SPR 4106 Syntax and semantics in formal terms

Chapter 4 "Introducing Extensions": 5 Essentials

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Introducing Extensions: Extensions for Words and Phrases

Extensions are **meanings** relativized to **situations**

- The meaning function $[\![\cdot]\!]$ (only introduced in Chapter 5)
- Whatever expression you put in, you get its meaning out
- Extensions are relative to situations: $[\![\cdot]\!]_s$

Extensions for Words and Phrases: Referential Expressions

Referential expressions (names, definites, . . .) denote **individuals**

- Extensions of proper names are insensitive to situations:

  for all s_1, s_2,

  $$[\![\,\text{Cairo}\,]\!]_{s_1} = [\![\,\text{Cairo}\,]\!]_{s_2}$$

- Extensions of definite descriptions are sensitive to situations:

  for some s_1, s_2,

  $$[\![\,\text{the capital of Egypt}\,]\!]_{s_1} \neq [\![\,\text{the capital of Egypt}\,]\!]_{s_2}$$

Extensions for Words and Phrases: Common Nouns

Common nouns denote **sets of** (pairs of) **individuals** . . .

- Sortal nouns denote sets of individuals:

  $[\![\text{city}]\!]_s = \{ x : x \text{ is a city in } s \}$

- Relational nouns denote sets of pairs of individuals:

  $[\![\text{citizen}]\!]_s = \{ \langle x, y \rangle : y \text{ is a citizen of } x \text{ in } s \}$

  - Functional nouns denote sets of pairs $\langle x, y \rangle$ where each x corresponds to only one y:

    $[\![\text{capital}]\!]_s = \{ \langle x, y \rangle : y \text{ is the capital of } x \text{ in } s \}$

. . . and so do **adjectives** (only introduced in Chapter 5)

Extensions for Words and Phrases: Verbs

Verbs denote **sets of** (pairs or triples of) **individuals** . . .

- Intransitive verbs denote sets of individuals:

  $[\![\text{stink}]\!]_s = \{ x : x \text{ stinks in } s \}$

- Transitive verbs denote sets of pairs of individuals:

  $[\![\text{covet}]\!]_s = \{ \langle x, y \rangle : x \text{ covets } y \text{ in } s \}$

- Ditransitive verbs denote sets of triples of individuals:

  $[\![\text{envy}]\!]_s = \{ \langle x, y, z \rangle : x \text{ envies } z \; y \text{ in } s \}$

. . . and intransitive verb phrases denote sets of individuals too

Extensions for Sentences: Truth Values

Sentences denote **truth values**: either 1 (true) or 0 (false)

- If the sentence is a referential term + an intransitive VP, the truth value is determined by checking whether the individual which is the extension of the former is a member of the set which is the extension of the latter:

  $[\![\,\text{Kari loves Per}\,]\!]_s = 1$ if and only if

  $[\![\,\text{Kari}\,]\!]_s \in [\![\,\text{loves Per}\,]\!]_s$, that is, if and only if

  $k \in \{\, x : x \text{ loves } p \text{ in } s \,\}$

. . . more in Chapter 5!