

# Syntactic Theory Homework 4: LFG and MG

Meaghan Fowlie

Corrected June 19, 2018

1. Consider the following LFG:

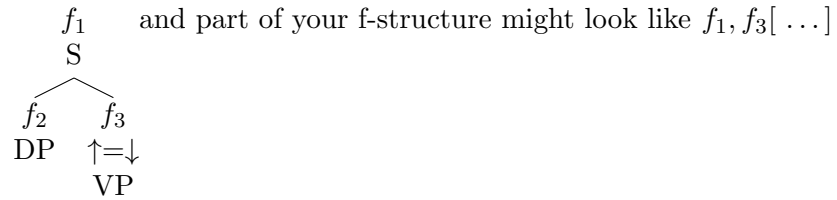
<b>Lexicon</b>			<b>Rules</b>		
colourless	A	( $\uparrow$ PRED) = colourless	S $\rightarrow$	DP	VP
				( $\uparrow$ SUBJ)= $\downarrow$	$\uparrow$ = $\downarrow$
green	A	( $\uparrow$ PRED) = green	VP $\rightarrow$	V	
ideas	N	( $\uparrow$ PRED) = idea ( $\uparrow$ NUM) = PL		$\uparrow$ = $\downarrow$	
sleep	V	( $\uparrow$ PRED) = sleep( $\langle$ $\uparrow$ SUBJ $\rangle$ ) ( $\uparrow$ TENSE) = PRES ( $\uparrow$ SUBJ NUM) = PL	VP $\rightarrow$	VP	AdvP
				$\uparrow$ = $\downarrow$	$\downarrow$ $\in$ ( $\uparrow$ ADJ)
furiously	Adv	( $\uparrow$ PRED) = furiously	AdvP $\rightarrow$	Adv	
				$\uparrow$ = $\downarrow$	
			DP $\rightarrow$	NP	
				$\uparrow$ = $\downarrow$	
				( $\uparrow$ NUM)=PL	
			NP $\rightarrow$	N	
				$\uparrow$ = $\downarrow$	
			NP $\rightarrow$	AP	NP
				$\downarrow$ $\in$ ( $\uparrow$ ADJ)	$\uparrow$ = $\downarrow$
			AP $\rightarrow$	A	
				$\uparrow$ = $\downarrow$	

Provide a parse for the following sentence:

(1) Colourless green ideas sleep furiously

This means you should provide a c-structure and an f-structure. To help me see your reasoning, annotate your structures with connections between the nodes of the c-structure and the f-structures. Formally this is usually done by annotating the c-structure nodes with variables  $f_i$  and then writing those variables into the f-structures. For example, if the S and VP nodes

are associated with the same local f-structure in the full f-structure, then part of your tree might look like



You can also just write arrows. Whatever works, just make it clear what corresponds to what.

2. Expand the grammar to cover the following sentence, and provide a parse:

(2) Green ideas furiously pick flowers

Hint: *flowers* is the OBJ of *pick*

Your answer should include the new grammar rules/lexical items, the c-structure and f-structure for (2) (you need only include the connections if there's something tricky this time), and any comments on choices you made or difficulties you encountered.

3. Consider the following Minimalist Grammar:

- We are making strings, and Merge and Move concatenate strings as follows:
- Merge: the selector (the one with the =X feature) goes on the left and the selected (the one with the X feature) goes on the right
- Move: the mover always lands on the left

- Formally, in case it helps:

**Merge:** For  $\alpha, \beta$  sequences of features,  $s, t \in \Sigma^*$ ,  $\text{movers}_s, \text{movers}_t$  expressions:

$$\text{Merge}(\langle s, =\mathbf{X}\alpha \rangle :: \text{movers}_s, \langle t, \mathbf{X}\beta \rangle :: \text{movers}_t) = \begin{cases} \langle st, \alpha \rangle :: \text{movers}_s \cdot \text{movers}_t & \text{if } \beta = \epsilon \\ \langle s, \alpha \rangle :: \langle t, \beta \rangle :: \text{movers}_s \cdot \text{movers}_t & \text{if } \beta \neq \epsilon \end{cases}$$

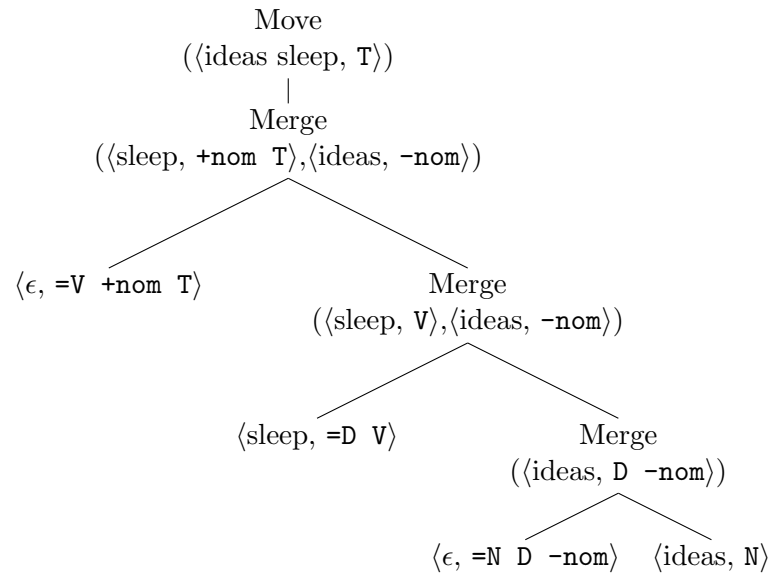
**Move:** For  $\alpha, \beta, \gamma \in F^*$ ,  $s, t \in \Sigma^*$ , suppose  $\exists! \langle t, \beta \rangle \in \text{movers}$  such that  $\beta = -\mathbf{f}\gamma$ . Then:

$$\text{Move}(\langle s, +\mathbf{f}\alpha, \rangle :: \text{movers}) = \begin{cases} \langle ts, \alpha \rangle :: \text{movers} - \langle t, \beta \rangle & \text{if } \gamma = \epsilon \\ \langle s, \alpha \rangle :: \langle t, \gamma \rangle :: \text{movers} - \langle t, \beta \rangle & \text{if } \gamma \neq \epsilon \end{cases}$$

- Lexicon:
  - $\langle \text{ideas, N} \rangle$
  - $\langle \text{flowers, N} \rangle$
  - $\langle \epsilon, =\text{N D} \rangle$
  - $\langle \epsilon, =\text{N D } -\text{nom} \rangle$
  - $\langle \text{sleep, =D V} \rangle$
  - $\langle \text{pick, =D =D V} \rangle$
  - $\langle \epsilon, =\text{V } +\text{nom T} \rangle$
  - $\langle \text{colourless, =N N} \rangle$
  - $\langle \text{green, =N N} \rangle$
  - $\langle \text{furiously, =V V} \rangle$

This is an *annotated derivation tree* for (3). Its internal nodes are annotated with the result of the operation.

(3) Ideas sleep



Does this grammar generate the following sentences? For each, if so, provide an annotated derivation tree, and if not, explain why not.

- (4) Colourless green ideas sleep
  - (5) Colourless green ideas sleep furiously
  - (6) Green ideas furiously pick flowers
4. (Bonus) The handling of adjectives and adverbs here is quite different from how it's done in phrase structure grammars. What's the principle difference? What do you think about this minimalist analysis of adjuncts?