Ling 320. Assignment 6. Due 18 October 2007.

Part 1: Derivations. This assignment uses the October 11th class grammar, with one change: semantic rule (f) is generalized to cover all transitive lexical items:

(f) If α has the form YP, $[\![\alpha]\!]^s = \{x \mid <x, [\![\mathrm{ZP}]\!]^s> \in [\![\mathrm{Y_t}]\!]^s\}$.

$\mathrm{Y_t}$ ZP

(1) For any s, $[\![\mathrm{S}]\!]^s = 1$ iff

$[\![\mathrm{NP}_1]\!]^s \in [\![\mathrm{VP}_1]\!]^s$	by (a)
$[\![\mathrm{N}_1]\!]^s \in [\![\mathrm{VP}_1]\!]^s$	by (b)
$[\![\mathit{E.}]\!]^s \in [\![\mathrm{VP}_1]\!]^s$	by (b)
$\mathrm{E} \in [\![\mathrm{VP}_1]\!]^s$	by (c)
$\mathrm{E} \in [\![\mathrm{VP}_2]\!]^s\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by (d)
$\mathrm{E} \in \{x \mid <x, [\![\mathrm{NP}_2]\!]^s> \in [\![\mathrm{V_t}]\!]^s\}\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by (f)
$\mathrm{E} \in \{x \mid <x, [\![\mathrm{N}_2]\!]^s> \in [\![\mathrm{V_t}]\!]^s\}\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by (b)
$\mathrm{E} \in \{x \mid <x, [\![\mathit{G.}]\!]^s> \in [\![\mathrm{V_t}]\!]^s\}\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by (b)
$\mathrm{E} \in \{x \mid <x, \mathrm{G}> \in [\![\mathrm{V_t}]\!]^s\}\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by (c)
$\mathrm{E} \in \{x \mid <x, \mathrm{G}> \in [\![\mathit{saw}]\!]^s\}\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by (b)
$\mathrm{E} \in \{x \mid <x, \mathrm{G}> \in \{<y, z> \mid y \text{ saw } z \text{ in } s\}\}\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by (c)
$\mathrm{E} \in \{x \mid x \text{ saw G in } s\}\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by def. $\in$
$\mathrm{E} \in \{x \mid x \text{ saw G in } s\}\ [\![\mathit{and}]\!]^s\ [\![\mathrm{VP}_3]\!]^s$	by (b)
$\mathrm{E} \in \{x \mid x \text{ saw G in } s\} \cap [\![\mathrm{VP}_3]\!]^s$	by (c)
$\mathrm{E} \in \{x \mid x \text{ saw G in } s\} \cap [\![\mathrm{V}_3]\!]^s$	by (b)
$\mathrm{E} \in \{x \mid x \text{ saw G in } s\} \cap [\![\mathit{fled}]\!]^s$	by (b)
$\mathrm{E} \in \{x \mid x \text{ saw G in } s\} \cap \{x \mid x \text{ fled in } s\}$	by (c)
$\mathrm{E} \in \{x \mid x \text{ saw G and } x \text{ fled in } s\}$	by def. $\cap$
E saw G and fled in s	by def. $\in$

(2) For any s, $[\![\mathrm{S}]\!]^s = 1$ iff

$[\![\mathrm{NP}_1]\!]^s \in [\![\mathrm{VP}_1]\!]^s$	by (a)
$[\![\mathrm{N}_1]\!]^s \in [\![\mathrm{VP}_1]\!]^s$	by (b)
$[\![\mathit{MJ}]\!]^s \in [\![\mathrm{VP}_1]\!]^s$	by (b)
$\mathrm{MJ} \in [\![\mathrm{VP}_1]\!]^s$	by (c)
$\mathrm{MJ} \in (\,[\![\mathrm{VP}_2]\!]^s)\ [\![\mathrm{Neg}]\!]^s$	by (e)
$\mathrm{MJ} \in (\,[\![\mathrm{VP}_2]\!]^s)\ [\![\mathit{not}]\!]^s$	by (b)
$\mathrm{MJ} \in (\,[\![\mathrm{VP}_2]\!]^s)'$	by (c)
$\mathrm{MJ} \notin [\![\mathrm{VP}_2]\!]^s$	by def. '
$\mathrm{MJ} \notin [\![\mathrm{AP}]\!]^s$	by (b)
$\mathrm{MJ} \notin \{x \mid <x, [\![\mathrm{PP}]\!]^s> \in [\![\mathrm{A_t}]\!]^s\}$	by (f)
$\mathrm{MJ} \notin \{x \mid <x, [\![\mathrm{NP}_2]\!]^s> \in [\![\mathrm{A_t}]\!]^s\}$	by (b)
$\mathrm{MJ} \notin \{x \mid <x, [\![\mathrm{N}_2]\!]^s> \in [\![\mathrm{A_t}]\!]^s\}$	by (b)
$\mathrm{MJ} \notin \{x \mid <x, [\![\mathit{T}]\!]^s> \in [\![\mathrm{A_t}]\!]^s\}$	by (b)
$\mathrm{MJ} \notin \{x \mid <x, \mathrm{T}> \in [\![\mathrm{A_t}]\!]^s\}$	by (c)
$\mathrm{MJ} \notin \{x \mid <x, \mathrm{T}> \in [\![\mathit{afraid}]\!]^s\}$	by (b)
$\mathrm{MJ} \notin \{x \mid <x, \mathrm{T}> \in \{<y, z> \mid y \text{ is afraid of } z \text{ in } s\}\}$	by (c)
$\mathrm{MJ} \notin \{x \mid x \text{ is afraid of T in } s\}$	by def. $\in$
MJ is not afraid of T in s	by def. $\notin$

Part 2: **Conjunction**.

(i) We can account for the interpretation of conjoined APs and PPs by modifying rule (d) so that it is generalized across VP, AP, and PP:

(d) If α has the form XP_1, $[\![\alpha]\!]^s = [\![\mathrm{XP}_2]\!]^s\ [\![\mathrm{Conj}]\!]^s\ [\![\mathrm{XP}_3]\!]^s$.

XP_2 Conj XP_3

(ii) Derivation for (6):

(6) For any s, $\llbracket S \rrbracket^s = 1$ iff

$\llbracket NP_1 \rrbracket^s \in \llbracket VP_1 \rrbracket^s$	by (a)
$\llbracket N_1 \rrbracket^s \in \llbracket VP_1 \rrbracket^s$	by (b)
$\llbracket \mathit{M} \rrbracket^s \in \llbracket VP_1 \rrbracket^s$	by (b)
$M \in \llbracket VP_1 \rrbracket^s$	by (c)
$M \in (\llbracket VP_2 \rrbracket^s)\ \llbracket Neg \rrbracket^s$	by (e)
$M \in (\llbracket VP_2 \rrbracket^s)\ \llbracket \mathit{not} \rrbracket^s$	by (b)
$M \in (\llbracket VP_2 \rrbracket^s)'$	by (c)
$M \notin \llbracket VP_2 \rrbracket^s$	by def. '
$M \notin \llbracket PP_1 \rrbracket^s$	by (b)
$M \notin (\llbracket PP_2 \rrbracket^s\ \llbracket Conj \rrbracket^s\ \llbracket PP_3 \rrbracket^s)$	by (d)
$M \notin (\llbracket PP_2 \rrbracket^s\ \llbracket \mathit{or} \rrbracket^s\ \llbracket PP_3 \rrbracket^s)$	by (b)
$M \notin (\llbracket PP_2 \rrbracket^s \cup \llbracket PP_3 \rrbracket^s)$	by (c)
$M \notin (\{x \mid \langle x, \llbracket NP_2 \rrbracket^s \rangle \in \llbracket P_{t,2} \rrbracket^s\} \cup \llbracket PP_3 \rrbracket^s)$	by (f)
$M \notin (\{x \mid \langle x, \llbracket NP_2 \rrbracket^s \rangle \in \llbracket P_{t,2} \rrbracket^s \cup \llbracket PP_3 \rrbracket^s)$	by (c)
$M \notin (\{x \mid \langle x, \llbracket N_2 \rrbracket^s \rangle \in \llbracket P_{t,2} \rrbracket^s\} \cup \llbracket PP_3 \rrbracket^s)$	by (b)
$M \notin (\{x \mid \langle x, \llbracket \mathit{Mx} \rrbracket^s \rangle \in \llbracket P_{t,2} \rrbracket^s\} \cup \llbracket PP_3 \rrbracket^s)$	by (b)
$M \notin (\{x \mid \langle x, Mx \rangle \in \llbracket P_{t,2} \rrbracket^s\} \cup \llbracket PP_3 \rrbracket^s)$	by (c)
$M \notin (\{x \mid \langle x, Mx \rangle \in \llbracket \mathit{in} \rrbracket^s\} \cup \llbracket PP_3 \rrbracket^s)$	by (c)
$M \notin (\{x \mid \langle x, Mx \rangle \in \{\langle y, z \rangle \mid y \text{ is in } z \text{ in } s\}\} \cup \llbracket PP_3 \rrbracket^s)$	by (c)
$M \notin (\{x \mid x \text{ is in Mx in } s\} \cup \llbracket PP_3 \rrbracket^s)$	by def. $\in$
$M \notin (\{x \mid x \text{ is in Mx in } s\} \cup \{x \mid \langle x, \llbracket NP_3 \rrbracket^s \rangle \in \llbracket P_{t,3} \rrbracket^s\})$	by (f)
$M \notin (\{x \mid x \text{ is in Mx in } s\} \cup \{x \mid \langle x, \llbracket N_3 \rrbracket^s \rangle \in \llbracket P_{t,3} \rrbracket^s\})$	by (b)
$M \notin (\{x \mid x \text{ is in Mx in } s\} \cup \{x \mid \langle x, \llbracket \mathit{T} \rrbracket^s \rangle \in \llbracket P_{t,3} \rrbracket^s\})$	by (b)
$M \notin (\{x \mid x \text{ is in Mx in } s\} \cup \{x \mid \langle x, T \rangle \in \llbracket P_{t,3} \rrbracket^s\})$	by (c)
$M \notin (\{x \mid x \text{ is in Mx in } s\} \cup \{x \mid \langle x, T \rangle \in \llbracket \mathit{near} \rrbracket^s\})$	by (b)
$M \notin (\{x \mid x \text{ is in Mx in } s\} \cup \{x \mid \langle x, T \rangle \in \{\langle y, z \rangle \mid y \text{ is near } z \text{ in } s\}\})$	by (c)
$M \notin (\{x \mid x \text{ is in Mx in } s\} \cup \{x \mid x \text{ is near T in } s\})$	by def. $\in$
$M \notin \{x \mid x \text{ is in Mx or near T in } s\}$	by def. $\cup$
M is not in Mx or near T in s	by def. $\notin$