FS=OBL
 ‘she saw that it was a stone’

1.2 Complex Nominal Predicates

NPs can be modified by elements preceding the noun, such as adjectives, relative clauses (that is, clauses containing a coreferent gap or a resumptive), numerals, deictics, and possessives, which all precede the noun:

- (10) a. khoexa khoe=s ge go |khii
 friendly person=3FS DECL TAM come
 ‘The friendly woman came.’
 b. [[‡an tama=ta hâ] khoe=s] ge go |khii
 know NEG=1S TAM person=3FS DECL TAM come
 ‘The woman that I don’t know came.’

The parallelism between NPs and free relative clauses extends to such modified NPs, since the part of the NP preceding the PGN marker may occupy the V slot:

- (11) a. Petru=b ge a [khoexa khoe]
 Peter=3MS DECL TAM friendly person
 ‘Peter is a friendly person.’
 b. Petru=b ge a [‡an tama=ta hâ] khoe
 Peter=3MS DECL TAM know NEG=1S TAM person
 ‘Peter is a person that I don’t know.’

We claim that these elements are complex predicates. It is impossible for the modifier to be separated from the noun:

- (12) a. * Petru=b ge khoexa a khoe
 Peter=3MS DECL friendly TAM person
 ‘Peter is a friendly person.’
 b. * Petru=b ge [‡an tama=ta hâ] a khoe
 Peter=3MS DECL know NEG=1S TAM TAM person
 ‘Peter is a person that I don’t know.’

In Khoekhoe, TAM markers like *a* can generally be placed anywhere between the subject and the verbal complex, but not within the verbal complex. Thus, (12) suggests that noun and modifier form a constituent. They can be embedded under at least one control verb, namely *kai* ‘to become’ (13), which supports the claim that they are predicates. Again, the modifier cannot be separated from the noun.

- (13) a. tsî=b ge †kham=ma ge [†kham †khoa] kai
 and=3MS DECL young=3MS+OBL TAM young elephant become
 ‘and the young one became a young elephant’ (Schaar, 1917, 83)
- b. †î=s ge go [gao=b di |hoo] kai
 3=3FS DECL TAM king=3MS POSS friend become
 ‘she became a friend of the king’

1.3 Conclusion

We conclude with the hypothesis that Khoekhoe argument NPs are syntactically indistinguishable from relative or nominalized clauses. As nouns by themselves can only be used predicatively, this suggests that nouns are essentially predicates and are not referential. The only lexical elements that can function referentially but not as predicates are the PGN markers themselves, which are also used as enclitic subject pronouns (8). Almost any more complex NP can be analyzed as consisting of a clause or a predicate and a PGN marker. As this is exactly the structure of relative clauses and nominalized clauses in Khoekhoe, we claim that all NPs – except for the bare PGN markers – are relative clauses or nominalized clauses – as argued for Classical Nahuatl by Launey (Launey, 2002, 117). As Khoekhoe nouns are essentially predicates and phrases only become referential by the addition of PGN markers, we assume that the PGN marker always is the head, which is compatible with the general head-final word-order of Khoekhoe. We will henceforth refer to Khoekhoe argument ‘NPs’ as DPs.

Khoekhoe does not appear to have type $\langle 1, 1 \rangle$ generalized quantifiers and no determiners representing generalized quantifiers at all, similar to what has been argued, among others, by Jelinek (1995) for Straits Salish and Koenig & Michelson (2012) for Oneida Iroquian.

There are two exceptions to the claim that all Khoekhoe DPs consist of a predicate or clause plus a PGN marker. First, two or more coreferent DPs with identical PGN marking can be serialized, yielding a single DP. Second, DPs may have a possessive marker consisting of *â* and the PGN marker adequate for the possessor, which follow the PGN marker of the DP. Both cases can be accounted for easily by adding two phrasal types, the first one recursively licensing DPs consisting of two coreferent NPs, and the second one licensing DPs consisting of an DP and a possessive marker.

2 Analysis

In this section, we will make the ideas from the previous section precise in the context of a formal HPSG analysis of predicates, NPs, and DPs in Khoekhoe. Our point of departure will be the analysis of Khoekhoe clause structure developed in Hahn (2013). There, it was argued that Khoekhoe clauses can be analyzed assuming a relatively uniform right-branching constituent structure illustrated by the bracketing in (14). Word order variation is derived to a large extent by allowing constituents to be discontinuous. While the sequence of multimoraic dependents – which includes DPs, PPs, and adverbs – is determined entirely by their syntactic positions, monomoraic elements – that is, subject PGN markers, clause type markers, and most TAM markers – may appear within the VP, making it a discontinuous constituent. Similarly, the head may be fronted to the position in front of a subject realized by a PGN marker only, accounting for (8). In this paper, we will not need to consider linearization or the syntax of TAM markers, clause type markers and the subject, as they are essentially covered by the linearization component developed previously.

- (14) [_S tara=s [_{TP} go [_{VP} ao=ba [‡khani=sa [maa]]]]]
 woman=3FS TAM man=3MS+OBL book=3FS+OBL give
 ‘the woman gave the man a book’

2.1 Lexical Predicates

We assume that not only verbs, but also nouns, adjectives, and some other words including deictics enter the syntax as predicates, with a non-empty SUBJ list, and that any phrase with an empty COMPS list and a nonempty SUBJ list may combine with a subject DP in a *head-subj-phrase* to form a clause. For instance, we assume the following entry for the noun *khoe* ‘person’:

- (15)
$$\left[\begin{array}{l} \text{CAT} \\ \text{CONT} \end{array} \left[\begin{array}{l} \text{SUBJ} \quad \langle \text{DP}_i \rangle \\ \text{COMPS} \quad \langle \rangle \\ \text{HEAD} \quad \textit{noun} \\ \text{INCONT} \quad \textit{person}' \\ \text{PARTS} \quad \left\langle \begin{array}{c} \dots s \dots \\ \dots \\ \text{person}(s, x_i) \\ \dots \end{array} \right\rangle, \text{person}(s, x_i), s \right\rangle \\ \text{INDEX} \quad s \end{array} \right] \right]$$

where DP is an abbreviation for a saturated structure with HEAD *pgn-marker*. The entries for verbs, deictics, etc. are analogous.

The semantic contribution is formalized in Discourse Representation Theory (DRT, Kamp & Reyle, 1993), which is embedded in HPSG using the constraint-based framework of Lexical Resource Semantics (LRS, Richter & Sailer, 2003).² INCONT is the core semantic contribution, while PARTS contains all subterms of the overall semantics that are contributed by the constituent. There is also an EXCONT attribute containing the semantic contribution of the maximal projection. The PARTS list of a phrase is the concatenation of the PARTS lists of the daughters. The LRS *Semantics Principle* (Richter & Sailer, 2003) says, inter alia, that, in an utterance, the PARTS list contains exactly the subexpressions of the EXCONT value. In the entry above, the first element of the PARTS list is a DRT box, which binds the event variable. Its content is not fully specified in the lexical entry – formally, the description says that its variables contain s and its content contains the entry $person(s, x_i)$. Other elements of the box can be contributed by other words in a sentence, and the Semantics Principle ensures that only elements that are contributed by some word can appear in the box.

In the context of our simple fragment, it does not seem to be necessary to use this particular approach to semantics, but the DRT representations showcase the essentials of the resulting expressions, and LRS offers the advantage that at the same time it allows semantic underspecification in the grammar and the feature structures yet contain the resolved semantic expressions as in the semantic framework of Pollard & Sag (1994), rather than some underspecified representations whose resolution is thought to take place outside of the linguistic representations, as in MRS (Copestake et al., 2005). A similar approach integrating DRT-style analyses in HPSG using LRS is pursued by Michelson & Koenig (2014).

The structure is similar to those resulting from a lexical rule licensing predicative nouns in English assumed, for instance, by Ginzburg & Sag (2001), but nouns do not have corresponding non-predicative lexical entries in Khoekhoe. As modifiers can always access the index of the referent via the noun’s SUBJ list, as there only are predicative nouns in Khoekhoe, our analysis does not suffer from the semantic problems with a lexical rule analysis in English noted by (Gerbl, 2009, 241, Müller, 2009).

We assume that Khoekhoe nouns and adjectives always come with event variables. This is in line with much work on the semantics of nonverbal predicates (e.g., Roy, 2013). We leave open whether it is of the same type as Davidsonian event variables, or of a different one, like Maienborn’s (2005, 2007) *Kimian states*.

Any predicate can combine with its subject in a *subj-head-phrase*, forming a clause. Assuming the our previous analysis of clause type and TAM markers and

²LRS was originally defined for Ty2, but the framework is more generally applicable to other kinds of logical languages that are defined inductively in the usual fashion. A DRS is represented by a feature structure with two list-valued attributes. The subexpression relation is defined straightforwardly. We assume that, within a feature structure representing a logical expression, two identical complex subterms occurring in different positions must not be token-identical, and that no variable can be bound by more than one box and that, in an utterance, a free variable cannot also occur bound. This is intended to prevent terms from occurring within several boxes.

of fronting developed, this licenses the basic structures in (1) and (8).

2.2 Relative Clauses

Modifying relative clauses In the analysis of English relative clauses by Sag (1997), relative clauses are treated as clauses that modify a noun. In Khoekhoe, modifying relative clauses are clauses that modify a noun and form with it a complex nominal predicate:

$$(16) \left[\begin{array}{l} \textit{mod-rel-cl} \\ \text{SLASH} \quad \langle \boxed{\text{I}} \textit{rel-pro}_i, \dots \rangle \\ \text{TO-BIND} \quad \langle \boxed{\text{I}} \rangle \\ \text{MOD} \quad \left[\begin{array}{l} \text{HEAD} \quad \textit{noun} \\ \text{SUBJ} \quad \langle \text{DP}_i \rangle \\ \text{LEX} \quad + \end{array} \right] \end{array} \right]$$

LEX enforces predicate complex formation, see Section A. For nonlocal feature percolation, we assume an adaptation of the mechanism of Pollard & Sag (1994) with the modification that a mother node’s SLASH value is the concatenation of those of the daughters minus those elements contained in the TO-BIND value of some daughter (not just the head daughter). Subjects are extracted by a unary construction or traces rather than lexically (Bouma et al., 2001) to allow extraction of subjects of complex nominal predicates. This analysis is not the only possible choice, but it makes our analysis of relative clauses simple and uniform and is consistent with the data that we are aware of. However, further research on Khoekhoe unbounded dependencies is needed to assess to what extent arguments for more recent analyses of unbounded dependency constructions apply to Khoekhoe.

Example Analysis: Complex Nominal Predicate We obtain the analysis in Figure 1 for the predicate $\neq an \textit{tama=ta h\hat{a}h\hat{a} khoe}$ ‘a person that I do not know’. We assume that, in a relative clause, the EXCONT of the relative clause must consist entirely of terms on its PARTS list, so in this case the EXCONT value is fully determined. Assuming that the PARTS list of the DP $\textit{Petru=b}$ ‘Peter’ has the elements

$$(17) \left\langle \begin{array}{c} \dots x_i \dots t \dots \\ \dots \\ \textit{peter}(t, x_i) \\ \dots \end{array} \right\rangle, \textit{peter}(t, x_i), t, x_i \rangle$$

there is – up to ordering of variables and predicates – a single resolution for the semantics of the clause (11b) ‘*Peter is a person that I don’t know*’, namely:

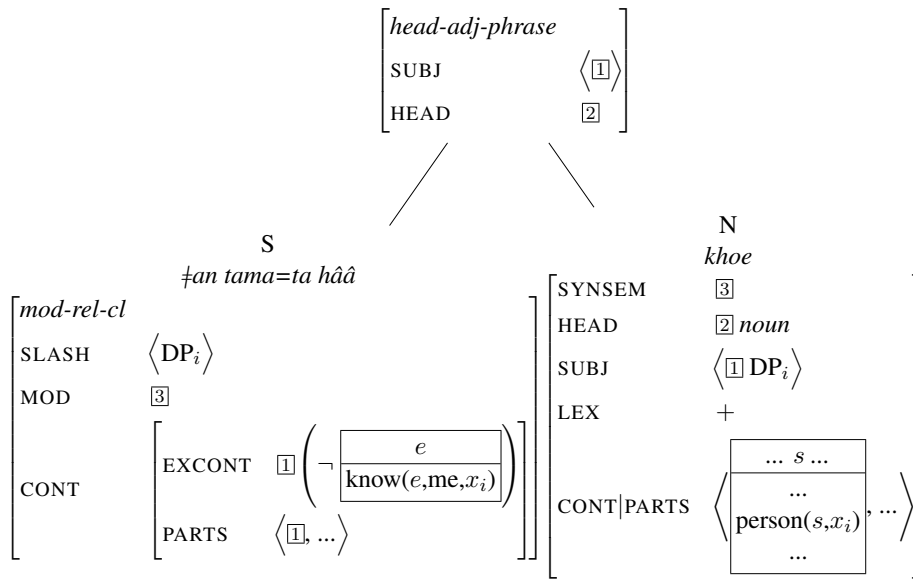
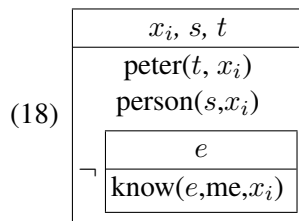
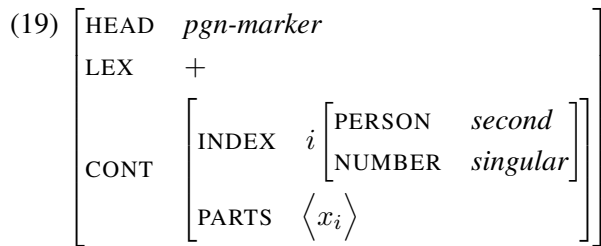


Figure 1: Analysis for the predicate in (11b)



DP formation We analyze the PGN marker as a pronoun. For the second-person PGN marker =*ts* as in (1a), we assume the following entry:



Independent relative clauses modify a PGN marker and form with it a DP:

$$(20) \left[\begin{array}{l} indep-rel-cl \\ SLASH \quad \langle \boxed{1} \ rel-pro_i, \dots \rangle \\ TO-BIND \quad \langle \boxed{1} \rangle \\ MOD \quad \left[\begin{array}{l} HEAD \quad pgn-marker \\ INDEX \quad i \\ LEX \quad + \end{array} \right] \end{array} \right]$$

Thus, DPs are constructed from clauses or predicates by adjunction to a PGN marker via the ordinary *head-adjunct-phrase* type. Spurious ambiguities resulting from recursive application are prevented by the LEX feature. As an alternative, one might stipulate that PGN markers may select as their complement a relative clause, which however would be incompatible with (29.2). A similar phrasal type can be defined for nominalized clauses as in (9), which identify a variable representing their own DRS with the index of the modified PGN marker (cf. Asher, 1993).

Example Analysis: DP Figure 2 shows the analysis of the DP *khoe=s* ‘a woman’. A unary projection removes the subject of the noun *khoe* from its SUBJ list and puts it on the SLASH list. We assume that subjects are extracted not lexically, but by a unary projection, because the subject still needs to be available on SUBJ when a noun combines with a modifier to form a complex nominal predicate. The projection applies to a LEX + predicate and forms a LEX – phrase, which can after the saturation of its COMPS requirements become a subject relative clause. In the example, there are no such requirements and the *subj-slash-intro* phrase is also an instance of *indep-rel-clause*, which binds off the nonlocal dependency and modifies a PGN marker, identifying its index with the index of the unrealized subject. In this simple example, the analysis may appear overly complicated, but the point is that DPs of this type are only special cases of a far more general pattern and our analysis captures this observation, generalizing immediately to more complex DPs.

As there are PGN markers for all persons, the analysis correctly predicts the availability of non-first-person DPs, which Launey considers typical of the ‘omnipredicative’ type. An example is *sa ||nao=ta* ‘I, your uncle’ in (21):

- (21) [saa ||nao=ta]=s ta †ûû?
 your uncle=1S=2FS TAM eat
 ‘Are you (trying to) eat me, your uncle?’ (Schaar, 1917, 83)

As adjunction is in principle optional, PGN markers may also form complete DPs by themselves, but independently required constraints on the LEX feature enforce that this is only possible in the subject position in sentences like those in (8), as shown in Hahn (2013).

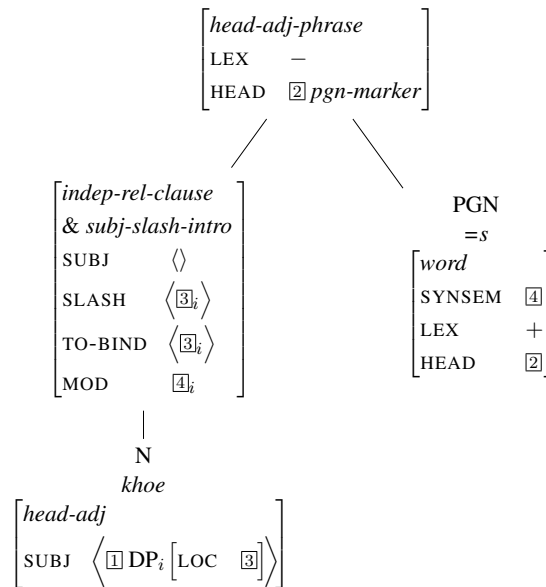


Figure 2: Analysis for the DP *khoe=s* ‘a woman’

Other Modifiers Most NP modifiers are relative clauses or predicates by themselves, but some are not. This clearly includes unmarked possessives, which we assume are licensed by a construction combining a DP with an NP, phrasally introducing the possessive semantics. It also presumably includes adjectival modifiers, which need not be intersective and for which we assume special lexical entries derived together with the predicative versions from underlying lexemes. One way of handling their semantics resulting in Montague-style representations (Montague, 1970) could use a Curried version of DRT, where DRT terms are typed as in Montague’s IL, and then underspecify which term is applied to the variable of the subject, allowing terms like $(alleged(murderer))(s, x)$ to appear in a DRT box.

3 A Second Predication Structure

We have seen above that word order alternations give rise to clauses that look like DPs, but which can be analyzed as word order alternations of ordinary predicative structures. However, this analysis cannot be maintained for all such structures. Consider

- (22) a. |khii go=ts ge b. |khii go=tsa? c. * |khii=tsa go?
 come TAM=2MS DECL come TAM=2MS+OBL
 ‘You came.’ ‘Did you come?’

- (23) a. kai a=ts ge b. kai a=tsa? c. * kai=tsa a?
 big TAM=2MS DECL big TAM=2MS+OBL
 ‘You are big.’ ‘Are you big?’
- (24) a. ||â-tani-ao=b kai=b ge
 warrior=3MS old=3MS DECL
 ‘he is an old warrior’ (adapted from Krönlein, 1889, 21)
- b. ama !gâi-ba=te †uu=b â=ts ge
 really good-APPL=1SG character=3MS POSS=2S DECL
 ‘your character is really pleasing to me’ (Krönlein, 1889, 320)

Haacke (1980) argues that these structures are to be analyzed the same way as (8). While this may be possible in his transformational analysis, this causes difficulties in our analysis, and, we believe, more generally in surface-oriented syntactic approaches. (22a), where the elements preceding *ge* together look like a free relative clause, is not licensed as a word order variant of (8a), as the TAM marker would be expected to follow the clause type marker in fronting. This may simply be a defect of our analysis in Hahn (2013), but there are more problems. If such structures are turned into interrogatives, the PGN marker receives the oblique marker *-a*, which is incompatible with the presence of a TAM marker following the PGN marker, as shown in (22c, 23c). Haacke derives the oblique marker from the TAM marker *a*, but it is not obvious how then the presence of two TAM markers in (22b, 23a) should be explained within our analysis. More strikingly, in (24a), there seems to be an element resembling a composite DP consisting of two DPs before the clause type marker. It cannot be analyzed directly as a word order variant as in (8), as the elements preceding the second PGN marker cannot form a predicate. Finally, in (24b), the element preceding *ge* clearly looks like a DP with a possessive marker, i.e., the final PGN marker is not the subject of the predicate, unlike the structures in (8).

Rather than stipulating special rules relating these patterns to structures like (8), it seems much more economical to describe them as a second structure of predication, in which an element that syntactically looks like a DP occupies the clause-initial position, followed by the clause-type marker. Indeed, it appears that any DP, preferably followed by a clause type marker when declarative, can be used in this structure – basic DPs consisting of a predicate or clause plus a PGN marker, multiple DPs, and DPs with possessive marker. Its analysis is very simple: a DP projects to a clause in a non-headed structure (25). We assume that the semantics of the clause is essentially the semantics of the DP. As the interpretation of a Khoekhoe DP is not a generalized quantifier, but simply a DRS, it is of the right semantic type. Only the index has to be changed – we assume that the index of the clause is an object denoting the DRS of the DP:³

³We assume that INCONT is inherited, but the INCONT value of a *dp-predicate-clause* and its projections does not play a role in our current grammar fragment and we do not know whether it is needed at all.

$$(25) \left[\begin{array}{l} dp\text{-predicate-clause} \\ \text{CAT} \left[\begin{array}{ll} \text{SUBJ} & \langle \rangle \\ \text{COMPS} & \langle \rangle \\ \text{HEAD} & dp\text{-predicate} \end{array} \right] \\ \text{CONT} \left[\begin{array}{ll} \text{INDEX} & z \\ \text{EXCONT} & \boxed{1} \end{array} \right] \\ \text{DTRS} \left\langle \text{DP} \left[\text{CONT} \left[\text{EXCONT} \boxed{1} \right] \right] \right\rangle \end{array} \right] \wedge z \approx \boxed{1}$$

where $z \approx \boxed{1}$ means that z represents the DRS $\boxed{1}$ (Asher, 1993, Maienborn, 2005). Constraining the FRONTED value from Hahn (2013) to be +, the linearization after CLLD-ed DPs and before the clause type marker is obtained. The appearance of *-a* in questions is stipulated by a constraint referring to initial, LEX –, DP daughters of *dp-predicate-clause* and *subj-head-phrase*, as it also occurs in DP subjects in interrogatives.⁴

As argued in detail by Haacke (1980), it is the interaction of this construction with an independently observed phenomenon adjoining an oblique DP to a clause that gives rise to the structures containing two juxtaposed DPs which have traditionally been regarded as copulative structures (Hagman, 1977, 58):⁵

- (26) saa=ts ge †gae-†gui-ao=tsa
 you=2S DECL leader=2S+OBL
 ‘You are the leader.’ (Hagman, 1977, 59)

Applying the ‘finalization’ phenomenon described by Hagman (1977, 113) to arguments and adjuncts of the matrix predicate in the DP, this structure also yields the second ‘initialization’ pattern discussed by Hagman (1977, 111).⁶ We should note that, even though we believe Haacke’s analysis to be difficult to maintain on a

⁴CLLD-ed subjects show the same pattern as DP subjects, so this might also be stated for constructions realizing CLLD-ed DPs. We leave open how case marking on CLLD-ed DPs is analyzed.

⁵Haacke interprets the second DP as a *deposed subject* in the sense of Haacke (1978), which would be inconsistent with our analysis developed here and in Hahn (2013), as the PGN marker appearing on the first DP is not a subject under our analysis and empty subjects in relativization apparently cannot at the same time give rise to a ‘deposed subject’. However, it would in any case be expected that the second DP can also be analyzed as a ‘dislocated NP’ in the sense of Haacke (1992b), which can be described as a DP adjoined to a clause that is coreferent with some DP occurring within the clause. If both the deposed subject analysis and the dislocated NP analysis were available, a spurious ambiguity would arise. Thus, it seems that the relevant mechanism is the adjunction of a DP.

The fact that the assertive marker *kom...o* may wrap around the second DP is not a problem, as it generally may wrap around ‘dislocated NPs’. Since =*o* is optional and can appear on several items, we assume that =*o* may simply attach to any projection marked by the clause type marker *kom*.

⁶In Hahn (2013), it was argued that ‘finalization’ should be analyzed as extraposition. The idea that elements can be extraposed from within a relative clause may seem dubious, but at least PP modifiers presumably can also be extraposed from DPs in other contexts, cf.

synchronic level, the pattern may certainly be derived *diachronically* from ordinary predication the way described by him.

4 Discussion and crosslinguistic aspects

Crosslinguistic Aspects TAM marking on nouns has received attention in the linguistic literature, cf. the crosslinguistic survey by Nordlinger & Sadler (2004). It has been argued that, at least in some languages where it occurs, it is different from tense marked on verbs or does not mark tense at all (e.g., Tonhauser, 2008). To what extent the semantics of TAM markers for nouns and verbs differ in Khoekhoe and what this means for the analysis, will have to be left to future research. The fact that different predicates have different paradigms of TAM markers might suggest that there is also a semantic difference, but our analysis does not seem to make significant predictions in this regard. It does, though, make the prediction that the temporal semantics of argument DPs matches the temporal semantics of NP predicates. Further research is needed on this issue. Related to this is the observation that, in our analysis, there is no shared event variable for complex nominal predicates with relative clause modifiers, as illustrated by (18).

Haacke's interpretation of DPs as parentheticals is reminiscent of the analysis of DPs in certain omnipredicative languages, where they do not occur in argument positions, but are adjoined to the clause (e.g., Jelinek & Demers, 1994). The situation is clearly less radical in Khoekhoe, where verbs, adjectives and postpositions have obligatory complement positions, which have to be filled *either* by a pronominal clitic or by a DP.

Adverbs and PPs cannot be used by themselves as predicates in Khoekhoe, but require a copula-like verb, which cannot be used with other predicates. This matches a remark by Launey (1994), who observes the same phenomenon in Classical Nahuatl and considers it to be typical for the omnipredicative type, which contrasts with languages like Arabic, that have clauses without overt copula, but are not omnipredicative.

Referential Indices for Nouns? We claimed that nouns are inherently predicative and do not come with an individual variable. A less radical alternative might treat nouns as referential and make NPs predicative on the phrasal level, using the unary phrasal construction proposed by Müller (2009). It might make categorial differentiation between nouns, verbs, and adjectives redundant outside of morphology, as NPs could now be distinguished from verbs and adjectives by having an individual rather than an event as their index. It might also allow a unification of

-
- (i) [tari='i] nî ||khuu [saa=ge xa] xam='e kha?
 who=3MS TAM attack we=1P of lion=3MS+OBL QUE
 'Who of us will attack the lion?' (Krönlein, 1889, 224)

modifying and free relative clauses as relative clauses modifying something coindexed with the SLASH element. Under such an analysis, Khoekhoe DPs would be obtained by making a referential element predicative and then referential again, which seems less economic than our treatment. Making it possible for referential NPs to directly combine with a PGN marker does not solve the problem, as there would then be expected to be a homophonous relative clause which would have to be ruled out artificially to avoid a spurious ambiguity. However, the presence of an individual index in a predicative NP seems to be suggested by the fact that there are examples where a predicative NPs seems to be taken up by a DP adjoined to the clause (Haacke, 1992b, 153):

- (27) nee=s ge [‡guuro !naa] ii xui-ao [||î=b ta ||gûû=n ai
 this=3FS TAM first time TAM because 3=3MS TAM parent=3P at
 !gammeba ‡gan]=sa
 marry ask=3FS+OBL
 ‘because this was the first time he requested consent for marriage from the
 parents’ ([Uriseb, 1993, 1])

However, the DP is also coreferent with the subject and it is not clear that the sentence should not be understood analogous to ‘This was the first time’, with the interpretation of ‘first’ reconstructed through discourse factors or semantic underspecification. We therefore see no compelling reasons to treat Khoekhoe nouns as referential and consider it more economical to treat them as primarily predicative.

A related idea is that the event variable for nominal predicates might come not from the noun, but from the TAM marker. However, as the same TAM markers are used for nouns and for stative verbs, and as present TAM markers are optional with nouns, this does not seem to be an attractive idea in the absence of supporting evidence.

5 Conclusion

Building on work by Haacke (1976, 1977, 1978, 1980), we have argued that Khoekhoe is an ‘omnipredicative’ language in which members of all open word classes function primarily and without derivation as predicates and in which argument DPs are derived in a uniform manner as projections of pronominal elements, modified by relative clauses. We have shown how the basic syntax and semantics of predication and NP structure in Khoekhoe can be described building on standard components of HPSG analyses. We then examined a second predication structure, which seems to be diachronically related to ordinary nominal predication, but which we showed to be a structure of its own, in which a DP directly projects to a clause.

A The LEX feature

Predicate complex formation is enforced by the LEX feature, following Müller (2002). In Hahn (2013), where it is used for complex verbal predicates, projections of the head are LEX + in the complex, outside –:

- (28) saa=ts ge [[i=ba go [[mû+ kai+] +=si+] +] –
you=2MS DECL 3=3MS+OBL TAM see make=3FS
'you made him see her'

The LEX value is used to determine the behaviour in linearization: Using the terminology of Donohue & Sag (1999), LEX + constructions and projections of most non-verbal elements are 'compacting', while LEX – projections of verbs are 'liberating', which means that LEX + constituents are always continuous, while higher projections of verbs can be discontinuous. The constraints on LEX are very simple: phrases are LEX + if and only if all daughters are LEX +, and it is assumed that PGN markers are LEX +, while the mechanism building DPs generates LEX – phrases. While this works well for the verbal complexes considered in the previous paper, this leads to trouble with complex nominal predicates, as they can contain complex elements like DPs and clauses, and, under our analysis, not all DPs would be constrained to be LEX –. We therefore need a different analysis if we want to use the same LEX feature for enforcing the formation of verbal and nonverbal complex predicates. The problems are solved by two changes in the analysis: (1) the grammatical constraint linking the LEX values of phrases and daughters is restricted to complement-head-phrases, (2) the complex itself is LEX – and only its strict subconstituents are LEX +.

The first change has the effect that the constraints do not affect NP modifiers any more. The second change has the effect that now adjuncts can decide whether they are realized within the complex or not, which allows us to model the fact that complex nominal predicates can contain complex adjuncts, while otherwise complex adjuncts are to be realized outside of the verbal complex, and also the fact that only some adjuncts are realized inside complex nominal predicates, while others cannot.

We have the following principles, replacing those of Hahn (2013):

- (29) 1. Phrases are 'compacting' if and only if their head-daughter is LEX +.
This predicts without the further stipulations needed in the previous analysis that DPs and PPs are compacting, even though they are LEX –.
2. In a complement-head-phrase, the LEX values of the head daughter and the complement daughter are identical.
This predicts that the complements realized within the predicate complex are exactly the LEX + complements, which agrees with the previous analysis.
3. If a headed phrase is LEX +, its head daughter must be LEX +.

4. Structures whose head is (the projection of) a non-predicate element (i.e., none of *verb*, *adjective*, *noun*, for which we can introduce a common supertype) are LEX –.

This stipulation is assumed in Hahn (2013) for DPs and PPs.

Unlike the previous analysis, these principles imply no correlation between the LEX values of non-head daughters other than complements and the LEX value of the head daughter. For adjuncts, such correlations can be enforced by the MOD value. A modifier modifying the projection of a predicate has MOD|LEX + if and only if it is realized within a predicate complex.

The analysis makes the prediction that predicates cannot take LEX – complements in their predicative complex. It seems that only nouns can have LEX + dependents in their complex. There are some non-heads in noun phrases that may qualify as complements. These mainly are clauses attaching to words like *!khai* ‘fact’. It seems, however, more reasonable to analyze these as adjunct clauses that differ from modifying relative clauses (16) in that they identify the index of the subject of the modified noun with a variable representing their own semantics. The prediction therefore seems not to conflict with the data.

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