

OT-LFG

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1 The basics of LFG

LFG is a parallel constraint-based grammar where c(onstituent)-structure (surface phrase structure), f(unctional)-structure (grammatical feature structure), a(rgument)-structure and s(emantic)-structure – sometimes p(rosodic)-structure (Butt and King 1998), m(orpho-logical)-structure (Frank and Zaenen 1998, Sadler and Spencer 2001) and i(nformation)/d(iscourse)-structure (King 1997, Butt and King 1998, to appear, Otaguro 2003), are linked: the function ϕ between c-structure and f-structure, Lexical Mapping Theory between a-structure and grammatical functions (Levin 1986, Bresnan and Kanerva 1989), and Glue semantics (function σ) between f-structure and s-structure (Dalrymple 2001).

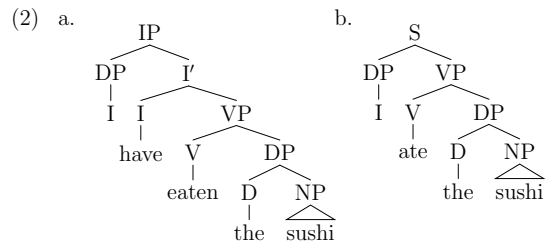
1.1 C-structure and extended X'-theory

- c-structure in LFG is represented as a familiar phrase structure tree.
- c-structure is surface-oriented. Following Economy of Expression, empty categories or similar sorts are not used unless required:

(1) **Economy of Expression** (Bresnan 2001:91)

All syntactic phrase structure node are optional and are not used unless required by independent principles (completeness, coherence, semantic expressivity).

- A c-structure tree is not derivational. Every lexical item is base-generated, so even functional categories (I, C) must be filled by lexical items (i.e. no V-to-I or SpecVP-to-SpecIP movement etc.).



1.2 F-structure

- f-structure in LFG is a representation of grammatical relations and morphosyntactic features.
- f-structure is in principle language-independent and universal.
- f-structure is constructed by unifications of f-descriptions of each lexical item.
- The main attributes are:
 - PRED (a kind of semantic representation with argument structure information)
 - GF (SUBJ, OBJ, ADJUNCT) and DF (TOPIC, FOCUS)
 - other morphosyntactic features (TENSE, ASPECT, PERSON, NUMBER, GENDER, CASE, DEF etc.)

(3) a. **Completeness Condition**

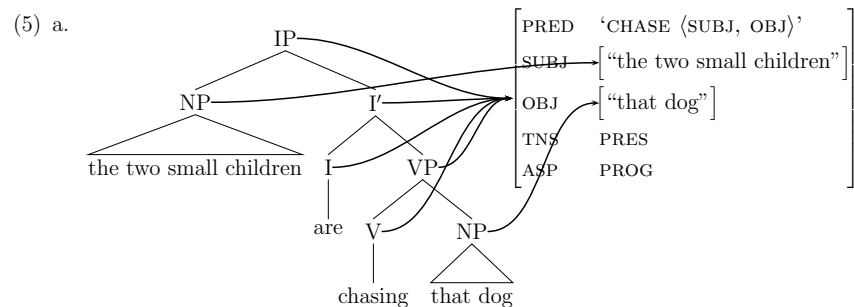
All argument functions specified in the value of the PRED feature must be present in the local f-structure.

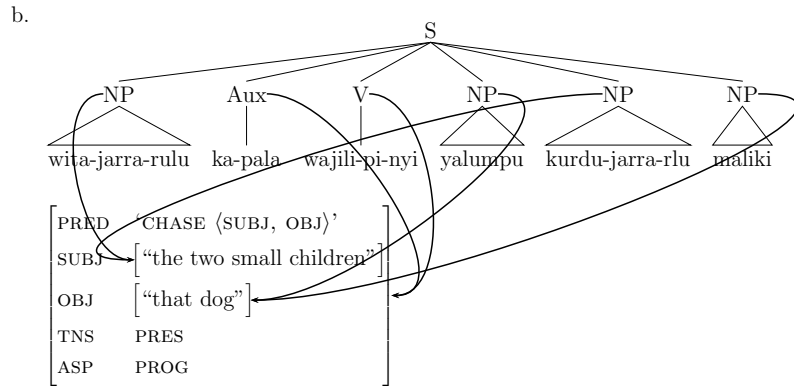
b. **Coherence Condition**

All argument functions in an f-structure must be selected by their local PRED.

(4) a. The two small children are chasing that dog.

- b. wita-jarra-rlu ka-pala wajili-pi-nyi yalumpu kurdu-jarra-rlu maliki
small-DUAL-ERG PRES-3DUSUBJ chase-NONPAST that.ABS child-DUAL-ERG dog.ABS
'The two small children are chasing that dog.'



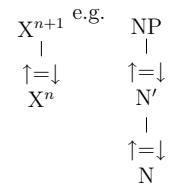


1.3 C-to-F

(6) c-structure and f-structure correspondence (Bresnan 2001:102):

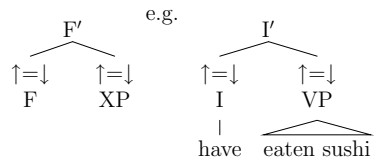
a. Head principle

C-structure heads are f-structure heads.



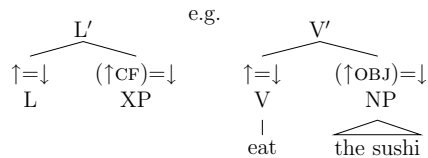
b. Co-head principle

Complements of functional categories are f-structure co-heads.



c. Complement principle

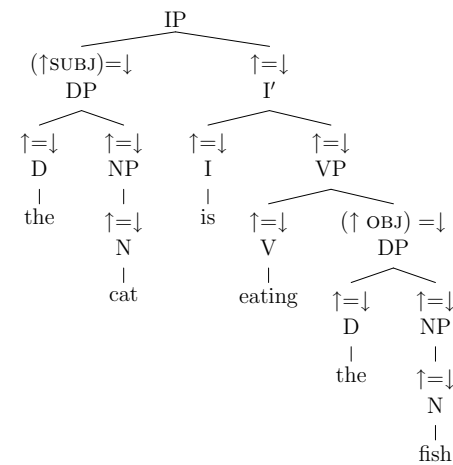
Complements of lexical categories are the non-discourse argument functions CF.



- (7) a.
- the*: D (↑DEF)=+
 - cat*: N (↑PRED)='CAT'
 - fish*: N (↑PRED)='FISH'
 - is*: I (↑TENSE)=PRES
(↑SUBJ)=↓
(↓PERS) = 3
(↓NUM) = SG
 - eat*: V (↑PRED)='EAT (...)'
 - ing*: *Infle*_V (↑ASPECT)=PROG

- b.
- IP → DP I'
 - I' → I VP
 - VP → V DP
 - DP → D NP
 - ...

c.



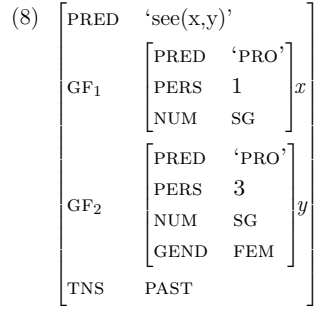
d.

PRED	'EAT <SUBJ, OBJ>'
SUBJ	[PRED 'CAT'
	PERS 3
	NUM SG
OBJ	[PRED 'FISH'
	DEF +
TNS	PRES
ASP	PROG

2 Optimality-Theoretic LFG

2.1 The input

- “the INPUT must represent morphosyntactic content in a universal, language independent form.” (Bresnan 1998:8) = (partially specified) f-structure

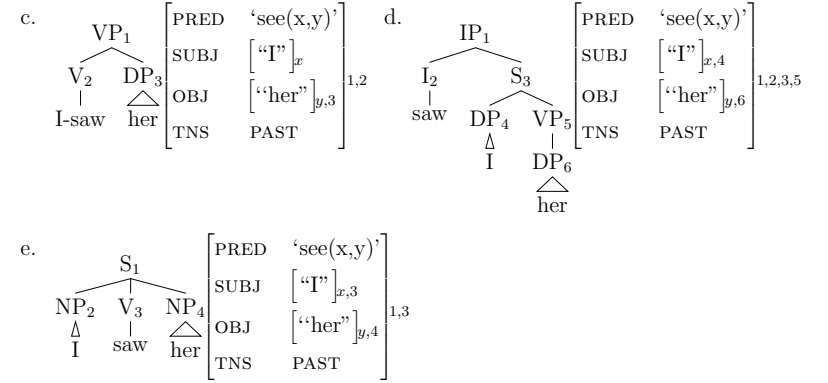
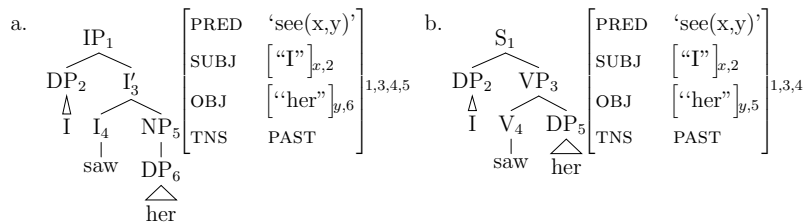


- the relations of the lexical heads “see”, “I” and “she” to each other. The main lexical head has the function PRED(icator) and “I” and “she” have underspecified grammatical functions GF.
- specifiers and clausal property of tense.
- structural sets of abstract features representing their morphosyntactic content in a language-independent format.

2.2 Gen

- (9) Restricted definition of *Gen* (Kuhn 2001[2000:10])
 For a given input representation Φ_{input} , the set of candidate analyses $Gen(\Phi_{input})$ is the set of LFG (c- and f-structure) analyses $\langle T, \Phi' \rangle$ generated by G_{inviol} (= an LFG grammar encodes certain basic inviolable principles – RO), such that $\Phi_{input} \sqsubseteq \Phi'$, i.e., those analyses whose f-structure is subsumed by the input f-structure.
- “although the resulting grammar is formally an LFG grammar, it is certainly unusual since it ‘overgenerate’ vastly, producing all universally possible c-structure-f-structure pairings.” (Kuhn 2001[2000:11])

(10) For the input (8),



- “Being infinite, the universal candidate set includes many more realizations of the given content than are illustrated here (= (10)), as well as many unfaithful candidates with different morphosyntactic content. It is the job of the constraint ranking to select those belonging to a given language.” (Bresnan 1998:18)

2.3 Constraints

- (11) Constraint ranking (Bresnan 1998:26)
 $\text{CC} \gg \text{OP-SPEC} \gg * \text{LEX-F} \gg \text{OB-HD} \gg \text{AGR} \gg \text{FULL-INT} \gg \text{STAY}$
- (12) a. OP-SPEC
 “an operator must be the value of a DF in the f-structure”
- b. *LEX-F
 “no lexical heads in functional categories”
- c. OB-HD
 “every projected category (X' , X'') has a lexically filled (extended) head”
- d. AGR
 “a subject and its predicate in c-structure agree”
 (i.e. a c-structure subject requires that its sister constituent have an agreeing extended head)
- e. FULL-INT
 “PRED values must be parsed” (RO)
- f. STAY
 “categories dominate their extended heads”

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