Lgcs 106: Semantics. Lecture notes. 2 May 2011.

0. Announcements

-The final exam is scheduled for Thursday, May 12th.

1. Current Class Grammar

(i) *Inventory of denotations*

Semantic types

(a) e and t are semantic types.

(b) If σ and τ are semantic types, then $<\sigma,\tau>$ is a semantic type.

(c) Nothing else is a semantic type.

Semantic denotation domains

(a) $D_e := D$ (the set of individuals).

(b) $D_t := \{0,1\}$ (the set of truth-values).

(c) For any semantic types σ and τ, $D_{<\sigma,\tau>}$ is the set of all functions from D_σ to D_τ.

(ii) Lexicon

For any assignment g:

PrN: $[\![Alexis]\!]^g$ = Alexis, … Pron$_{wh}$: *who*.

Pron: For any index i, $[\![she_i]\!]^g = g(i)$, $[\![he_i]\!]^g = g(i)$, $[\![him_i]\!] = g(i)$, $[\![her_i]\!]^g = g(i)$, …

V:	$[\![laugh]\!]^g = [\lambda x\ .\ \text{laugh}(x)]$	A:	$[\![kind]\!]^g = [\lambda x\ .\ \text{kind}(x)]$
N:	$[\![cat]\!]^g = [\lambda x\ .\ \text{cat}(x)]$	P:	$[\![around]\!]^g = [\lambda x\ .\ \text{around}(x)]$
V:	$[\![love]\!]^g = [\lambda x\ .\ [\lambda y\ .\ \text{love}(y)(x)]]$	A:	$[\![fond]\!]^g = [\lambda x\ .\ [\lambda y\ .\ \text{fond}(y)(x)]]$
N:	$[\![part]\!]^g = [\lambda x\ .\ [\lambda y\ .\ \text{part}(y)(x)]]$	P:	$[\![above]\!]^g = [\lambda x\ .\ [\lambda y\ .\ \text{above}(y)(x)]]$

D: $[\![the]\!]^g = [\lambda f_{et} : \exists! x\ [f(x) = 1]\ .\ \iota x\ [f(x) = 1]\ ]$

$[\![every]\!]^g = [\lambda f_{et}\ .\ [\lambda g_{et}\ .$ for all x, if $f(x) = 1$, $g(x) = 1]]$

$[\![no]\!]^g = [\lambda f_{et}\ .\ [\lambda g_{et}\ .$ there is no x such that $f(x) = 1$ and $g(x) = 1]]$

$[\![a]\!]^g = [\lambda f_{et}\ .\ [\lambda g_{et}\ .$ there is an x such that $f(x) = 1$ and $g(x) = 1]]$

$[\![some]\!]^g = [\lambda f_{et}\ .\ [\lambda g_{et}\ .$ there is an x such that $f(x) = 1$ and $g(x) = 1]]$

Neg: $[\![not]\!]^g = [\lambda f_{et}\ .\ [\lambda x\ .\ f(x) = 0]]$

Conj: $[\![and_1]\!]^g$ = (given in the text, page. 44)

$[\![and_2]\!]^g = [\lambda f_{et}\ .\ [\lambda g_{et}\ .\ [\lambda x\ .\ [\![and_1]\!]^g(f(x))(g(x))]]]$

$[\![and_3]\!]^g = [\lambda f_{<et,t>}\ .\ [\lambda g_{<et,t>}\ .\ [\lambda h_{et}\ .\ [\![and_1]\!]^g(f(h))(g(h))]]]$

$[\![and_4]\!]^g = [\lambda f_{<e,et>}\ .\ [\lambda g_{<e,et>}\ .\ [\lambda x\ .\ [\lambda y\ .\ [\![and_1]\!]^g(f(y)(x))(g(y)(x))]]]]$

T: (We neglect for now the semantic contribution of tense.)

Semantically vacuous: V: *be*; D: *a*; P: *of*; C: *that*.

(iii) Syntax

TP → DP T'	T' → T VP	DP → PrN/Pron	DP → D NP
VP → V (DP)	PP → P (DP)	AP → A (PP)	NP → N (PP)
NP → AP NP	NP → NP PP	NP → NP CP	VP → V AP/PP/DP
CP → C TP	XP → Neg XP, where X ∈ {V, A, P, D}.		
X → X Conj'	Conj' → Conj X, where X ∈ {V(P), A(P), P(P), DP}.		

Wh-Movement

Raise a Pron$_{wh}$ to the left of C, leaving a co-indexed trace in its original position.

(iv) Semantic rules of composition. For any assignment g, and index i:

(a) *Functional Application* (FA)
If α is a branching node, $\{\beta, \gamma\}$ are its daughters, and $[\![\beta]\!]^g$ is a function whose domain contains $[\![\gamma]\!]^g$, then $[\![\alpha]\!]^g = [\![\beta]\!]^g([\![\gamma]\!]^g)$.

(b) *Non-Branching Nodes* (NN)
If α is a non-branching node whose daughter node is β, then $[\![\alpha]\!]^g = [\![\beta]\!]^g$.

(c) *Terminal Nodes* (TN)
If α is a terminal node, then $[\![\alpha]\!]^g$ is specified in the lexicon.

(d) *Predicate Modification* (PM)
If α is a branching node, $\{\beta, \gamma\}$ are its daughters, and $[\![\beta]\!]^g$ and $[\![\gamma]\!]^g$ are functions of type et, then $[\![\gamma]\!]^g = [\lambda x\ .\ [\![\alpha]\!]^g(x) = 1$ and $[\![\beta]\!]^g(x) = 1]$.

(e) *Predicate Abstraction* (PA)
If α is a branching node whose daughters are a relative pronoun and β, then $[\![\alpha]\!]^g = [\lambda x\ .\ [\![\beta]\!]^{g[1\to x]}]$.

(v) *Type-shifting rules*

(a) For every lexical item α_1 with a meaning of type e, there is a homophonous and syntactically identical item α_2 with the following meaning of type $<et,t>$:
$[\![\alpha_2]\!]^g = [\lambda f_{et}\ .\ f([\![\alpha_1]\!]^g) = 1]$

(b) For every lexical item α_1 with a meaning of type $<e,et>$, there is a homophonous and syntactically identical item α_2 with the following meaning of type $<<et,t>,et>$: $[\![\alpha_2]\!]^g = [\lambda f_{<et,t>}\ .\ [\lambda x\ .\ f([\lambda y\ .\ [\![\alpha_1]\!]^g(y)(x) = 1]) = 1]]$.

Part 1: Derivations: Presuppositions and Pronouns

Assume that g = [1→Alexis, 2→Hyomin].

Derive the truth-conditions for:

(1) [$_{DPS}$ Every student] saw [$_{DPO}$ the snake near her$_2$].

(i) Provide the tree structure for (1), and the semantics types for each node.

(ii) Solve for the subject $[\![DP_S]\!]^g$.

(iii) Solve for the object $[\![DP_O]\!]^g$.

(iv) Solve for $[\![VP]\!]^g$.

(v) Solve for $[\![TP]\!]^g$.

(vi) Is *her*$_2$ a bound variable pronoun, or a referential pronoun?

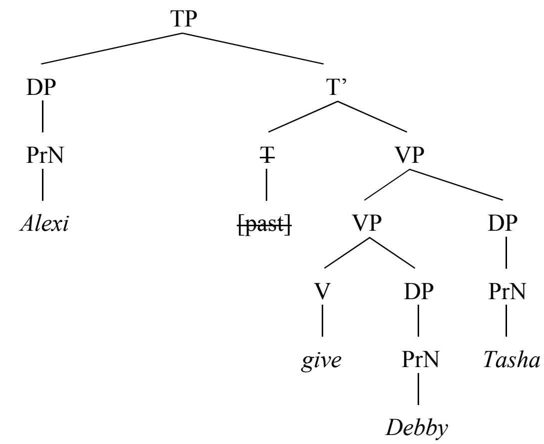
Part 2: Double Objects Again

Our grammar does not yet account for verbs that take more than one object: Consider now:

(2) Alexis gave Debby Tasha.

We can assume the following binary branching structure for this sentence:

Thus:



(v) Posit a semantics for $[\![give]\!]^g$, given this structure.

(vi) Give the semantic type of each node.

(vii) Derive the truth-conditions for the whole sentence.

(viii) Posit a derived semantics for $[\![give_2]\!]^g$, given two quantificational DP objects:

(3) Alexis showed a visitor every building.