Lgcs 106, Semantics. Class Grammar. 24 Feb 2010.

0. Announcements
-Assignment 4: Due next Wednesday.

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; Elements of {0,1}; Subsets of D; Subsets of DxD; Subsets of {A | A ⊆ D}; Subsets of {<A,B> | A,B ⊆ D }; ∩, ∪, '.

(ii) *Lexicon*

N_{pn}: $[\![Emery]\!]^s$ = Emery or $[\![Emery]\!]^s = \{A \mid \text{Emery} \in A\}$…
V: $[\![smile]\!]^s = \{x \mid \text{smile}(x)(s)\}$, be_1 (vacuous)
V_t: $[\![save]\!]^s = \{<x,y> \mid \text{save}(x)(y)(s)\}$, …
A: $[\![nice]\!]^s = \{x \mid \text{nice}(x)(s)\}$, …
A_t: $[\![fond]\!]^s = \{<x,y> \mid \text{fond}(x)(y)(s)\}$, …
N: $[\![cat]\!]^s = \{x \mid \text{cat}(x)(s)\}$, …
N_t: $[\![fan]\!]^s = \{<x,y> \mid \text{fan}(x)(y)(s)\}$, …
P: $[\![around]\!]^s = \{x \mid \text{around}(x)(s)\}$, …
P_t: $[\![near]\!]^s = \{<x,y> \mid \text{near}(x)(y)(s)\}$, …
Conj: $[\![and]\!]^s = \cap$, $[\![or]\!]^s = \cup$
Neg: $[\![not]\!]^s = '$
T: be_2 (We will neglect for now the semantic contribution of the T node.)
D: a_1 (vacuous)
$[\![some]\!]^s = \{<A,B> \mid A \cap B \neq \emptyset\}$; $[\![no]\!]^s = \{<A,B> \mid A \cap B = \emptyset\}$;
$[\![every]\!]^s = \{<A,B> \mid A \subseteq B\}$; $[\![two]\!]^s = \{<A,B> \mid |A \cap B| \geq 2\}$;
$[\![a]\!]^s = \{<A,B> \mid |A \cap B| \geq 1\}$; $[\![one]\!]^s = \{<A,B> \mid |A \cap B| \geq 1\}$.

(iii) *Syntactic rules*

S → DP (T) VP	DP → D NP	NP → N_{pn}
NP → N	NP → N_t PP	NP → AP NP
NP → NP PP	VP → V ({DP/AP/PP})	VP → V_t NP
AP → A	AP → A_t PP	PP → P
PP → P_t NP	XP → Neg XP, X ∈ {V, A, P, D}	
XP → XP Conj XP, X ∈ {N, V, A, P, D}		

(iv) *Semantic rules of composition*

For any situation *s*,
(a) If α has the form $[_S$ DP (T) VP], $[\![\alpha]\!]^s = 1$ iff $[\![VP]\!]^s \in [\![DP]\!]^s$ }.
(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], $[\![\alpha]\!]^s = \{x \mid <x, [\![ZP_2]\!]^s> \in [\![Y_t]\!]^s\}$.
(g) If α has the form $[_{YP/ZP}$ YP ZP], $[\![\alpha]\!]^s = [\![YP]\!]^s \cap [\![ZP]\!]^s$.
(h) If α has the form $[_{DP}$ D NP], $[\![\alpha]\!]^s = \{A \mid < [\![NP]\!]^s, A> \in [\![D]\!]^s\}$.

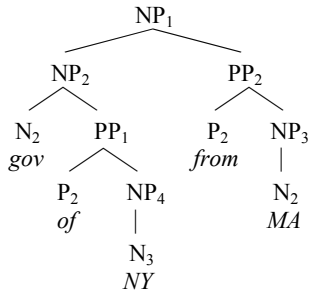
2. Practice

(1) Mats and Karen are running.
(2) Not every man on Earth is wise.

3. Arguments (Complements) vs. Modifiers (Adjuncts).

It has often been observed that there are two kinds of PPs that occur within an NP; consider for example *governor of New York from Massachusetts*. These two PPs have semantically distinct functions; the first, *of NY*, is an **argument** of *governor*, while the second, *from MA*, **modifies** *governor of NY*. These two PPs occur is different positions within a syntactic tree, and are interpreted by different semantic rules:

(3)



The first PP, *of NY*, is an **argument**. It is sister to the N *governor*, and denotes an individual, since *of* is vacuous. This PP combines with *governor* by rule (f).

The second type of PP, *from MA*, is a **modifier**. It is sister to NP, and denotes a set. In this case, the P, *from*, is **not** vacuous, and the whole PP *from MA* denotes a set of individuals. This PP combines with its sister by rule (g), set intersection.

Rule (g) is sometimes called *intersective modification*, since it uses set-theoretic intersection. This rule is general enough to cover stacked PP modifiers in unlimited numbers:

(4) Kaline is a cat [from Texas] [in LA] [near Tom]...

In each case, the modifier provides further restriction on the set denoted by the NP modified.

Arguments and modifiers, then, differ both semantically and syntactically. Syntactically, arguments are sisters to N, while modifiers are sisters to NP:

(5) $NP \rightarrow N_t\ PP$ (6) $NP \rightarrow NP\ PP$

As a result, arguments always precede modifiers, and, likewise, modifiers may occur iteratively (or *stack*), while arguments may only occur once. This is consistent with their semantics, where modifiers combine with the NP they modify by intersection, and thus the rule can apply more than once. (See class discussion.)

4. Assignment 4. Quantifiers in Object Position.

Part 1. Provide derivations for the following sentences:

(7) No ship near Hawaii sank.
(8) Every discussion of Max was surprising.
(9) Alexis and a professor are working.

Part 2. Our grammar does not account for quantificational DPs in object position:

(10) Alexis visited every planet.

(i) Propose a new syntactic rule to account for (10).

(ii) Given your new rule, provide the syntactic tree for (10).

(iii) Propose a new semantic rule to account for (10).

(iv) Using your new semantic rule, derive the truth-conditions for (10).

5. Subtypes of Predicates: Stage-level and Individual-level

The basic distinction (Milsark 1974, Carlson 1977):

(11) Some policemen are	available	intelligent	
	naked	handsome	
	in the cruiser	nice guys	
(12) We saw some policemen	available	#intelligent	
	naked	#handsome	
	in the cruiser	#nice guys	
	eat donuts	#love donuts	
	read Latin	#know Latin	
(13) There are some policemen	available	#intelligent	
	naked	#handsome	
	in the cruiser	#nice guys	
	eating donuts	#loving donuts	
	reading Latin	#knowing Latin	
(14) Some policemen were	available	#intelligent	in my office.
	naked	#handsome	
	in the cruiser	#nice guys	
	ate donuts	#loved donuts	
	read Latin	#knew Latin	
(15) Some policemen were	available	#intelligent	last night.
	naked	#handsome	
	in the cruiser	#nice guys	
	ate donuts	#loved donuts	
	read Latin	#knew Latin	
(16) He (was)	available	intelligent	
	naked	handsome	
	in the cruiser	a nice guy	
	ate donuts	loved donuts	
	read Latin	knew Latin	

From Carlson (1977):

"The notion that individuals are simple, straightforward sorts of things, is a notion that has been known to be simply wrong for a very long time… somehow we may count an infant and a retired fireman as 'the same' individual, even though the infant and the retired fireman have virtually nothing directly observable in common… In our world of people, cities, refrigerators, and plants, under normal circumstances we are not at all struck by the observation that our notion of an individual is really very elusive and abstract…"

"Suppose that [predicates] are ... predicated of *different sorts of things*. Suppose we take an individual, Jake, and look at him as being composed of a set of Jake-stages, or temporally-bounded portions of Jake's existence. There is more to Jake, however, than a set of stages. There is whatever it is that ties all these stages together to make them stages of the same thing. Let us call this whatever-it-is the individual Jake. [Some] predicates… then are not predicated of individuals, but of stages of individuals; and [others] are predicated of the individual, or the thing that ties all the stages together. Now these "stages" can be short or long in duration, but they are nonetheless perceived as parts of a whole. Thus the apparently temporary nature of such predication…"

"A stage is conceived of as being, roughly, a spatially and temporally bounded manifestation of something... An individual, then, is (at least) that whatever-it-is that ties a series of stages together to make them stages of the same thing."