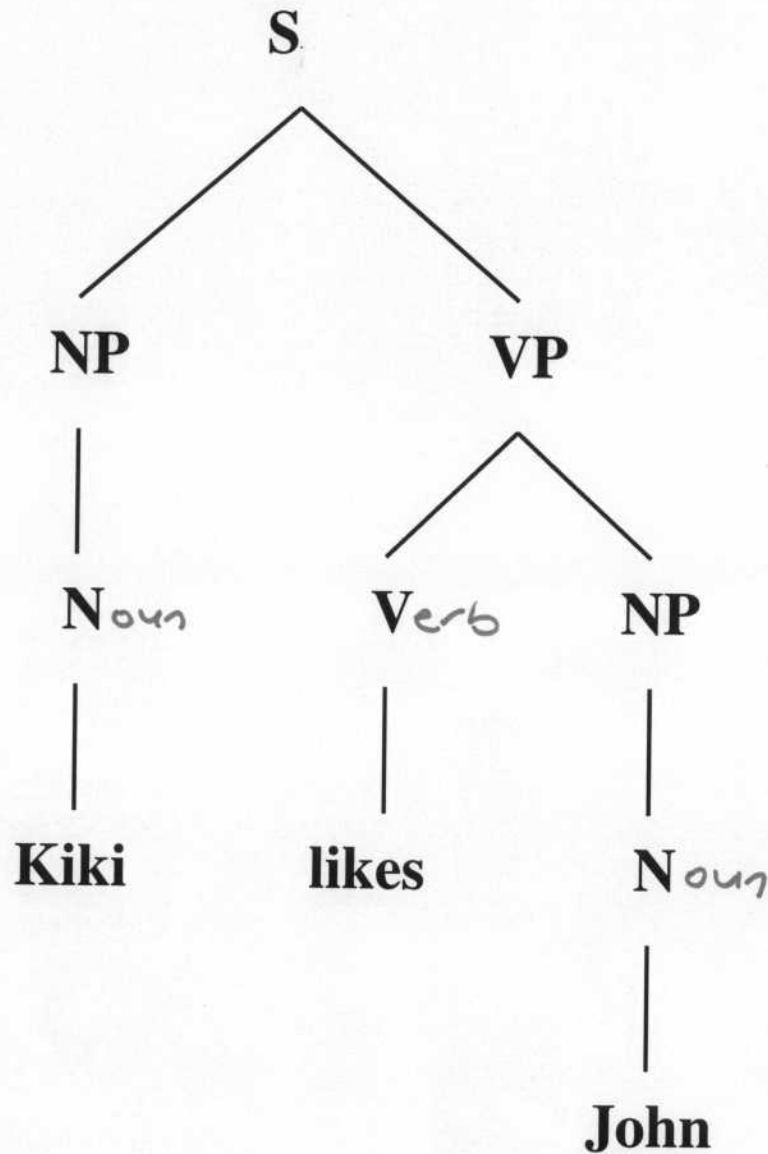


AN ORDINARY TREE

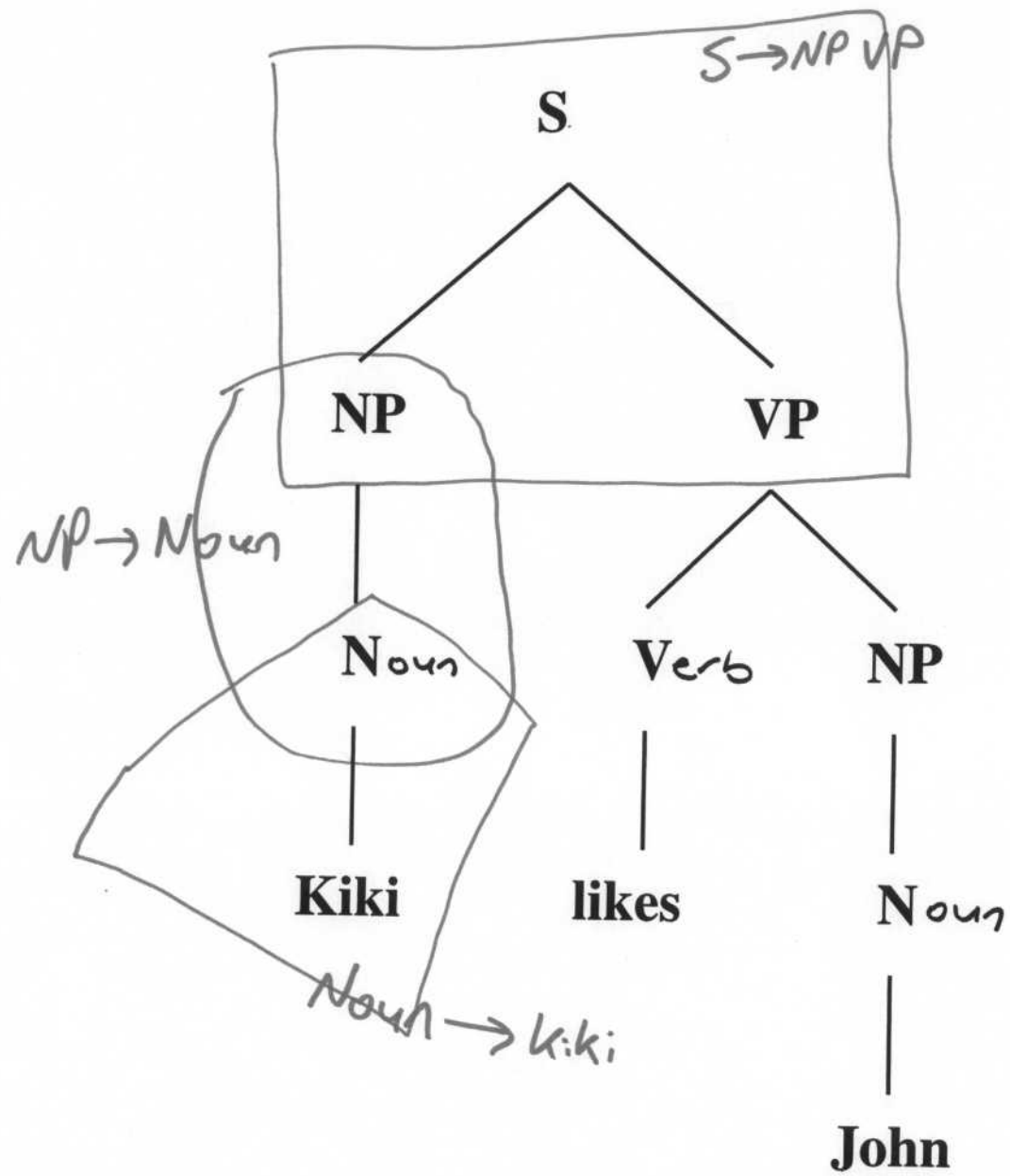


$S \rightarrow NP VP$

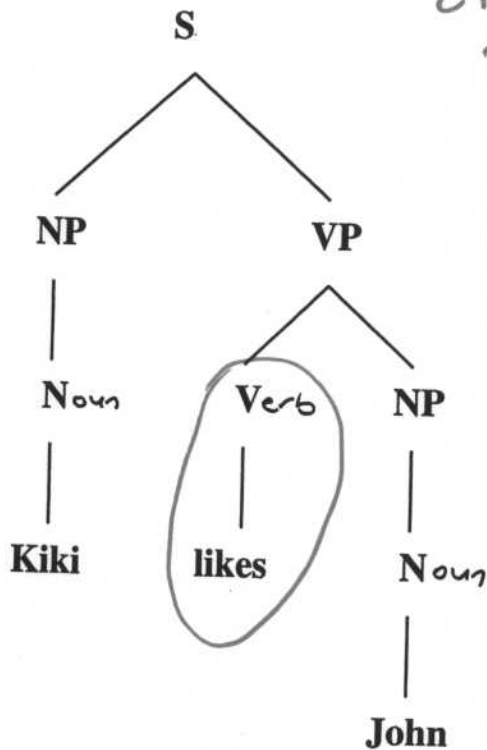
$NP \rightarrow Noun$

$Noun \rightarrow Kiki$

⋮

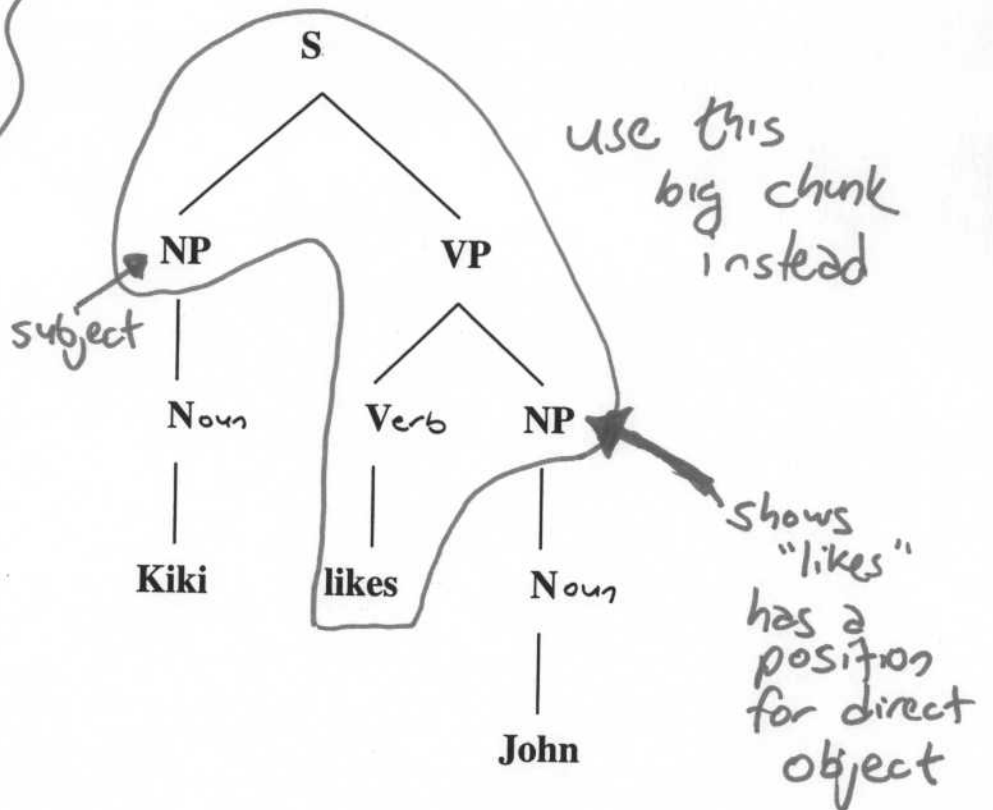


CONTEXT-FREE GRAMMAR (CFG)

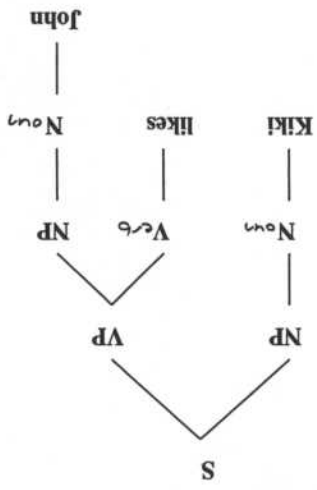
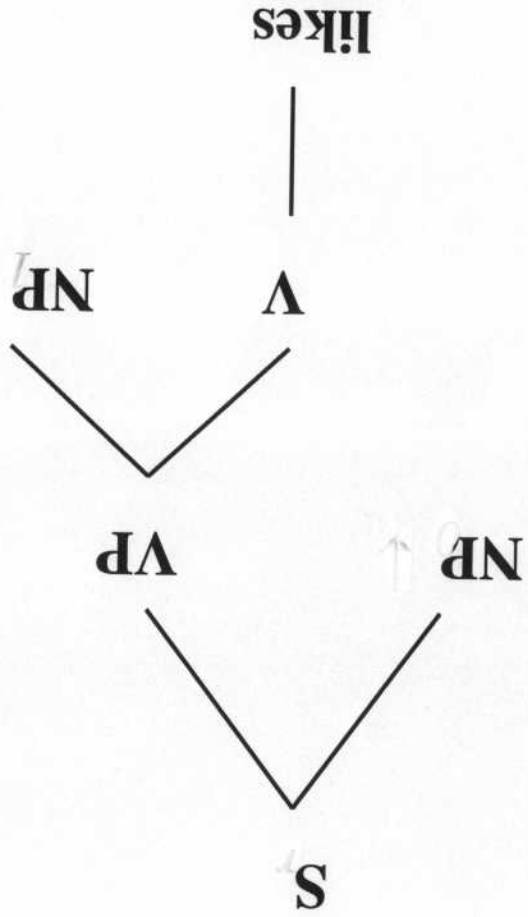


little chunk corresponds to rule
Verb $\rightarrow$ likes

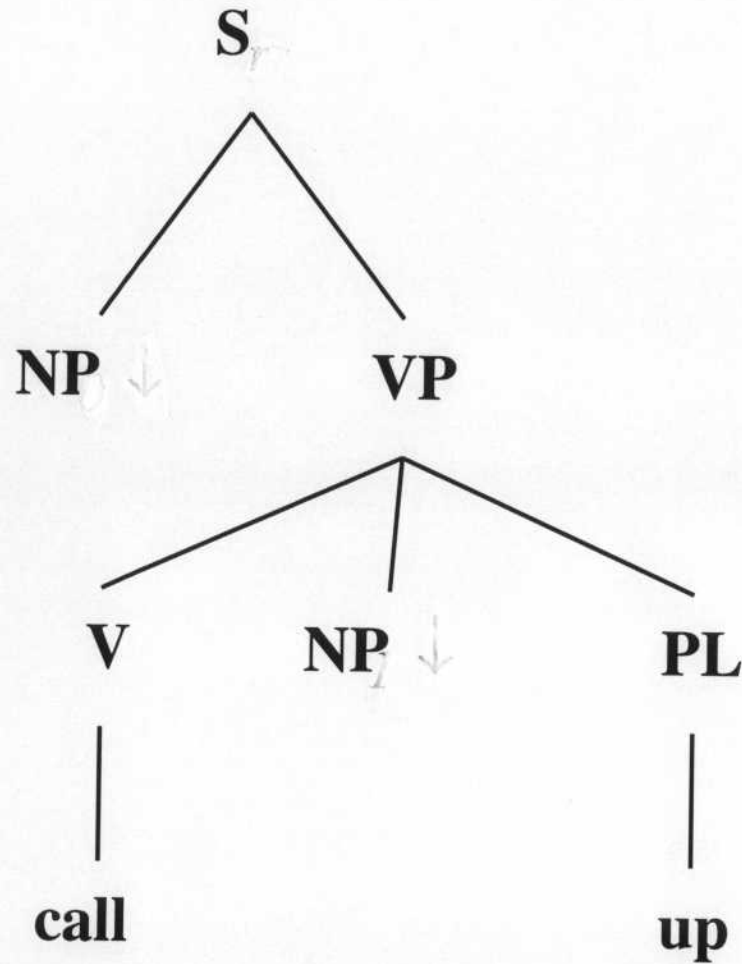
TREE-ADJOINING GRAMMAR (TAG)



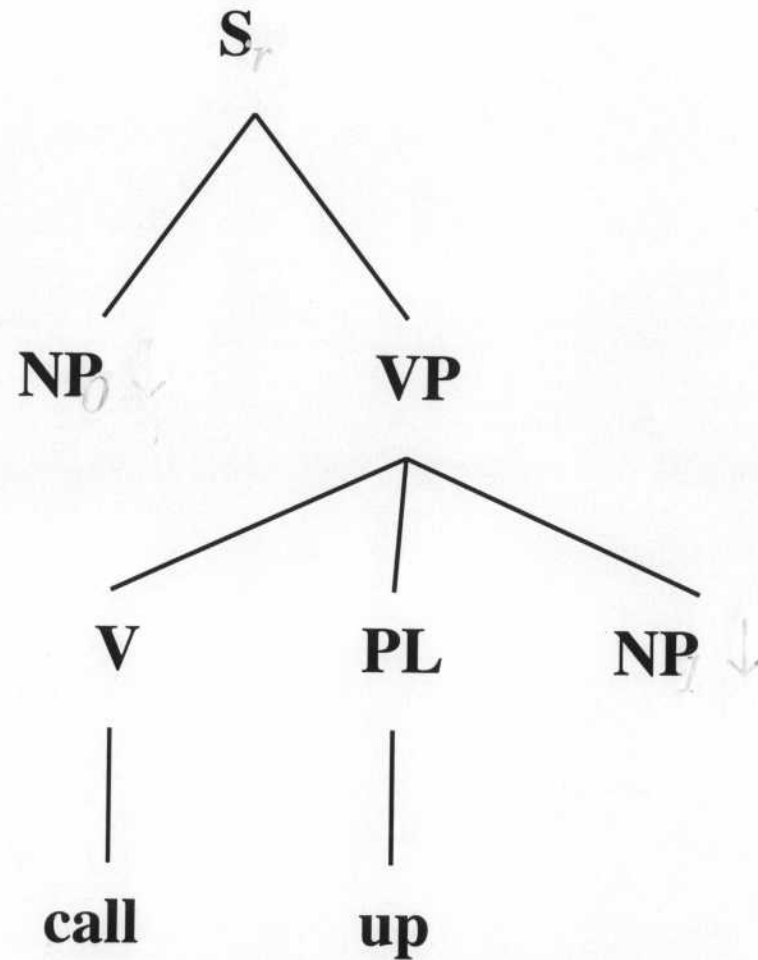
TAG BUILDING BLOCKS ("ELEMENTARY TREES")



Idioms & STUFF FOR FREE!

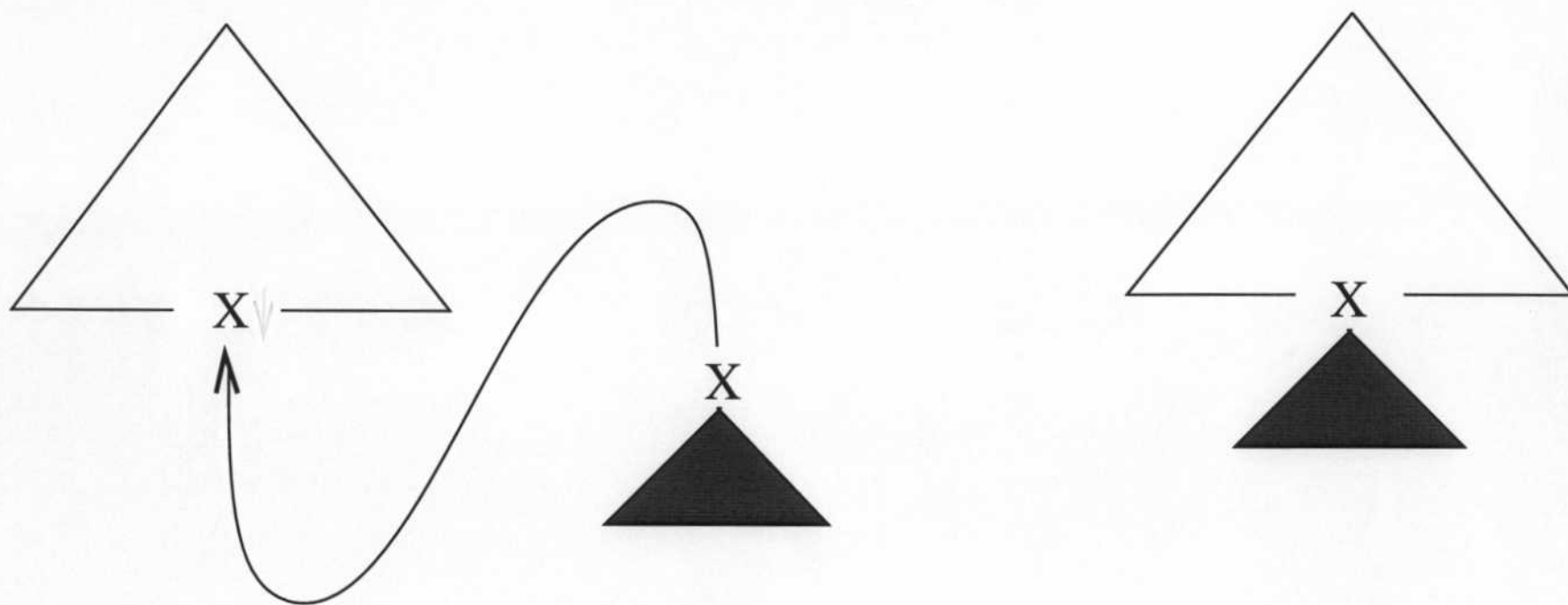


discontinuous "word"
— like a template

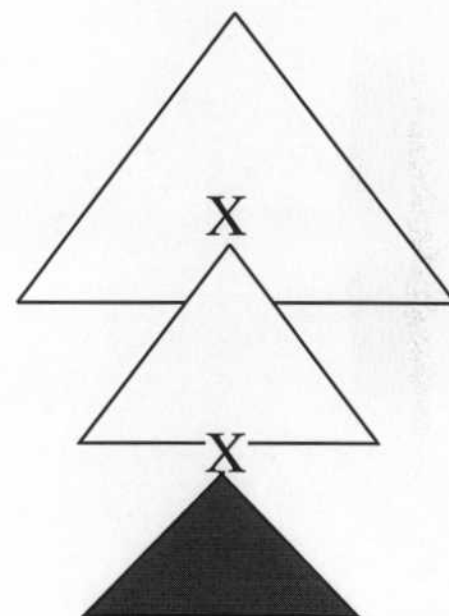
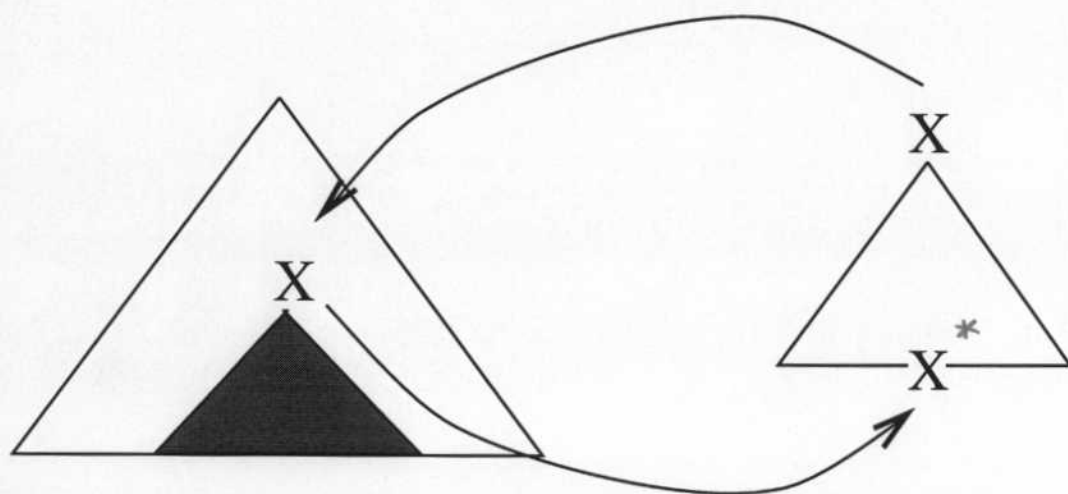


Also consider:
"kick the bucket"

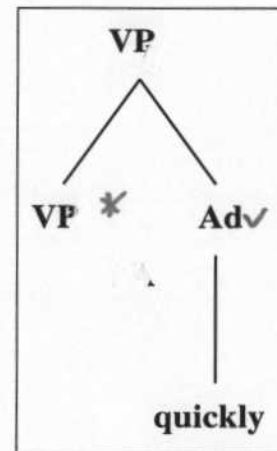
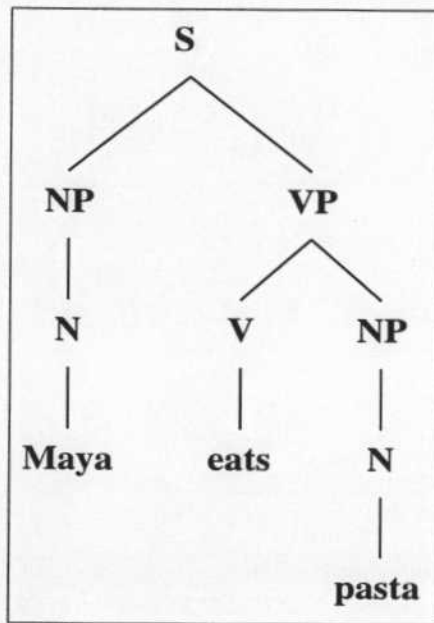
Initial Trees and Substitution



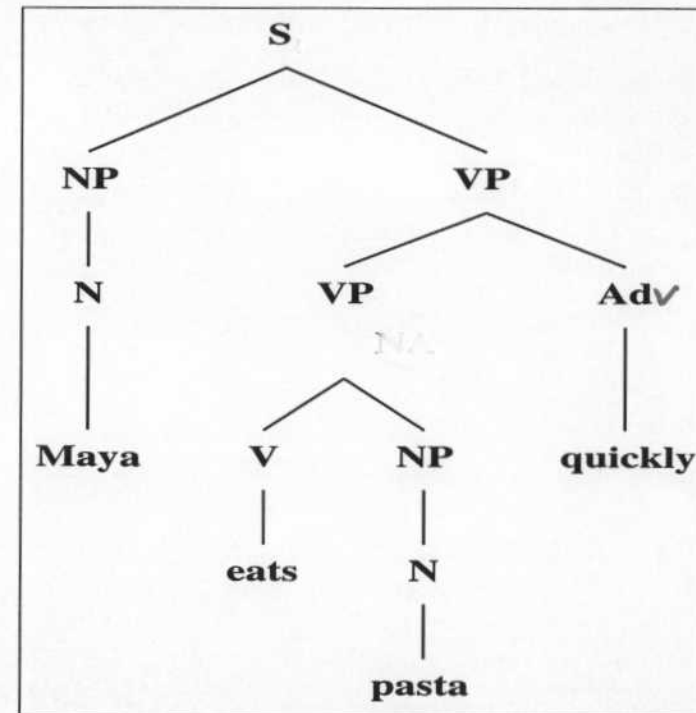
Auxiliary Trees and Adjunction



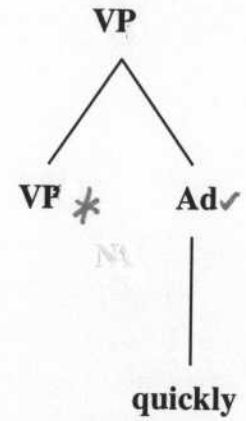
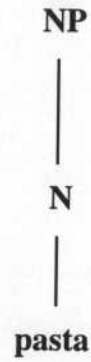
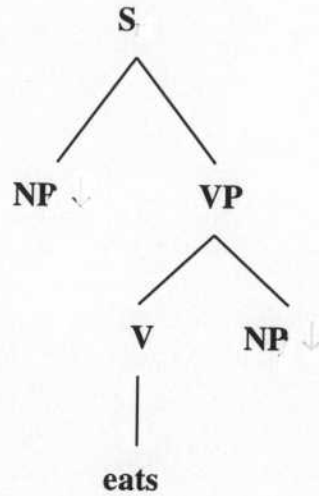
Adjunction



$\Rightarrow$

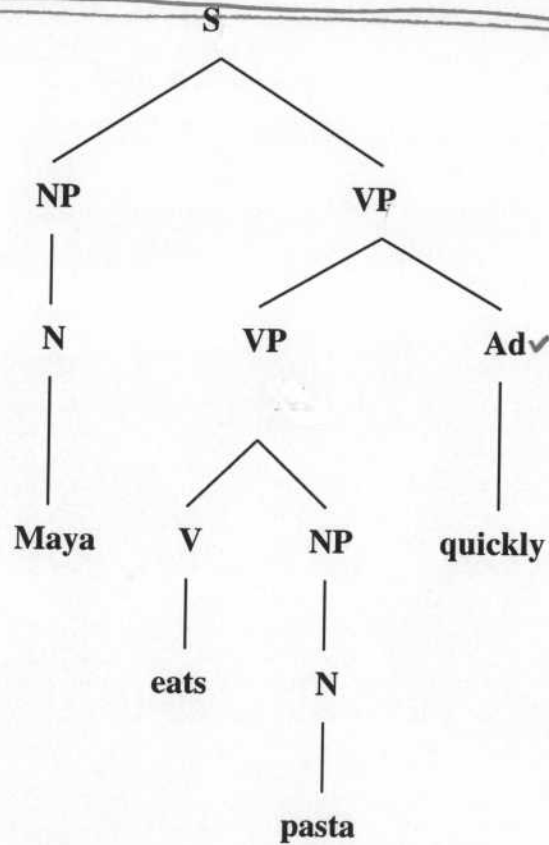


ELEMENTARY TREES



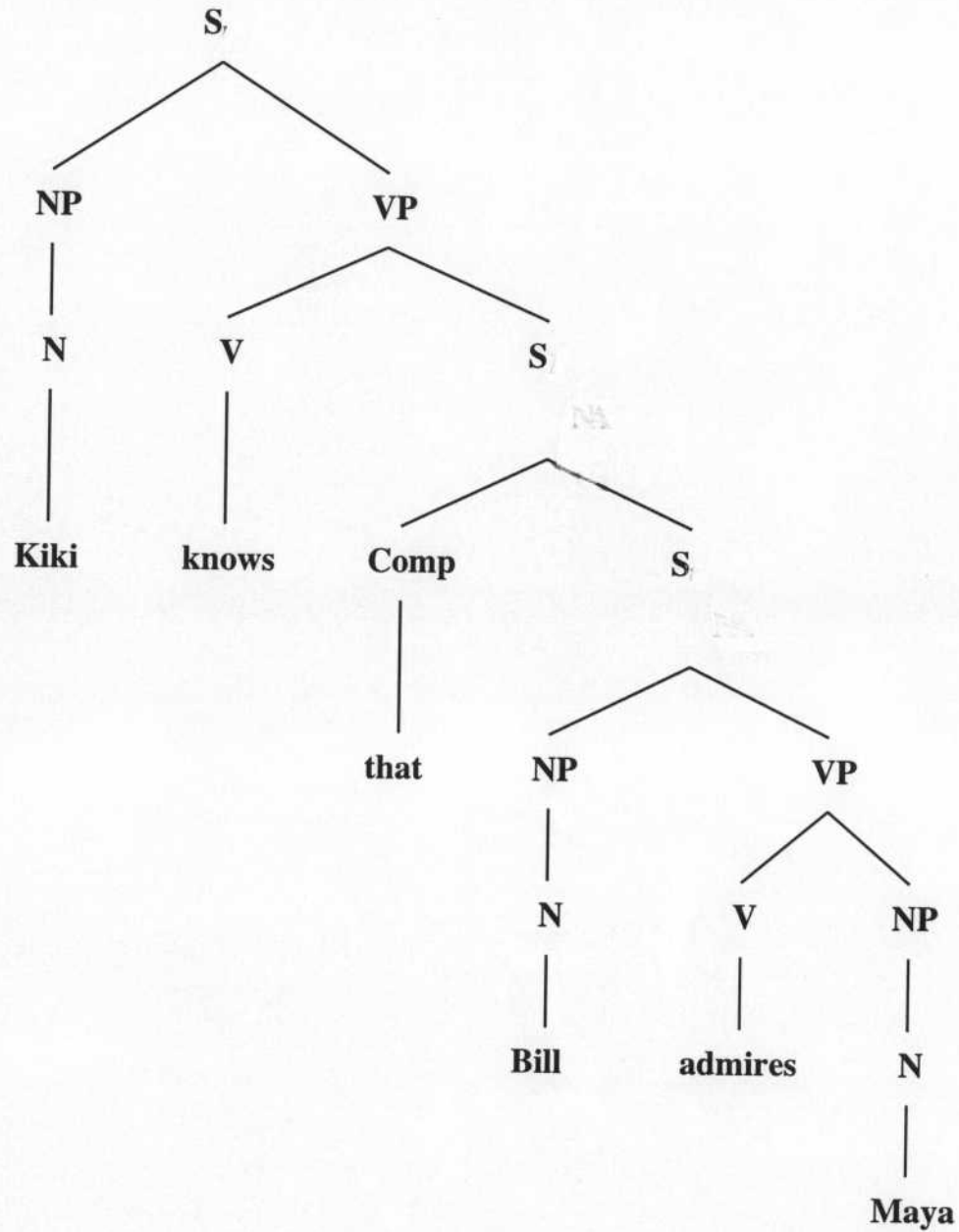
initial

auxiliary

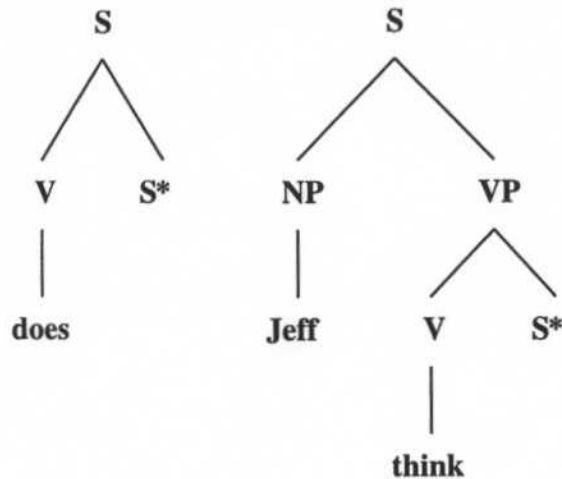
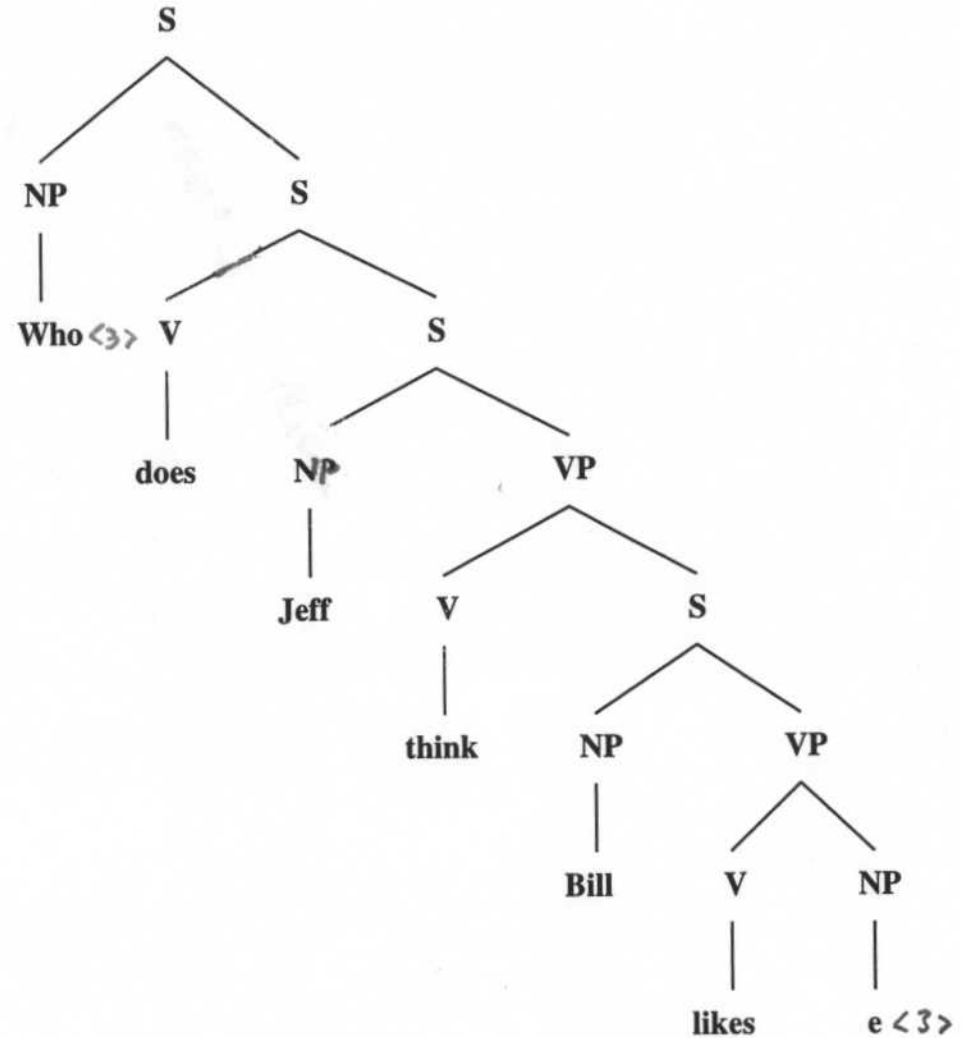
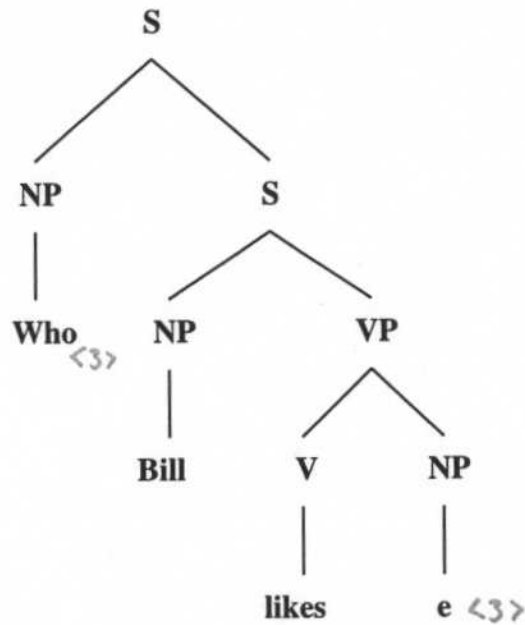


DERIVED TREE

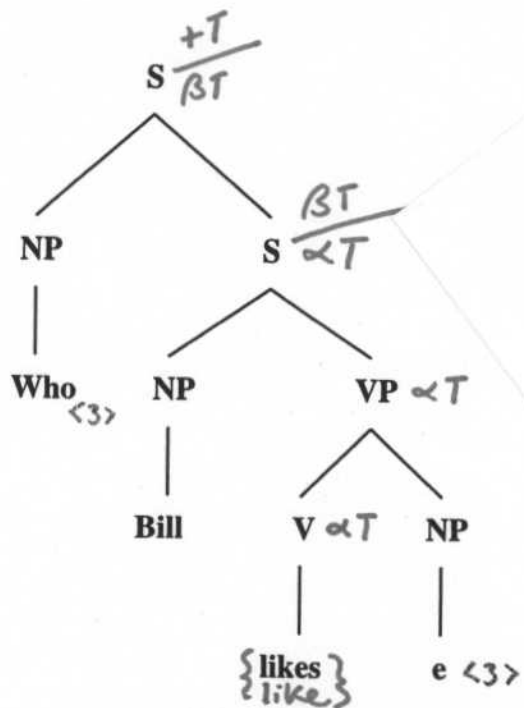
How WAS THIS TREE BUILT?



LONG-DISTANCE DEPENDENCY



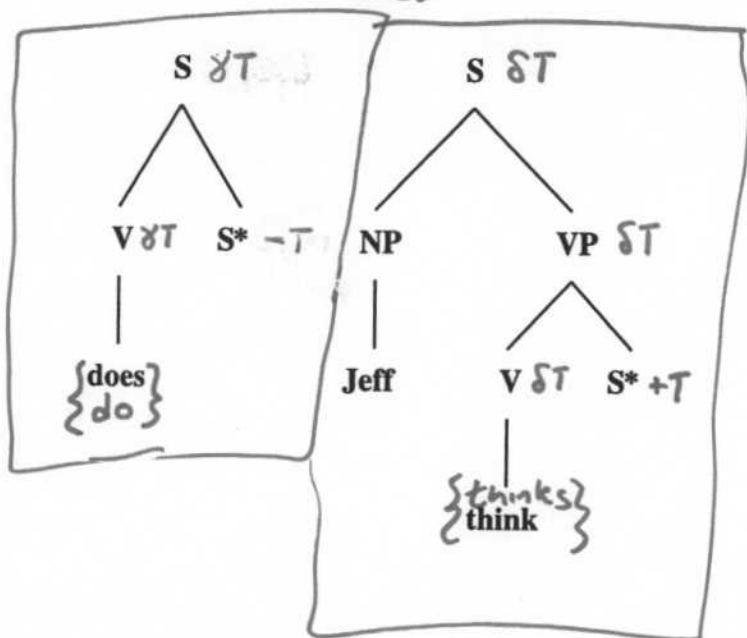
But what other trees can we get?



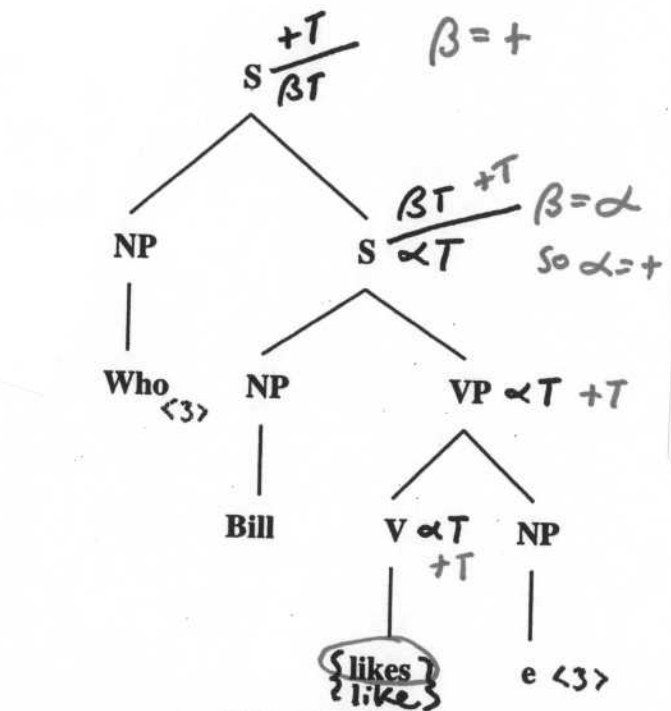
$+T$ = "tensed"
likes, is, has...

$-T$ = "untensed" (stem)
like, be, have

PUT FEATURES
ON THE
ELEMENTARY TREES

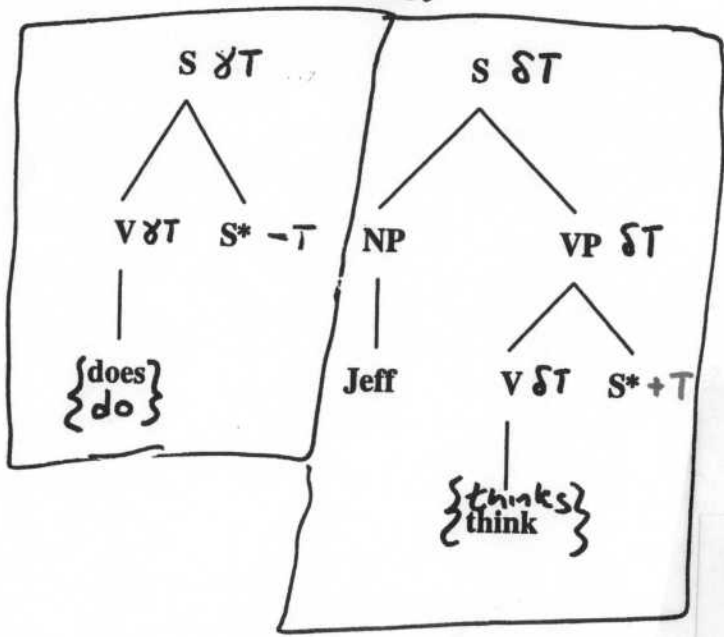


What other trees can we get?



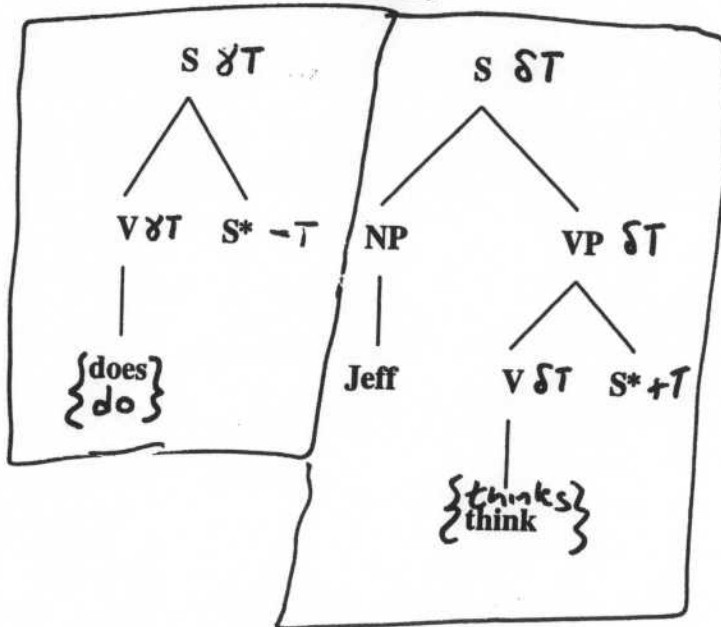
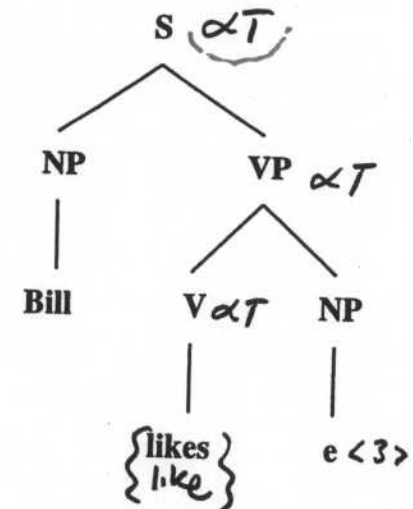
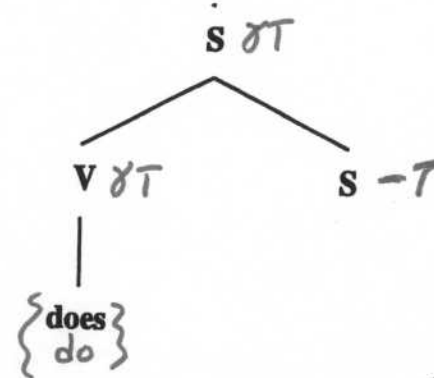
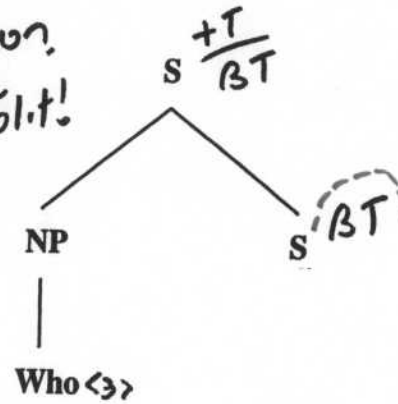
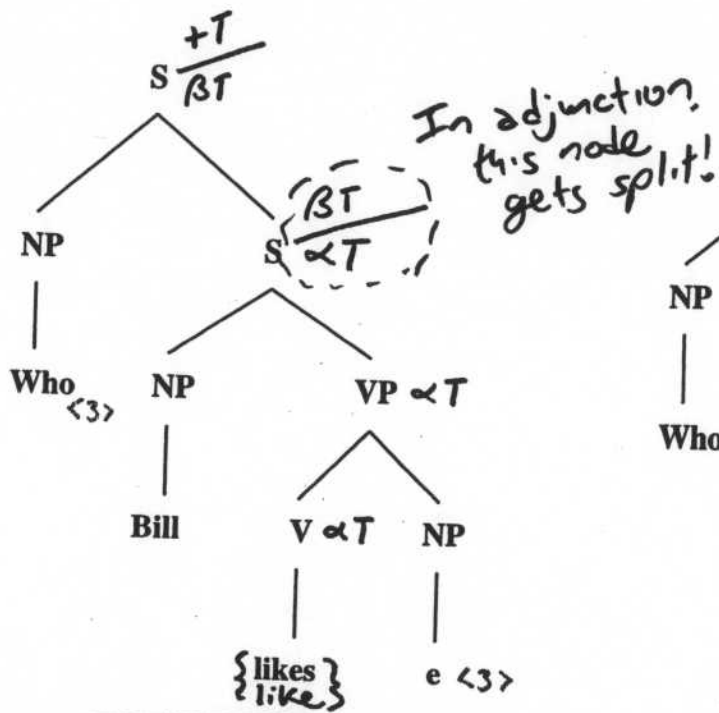
$+T$ = "tensed"
 likes, is, has...
 $-T$ = "untensed" (stem)
 like, be, have

Solve for
 α, β
 "UNIFICATION"

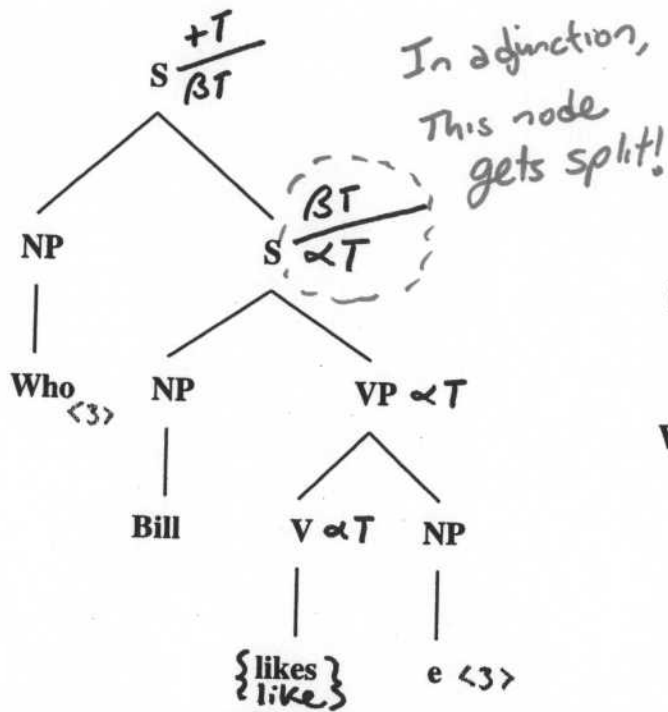


What other trees can we get?

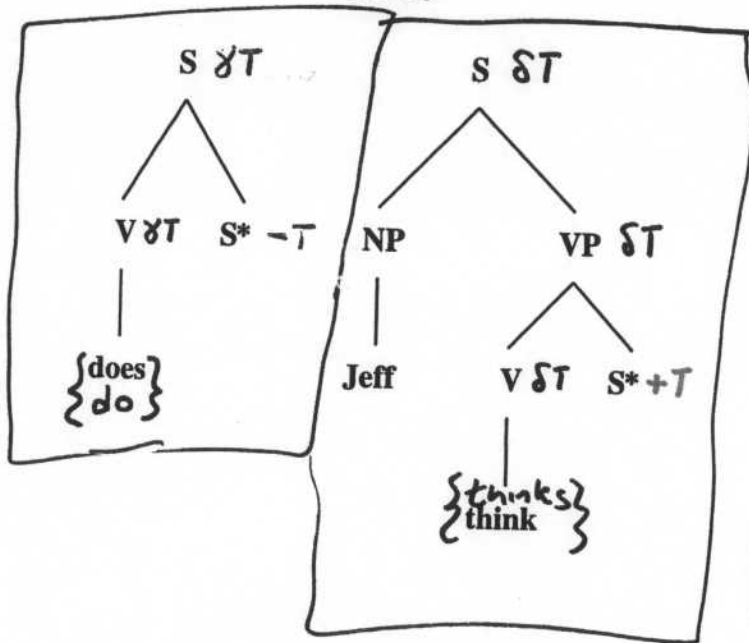
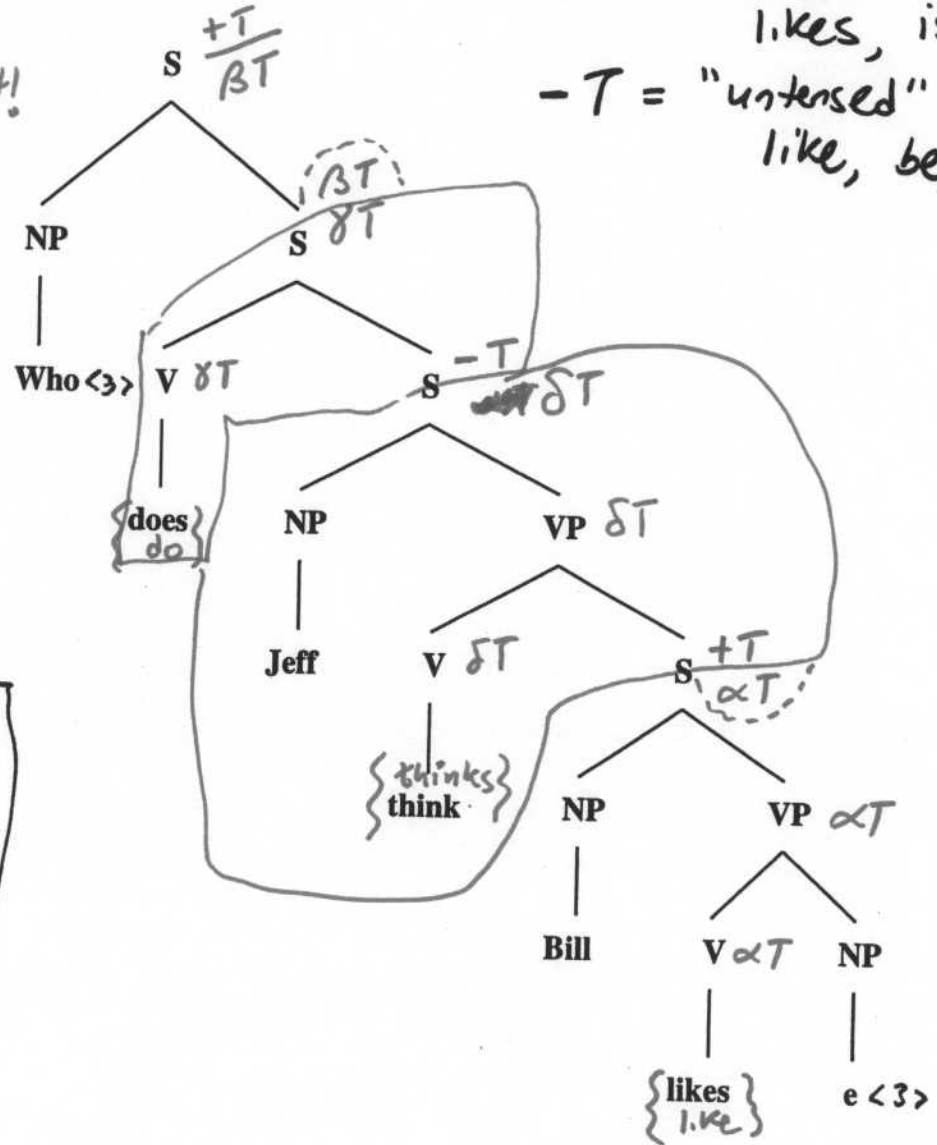
+T = "tensed"
likes, is, has...
-T = "untensed" (stem)
like, be, have



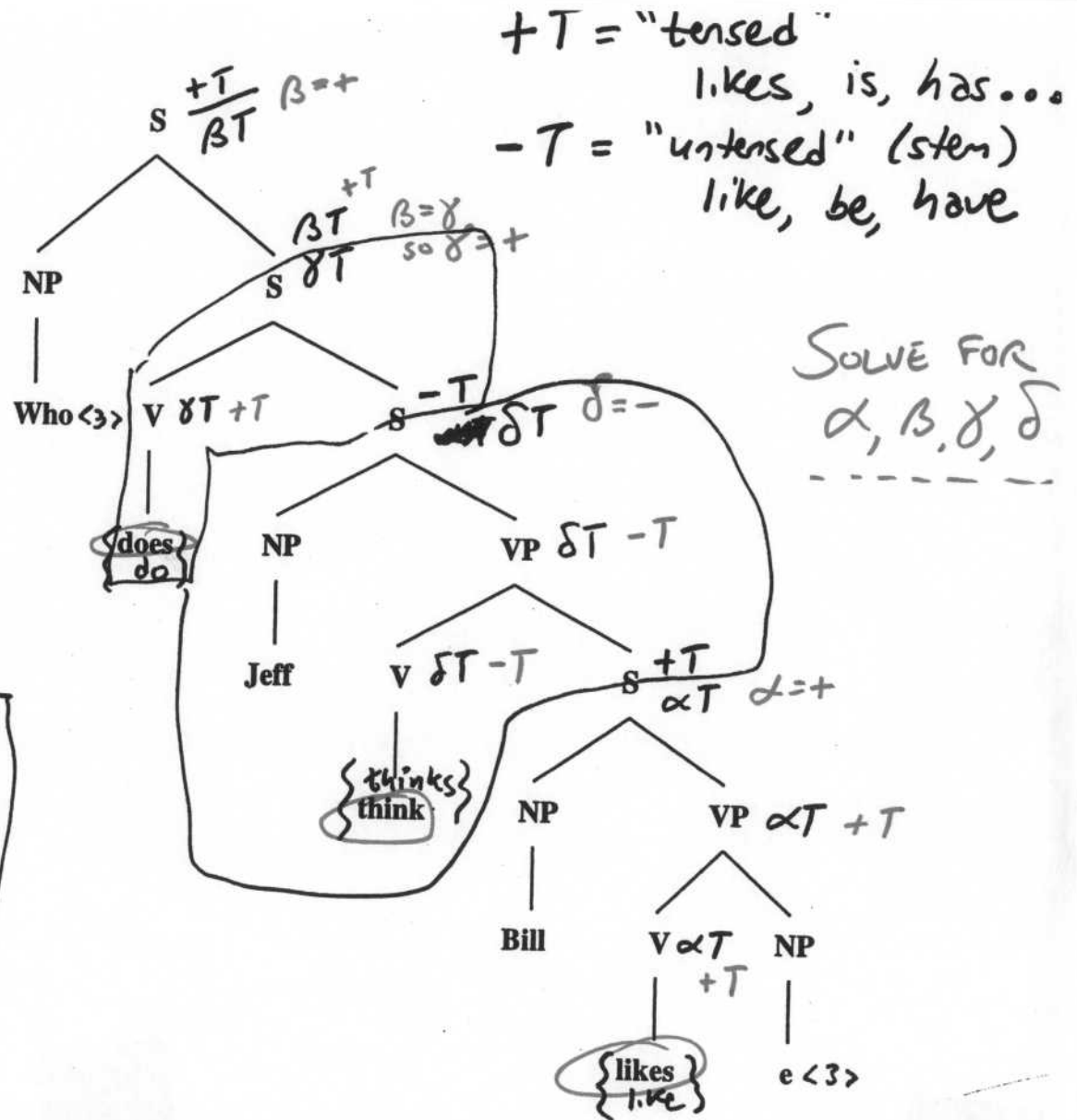
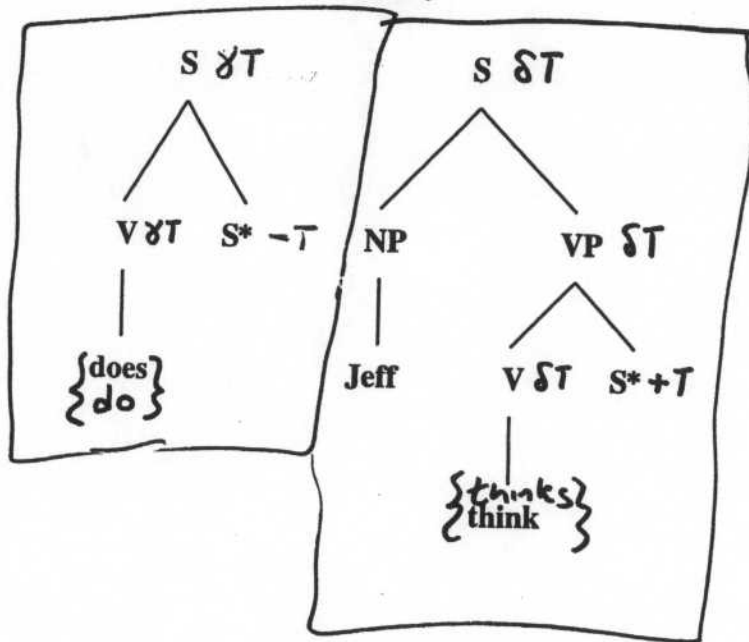
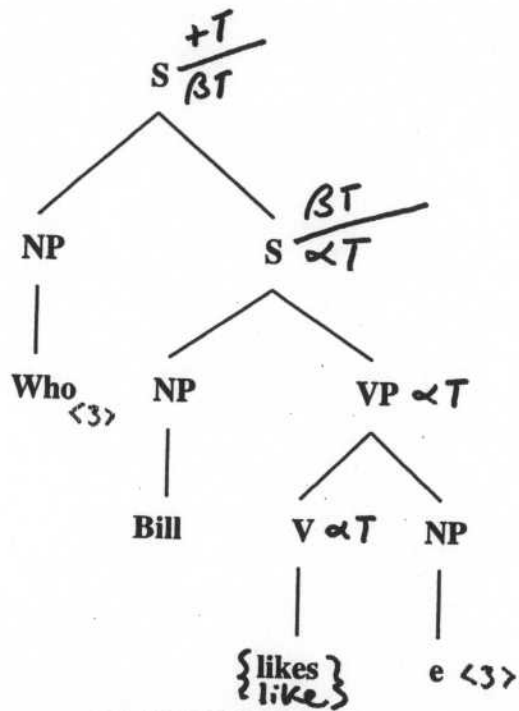
What other trees can we get?



+T = "tensed"
likes, is, has...
-T = "untensed" (stem)
like, be, have



What other trees can we get?



$+T$ = "tensed"
likes, is, has...

$-T$ = "untensed" (stem)
like, be, have

Solve for
 $\alpha, \beta, \delta, \delta$

What other trees can we get?