

## Names and Predicates in Natural Language. Part I

### 1. Preliminaries.

- Our leading goal: to implement the Fregean program for natural language sentence structures as represented in modern syntactic theory (in particular, in GB).

(1) The Principle of Compositionality: The meaning of a complex expression is determined by the meaning of its parts and the way those parts are combined.

⇒ Meaning of the parts: for the time being, only names and verbal predicates ( $V_{intr}$ ,  $V_{trans}$ , VP).  
§2. LEXICON.

⇒ The way those parts are combined: §3. SEMANTIC RULES OF COMBINATION.

### 2. The Lexikon: Denotations of simple words.

- Names: a name denotes always the same individual, no matter which world we are in (that is, for the purpose of this course, we treat names as “rigid designators”).

(2) World  $w_{100}$ :  
U = {Ann, Betty, Connor}

(3)  $[[\text{Connor}]]^{w_{100}} = \text{Connor}$   
 $[[\text{Ann}]]^{w_{100}} = \text{Ann}$

(4) World  $w_{101}$ :  
U = {Connor, Dan, Effi, Greg}

(5)  $[[\text{Connor}]]^{w_{101}} = \text{Connor}$   
 $[[\text{Ann}]]^{w_{101}}$  is undefined.

- Predicates: their denotation may vary from world to world.

(6) World  $w_{100}$ :  
U = {Ann, Betty, Connor}  
Betty and Connor smoke; Ann doesn't.

(7)  $[[\text{smoke}]]^{w_{100}} = \{\text{Betty, Connor}\}$   
 $= \{x: x \text{ smokes in } w_{100}\}$

QUESTION 1: Give the denotation of **kiss** (in both variants) in world  $w_{100}$ . Do the same for **assign**.

(8) World  $w_{100}$ :  
 $U = \{Ann, Betty, Connor\}$   
 Ann kisses Ann, Ann kisses Betty, and Betty kisses Connor.  
 Ann assigns Ann to Connor, Betty assigns Ann to Betty, Betty assigns Betty to Ann, and Connor assigns Betty to Betty.

(9)  $[[\mathbf{kiss}]]^{w_{100}} =$   
 $=$

(10)  $[[\mathbf{assign}]]^{w_{100}} =$   
 $=$

### 3. The semantic rules: how the meanings of words are combined.

■ Combining a subject NP with the VP:

(11) For any arbitrary NP, VP and world  $w$

$$\begin{array}{c} \text{IP} \\ \text{r} \quad \cup \\ \text{NP} \quad \text{VP} \end{array} \quad \begin{array}{c} w \\ \\ \\ \end{array} = 1 \quad \text{iff} \quad [[\text{NP}]]^w \in [[\text{VP}]]^w$$

QUESTION 2: Take the denotation of **kiss** in  $w$  to be the set of pairs in (9). What is the denotation of VP in (12)? And what is the semantic contribution of the rule merging the V and the NPob into the VP?

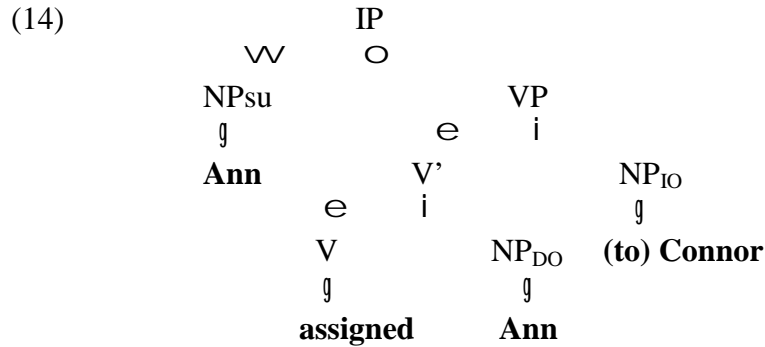
(12)

$w$	$\circ$		
NP <sub>su</sub>		VP	
g		e	i
<b>John</b>		V	NP <sub>ob</sub>
		g	g
		<b>kisses</b>	<b>Mary</b>

(13) For any arbitrary  $V_{\text{trans}}$ , NP and world  $w$

$$\begin{array}{c} \text{VP} \\ \text{r} \quad \cup \\ \text{V}_{\text{trans}} \quad \text{NP} \end{array} \quad \begin{array}{c} w \\ \\ \\ \end{array} =$$

EXERCISE 1: With the 3-place predicate **assign**, we have three levels of NP embedding: least embedded (=NP subject), middle embedded (= NP indirect object), and most embedded (= NP direct object). For the least embedded, we can use the rule in (11). For the middle embedded, we can use the rule we gave in (13). What is the rule combining the most embedded NP (=the NP direct object) with the ditransitive verb **assign**? And what is the resulting denotation of V'?



(15) For any arbitrary  $V_{\text{ditrans}}$ , NP and world  $w$

$$\begin{array}{ccc}
 & \text{VP} & \\
 \downarrow & \cup & \\
 V_{\text{ditrans}} & \text{NP} & \\
 & & w =
 \end{array}$$