

HPSG AND ARABIC

Head-driven Phrase Structure Grammar (HPSG)

HPSG is a monostratal constraint-based approach to syntax.

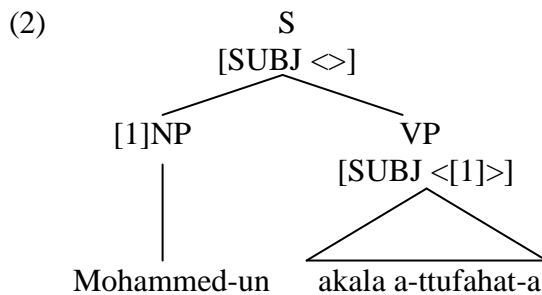
- As a monostratal approach it assumes that linguistic expressions have a single level of syntactic structure and hence has no movement processes.
- As a constraint-based approach it licenses linguistic expressions through a complex system of phrase types subject to appropriate constraints. For example, it has a type headed-phrase with sub-types including head-complement-phrase and head-subject-phrase.

For introductions see Sag, Wasow, and Bender (2003), Kim and Sells (2008), Green (forthcoming), Kathol, Przepiórkowski and Tseng (forthcoming). (The last two are available from me.)

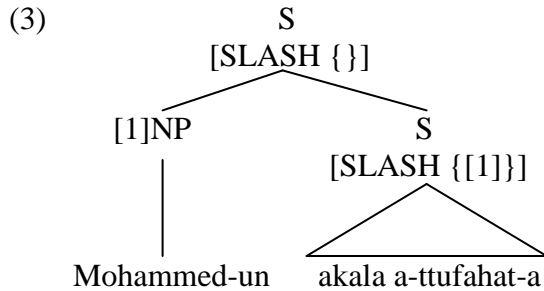
Subject-initial clauses

One possibility is that subject-initial clauses are just subject-initial structures of the kind that English has so that (1) has the structure in (2), where the SUBJ feature indicates what sort of subject a head requires.

- (1) Mohammed-un akala a-ttufahat-a
Mohammed-NOM ate.3SG.MASC the-apple-ACC
'Mohammed ate the apple'.



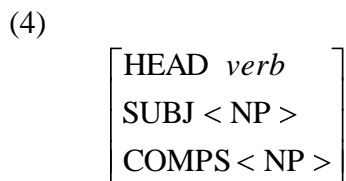
Given that Arabic has verb-initial clauses, another possibility is that subject-initial clauses are verb-initial clauses with a subject that is fronted because it is a topic so that (1) has the structure in (3), where the SLASH feature connects a filler and a gap.



(2) is like a minimalist analysis in which the subject is in SpecTP. (3) is like a minimalist analysis in which the subject is in SpecCP or Spec TopP.

There seem to be arguments that some pre-verbal subjects are not topics. If this is right, then it is probable that both structures should be available.

Structures like (2) require verbs to have categories like the following:

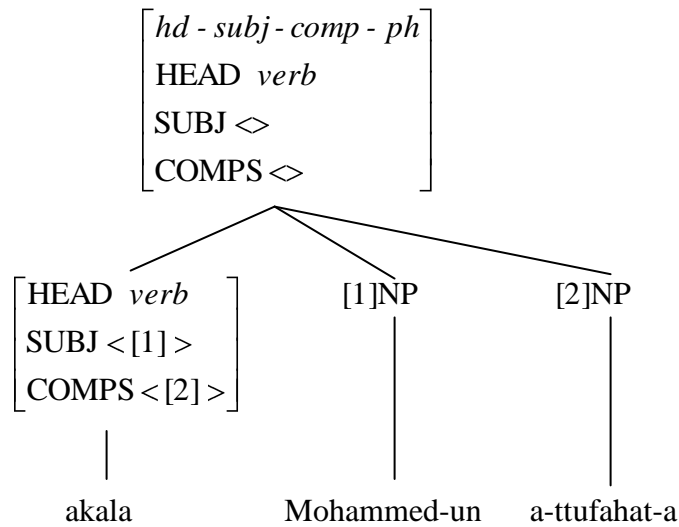


Verb-initial clauses

One possibility for verb-initial clauses is that they are structures in which a head has both its subject and its complements as sisters. Within this approach (5) has the structure in (6).

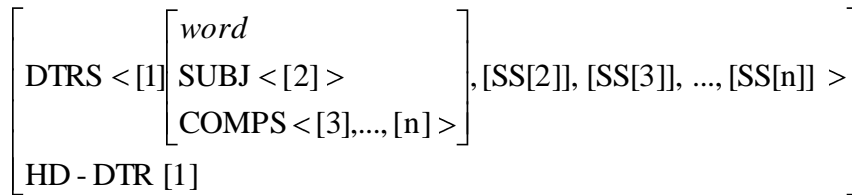
- (5) Akala Mohammed-un a-ttufahat-a
 ate.3SG.MASC Mohammed-NOM the-apple-ACC
 ‘Mohammed ate the apple’.

(6)



This approach requires a special phrase type, a head-subject-complement phrase, subject to an appropriate constraint as follows:

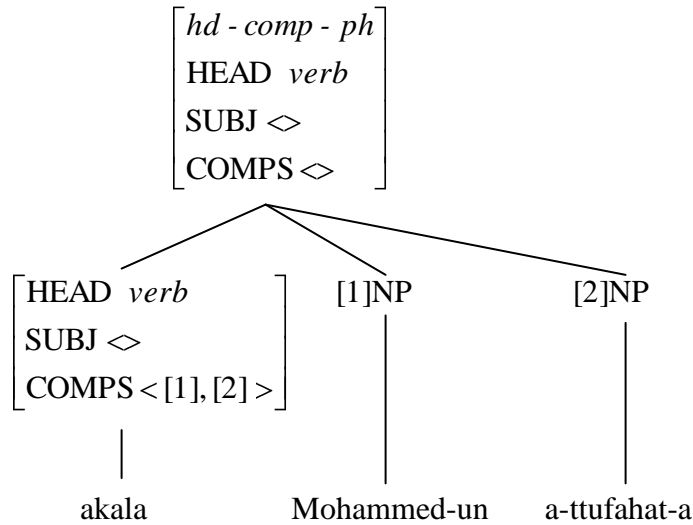
(7) *hd-subj-comp-ph* →



Essentially this approach is taken to English auxiliary-initial sentences in Pollard and Sag (1994) and Ginzburg and Sag (2000).

An alternative approach treats post-verbal subjects as extra complements. This approach was originally proposed for Welsh verb-initial clauses in Borsley (1989). It gives the following structure for (5):

(8)



On this approach verb-initial clauses are head-complement phrases, subject to the following constraint:

$$(9) \textit{hd-comp-ph} \rightarrow \left[\begin{array}{l}
 \text{DTRS } \langle [1] \left[\begin{array}{l} \textit{word} \\ \text{COMPS } \langle [2], \dots, [n] \rangle \end{array} \right], [\text{SS}[2]], \dots, [\text{SS}[n]] \rangle \\
 \text{HD-DTR } [1]
 \end{array} \right]$$

No special phrase type is required. However, an extra set of verbal categories like the following is required:

(10)

$$\left[\begin{array}{l}
 \text{HEAD } \textit{verb} \\
 \text{SUBJ } \diamond \\
 \text{COMPS } \langle \text{NP}, \text{NP} \rangle
 \end{array} \right]$$

These could be derived from the ordinary verbal categories by a lexical rule, as follows:

(11)

$$\left[\begin{array}{l}
 \text{HEAD } \textit{verb} \\
 \text{SUBJ } \langle [1] \rangle \\
 \text{COMPS } [2]
 \end{array} \right] \Rightarrow \left[\begin{array}{l}
 \text{HEAD } \textit{verb} \\
 \text{SUBJ } \diamond \\
 \text{COMPS } \langle [1] \rangle \oplus [2]
 \end{array} \right]$$

This approach is taken to English auxiliary-initial sentences in Sag, Wasow and Bender (2003).

On the extra complement analysis one expects post-verbal subjects to have something in common with other expressions which are the first member of a COMPS list. Borsley

(16)

$$[\text{INV } -] \rightarrow \left[\begin{array}{l} \text{HEAD } \left[\text{AGR } [1] \right] \\ \text{SUBJ } \left\langle \left[\text{AGR } [1] \right] \right\rangle \end{array} \right]$$

(17)

$$[\text{INV } +] \rightarrow \left[\begin{array}{l} \text{HEAD } \left[\text{AGR } \left[\begin{array}{l} \text{PERS } [1] \\ \text{NUMB } \textit{sing} \\ \text{GEND } [2] \end{array} \right] \right] \\ \text{SUBJ } \left\langle \left[\text{AGR } \left[\begin{array}{l} \text{PERS } [1] \\ \text{NUMB } \textit{numb} \\ \text{GEND } [2] \end{array} \right] \right] \right\rangle \end{array} \right]$$

Clitics

Arabic clitics can probably be analyzed as pronominal affixes in the same way as Romance clitics have been, e.g. in Miller and Sag (1997).

Miller and Sag assume that the basic combinatorial potential of a word is encoded by the feature ARG(UMENT)-ST(RUCTURE), whose value is a list of synsem objects (combinations of syntactic and semantic information).

When all the synsem objects are canonical, the relation between the values of ARG-ST, SUBJ and COMPS is as follows:

(18)

$$\left[\begin{array}{l} \text{ARG - ST } \langle [1], [2], \dots, [n] \rangle \\ \text{SUBJ } \langle [1] \rangle \\ \text{COMPS } \langle [2], \dots, [n] \rangle \end{array} \right]$$

However, ARG-ST lists may also contain affixal synsem objects. These do not appear in the value of SUBJ or COMPS. Instead they are realized by affixes.

On this approach a verb with an ordinary NP object, e.g. that in (19), will have the category in (20).

- (19) Mohammed raʔa Salwa.
Mohammed saw-PAST-3-MASC-SG Salwa
'Mohammed saw Salwa.'

(20)

$$\left[\begin{array}{l} \text{HEAD } \textit{verb} \\ \text{SUBJ } \langle [1] \rangle \\ \text{COMPS } \langle [2] \rangle \\ \text{ARG - ST } \langle [1]\text{NP}, [2]\text{NP} \rangle \end{array} \right]$$

A verb with an object clitic, e.g. the verb in (21), will have the category in (22).

(21) Mohammed raʔa-ha.

Mohammed saw-PAST-3-MASC-SG-her

‘Mohammed saw her.’

(22)

$$\left[\begin{array}{l} \text{HEAD } \textit{verb} \\ \text{SUBJ } \langle [1] \rangle \\ \text{COMPS } \diamond \\ \text{ARG - ST } \langle [1]\text{NP}, \text{NP}_{\textit{aff}} \rangle \end{array} \right]$$

A preposition with an ordinary NP object, e.g. that in (23), will have the category in (24).

(23) maʔa Salwa

with Salwa

(24)

$$\left[\begin{array}{l} \text{HEAD } \textit{prep} \\ \text{SUBJ } \diamond \\ \text{COMPS } \langle [1] \rangle \\ \text{ARG - ST } \langle [1]\text{NP} \rangle \end{array} \right]$$

A preposition with an object clitic, e.g. that in (25), will have the category in (22).

(25) maʔa-ha

with-her

(26)

$$\left[\begin{array}{l} \text{HEAD } \textit{prep} \\ \text{SUBJ } \diamond \\ \text{COMPS } \diamond \\ \text{ARG - ST } \langle \text{NP}_{\textit{aff}} \rangle \end{array} \right]$$

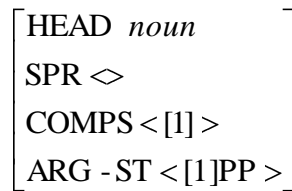
Noun phrases

A noun + complement noun phrase such as (27) is straightforward.

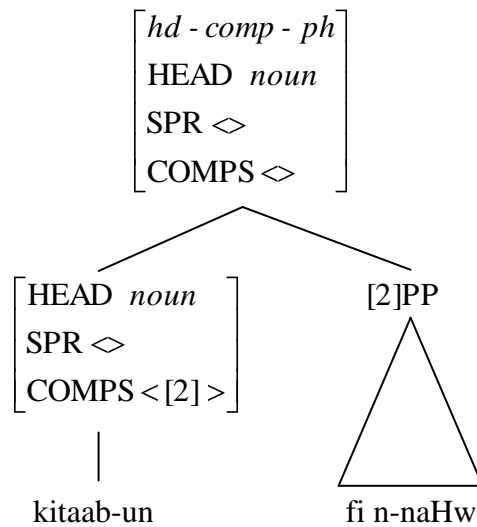
- (27) *kitaab-un fi n-naHw*
book-INDEF about syntax
'a book about syntax'

The noun will have the category in (28) and the example will have the structure in (29) (ignoring the ARG-ST feature).

(28)



(29)

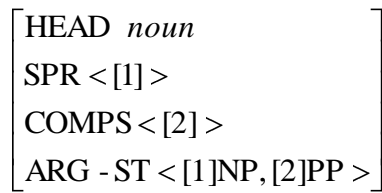


An issue arises about noun phrases with a possessor such as (30).

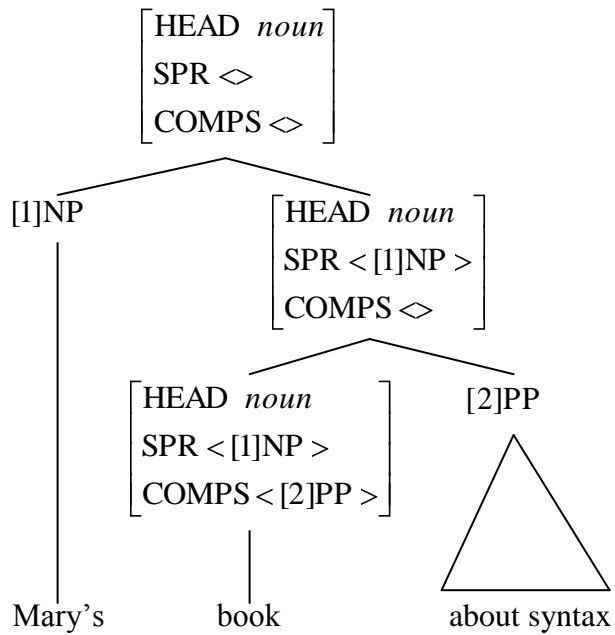
- (30) *kitaab-u Salwa fi n-naHw*
book-NOM Salwa about syntax
'Salwa's book about syntax'

In HPSG analyses of English possessors are analyzed realizations of the SPR feature, giving categories like (31) and structures like (32).

(31)

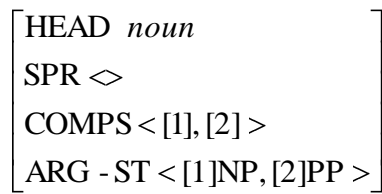


(32)

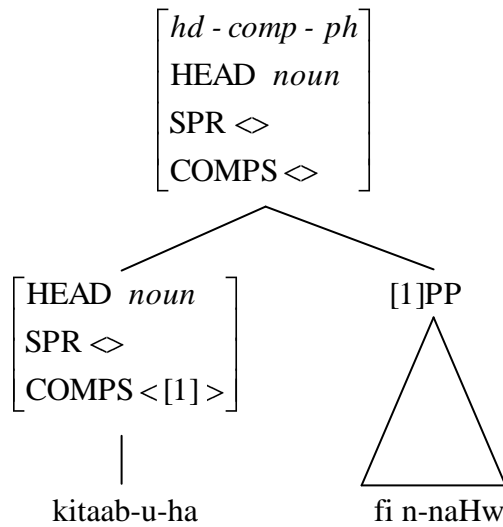


There are, however, two reasons for treating Arabic possessors as extra complements, giving categories like (33) and structures like (34).

(33)



(37)



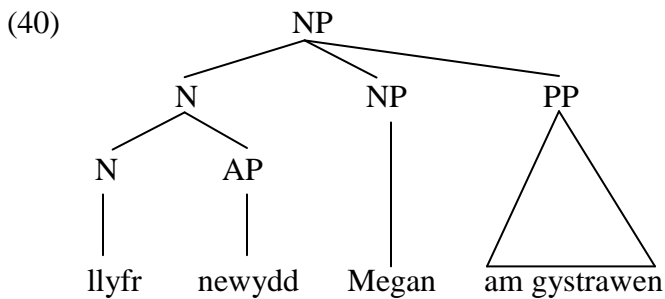
A further issue arises about attributive adjectives, which after a possessor and before any ordinary complement.

(38) *kitaab-u Salwa l-jadiid-u fi n-naHw*
book-NOM Salwa the-new about syntax
'Salwa's new book about syntax'

Attributive adjectives are standardly analyzed as modifiers combining with a nominal constituent to form a larger nominal constituent.

It is fairly easy to apply this approach to Welsh and Persian in which Attributive adjectives precede both possessors and ordinary complements. The Welsh example in (39) can have the analysis in (40).

(39) *llyfr newydd Megan am gystrawen*
book new Megan about syntax
'Megan's new book about syntax.'

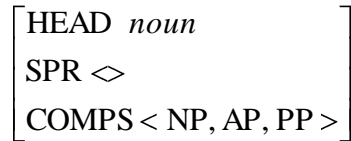


See Samvellian (2007) for analysis of Persian NPs along these lines.

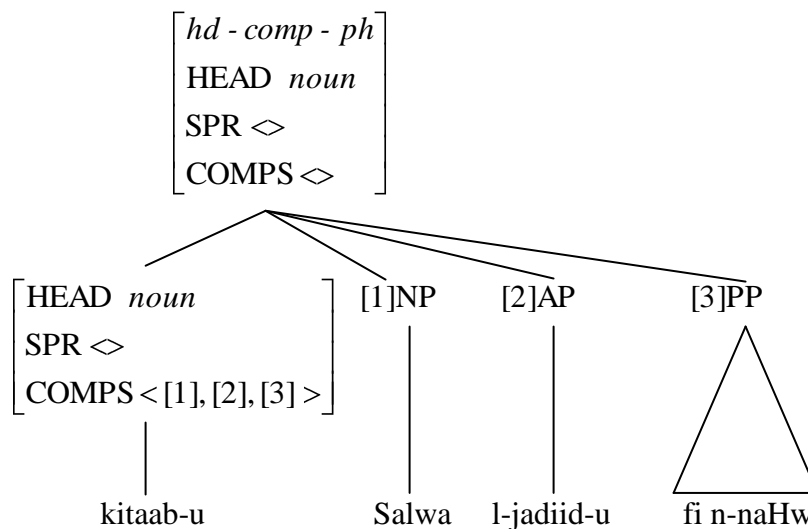
A different approach is necessary for Arabic. One possibility is to assume that attributive adjectives are optional extra complements. This is an approach taken to verbal adjuncts in Bouma, Malouf and Sag (2001).

On this approach *kitaab* in (38) has the category in (41) and (38) has the structure in (42).

(41)



(42)



Another possibility would be to assume that Arabic has a special phrase type, a head-complement-adjunct phrase, allowing a head to have its complements and optional adjuncts as sisters.

Other issues in noun phrases are the nature of the definite article, agreement between attributive adjectives and nouns and the absence of the definite article with possessed nouns. These matters are discussed in connection with Hebrew in Wintner (2000).

Other references

A number of issues in Maltese syntax, including clause structure and noun phrase structure, are discussed in Müller (2009).

Resumptive pronouns in Hebrew are discussed in Vaillette (2001).

REFERENCES

- Borsley, R. D. (1989), 'An HPSG approach to Welsh', *Journal of Linguistics* 25, 333-354.
- Borsley, R. D. (1995), 'On some similarities and differences between Welsh and Syrian Arabic', *Linguistics* 33, 99-122.
- Bouma, G., R. Malouf, and I. A. Sag (2001), 'Satisfying constraints on extraction and adjunction', *Natural Language and Linguistic Theory* 19, 1-65.
- Ginzburg, J. and I. A. Sag (2000), *Interrogative Investigations: The Form, Meaning and Use of English Interrogatives*, Stanford: CSLI Publications (chapters 1, 2 5, and 6).
- Green, G. (forthcoming), 'Elementary principles of Head-driven Phrase Structure Grammar', to appear in R. D. Borsley and K. Börjars (eds.), *Non-Transformational Syntax*. Cambridge: Blackwell.
- Kathol, A., A. Przepiórkowski and J. Tseng (forthcoming), 'Advanced topics in Head-driven Phrase Structure Grammar', to appear in R. D. Borsley and K. Börjars (eds.), *Non-Transformational Syntax*. Cambridge: Blackwell.
- Kim, J-B. and P. Sells (2008), *English Syntax: An Introduction* Stanford: CSLI Publications.
- Miller, P., and I. A. Sag (1997), 'French clitic movement without clitics or movement', *Natural Language and Linguistic Theory*. 15: 573--639.
- Müller, S. (2009), 'Towards an HPSG Analysis of Maltese', in B. Comrie, R. Fabri, B. Hume, M. Mifsud, T. Stolz and M. Vanhove (eds), *Introducing Maltese linguistics. Papers from the 1st International Conference on Maltese Linguistics (Bremen/Germany, 18–20 October, 2007)* Amsterdam, Philadelphia: John Benjamins, pp. 83–112, <http://hpsg.fu-berlin.de/~stefan/PS/maltese-sketch.pdf>
- Pollard, C. and I. A. Sag (1994), *Head-driven Phrase Structure Grammar*, Chicago: University of Chicago Press.
- Sag, I. A., T. Wasow, and E. M. Bender (2003), *Syntactic Theory*, Second Edition, Stanford: CSLI Publications.
- Samvellián, P. (2007), 'A (phrasal) affix analysis of the Persian Ezafe', *Journal of Linguistics* 43, 605–645.
- Vaillette, N. (2001), 'Hebrew relative clauses in HPSG', in D. Flickinger and A. Kathol (eds.), *Proceedings of the 7th International Conference on Head-Driven Phrase Structure Grammar*, Stanford: CSLI Publications, pp. 305-324.
- Wintner, S. (2000), 'Definiteness in the Hebrew noun phrase', *Journal of Linguistics* 36,319–363.