

(1) Tom read a book. (Chomsky 2015:10) [C,Tpres,[D,n,Tom],v\*,read,a,n,book]

- Merge n + book
- Label from Head: [n [n ] [book ]]
- Merge a + n
- Label from Head: [a [a ] [n [n ] [book ]]]
- Phi Passed from N to D
- Merge read + a
- Unlabeled: [- [read ] [a [a ] [n [n ] [book ]]]]
- Merge (for labeling) a + -
- Unlabeled: [- [a [a ] [n [n ] [book ]]] [- [read ] [a [a ] [n [n ] [book ]]]]
- Merge v\* + -
- Label from Head: [v\* [v\* ] [- [a [a ] [n [n ] [book ]]] [- [read ] [a [a ] [n [n ] [book ]]]]]]
- Pass Features v\* to read
- Passed Features: uPerson uNumber uGender Case:Acc
- Checked Features: uPerson uNumber uGender Case:Acc
- Label (Checked Phi): [read [read ] [a [a ] [n [n ] [book ]]]]
- Label via shared features: [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]
- Label from Head: [v\* [v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]
- Root movement (dephase): [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]
- Transfer: [a [a ] [n [n ] [book ]]]
- Substream
- Merge n + Tom
- Label from Head: [n [n ] [Tom ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [Tom ]]]
- Phi Passed from N to D
- Main Stream
- Merge read+v\* + D
- Unlabeled: [- [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]
- Merge Tpres + -
- Unlabeled: [- [Tpres ] [- [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]]]
- Merge (for labeling) D + -

- Label via movement: [read+v\* [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]
- Unlabeled: [- [D [D ] [n [n ] [Tom ]]] [- [Tpres ] [read+v\* [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]]]
- Merge C + \_
- Label from Head: [C [C ] [- [D [D ] [n [n ] [Tom ]]] [- [Tpres ] [read+v\* [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]]]]]
- Pass Features C to Tpres
- Passed Features: uPerson uNumber uGender Case:Nom
- Checked Features: uPerson uNumber uGender Case:Nom
- Label (Checked Phi): [Tpres [Tpres ] [read+v\* [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]]]
- Label via shared features: [Phi2 [D [D ] [n [n ] [Tom ]]] [Tpres [Tpres ] [read+v\* [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]]]]]
- Label from Head: [C [C ] [Phi2 [D [D ] [n [n ] [Tom ]]] [Tpres [Tpres ] [read+v\* [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]]]]]
- Transfer: [Phi2 [D [D ] [n [n ] [Tom ]]] [Tpres [Tpres ] [read+v\* [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]]]]]
- Transfer: [C [C ] [Phi2 [D [D ] [n [n ] [Tom ]]] [Tpres [Tpres ] [read+v\* [D [D ] [n [n ] [Tom ]]] [read+v\* [read+v\* ] [Phi1 [a [a ] [n [n ] [book ]]] [read [read ] [a [a ] [n [n ] [book ]]]]]]]]]]]]

Number of Merge Operations: 9

Number of Feature Inheritance Operations: 4

Number of Feature Checking Operations: 8

(2) They expected John to win. (Chomsky 2015:10) [C,Tpast,[D,n,they],v\*,expect,toT,[D,n,John],vUnerg,win]

- Merge vUnerg + win
- Unlabeled: [- [vUnerg ] [win ]]
- Substream
- Merge n + John
- Label from Head: [n [n ] [John ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [John ]]]
- Phi Passed from N to D
- Main Stream
- Merge \_ + D
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [- [vUnerg ] [win ]]]
- Merge toT + \_
- Unlabeled: [- [toT ] [- [D [D ] [n [n ] [John ]]] [- [vUnerg ] [win ]]]]

- Merge (for labeling) D + \_
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [- [toT ] [- [D [D ] [n [n ] [John ]]] [- [vUnerg ] [win ]]]]]
- Merge expect + \_
- Unlabeled: [- [expect ] [- [D [D ] [n [n ] [John ]]] [- [toT ] [- [D [D ] [n [n ] [John ]]] [- [vUnerg ] [win ]]]]]]]
- Merge (for labeling) D + \_
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [- [expect ] [- [D [D ] [n [n ] [John ]]] [- [toT ] [- [D [D ] [n [n ] [John ]]] [- [vUnerg ] [win ]]]]]]]
- Merge v\* + \_
- Label from Head: [v\* [v\* ] [- [D [D ] [n [n ] [John ]]] [- [expect ] [- [D [D ] [n [n ] [John ]]] [- [toT ] [- [D [D ] [n [n ] [John ]]] [- [vUnerg ] [win ]]]]]]]]
- Pass Features v\* to expect
- Passed Features: uPerson uNumber uGender Case:Acc
- Pass Features v\* to toT
- Passed Features: uPerson uNumber uGender Case:Acc
- Pass Features v\* to vUnerg
- Passed Features: uPerson uNumber uGender Case:Acc
- Pass Features v\* to win
- Passed Features: uPerson uNumber uGender Case:Acc
- Checked Features: uPerson uNumber uGender Case:Acc
- Label (Checked Phi): [vUnerg [vUnerg ] [win ]]
- Label via movement: [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]
- Label (Checked Phi): [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]
- Label via movement: [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]
- Label (Checked Phi): [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]
- Label via shared features: [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]
- Label from Head: [v\* [v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
- Root movement (dephase): [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
- Transfer: [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]
- Substream
- Merge n + they
- Label from Head: [n [n ] [they ]]

- Merge D + n
- Label from Head: [D [D ] [n [n ] [they ]]]
- Phi Passed from N to D
- Main Stream
- Merge expect+v\* + D
- Unlabeled: [- [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]
- Merge Tpast + -
- Unlabeled: [- [Tpast ] [- [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]
- Merge (for labeling) D + -
- Label via movement: [expect+v\* [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]
- Unlabeled: [- [D [D ] [n [n ] [they ]]] [- [Tpast ] [expect+v\* [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]
- Merge C + -
- Label from Head: [C [C ] [- [D [D ] [n [n ] [they ]]] [- [Tpast ] [expect+v\* [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]]
- Pass Features C to Tpast
- Passed Features: uPerson uNumber uGender Case:Nom
- Checked Features: uPerson uNumber uGender Case:Nom
- Label (Checked Phi): [Tpast [Tpast ] [expect+v\* [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]
- Label via shared features: [Phi2 [D [D ] [n [n ] [they ]]] [Tpast [Tpast ] [expect+v\* [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]
- Label from Head: [C [C ] [Phi2 [D [D ] [n [n ] [they ]]] [Tpast [Tpast ] [expect+v\* [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]
- Transfer: [Phi2 [D [D ] [n [n ] [they ]]] [Tpast [Tpast ] [expect+v\* [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]
- Transfer: [C [C ] [Phi2 [D [D ] [n [n ] [they ]]] [Tpast [Tpast ] [expect+v\* [D [D ] [n [n ] [they ]]] [expect+v\* [expect+v\* ] [Phi1 [D [D ] [n [n ] [John ]]] [expect [expect ] [toT [D [D ] [n [n ] [John ]]] [toT [toT ] [vUnerg [D [D ] [n [n ] [John ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]

Number of Merge Operations: 12

Number of Feature Inheritance Operations: 7

Number of Feature Checking Operations: 8

- (3) Who do you expect to win. (Chomsky 2015:10) [C\_Q, Tpres, [D, n, you], v\*, expect, toT, [Q, n, who], vUnerg, win]
- Merge vUnerg + win
  - Unlabeled: [- [vUnerg ] [win ]]
  - Substream
  - Merge n + who
  - Label from Head: [n [n ] [who ]]
  - Merge Q + n
  - Label from Head: [Q [Q ] [n [n ] [who ]]]
  - Phi Passed from N to D
  - Main Stream
  - Merge - + Q
  - Unlabeled: [- [Q [Q ] [n [n ] [who ]]] [- [vUnerg ] [win ]]]
  - Merge toT + -
  - Unlabeled: [- [toT ] [- [Q [Q ] [n [n ] [who ]]] [- [vUnerg ] [win ]]]]
  - Merge (for labeling) Q + -
  - Unlabeled: [- [Q [Q ] [n [n ] [who ]]] [- [toT ] [- [Q [Q ] [n [n ] [who ]]] [- [vUnerg ] [win ]]]]]]
  - Merge expect + -
  - Unlabeled: [- [expect ] [- [Q [Q ] [n [n ] [who ]]] [- [toT ] [- [Q [Q ] [n [n ] [who ]]] [- [vUnerg ] [win ]]]]]]]]
  - Merge (for labeling) Q + -
  - Unlabeled: [- [Q [Q ] [n [n ] [who ]]] [- [expect ] [- [Q [Q ] [n [n ] [who ]]] [- [toT ] [- [Q [Q ] [n [n ] [who ]]] [- [vUnerg ] [win ]]]]]]]]]]
  - Merge v\* + -
  - Label from Head: [v\* [v\* ] [- [Q [Q ] [n [n ] [who ]]] [- [expect ] [- [Q [Q ] [n [n ] [who ]]] [- [toT ] [- [Q [Q ] [n [n ] [who ]]] [- [vUnerg ] [win ]]]]]]]]]]
  - Pass Features v\* to expect
  - Passed Features: uPerson uNumber uGender Case:Acc
  - Pass Features v\* to toT
  - Passed Features: uPerson uNumber uGender Case:Acc
  - Pass Features v\* to vUnerg
  - Passed Features: uPerson uNumber uGender Case:Acc
  - Pass Features v\* to win
  - Passed Features: uPerson uNumber uGender Case:Acc
  - Checked Features: uPerson uNumber uGender Case:Acc
  - Label (Checked Phi): [vUnerg [vUnerg ] [win ]]

- Label via movement: [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]
- Label (Checked Phi): [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]
- Label via movement: [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]
- Label (Checked Phi): [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]
- Label via shared features: [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]
- Label from Head: [v\* [v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]
- Root movement (dephase): [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]
- Transfer: [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]
- Substream
- Merge n + you
- Label from Head: [n [n ] [you ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [you ]]]
- Phi Passed from N to D
- Main Stream
- Merge expect+v\* + D
- Unlabeled: [- [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
- Merge Tpres + -
- Unlabeled: [- [Tpres ] [- [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]]]
- Merge (for labeling) D + -
- Label via movement: [expect+v\* [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
- Unlabeled: [- [D [D ] [n [n ] [you ]]] [- [Tpres ] [expect+v\* [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]]]
- Merge C\_Q + -
- Label from Head: [C\_Q [C\_Q ] [- [D [D ] [n [n ] [you ]]] [- [Tpres ] [expect+v\* [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]]]
- Pass Features C\_Q to Tpres

- Passed Features: uPerson uNumber uGender Case:Nom
  - Checked Features: uPerson uNumber uGender Case:Nom uScp uQ
  - Label (Checked Phi): [Tpres [Tpres ] [expect+v\* [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
  - Label via shared features: [Phi2 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [expect+v\* [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
  - Label from Head: [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [expect+v\* [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
  - Merge (for labeling) C\_Q + Q
  - Label via shared features: [Q [Q [Q ] [n [n ] [who ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [expect+v\* [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
  - Transfer: [Q [Q [Q ] [n [n ] [who ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [expect+v\* [D [D ] [n [n ] [you ]]] [expect+v\* [expect+v\* ] [Phi1 [Q [Q ] [n [n ] [who ]]] [expect [expect ] [toT [Q [Q ] [n [n ] [who ]]] [toT [toT ] [vUnerg [Q [Q ] [n [n ] [who ]]] [vUnerg [vUnerg ] [win ]]]]]]]]]]
- Number of Merge Operations: 13
- Number of Feature Inheritance Operations: 7
- Number of Feature Checking Operations: 10

(4) What do you think that John read? [C\_Q,Tpres,[D,n,you],vUnerg,think,that,Tpast,[D,n,John],v\*,read,Q,n,what]

- Merge n + what
- Label from Head: [n [n ] [what ]]
- Merge Q + n
- Label from Head: [Q [Q ] [n [n ] [what ]]]
- Phi Passed from N to D
- Merge read + Q
- Unlabeled: [- [read ] [Q [Q ] [n [n ] [what ]]]]
- Merge (for labeling) Q + -
- Unlabeled: [- [Q [Q ] [n [n ] [what ]]] [- [read ] [Q [Q ] [n [n ] [what ]]]]
- Merge v\* + -
- Label from Head: [v\* [v\* ] [- [Q [Q ] [n [n ] [what ]]] [- [read ] [Q [Q ] [n [n ] [what ]]]]]]
- Pass Features v\* to read
- Passed Features: uPerson uNumber uGender Case:Acc
- Checked Features: uPerson uNumber uGender Case:Acc
- Label (Checked Phi): [read [read ] [Q [Q ] [n [n ] [what ]]]]
- Label via shared features: [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]

- Label from Head: [v\* [v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]
- Root movement (dephase): [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]
- Transfer: [Q [Q ] [n [n ] [what ]]]
- Substream
- Merge n + John
- Label from Head: [n [n ] [John ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [John ]]]
- Phi Passed from N to D
- Main Stream
- Merge read+v\* + D
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]
- Merge Tpast + \_
- Unlabeled: [- [Tpast ] [- [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Merge (for labeling) D + \_
- Label via movement: [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [- [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Merge that + \_
- Label from Head: [that [that ] [- [D [D ] [n [n ] [John ]]] [- [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]
- Pass Features that to Tpast
- Passed Features: uPerson uNumber uGender Case:Nom
- Checked Features: uPerson uNumber uGender Case:Nom
- Label (Checked Phi): [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Label via shared features: [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Label from Head: [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]
- Merge (due to uF) Q + \_
- Label from Head: [- [Q [Q ] [n [n ] [what ]]] [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]



- Transfer: [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Merge think + \_
- Unlabeled: [- [think ] [- [Q [Q ] [n [n ] [what ]]] [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]
- Merge (for labeling) Q + \_
- Label via movement: [that [Q [Q ] [n [n ] [what ]]] [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]
- Unlabeled: [- [Q [Q ] [n [n ] [what ]]] [- [think ] [that [Q [Q ] [n [n ] [what ]]] [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]
- Merge vUnerg + \_
- Unlabeled: [- [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [- [think ] [that [Q [Q ] [n [n ] [what ]]] [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]
- Substream
- Merge n + you
- Label from Head: [n [n ] [you ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [you ]]]
- Phi Passed from N to D
- Main Stream
- Merge \_ + D
- Unlabeled: [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [- [think ] [that [Q [Q ] [n [n ] [what ]]] [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]
- Merge Tpres + \_
- Unlabeled: [- [Tpres ] [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [- [think ] [that [Q [Q ] [n [n ] [what ]]] [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]]
- Merge (for labeling) D + \_
- Unlabeled: [- [D [D ] [n [n ] [you ]]] [- [Tpres ] [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [- [think ] [that [Q [Q ] [n [n ] [what ]]] [that [that ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]]]]
- Merge C\_Q + \_



Number of Merge Operations: 17

Number of Feature Inheritance Operations: 8

Number of Feature Checking Operations: 14

(5) What do you think John read? [C\_Q,Tpres,[D,n,you],vUnerg,think,C\_Null,Tpast,[D,n,John],v\*,read,Q,n,what]

- Merge n + what
- Label from Head: [n [n ] [what ]]
- Merge Q + n
- Label from Head: [Q [Q ] [n [n ] [what ]]]
- Phi Passed from N to D
- Merge read + Q
- Unlabeled: [- [read ] [Q [Q ] [n [n ] [what ]]]]
- Merge (for labeling) Q + -
- Unlabeled: [- [Q [Q ] [n [n ] [what ]]] [- [read ] [Q [Q ] [n [n ] [what ]]]]
- Merge v\* + -
- Label from Head: [v\* [v\* ] [- [Q [Q ] [n [n ] [what ]]] [- [read ] [Q [Q ] [n [n ] [what ]]]]]]
- Pass Features v\* to read
- Passed Features: uPerson uNumber uGender Case:Acc
- Checked Features: uPerson uNumber uGender Case:Acc
- Label (Checked Phi): [read [read ] [Q [Q ] [n [n ] [what ]]]]
- Label via shared features: [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]
- Label from Head: [v\* [v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]
- Root movement (dephase): [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]
- Transfer: [Q [Q ] [n [n ] [what ]]]
- Substream
- Merge n + John
- Label from Head: [n [n ] [John ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [John ]]]
- Phi Passed from N to D
- Main Stream
- Merge read+v\* + D
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]

- Merge Tpast + \_
- Unlabeled: [- [Tpast ] [- [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]
- Merge (for labeling) D + \_
- Label via movement: [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [- [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]
- Merge C + \_
- Label from Head: [C [C ] [- [D [D ] [n [n ] [John ]]] [- [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Pass Features C to Tpast
- Passed Features: uPerson uNumber uGender Case:Nom
- Checked Features: uPerson uNumber uGender Case:Nom
- Label (Checked Phi): [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]
- Label via shared features: [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Label from Head: [C [C ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Delete C (dephase): [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Merge (due to uF) Q + \_
- Label from Head: [- [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]
- Transfer: [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]
- Merge think + \_
- Unlabeled: [- [think ] [- [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]
- Merge (for labeling) Q + \_
- Label via movement: [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]
- Unlabeled: [- [Q [Q ] [n [n ] [what ]]] [- [think ] [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]
- Merge vUnerg + \_



- Label via movement: [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [think [think ] [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]
- Label (Checked Phi): [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [think [think ] [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]
- Label via shared features: [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [think [think ] [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]
- Label from Head: [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [think [think ] [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]
- Merge (for labeling) C\_Q + Q
- Label via shared features: [Q [Q [Q ] [n [n ] [what ]]] [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [- [Q [Q ] [n [n ] [what ]]] [think [think ] [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]
- Label via movement: [think [Q [Q ] [n [n ] [what ]]] [think [think ] [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]
- Transfer: [Q [Q [Q ] [n [n ] [what ]]] [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [think [Q [Q ] [n [n ] [what ]]] [think [think ] [Phi2 [Q [Q ] [n [n ] [what ]]] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [read+v\* [D [D ] [n [n ] [John ]]] [read+v\* [read+v\* ] [Phi1 [Q [Q ] [n [n ] [what ]]] [read [read ] [Q [Q ] [n [n ] [what ]]]]]]]]]]]]]]]]]]]

Number of Merge Operations: 17

Number of Feature Inheritance Operations: 8

Number of Feature Checking Operations: 14

(6) \*Who do you think that read the book. (Chomsky 2015:10)

[C\_Q,Tpres,[D,n,you],vUnerg,think,that,Tpast,[Q,n,who],v\*,read,the,n,book]

- Merge n + book
- Label from Head: [n [n ] [book ]]
- Merge the + n
- Label from Head: [the [the ] [n [n ] [book ]]]
- Phi Passed from N to D
- Merge read + the
- Unlabeled: [- [read ] [the [the ] [n [n ] [book ]]]]
- Merge (for labeling) the + -
- Unlabeled: [- [the [the ] [n [n ] [book ]]] [- [read ] [the [the ] [n [n ] [book ]]]]]
- Merge v\* + -

- Label from Head: [v\* [v\* ] [- [the [the ] [n [n ] [book ]]] [- [read ] [the [the ] [n [n ] [book ]]]]]]
- Pass Features v\* to read
- Passed Features: uPerson uNumber uGender Case:Acc
- Checked Features: uPerson uNumber uGender Case:Acc
- Label (Checked Phi): [read [read ] [the [the ] [n [n ] [book ]]]]
- Label via shared features: [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]
- Label from Head: [v\* [v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]
- Root movement (dephase): [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]
- Transfer: [the [the ] [n [n ] [book ]]]
- Substream
- Merge n + who
- Label from Head: [n [n ] [who ]]
- Merge Q + n
- Label from Head: [Q [Q ] [n [n ] [who ]]]
- Phi Passed from N to D
- Main Stream
- Merge read+v\* + Q
- Unlabeled: [- [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]
- Merge Tpast + \_
- Unlabeled: [- [Tpast ] [- [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]
- Merge (for labeling) Q + \_
- Label via movement: [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]
- Unlabeled: [- [Q [Q ] [n [n ] [who ]]] [- [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
- Merge that + \_
- Label from Head: [that [that ] [- [Q [Q ] [n [n ] [who ]]] [- [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
- Pass Features that to Tpast
- Passed Features: uPerson uNumber uGender Case:Nom
- Checked Features: uPerson uNumber uGender Case:Nom
- Label (Checked Phi): [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]

- Label via shared features: [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]
- Label from Head: [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]
- Remerge of Q blocked by Remerge Condition (shared features)
- Transfer: [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]
- Merge think + that
- Unlabeled: [- [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
- Merge vUnerg + \_
- Unlabeled: [- [vUnerg ] [- [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]
- Substream
- Merge n + you
- Label from Head: [n [n ] [you ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [you ]]]
- Phi Passed from N to D
- Main Stream
- Merge \_ + D
- Unlabeled: [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]
- Merge Tpres + \_
- Unlabeled: [- [Tpres ] [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]]]
- Merge (for labeling) D + \_
- Unlabeled: [- [D [D ] [n [n ] [you ]]] [- [Tpres ] [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]]]]]
- Merge C\_Q + \_
- Label from Head: [C\_Q [C\_Q ] [- [D [D ] [n [n ] [you ]]] [- [Tpres ] [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]]]]]
- Pass Features C\_Q to Tpres
- Passed Features: uPerson uNumber uGender Case:Nom



- Pass Features C\_Q to vUnerg
  - Passed Features: uPerson uNumber uGender Case:Nom
  - Pass Features C\_Q to think
  - Passed Features: uPerson uNumber uGender Case:Nom
  - Checked Features: uPerson uNumber uGender Case:Nom
  - Label (Checked Phi): [think [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
  - Label (Checked Phi): [vUnerg [vUnerg ] [think [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
  - Label via movement: [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [think [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
  - Label (Checked Phi): [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [think [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
  - Label via shared features: [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [think [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
  - Label from Head: [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [think [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
  - Crash (Unchecked Feature): [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [think [think ] [that [that ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
- Number of Merge Operations: 16
- Number of Feature Inheritance Operations: 8
- Number of Feature Checking Operations: 12

(7) Who do you think read the book? (Chomsky 2015:10)

[C\_Q,Tpres,[D,n,you],vUnerg,think,C\_Null,Tpast,[Q,n,who],v\*,read,the,n,book]

- Merge n + book
- Label from Head: [n [n ] [book ]]
- Merge the + n
- Label from Head: [the [the ] [n [n ] [book ]]]
- Phi Passed from N to D
- Merge read + the
- Unlabeled: [\_ [read ] [the [the ] [n [n ] [book ]]]]

- Merge (for labeling) the + \_
- Unlabeled: [- [the [the ] [n [n ] [book ]]] [- [read ] [the [the ] [n [n ] [book ]]]]
- Merge v\* + \_
- Label from Head: [v\* [v\* ] [- [the [the ] [n [n ] [book ]]] [- [read ] [the [the ] [n [n ] [book ]]]]]]
- Pass Features v\* to read
- Passed Features: uPerson uNumber uGender Case:Acc
- Checked Features: uPerson uNumber uGender Case:Acc
- Label (Checked Phi): [read [read ] [the [the ] [n [n ] [book ]]]]
- Label via shared features: [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]
- Label from Head: [v\* [v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]
- Root movement (dephase): [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]
- Transfer: [the [the ] [n [n ] [book ]]]
- Substream
- Merge n + who
- Label from Head: [n [n ] [who ]]
- Merge Q + n
- Label from Head: [Q [Q ] [n [n ] [who ]]]
- Phi Passed from N to D
- Main Stream
- Merge read+v\* + Q
- Unlabeled: [- [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]
- Merge Tpast + \_
- Unlabeled: [- [Tpast ] [- [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]
- Merge (for labeling) Q + \_
- Label via movement: [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]
- Unlabeled: [- [Q [Q ] [n [n ] [who ]]] [- [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]
- Merge C + \_
- Label from Head: [C [C ] [- [Q [Q ] [n [n ] [who ]]] [- [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]
- Pass Features C to Tpast
- Passed Features: uPerson uNumber uGender Case:Nom

- Checked Features: uPerson uNumber uGender Case:Nom
- Label (Checked Phi): [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]
- Label via shared features: [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]
- Label from Head: [C [C ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]
- Delete C (dephase): [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]
- Transfer: [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]
- Merge think + Phi2
- Unlabeled: [- [think ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]
- Merge (for labeling) Q + \_
- Unlabeled: [- [Q [Q ] [n [n ] [who ]]] [- [think ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]]]]]]
- Merge vUnerg + \_
- Unlabeled: [- [vUnerg ] [- [Q [Q ] [n [n ] [who ]]] [- [think ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]]]]]]
- Substream
- Merge n + you
- Label from Head: [n [n ] [you ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [you ]]]
- Phi Passed from N to D
- Main Stream
- Merge \_ + D
- Unlabeled: [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [Q [Q ] [n [n ] [who ]]] [- [think ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]]]]]]
- Merge Tpres + \_
- Unlabeled: [- [Tpres ] [- [D [D ] [n [n ] [you ]]] [- [vUnerg ] [- [Q [Q ] [n [n ] [who ]]] [- [think ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]]]]]]
- Merge (for labeling) D + \_



- Transfer: [Q [Q [Q ] [n [n ] [who ]]] [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [think [Q [Q ] [n [n ] [who ]]] [think [think ] [Phi2 [Q [Q ] [n [n ] [who ]]] [Tpast [Tpast ] [read+v\* [Q [Q ] [n [n ] [who ]]] [read+v\* [read+v\* ] [Phi1 [the [the ] [n [n ] [book ]]] [read [read ] [the [the ] [n [n ] [book ]]]]]]]]]]]]]]]]]]]]

Number of Merge Operations: 17

Number of Feature Inheritance Operations: 8

(8) \*Which dog do you wonder John likes? (Chomsky 2015:8)

- Merge n + dog
- Label from Head: [n [n ] [dog ]]
- Merge which + n
- Label from Head: [which [which ] [n [n ] [dog ]]]
- Phi Passed from N to D
- Merge like + which
- Unlabeled: [\_ [like ] [which [which ] [n [n ] [dog ]]]]
- Merge (for labeling) which + \_
- Unlabeled: [\_ [which [which ] [n [n ] [dog ]]] [\_ [like ] [which [which ] [n [n ] [dog ]]]]
- Merge v\* + \_
- Label from Head: [v\* [v\* ] [\_ [which [which ] [n [n ] [dog ]]] [\_ [like ] [which [which ] [n [n ] [dog ]]]]]]
- Pass Features v\* to like
- Passed Features: uPerson uNumber uGender Case:Acc
- Checked Features: uPerson uNumber uGender Case:Acc
- Label (Checked Phi): [like [like ] [which [which ] [n [n ] [dog ]]]]
- Label via shared features: [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]
- Label from Head: [v\* [v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]
- Root movement (dephase): [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]
- Transfer: [which [which ] [n [n ] [dog ]]]
- Substream
- Merge n + John
- Label from Head: [n [n ] [John ]]
- Merge D + n
- Label from Head: [D [D ] [n [n ] [John ]]]
- Phi Passed from N to D
- Main Stream

- Merge like+v\* + D
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]
- Merge Tpast + \_
- Unlabeled: [- [Tpast ] [- [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]
- Merge (for labeling) D + \_
- Label via movement: [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]
- Unlabeled: [- [D [D ] [n [n ] [John ]]] [- [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]
- Merge C\_Q + \_
- Label from Head: [C\_Q [C\_Q ] [- [D [D ] [n [n ] [John ]]] [- [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]
- Pass Features C\_Q to Tpast
- Passed Features: uPerson uNumber uGender Case:Nom
- Checked Features: uPerson uNumber uGender Case:Nom uScp uQ
- Label (Checked Phi): [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]
- Label via shared features: [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]
- Label from Head: [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]
- Merge (for labeling) C\_Q + which
- Label via shared features: [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]]]
- Merge wonder + Q
- Unlabeled: [- [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]]]
- Merge vUnerg + \_
- Unlabeled: [- [vUnerg ] [- [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]]]
- Substream
- Merge n + you
- Label from Head: [n [n ] [you ]]
- Merge D + n

- Label from Head: [D [D ] [n [n ] [you ]]]
- Phi Passed from N to D
- Main Stream
- Merge  $\_ + D$
- Unlabeled:  $\_ \_ [D [D ] [n [n ] [you ]]] \_ \_ [vUnerg ] \_ \_ [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v* [D [D ] [n [n ] [John ]]] [like+v* [like+v* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]$
- Merge Tpres +  $\_$
- Unlabeled:  $\_ \_ [Tpres ] \_ \_ [D [D ] [n [n ] [you ]]] \_ \_ [vUnerg ] \_ \_ [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v* [D [D ] [n [n ] [John ]]] [like+v* [like+v* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]$
- Merge (for labeling) D +  $\_$
- Unlabeled:  $\_ \_ [D [D ] [n [n ] [you ]]] \_ \_ [Tpres ] \_ \_ [D [D ] [n [n ] [you ]]] \_ \_ [vUnerg ] \_ \_ [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v* [D [D ] [n [n ] [John ]]] [like+v* [like+v* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]$
- Merge C\\_Q +  $\_$
- Label from Head:  $[C\_Q [C\_Q ] \_ \_ [D [D ] [n [n ] [you ]]] \_ \_ [Tpres ] \_ \_ [D [D ] [n [n ] [you ]]] \_ \_ [vUnerg ] \_ \_ [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v* [D [D ] [n [n ] [John ]]] [like+v* [like+v* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]$
- Pass Features C\\_Q to Tpres
- Passed Features: uPerson uNumber uGender Case:Nom
- Pass Features C\\_Q to vUnerg
- Passed Features: uPerson uNumber uGender Case:Nom
- Pass Features C\\_Q to wonder
- Passed Features: uPerson uNumber uGender Case:Nom
- Checked Features: uPerson uNumber uGender Case:Nom uQ
- Label (Checked Phi):  $[wonder [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v* [D [D ] [n [n ] [John ]]] [like+v* [like+v* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]$
- Label (Checked Phi):  $[vUnerg [vUnerg ] [wonder [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v* [D [D ] [n [n ] [John ]]] [like+v* [like+v* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]$
- Label via movement:  $[vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [wonder [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v* [D [D ] [n [n ] [John ]]] [like+v* [like+v* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]$
- Label (Checked Phi):  $[Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [wonder [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v* [D [D ] [n [n ] [John ]]] [like+v* [like+v* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]$

- Label via shared features: [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [wonder [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]
- Label from Head: [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [wonder [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]
- Merge (for labeling) C\_Q + Q
- Label via shared features: [Q [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]] [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [wonder [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]
- Transfer: [Q [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]] [C\_Q [C\_Q ] [Phi3 [D [D ] [n [n ] [you ]]] [Tpres [Tpres ] [vUnerg [D [D ] [n [n ] [you ]]] [vUnerg [vUnerg ] [wonder [wonder ] [Q [which [which ] [n [n ] [dog ]]] [C\_Q [C\_Q ] [Phi2 [D [D ] [n [n ] [John ]]] [Tpast [Tpast ] [like+v\* [D [D ] [n [n ] [John ]]] [like+v\* [like+v\* ] [Phi1 [which [which ] [n [n ] [dog ]]] [like [like ] [which [which ] [n [n ] [dog ]]]]]]]]]]]]]]]]]]]

Number of Merge Operations: 18

Number of Feature Inheritance Operations: 8

Number of Feature Checking Operations: 15

- (9) There is likely to be a man in the room. (Epstein, Kitahara, Seely 201: 468)  
[C,Tpres,v\_be,likely,toT,[n\_Expl,there],v\_be,[P\_in,the,n,room],a,n,man]

- Merge n + man
- Label from Head: [n [n ] [man ]]
- Merge a + n
- Label from Head: [a [a ] [n [n ] [man ]]]
- Phi Passed from N to D
- Substream
- Merge n + room
- Label from Head: [n [n ] [room ]]
- Merge the + n
- Label from Head: [the [the ] [n [n ] [room ]]]
- Phi Passed from N to D
- Merge P\_in + the
- Label from Head: [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]
- Pass Features P\_in to room



- Passed Features: uPerson uNumber uGender Case:Dat
- Checked Features: uPerson uNumber uGender Case:Dat
- Label from Head: [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]
- Main Stream
- Merge a + P\_in
- Merge v\_be + a
- Unlabeled: [- [v\_be ] [a [a [a ] [n [n ] [man ]]] [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]]]
- Substream
- Merge n + there
- Label from Head: [n [n ] [there ]]
- Main Stream
- Merge \_ + n
- Unlabeled: [- [n [n ] [there ]] [- [v\_be ] [a [a [a ] [n [n ] [man ]]] [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]]]]]
- Merge toT + \_
- Pass Features \_ to v\_be
- Passed Features: uPerson uNumber uGender
- Unlabeled: [- [toT ] [- [n [n ] [there ]] [- [v\_be ] [a [a [a ] [n [n ] [man ]]] [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]]]]]]]
- Merge (for labeling) n + \_
- Unlabeled: [- [n [n ] [there ]] [- [toT ] [- [n [n ] [there ]] [- [v\_be ] [a [a [a ] [n [n ] [man ]]] [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]]]]]]]]]
- Merge likely + \_
- Pass Features \_ to toT
- Passed Features: uPerson uNumber uGender
- Unlabeled: [- [likely ] [- [n [n ] [there ]] [- [toT ] [- [n [n ] [there ]] [- [v\_be ] [a [a [a ] [n [n ] [man ]]] [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]]]]]]]]]
- Merge (for labeling) n + \_
- Unlabeled: [- [n [n ] [there ]] [- [likely ] [- [n [n ] [there ]] [- [toT ] [- [n [n ] [there ]] [- [v\_be ] [a [a [a ] [n [n ] [man ]]] [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]]]]]]]]]]]
- Merge v\_be + \_
- Pass Features \_ to likely
- Passed Features: uPerson uNumber uGender
- Unlabeled: [- [v\_be ] [- [n [n ] [there ]] [- [likely ] [- [n [n ] [there ]] [- [toT ] [- [n [n ] [there ]] [- [v\_be ] [a [a [a ] [n [n ] [man ]]] [P\_in [P\_in ] [the [the ] [n [n ] [room ]]]]]]]]]]]]]]]]
- Merge (for labeling) n + \_



- Label via shared features: [Phi1 [n [n] [there]] [Tpres [Tpres] [v\_be [n [n] [there]] [v\_be [v\_be] [likely [n [n] [there]] [likely [likely] [toT [n [n] [there]] [toT [toT] [v\_be [n [n] [there]] [v\_be [v\_be] [a [a [a] [n [n] [man]]] [P\_in [P\_in] [the [the] [n [n] [room]]]]]]]]]]]]]
- Label from Head: [C [C] [Phi1 [n [n] [there]] [Tpres [Tpres] [v\_be [n [n] [there]] [v\_be [v\_be] [likely [n [n] [there]] [likely [likely] [toT [n [n] [there]] [toT [toT] [v\_be [n [n] [there]] [v\_be [v\_be] [a [a [a] [n [n] [man]]] [P\_in [P\_in] [the [the] [n [n] [room]]]]]]]]]]]]]
- Remerge of a blocked by Remerge Condition (shared features)
- Transfer: [Phi1 [n [n] [there]] [Tpres [Tpres] [v\_be [n [n] [there]] [v\_be [v\_be] [likely [n [n] [there]] [likely [likely] [toT [n [n] [there]] [toT [toT] [v\_be [n [n] [there]] [v\_be [v\_be] [a [a [a] [n [n] [man]]] [P\_in [P\_in] [the [the] [n [n] [room]]]]]]]]]]]]]
- Transfer: [C [C] [Phi1 [n [n] [there]] [Tpres [Tpres] [v\_be [n [n] [there]] [v\_be [v\_be] [likely [n [n] [there]] [likely [likely] [toT [n [n] [there]] [toT [toT] [v\_be [n [n] [there]] [v\_be [v\_be] [a [a [a] [n [n] [man]]] [P\_in [P\_in] [the [the] [n [n] [room]]]]]]]]]]]]]

Number of Merge Operations: 14

Number of Feature Checking Operations: 8