

SPR 4106 Syntax and semantics in formal terms

Chapters 7–8 “Propositions” – “Intensions” : 5 essentials

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Situations of Evaluation = Possible Worlds = the Stuff that Sentence Meanings are Made of

The extension of a sentence at a situation is a truth value.

- For example: $\llbracket \text{Jan Garbarek is a linguist} \rrbracket_s = 0$
if s is 'our', 'the actual' situation, or world.

But what if we remove the s index?

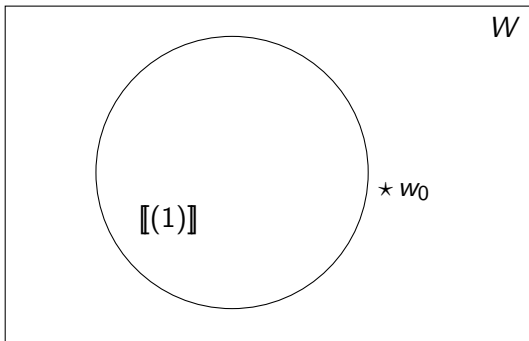
Then we get the meaning, or **intension**, of the sentence:
a function from situations to truth values, equivalently,
the set of situations at which the extension is 1

- $\llbracket \text{Jan Garbarek is a linguist} \rrbracket = \{ w : \text{JG is a linguist in } w \}$

Possible Worlds are Valuable Tools, Part I

Certain meanings can only be defined in terms of possible worlds:

- (1) Jan Garbarek is a linguist.
- (2) Jan Garbarek might have been a linguist.



Possible Worlds are Valuable Tools, Part II

Sense relations must be defined in terms of possible worlds

For a to be a **hyponym** of b , or for a and b to be **incompatible**, it is not enough that $\llbracket a \rrbracket_{@}$ is a subset of $\llbracket b \rrbracket_{@}$, or that the intersection of $\llbracket a \rrbracket_{@}$ and $\llbracket b \rrbracket_{@}$ is empty—

(3) $\sqrt{\text{I dreamt that I was history's first female priest.}}$

we need to say that *for all worlds w ,*

- $\llbracket a \rrbracket_w \subseteq \llbracket b \rrbracket_w$ (hyponymy) or
- $\llbracket a \rrbracket_w \cap \llbracket b \rrbracket_w = \emptyset$ (incompatibility)

(4) $? \text{I dreamt I had a round angular hammer that was a sickel.}$

Material Implication and its Limits

(5) If she's 20 she's too young.

The truth table for (5) according to material implication:

she's 20	she's too young	if she's 20 she's too young
1	1	1
1	0	0
0	1	1
0	0	1

- True as soon as she is at least 21 – close enough
- But a **counterfactual** like (6) will come out true no matter:

(6) If she were 21 she'd be old enough.

Propositional Attitude Verbs and Intensional Composition

The extension of a propositional attitude verb, *believe*:

$$\llbracket \text{believe} \rrbracket_w = \{ \langle x, p \rangle : B_{x,w} \subseteq p \}$$

where $B_{x,w}$ is the set of belief worlds of x in w

- (7) Her husband believes that she is seeing an old friend.

The composition principle **intensional plugging in**:

If the extension of a is a set of pairs $\langle x, p \rangle$ where x is an individual and p is a proposition and the extension of b is a truth value, then

$$\llbracket a + b \rrbracket_w = \{ x : \langle x, \llbracket b \rrbracket \rangle \in \llbracket a \rrbracket_w \}$$

$\llbracket b \rrbracket$ is the **intension** of b .