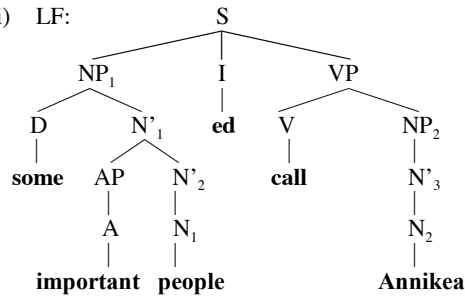


Ling 325, Practice derivations, 2/18.

(1) Some important people called Annikea.

(i) LF:

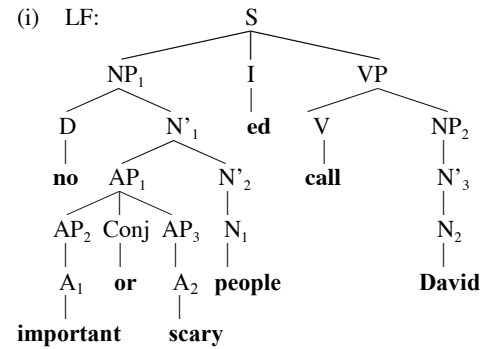


- (ii) [S] = 1 iff <[N'₁], [VP]> ∈ [D] by 11
 iff <[AP] ∩ [N'₂], [VP]> ∈ [D] by 12
 iff <[A] ∩ [N'₂], [VP]> ∈ [D] by 1
 iff <[A] ∩ [N₁], [VP]> ∈ [D] by 1
 iff <[A] ∩ [N₁], {x | <x, [NP₂]} ∈ [V]}> ∈ [D] by 10
 iff <[A] ∩ [N₁], {x | <x, [N'₃]} ∈ [V]}> ∈ [D] by 1
 iff <[A] ∩ [N₁], {x | <x, [N₂]} ∈ [V]}> ∈ [D] by 1
 iff <[important] ∩ [N₁], {x | <x, [N₂]} ∈ [V]}> ∈ [D] by 1
 iff <[important] ∩ [people], {x | <x, [N₂]} ∈ [V]}> ∈ [D] by 1
 iff <[important] ∩ [people], {x | <x, [Annikea]} ∈ [V]}> ∈ [D] by 1
 iff <[important] ∩ [people], {x | <x, [Annikea]} ∈ [call]}> ∈ [D] by 1
 iff <[important] ∩ [people], {x | <x, [Annikea]} ∈ [call]}> ∈ [some] by 1
 iff <{x | x is important} ∩ [people], {x | <x, [Annikea]} ∈ [call]}> ∈ [some] by lex. entry important
 iff <{x | x is important} ∩ {x | x is a person}, {x | <x, [Annikea]} ∈ [call]}> ∈ [some] by lex. entry person
 iff <{x | x is important} ∩ {x | x is a person}, {x | <x, Annikea} ∈ [call]}> ∈ [some] by lex. entry Annikea
 iff <{x | x is important} ∩ {x | x is a person}, {x | <x, Annikea} ∈ {<y,z> | y calls z}}> ∈ [some] by lex. entry call

- iff <{x | x is important} ∩ {x | x is a person}, {x | x calls Annikea}> ∈ [some] simplification
 iff <{x | x is important} ∩ {x | x is a person}, {x | x calls Annikea}> ∈ {<A,B> | A ∩ B ≠ ∅} by lexical entry some
 iff {x | x is important} ∩ {x | x is a person} ∩ {x | x calls Annikea} ≠ ∅ simplification

(2) No important or scary people called David.

(i) LF:

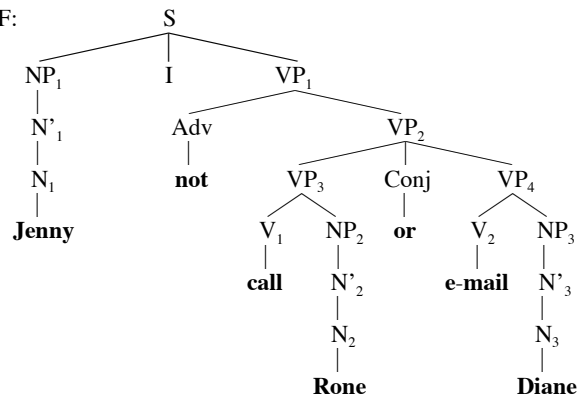


- (ii) [S] = 1 iff <[N'₁], [VP]> ∈ [D] by 11
 iff <[AP₁] ∩ [N'₂], [VP]> ∈ [D] by 12
 iff <([AP₂] ∪ [AP₃]) ∩ [N'₂], [VP]> ∈ [D] by 8
 iff <([A₁] ∪ [A₃]) ∩ [N'₂], [VP]> ∈ [D] by 1
 iff <([A₁] ∪ [A₂]) ∩ [N'₂], [VP]> ∈ [D] by 1
 iff <([A₁] ∪ [A₂]) ∩ [N'₁], [VP]> ∈ [D] by 1
 iff <([A₁] ∪ [A₂]) ∩ [N'₁], {x | <x, [NP₂]} ∈ [V]}> ∈ [D] by 10
 iff <([A₁] ∪ [A₂]) ∩ [N'₁], {x | <x, [N'₃]} ∈ [V]}> ∈ [D] by 1
 iff <([A₁] ∪ [A₂]) ∩ [N'₁], {x | <x, [N₂]} ∈ [V]}> ∈ [D] by 1
 iff <([important] ∪ [scary]) ∩ [people], {x | <x, [David]} ∈ [call]}> ∈ [no] by 1 (6 times)
 iff <({x | x is important} ∪ {x | x is scary}) ∩ {x | x is a person}, {x | <x, [David]} ∈ [call]}> ∈ [no] by lex. entries for important, scary, people

$\text{iff } \langle \{x \mid x \text{ is important} \} \cup \{x \mid x \text{ is scary} \} \rangle \cap \{x \mid x \text{ is a person} \}, \{x \mid \langle x, \text{David} \rangle \in [\mathbf{call}]\} \rangle \in [\mathbf{no}]$ by lex. entry for **David**
 $\text{iff } \langle \{x \mid x \text{ is important} \} \cup \{x \mid x \text{ is scary} \} \rangle \cap \{x \mid x \text{ is a person} \}, \{x \mid \langle x, \text{David} \rangle \in \langle \langle y, z \rangle \mid y \text{ calls } z \rangle \} \rangle \in [\mathbf{no}]$ by lex. entry for **call**
 $\text{iff } \langle \{x \mid x \text{ is important} \} \cup \{x \mid x \text{ is scary} \} \rangle \cap \{x \mid x \text{ is a person} \}, \{x \mid x \text{ calls David} \} \rangle \in [\mathbf{no}]$ simplification
 $\text{iff } \langle \{x \mid x \text{ is important} \} \cup \{x \mid x \text{ is scary} \} \rangle \cap \{x \mid x \text{ is a person} \}, \{x \mid x \text{ calls David} \} \rangle \in \langle \langle A, B \rangle \mid A \cap B = \emptyset \rangle$ by lex. entry for **no**
 $\text{iff } (\{x \mid x \text{ is important} \} \cup \{x \mid x \text{ is scary} \}) \cap \{x \mid x \text{ is a person} \} \cap \{x \mid x \text{ calls David} \} = \emptyset$ simplification

(3) Jenny did not call Rone or e-mail Diane.

(i) LF:

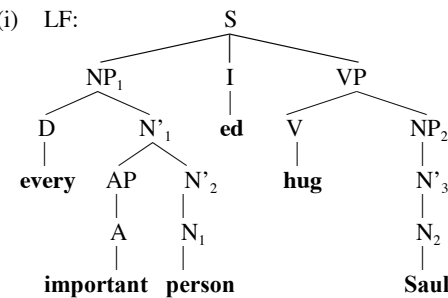


(ii) $[S] = 1$ iff $[NP_1] \in [VP_1]$ by 2
 iff $[N'_1] \in [VP_1]$ by 1
 iff $[N_1] \in [VP_1]$ by 1
 iff $[N_1] \in [VP_2]$ by 5
 iff $[N_1] \notin [VP_2]$ by def. ⁻
 iff $[N_1] \notin [VP_3] \cup [VP_4]$ by 4
 iff $[N_1] \notin \{x \mid \langle x, [NP_2] \rangle \in [V_1]\} \cup \{x \mid \langle x, [NP_3] \rangle \in [V_2]\}$ by 4

$\text{iff } [N_1] \notin \{x \mid \langle x, [N'_2] \rangle \in [V_1]\} \cup \{x \mid \langle x, [NP_3] \rangle \in [V_2]\}$ by 1
 $\text{iff } [N_1] \notin \{x \mid \langle x, [N_2] \rangle \in [V_1]\} \cup \{x \mid \langle x, [NP_3] \rangle \in [V_2]\}$ 1
 $\text{iff } [N_1] \notin \{x \mid \langle x, [N_2] \rangle \in [V_1]\} \cup \{x \mid \langle x, [N'_3] \rangle \in [V_2]\}$ by 1
 $\text{iff } [N_1] \notin \{x \mid \langle x, [N_2] \rangle \in [V_1]\} \cup \{x \mid \langle x, [N_3] \rangle \in [V_2]\}$ by 1
 $\text{iff } [\mathbf{Jenny}] \notin \{x \mid \langle x, [N_2] \rangle \in [V_1]\} \cup \{x \mid \langle x, [N_3] \rangle \in [V_2]\}$ by 1
 $\text{iff } [\mathbf{Jenny}] \notin \{x \mid \langle x, [\mathbf{Rone}] \rangle \in [V_1]\} \cup \{x \mid \langle x, [N_3] \rangle \in [V_2]\}$ by 1
 $\text{iff } [\mathbf{Jenny}] \notin \{x \mid \langle x, [\mathbf{Rone}] \rangle \in [\mathbf{call}]\} \cup \{x \mid \langle x, [N_3] \rangle \in [V_2]\}$ by 1
 $\text{iff } [\mathbf{Jenny}] \notin \{x \mid \langle x, [\mathbf{Rone}] \rangle \in [\mathbf{call}]\} \cup \{x \mid \langle x, [\mathbf{Diane}] \rangle \in [V_2]\}$ by 1
 $\text{iff } [\mathbf{Jenny}] \notin \{x \mid \langle x, [\mathbf{Rone}] \rangle \in [\mathbf{call}]\} \cup \{x \mid \langle x, [\mathbf{Diane}] \rangle \in [\mathbf{e-mail}]\}$ by 1
 $\text{iff } \mathbf{Jenny} \notin \{x \mid \langle x, [\mathbf{Rone}] \rangle \in [\mathbf{call}]\} \cup \{x \mid \langle x, [\mathbf{Diane}] \rangle \in [\mathbf{e-mail}]\}$ by l.e. **Jenn**
 $\text{iff } \mathbf{Jenny} \notin \{x \mid \langle x, \mathbf{Rone} \rangle \in [\mathbf{call}]\} \cup \{x \mid \langle x, [\mathbf{Diane}] \rangle \in [\mathbf{e-mail}]\}$ by l.e. **Rone**
 $\text{iff } \mathbf{Jenny} \notin \{x \mid \langle x, \mathbf{Rone} \rangle \in [\mathbf{call}]\} \cup \{x \mid \langle x, \mathbf{Diane} \rangle \in [\mathbf{e-mail}]\}$ by l.e. **Diane**
 $\text{iff } \mathbf{Jenny} \notin \{x \mid \langle x, \mathbf{Rone} \rangle \in \langle \langle y, z \rangle \mid y \text{ calls } z \rangle \} \cup \{x \mid \langle x, \mathbf{Diane} \rangle \in [\mathbf{e-mail}]\}$ by l.e. **call**
 $\text{iff } \mathbf{Jenny} \notin \{x \mid x \text{ calls Rone} \} \cup \{x \mid \langle x, \mathbf{Diane} \rangle \in [\mathbf{e-mail}]\}$ simplification
 $\text{iff } \mathbf{Jenny} \notin \{x \mid x \text{ calls Rone} \} \cup \{x \mid \langle x, \mathbf{Diane} \rangle \in \langle \langle y, z \rangle \mid y \text{ e-mails } z \rangle \}$ by l.e. **e-mail**
 $\text{iff } \mathbf{Jenny} \notin \{x \mid x \text{ calls Rone} \} \cup \{x \mid \mathbf{e-mails Diane} \}$ simplification

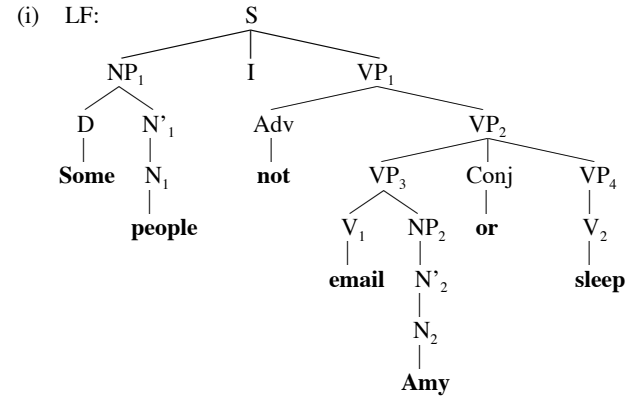
(4) Every important person hugged Saul.

(i) LF:



- (ii) [S] = 1 iff $\langle [N'_1], [VP] \rangle \in [D]$ by 11
iff $\langle [AP] \cap [N'_2], [VP] \rangle \in [D]$ by 12
iff $\langle [A] \cap [N'_2], [VP] \rangle \in [D]$ by 1
iff $\langle [A] \cap [N_1], [VP] \rangle \in [D]$ by 1
iff $\langle [A] \cap [N_1], \{x \mid \langle x, [NP_2] \rangle \in [V] \} \rangle \in [D]$ by 10
iff $\langle [A] \cap [N_1], \{x \mid \langle x, [N'_3] \rangle \in [V] \} \rangle \in [D]$ by 1
iff $\langle [A] \cap [N_1], \{x \mid \langle x, [N_2] \rangle \in [V] \} \rangle \in [D]$ by 1
iff $\langle [\text{important}] \cap [N_1], \{x \mid \langle x, [N_2] \rangle \in [V] \} \rangle \in [D]$ by 1
iff $\langle [\text{important}] \cap [\text{person}], \{x \mid \langle x, [N_2] \rangle \in [V] \} \rangle \in [D]$ by 1
iff $\langle [\text{important}] \cap [\text{person}], \{x \mid \langle x, [\text{Saul}] \rangle \in [V] \} \rangle \in [D]$ by 1
iff $\langle [\text{important}] \cap [\text{person}], \{x \mid \langle x, [\text{Saul}] \rangle \in [\text{hug}] \} \rangle \in [D]$ by 1
iff $\langle [\text{important}] \cap [\text{person}], \{x \mid \langle x, [\text{Saul}] \rangle \in [\text{hug}] \} \rangle \in [\text{every}]$ by 1
iff $\langle \{x \mid x \text{ is important} \} \cap [\text{person}], \{x \mid \langle x, [\text{Saul}] \rangle \in [\text{hug}] \} \rangle \in [\text{every}]$
by lex. entry **important**
iff $\langle \{x \mid x \text{ is important} \} \cap \{x \mid x \text{ is a person} \}, \{x \mid \langle x, [\text{Saul}] \rangle \in [\text{hug}] \} \rangle \in [\text{every}]$
by lex. entry **person**
iff $\langle \{x \mid x \text{ is important} \} \cap \{x \mid x \text{ is a person} \}, \{x \mid \langle x, \text{Saul} \rangle \in [\text{hug}] \} \rangle \in [\text{every}]$
by lex. entry **Saul**
iff $\langle \{x \mid x \text{ is important} \} \cap \{x \mid x \text{ is a person} \}, \{x \mid \langle x, \text{Saul} \rangle \in \{ \langle y, z \rangle \mid y \text{ hugs } z \} \} \rangle \in [\text{every}]$
by lex. entry **hug**
iff $\langle \{x \mid x \text{ is important} \} \cap \{x \mid x \text{ is a person} \}, \{x \mid x \text{ hugs Saul} \} \rangle \in [\text{every}]$
simplification
iff $\langle \{x \mid x \text{ is important} \} \cap \{x \mid x \text{ is a person} \}, \{x \mid x \text{ hugs } S. \} \rangle \in \{ \langle A, B \rangle \mid A \subseteq B \}$
by lexical entry **every**
iff $(\{x \mid x \text{ is important} \} \cap \{x \mid x \text{ is a person} \}) \subseteq \{x \mid x \text{ hugs Saul} \}$ simplification

(5) Some people did not e-mail Amy or sleep.



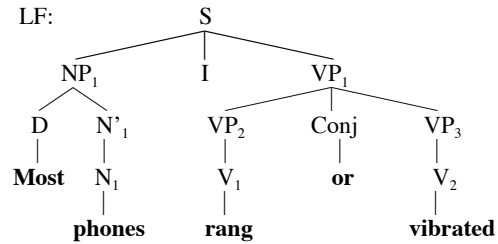
- (ii) [S] = 1 iff $\langle [N'_1], [VP] \rangle \in [D]$ by 11
iff $\langle [N_1], [VP_1] \rangle \in [D]$ by 1
iff $\langle [N_1], [VP_2] \rangle \in [D]$ by 5
iff $\langle [N_1], ([VP_3] \cup [VP_4]) \rangle \in [D]$ by 4
iff $\langle [N_1], ([VP_3] \cup [V_2]) \rangle \in [D]$ by 1
iff $\langle [N_1], (\{x \mid \langle x, [NP_2] \rangle \in [V_1] \} \cup [V_2]) \rangle \in [D]$ by 10
iff $\langle [N_1], (\{x \mid \langle x, [N'_2] \rangle \in [V_1] \} \cup [V_2]) \rangle \in [D]$ by 1
iff $\langle [N_1], (\{x \mid \langle x, [N'_2] \rangle \in [V_1] \} \cup [V_2]) \rangle \in [D]$ by 1
iff $\langle [N_1], (\{x \mid \langle x, [N_2] \rangle \in [V_1] \} \cup [V_2]) \rangle \in [D]$ by 1
iff $\langle [\text{people}], (\{x \mid \langle x, [N_2] \rangle \in [V_1] \} \cup [V_2]) \rangle \in [D]$ by 1
iff $\langle [\text{people}], (\{x \mid \langle x, [\text{Amy}] \rangle \in [V_1] \} \cup [V_2]) \rangle \in [D]$ by 1
iff $\langle [\text{people}], (\{x \mid \langle x, [\text{Amy}] \rangle \in [\text{email}] \} \cup [V_2]) \rangle \in [D]$ by 1
iff $\langle [\text{people}], (\{x \mid \langle x, [\text{Amy}] \rangle \in [\text{email}] \} \cup [\text{sleep}]) \rangle \in [D]$ by 1
iff $\langle [\text{people}], (\{x \mid \langle x, [\text{Amy}] \rangle \in [\text{email}] \} \cup [\text{sleep}]) \rangle \in [\text{some}]$ by 1
iff $\langle \{x \mid x \text{ is a person} \}, (\{x \mid \langle x, [\text{Amy}] \rangle \in [\text{email}] \} \cup [\text{sleep}]) \rangle \in [\text{some}]$
by l.e. **people**
iff $\langle \{x \mid x \text{ is a person} \}, (\{x \mid \langle x, \text{Amy} \rangle \in [\text{email}] \} \cup [\text{sleep}]) \rangle \in [\text{some}]$
by l.e. **Amy**

iff $\langle \{x \mid x \text{ is a person}\}, (\{x \mid \langle x, \text{Amy} \rangle \in \{ \langle y, z \rangle \mid y \text{ emailed } z \}) \cup [\text{sleep}]\rangle \in [\text{some}]$
 by l.e. **email**
 iff $\langle \{x \mid x \text{ is a person}\}, (\{x \mid x \text{ emailed Amy}\} \cup [\text{sleep}]) \rangle \in [\text{some}]$ simplification
 iff $\langle \{x \mid x \text{ is a person}\}, (\{x \mid x \text{ emailed Amy}\} \cup \{x \mid x \text{ sleeps}\}) \rangle \in [\text{some}]$
 by l.e. **sleep**
 iff $\langle \{x \mid x \text{ is a person}\}, (\{x \mid x \text{ emailed Amy}\} \cup \{x \mid x \text{ sleeps}\}) \rangle \in \{ \langle A, B \rangle \mid A \cap B \neq \emptyset \}$
 by l.e. **some**
 iff $\{x \mid x \text{ is a person}\} \cap (\{x \mid x \text{ emailed Amy}\} \cup \{x \mid x \text{ sleeps}\}) \neq \emptyset$
 simplification

iff $\langle \{x \mid x \text{ is a phone}\}, \{x \mid x \text{ rang}\} \cup \{x \mid x \text{ vibrated}\} \rangle \in [\text{most}]$ by l.e. **vibrated**
 iff $\langle \{x \mid x \text{ is a phone}\}, \{x \mid x \text{ rang}\} \cup \{x \mid x \text{ vibrated}\} \rangle \in \{ \langle A, B \rangle \mid |A \cap B| > |A - B| \}$
 by l.e. **most**
 iff $| \{x \mid x \text{ is a phone}\} \cap (\{x \mid x \text{ rang}\} \cup \{x \mid x \text{ vibrated}\}) | > | \{x \mid x \text{ is a phone}\} - (\{x \mid x \text{ rang}\} \cup \{x \mid x \text{ vibrated}\}) |$
 simplification

(6) Most phones rang or vibrated.

(i) LF:



(ii) $[S] = 1$ iff $\langle [N'_1], [VP] \rangle \in [D]$ by 11
 iff $\langle [N_1], [VP_1] \rangle \in [D]$ by 1
 iff $\langle [N_1], ([VP_2] \cup [VP_3]) \rangle \in [D]$ by 4
 iff $\langle [N_1], ([V_1] \cup [VP_3]) \rangle \in [D]$ by 1
 iff $\langle [N_1], [V_1] \cup [V_2] \rangle \in [D]$ by 1
 iff $\langle [N_1], [V_1] \cup [V_2] \rangle \in [D]$ by 1
 iff $\langle [\text{phones}], [V_1] \cup [V_2] \rangle \in [D]$ by 1
 iff $\langle [\text{phones}], [\text{rang}] \cup [V_2] \rangle \in [D]$ by 1
 iff $\langle [\text{phones}], [\text{rang}] \cup [\text{vibrated}] \rangle \in [D]$ by 1
 iff $\langle [\text{phones}], [\text{rang}] \cup [\text{vibrated}] \rangle \in [\text{most}]$ by 1
 iff $\langle \{x \mid x \text{ is a phone}\}, [\text{rang}] \cup [\text{vibrated}] \rangle \in [\text{most}]$ by l.e. **phone**
 iff $\langle \{x \mid x \text{ is a phone}\}, \{x \mid x \text{ rang}\} \cup [\text{vibrated}] \rangle \in [\text{most}]$ by l.e. **rang**
 iff $\langle \{x \mid x \text{ is a phone}\}, \{x \mid x \text{ rang}\} \cup \{x \mid x \text{ vibrated}\} \rangle \in [\text{most}]$ by l.e. **vibrated**