Lgcs 106, Semantics. Class Grammar. 11 Feb 2010.

1. Current Grammar.

(i) *Inventory of denotations*

Let D be the set of all individuals that exist in the real world. Possible denotations are:

Elements of D, the set of actual individuals.
Elements of {0,1}, the set of truth-values.
Subsets of D.
Operations on sets: Intersection (∩), Union (∪), Complement (').

(ii) *Lexicon*

N: $[\![Emery]\!]^s$ = Emery, …
V: $[\![smile]\!]^s$ = {x | smile(x)(s)}, be_1 (vacuous)
V_t: $[\![save]\!]^s$ = {<x,y> | save(x)(y)(s)}, …
A: $[\![nice]\!]^s$ = {x | nice(x)(s)}, …
A_t: $[\![fond]\!]^s$ = {<x,y> | fond(x)(y)(s)}, …
N_{pred}: $[\![cat]\!]^s$ = {x | cat(x)(s), …
$N_{pred,t}$: $[\![fan]\!]^s$ = {<x,y> | fan(x)(y)(s), …
P: $[\![around]\!]^s$ = {x | around(x)(s)}, …
P_t: $[\![near]\!]^s$ = {<x,y> | near(x)(y)(s)}, …
Conj: $[\![and]\!]^v$ = ∩, $[\![or]\!]^v$ = ∪
Neg: $[\![not]\!]^v$ = '
T: be_2 (We will neglect for now the semantic contribution of the T node.)
D: *a* (vacuous)

(iii) *Syntactic rules*

S → NP (T) VP
NP → (D) $N_{(pred)}$ NP → $N_{pred,t}$ PP
VP → V ({NP/AP/PP}) VP → V_t NP
AP → A AP → A_t PP
PP → P PP → P_t NP
XP → Neg XP, where X ∈ {N_{pred}, V, A, P}
XP → XP Conj XP, where X ∈ {N_{pred}, V, A, P}

(iv) *Semantic rules of composition*

For any situation *s*,

(a) If α has the form [$_S$ NP (T) VP], $[\![\alpha]\!]^s = 1$ iff $[\![NP]\!]^s \in [\![VP]\!]^s$.
(b) If α is a non-branching node whose daughter node is β, then $[\![\alpha]\!]^s = [\![\beta]\!]^s$.
(c) If α is a terminal node, then $[\![\alpha]\!]^s$ is specified in the lexicon.
(d) If α has the form [$_{XP1}$ XP_2 Conj XP_3], $[\![\alpha]\!]^s = [\![XP_2]\!]^s\ [\![Conj]\!]^s\ [\![XP_3]\!]^s$.
(e) If α has the form [$_{XP1}$ Neg XP_2], $[\![\alpha]\!]^s = [\![XP_2]\!]^s\ [\![Neg]\!]^s$.
(f) If α has the form [$_{YP}$ Y_t ZP], $[\![\alpha]\!]^s = \{x \mid \langle x, [\![ZP_2]\!]^s \rangle \in [\![Y_t]\!]^s$