Lecture #6

24.979 Topics in Semantics

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Today:

- Wrap up plural definite descriptions

Future lectures:

- Exhaustification (and so-called free choice occurrences of *any*)
- Explanatory approaches to *any*

Some puzzles and three families of approaches to them

(1)   a.   The soldiers with any siege experience were fired.

          b.   The soldiers with any siege experience met on the field.

(2)   a.   The soldiers with any siege experience surrounded the fort.

          b.   ?The soldiers with any siege experience weighed 900 kg.

Two families of approaches to these puzzles:

- DP-centered approaches
- S-centered approaches

Mitya's third family of approaches:

- Intermediate (between DP- and S-centered) approaches?

  (Intuition: we might avoid some pitfalls for the DP-centered approaches discussed, such as those involving singular definite description, partitives.)

Starting point: Conjunction and collectivity

So-called plurality-coordination problem (Winter 2001, among others)

(3)   a.   John and Bill met in the hallway.
      b.   John and Bill surrounded the fort.

(4)   John read a book and loves Mary.

(5)   a. $[\![\text{and}_{(e(ee))}]\!] = \lambda x.\ \lambda y.\ x+y$
      b. $[\![\text{and}_{(et)((et)t)}]\!] = \lambda P.\ \lambda Q.\ \lambda x.\ P(x) \land Q(x)$

1. Winter (and also Champollion): We need only the latter and its ilk (see, e.g., Krifka and Lasersohn for the other direction, discussed in Winter 2001). This approach will allow us to cook up Mitya's intermediate approach.

2. Schein (cf. also Hirsch): We need only sentential conjunction. This will guide us in spelling out our final S-centered approach.

Intermediate Winter-inspired approach

Winter, paraphrased (cf. Fox 2015)

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(6)   John and Mary met.

(7) $[\![\text{and}_{(et)((et)t)}]\!] = \lambda P.\ \lambda Q.\ \lambda x.\ P(x) \wedge Q(x)$

Two type-shifting operators: G and $\exists$ (Winter 2001, Sect. 2.3)

(8) $[\![\text{G John}]\!] = \lambda x.\ \text{John} \sqsubseteq x$, $[\![\text{G Mary}]\!] = \lambda x.\ \text{Mary} \sqsubseteq x$

(9) $[\![[\text{G John}]\ [\text{and}\ [\text{G Mary}]]]\!] = \lambda x.\ \text{John} \sqsubseteq x \wedge \text{Mary} \sqsubseteq x$

(10) $[\![\exists\ [[\text{G John}]\ [\text{and}\ [\text{G Mary}]]]]\!] = \lambda P. \exists x\ (\text{John} \sqsubseteq x \wedge \text{Mary} \sqsubseteq x \wedge P(x))$

Putting all the pieces together

(11) $[\![[\exists\ [[\text{G John}]\ [\text{and}\ [\text{G Mary}]]]\ \text{met}]\!] = 1$ iff
         $\exists x(\text{John} \sqsubseteq x \wedge \text{Mary} \sqsubseteq x \wedge \text{meet}(x))$ $(\Rightarrow \text{meet}(j+m))$

(Yes, this non-exhaustive interpretation is too weak. We shelve this for 2 slides.)

Back to any: type-shifting in the absence of conjunction

Acceptability of *any*

(12)   a.   The soldiers with any siege experience surrounded the fort.
          b.   [∃ [G [the soldiers with any siege experience]] surrounded the fort]

(13)   a. $\lambda x.$ [[the soldiers with any siege experience]] $\sqsubseteq x$
          b. $\Rightarrow_s \lambda x.$ [[the soldiers with any considerable siege experience]] $\sqsubseteq x$

Two SER constituents (as it stands)

(14)   [G [the soldiers with any siege experience]] is SER with respect to [any siege experience].

(15)   [∃ [G [the soldiers with any siege experience]] surrounded the fort] is SER with respect to [any siege experience].

Back to any

Some positive consequences:

1. Cross-speaker variation and markedness (Gajewski 2016)

2. Incompatibility with existential partitives

(16)   a. #Some of the soldiers with any experience were fired.
       b.   Some of [(#∃) [(#G) [the soldiers with any experiences]]] …

(17)   #Some of some/all/∅ soldiers were fired.

3. Difference in acceptability of singular vs. plural definite descriptions

(Remaining issues: What about (tentative) variation among predicates? Does adding exhaustiveness affect our conclusions?)

Problem with non-exhaustiveness

Instance 1

(18)   a. #John met in the hallway.
        b. [∃ [G John] [met in the hallway]]
        c. $\exists x(\text{John} \sqsubseteq x \wedge \text{meet}(x))$

Instance 2

(19)   a. The soldiers with any siege experience surrounded the fort.
        b. [∃ [G [the soldiers with any siege experience]] surrounded the fort]
        c. $\exists x(\llbracket\text{the soldiers with any experience}\rrbracket)\sqsubseteq x \wedge \text{surround}(f)(x))$

(20)   a. John and Mary surrounded the fort.
        b. [∃ [[G John] [and [G Mary]]] surrounded the fort]
        c. $\exists x(\text{John} \sqsubseteq x \wedge \text{Mary} \sqsubseteq x \wedge \text{surround}(f)(x))$

Eliminating non-exhaustiveness

Resolution via a third covert operator: exh

(21) $\llbracket$exh S$\rrbracket = 1$ iff $\llbracket$S$\rrbracket = 1 \wedge \forall$S'$\in$ALT(S): $\llbracket$S'$\rrbracket = 1 \rightarrow$ ˆ$\llbracket$S$\rrbracket \Rightarrow$ˆ$\llbracket$S'$\rrbracket$

Parse 1 (stronger)

(22)   [exh [$\exists$ [G [the soldiers with any siege experience]] surrounded F]]

(23)   ALT([$\exists$ [G [the soldiers with any siege experience]] surrounded F]) = $\{[\exists$ [G X] surrounded F] | $\llbracket$X$\rrbracket \in D_e\}$

(24) $\exists x(S \sqsubseteq x \wedge$ surround(f)(x)) $\wedge \forall y(y \not\sqsubseteq S \rightarrow \neg\exists x(y \sqsubseteq x \wedge$ surround(f)(x)))

Parse 2 (simplified; weaker)

(25)   [$\exists \lambda x$ [exh [x [G the soldiers with any siege exp]]] surround F]

(26)   ALT([x [G the soldiers with any siege experience]]]) = $\{[x$ [G X]] | $\llbracket$X$\rrbracket \in D_e\}$

(27) $\exists x(S \sqsubseteq x \wedge \forall y(y \not\sqsubseteq S \rightarrow \neg y \sqsubseteq x) \wedge$ surround(f)(x))

Note that adding exhaustiveness does not affect our conclusions about *any*.

S-level, Schein-inspired approach

A rendition of Schein's event-based approach

(28)   The Columbia students (noisily) and the Harvard students (quietly) surrounded the Pentagon.

Schein's paraphrase (cf., Schein 2012)

(29)   The Columbia students participated (noisily), and the Harvard students participated (quietly); & it all was a surrounding the Pentagon; & no one else participated.

  (we ignore modification in order to have simpler representations)

Implementation: thematic roles and participation in events

(30) $[\![AG]\!] = \lambda x.\ \lambda e.\ \exists e'(ag(e')(x) \land e' \sqsubseteq e)$

(31)   [[[AG the Harvard students] ~~surround P~~]
  [and [AG the Columbia students] surround P]]]

A rendition of Schein's event-based approach

(32) [[[AG the Harvard students] ~~surround P~~]
           [and [[AG the Columbia students] surround P]]]

Interpretation (ignoring non-exhaustiveness for now)

(33) $\lambda e.\ \exists e'(ag(e')(h) \wedge e' \sqsubseteq e \wedge surround(e)(p))$
           $\wedge\ \exists e'(ag(e')(c) \wedge e' \sqsubseteq e \wedge surround(e)(p))$

(34) $\Leftrightarrow \lambda e.\ \exists e'(ag(e')(h) \wedge e' \sqsubseteq e) \wedge \exists e'(ag(e')(c) \wedge e' \sqsubseteq e) \wedge surround(e)(p)$

We still need to enrich these representations, see below (exhaustiveness, perhaps existential closure/extension to worlds). All the enrichments will be built in on top of what we have now though...

Back to any

Acceptability of *any*

(35) a. The students with any experience surrounded the fort.
      b. [AG the soldiers with any experience surround the fort]
      c. $\lambda e. \exists e'(ag(e')(S) \wedge e' \sqsubseteq e \wedge surround(e)(f))$

(36) For any S^+ and S such that $S^+ \sqsubseteq S$:
      a. $\lambda e. \exists e'(ag(e')(S) \wedge e' \sqsubseteq e \wedge surround(e)(f))$
      b. $\Rightarrow_s \lambda e. \exists e'(ag(e')(S^+) \wedge e' \sqsubseteq e \wedge surround(e)(f))$

(37) [AG the soldiers with any experience surrounded the fort] is SER with
      respect to [any experience].

Let's now fix up our representations a bit...

Eliminating non-exhaustiveness

Parse (weaker)

(38) [exh [AG the soldiers with any experience surround the fort]]

(39) ALT([AG the soldiers with any experience surround the fort]) =
{[AG X surround the fort]] | $[\![X]\!] \in D_e$}

(40) $\lambda e. \exists e'(ag(e')(S) \land e' \sqsubseteq e \land surround(e)(p)) \land$
$\forall y(y \not\sqsubseteq S \to \neg\exists e'(ag(e')(y) \land e' \sqsubseteq e)$

Suspension of entailment

(41) a. $\lambda e. \exists e'(ag(e')(S) \land e' \sqsubseteq e \land surround(e)(p)) \land$
$\forall y(y \not\sqsubseteq S \to \neg\exists e'(ag(e')(y) \land e' \sqsubseteq e))$

b. $\not\Rightarrow_s \lambda e. \exists e'(ag(e')(S^+) \land e' \sqsubseteq e \land surround(e)(p)) \land$
$\forall y(y \not\sqsubseteq S^+ \to \neg\exists e'(ag(e')(y) \land e' \sqsubseteq e))$

Lack of SERness

(42) [exh [AG the soldiers with any experience surround the fort]] is not
SER with respect to [any experience].

Existential closure

Existential closurse

(43)   [EC [exh [AG the soldiers with any experience surround the fort]]]

(44) $\lambda w.\ \exists e(e \sqsubseteq w \land \exists e'(ag(e')(S) \land e' \sqsubseteq e \land surround(e)(p)) \land$
$$\forall y(y \not\sqsubseteq S \to \neg\exists e'(ag(e')(y) \land e' \sqsubseteq e)))$$

Lack of SERness

(45)   [EC [exh [AG the soldiers with any experience surround the fort]]] is not
        SER with respect to [any experience].

(There is another, stronger parse with *exh* above *EC*.)

Contrast with distributive predicates (regardless of parsing with AG)

(46)   [AG the soldiers with any experience arrived] and [EC [exh [AG the
        soldiers with any experience arrived]]] are SER with respect to [any
        experience]. [exh [AG the soldiers with any experience arrived]] is not
        SER with respect to [any experience].

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Back to any: summary

Some positive consequences:

1. Incompatibility with existential partitives

(47)   #Some of the soldiers with any experience were fired.

2. Difference in acceptability of singular vs. plural definite descriptions

3. Cross-speaker variation: preferences with respect to evaluation of the Condition at the matrix vs. embedded levels? (see the explanatory approach)

4. Towards variation between predicates: cumulation vs. participation?

(48)   a.   surround, lift the table
       b.   be numerous
       c.   weigh (cf. Beck 2014, Dotlačil & Nouwen 2016)

More general summary

Recall why we started to discuss collective predicates: environments.

(49) *Fewer than 10 soldiers surrounded any fort.

However, in the case of definite descriptions, the data does not obviously support the environments-based approach (in fact, it seems to contradict it).

(50) The soldiers with any siege experience surrounded the fort.

In parallel to our discussion of some examples with modified numerals, as in (51), we tried to identify the source of the acceptability of (50) in sub-constituents of the sentences under discussion (while keeping the Condition fixed).

(51) Fewer than 10 soldiers with any experience surrounded the fort.

Tentatively, we conclude that an intermediate and an S-centered strategy may be better than DP-centered ones.

24.979 Topics in Semantics: Negative Polarity Items
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