

Hausser. 1988. Left-Associative Grammar: The Algebraic Definitions.
Computers and translation, 3, 121-155

$$r_i: [\text{CAT-1 CAT-2}] \Rightarrow [r_i \text{ CAT-3}]$$

3.1 *The Definition of $a^k b^k c^k$*

$$\begin{aligned} LX &=_{\text{def}} \{[a (bc)], [b (b)], [c (c)]\} \\ ST_S &=_{\text{def}} \{(\{r-1, r-2\} (bc))\} \\ r-1: [(X) (bc)] &\Rightarrow [\{r-1, r-2\} (bXc)], \\ r-2: [(bXc) (b)] &\Rightarrow [\{r-2, r-3\} (Xc)], \\ r-3: [(cX) (c)] &\Rightarrow [\{r-3\} (X)] \\ ST_F &=_{\text{def}} \{[r-3 \epsilon]\}. \end{aligned}$$

<i>Input:</i>	a	a	a	b	b	b	c	c	c	
				↓ <i>lexical look-up</i> ↓						
r-1:	a	a	a	b	b	b	c	c	c	
	(bc)(bc)(bc)			(b)	(b)	(b)	(c)	(c)	(c)	
r-1:	aa	a	b	b	b	c	c	c		
	(bbcc)		(bc)	(b)	(b)	(b)	(c)	(c)	(c)	
r-2:	aaa	b	b	b	c	c	c			
	(bbbccc)		(b)	(b)	(b)	(c)	(c)	(c)		
r-2:	aaab	b	b	c	c	c				
	(bbccc)		(b)	(b)	(c)	(c)	(c)			
r-2:	aaabb	b	c	c	c					
	(bccc)		(b)	(c)	(c)	(c)				
r-3:	aaabbb	c	c	c						
	(ccc)			(c)	(c)	(c)				
r-3:	aaabbbc	c								
	(cc)		(c)	(c)	(c)					
r-3:	aaabbbcc	c								
	(c)			(c)	(c)					
	aaabbbccc									
	ε									

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 $r-1: [(X) (bc)] \Rightarrow [\{r-1, r-2\} (bXc)],$
 $r-2: [(bXc) (b)] \Rightarrow [\{r-2, r-3\} (Xc)],$
 $r-3: [(cX) (c)] \Rightarrow [\{r-3\} (X)]$
 $ST_F =_{def} \{ [r_{p-3} \epsilon] \}.$

*START-0

1

(B C) A

(B C) A

*RULE-1

2

(B B C C) A A

(B C) A

*RULE-1

3

(B B B C C C) A A A

(B) B

*RULE-2

4

(B B C C C) A A A B

(B) B

*RULE-2

5

(B C C C) A A A B B

(B) B

*RULE-2

6

(C C C) A A A B B B

(C) C

*RULE-3

7

(C C) A A A B B B C

(C) C

*RULE-3

8

(C) A A A B B B C C

(C) C

*RULE-3

9

(NIL) A A A B B B C C C

3.1 The Definition of $a^k b^k c^k$

$LX =_{def} \{[a (bc)], [b (b)], [c (c)]\}$

$ST_S =_{def} \{(\{r-1, r-2\} (bc))\}$

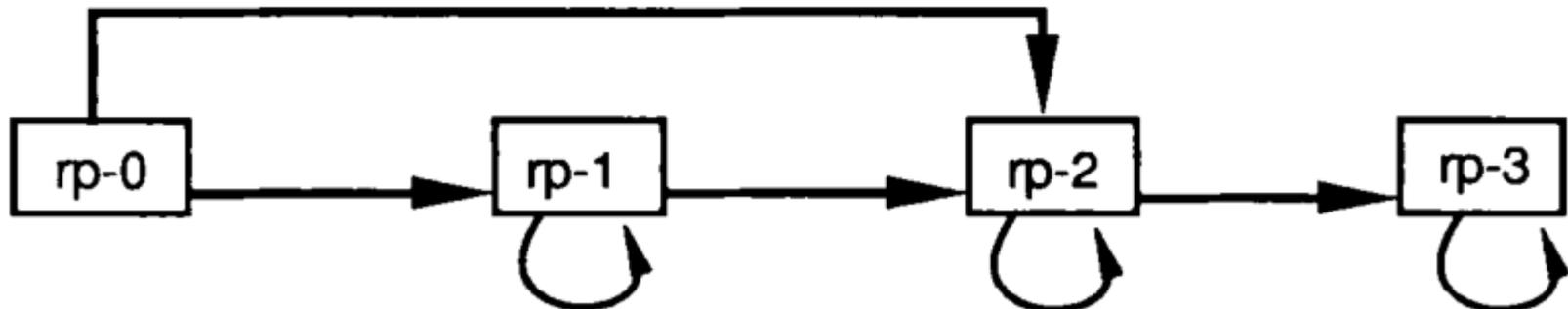
r-1: $[(X) (bc)] \Rightarrow [\{r-1, r-2\} (bXc)],$

r-2: $[(bXc) (b)] \Rightarrow [\{r-2, r-3\} (Xc)],$

r-3: $[(cX) (c)] \Rightarrow [\{r-3\} (X)]$

$ST_F =_{def} \{[rp-3 \epsilon]\}.$

8.3 The Control Structure of an LA-Grammar (Final Notation)



LAN versus RTN/ATN

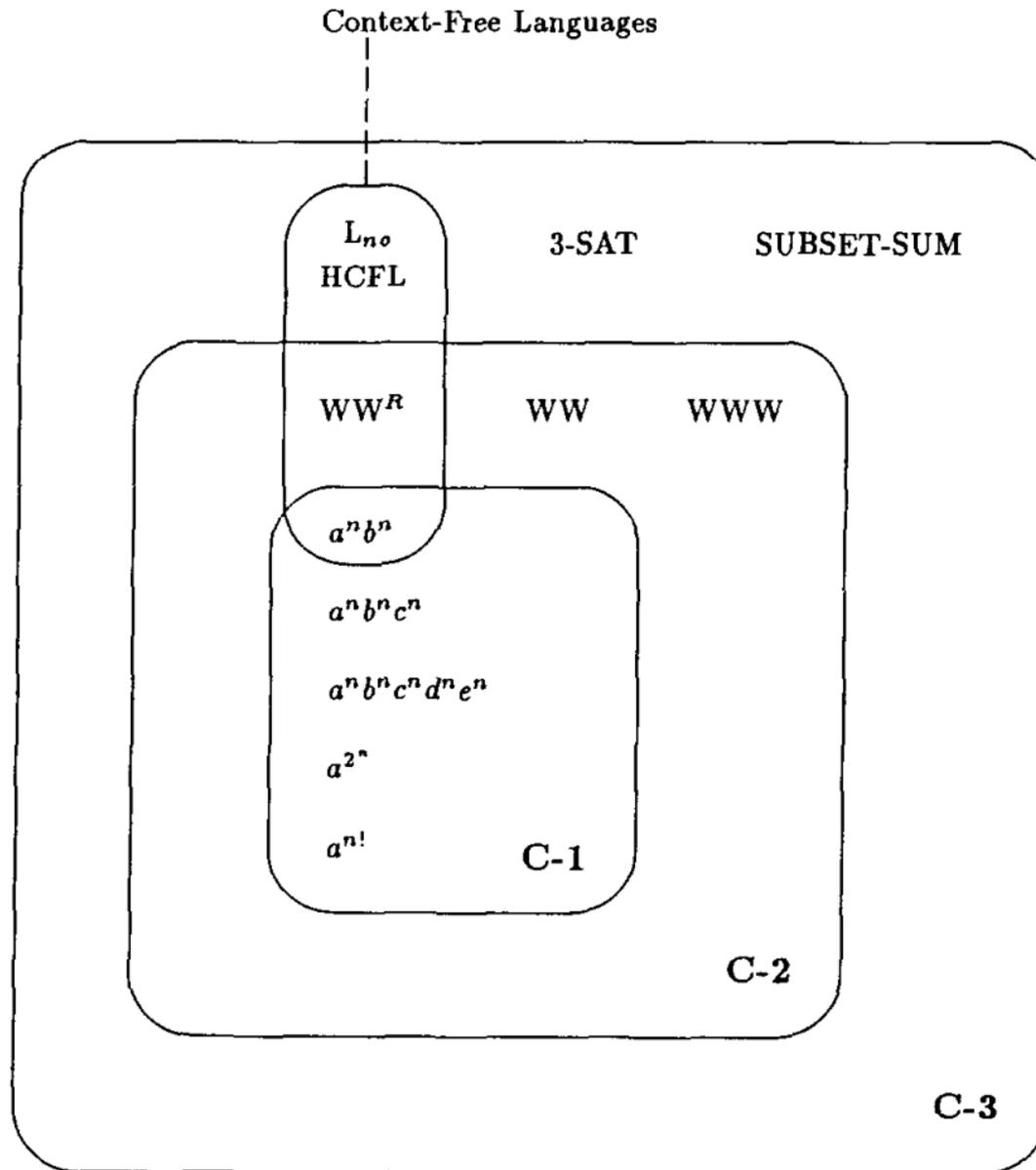
In summary, the representation of LANs à la 8.3 differs from conventional networks (including finite-state networks) in that

- (i) 'roles' are represented in LANs by rule names;
- (ii) 'states' are represented in LANs by the successful application of a rule;
- (iii) categories are handled only rule-internally in LANs; and
- (iv) rules in LANs handle only single transitions, consisting of the left-associative composition of a sentence start and a new word.

Finally, LANs differ from RTNs and ATNs in that

- (i) LANs do not contain any sub-networks, and
- (ii) LANs do not contain 'jumps'.

Hausser (1991): Complexity in Left-Associative Grammar. *ThCoSc.* 106, 283-308.



Weitere Fragen

- LAG versus CCG?
- LAG und satzmediale Linksrekursion?
- Zusammenspiel mit Semantik? Passiv?
- Gilt die Kritik an ATNs auch für LAG?