Anaphora P-Set

24.954: Pragmatics in Linguistic Theory

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> Questions
>
> Compute the CCP of the following sentence, using our dynamic fragment extended to account for anaphora. You can ignore gender.
>
> (1) A^1 son of some^2 famous actress came and he$_1$ told us about her$_2$.

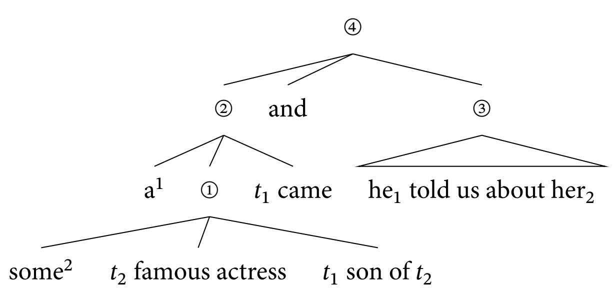
In our system, we have special (syncategorematic) interpretation rules for sentences of the form "P and Q", and sentences of the form "a^n ϕ ψ". This isn't a *necessary* feature of FCS (i.e., we can make things more compositional, if we like) but it did simplify the exposition. Let's remind ourselves of these rules:

(2) $\text{a}^n\ \phi\ \psi \coloneqq [\![\text{a}^n]\!]\ ;\ [\![\phi]\!]\ ;\ [\![\psi]\!]$

(3) $\text{P and Q} \coloneqq [\![\text{P}]\!]\ ;\ [\![\text{Q}]\!]$

We'll assume the following LF for the sentence we're interested in. Since our interpretation rules are syncategorematic, the syntactic structure doesn't make a large difference, so to simplify, let's assume that both coordinated sentences and quantificational structures are ternary.

(4)



Let's start by stating the interpretation of each of the daughters of ①:

(5) $[\![\text{some}^2]\!] \coloneqq \lambda c : 2 \notin \mathsf{dom}\ c\ .\ \{\, \langle g'[2 \mapsto x], w\rangle \mid \langle g, w\rangle \in c \wedge x \in D_{\mathrm{e}} \,\}$

(6) $[\![t_2 \text{ famous actress}]\!] = \lambda c : 2 \in \mathsf{dom}\ c\ .\ \{\, \langle g, w\rangle \in c \mid \mathsf{famous\text{-}actress}_w\ g_2 \,\}$

(7) $[\![t_1 \text{ son of } t_2]\!] = \lambda c : 1, 2 \in \mathsf{dom}\ c\ .\ \{\, \langle g, w\rangle \in c \mid g_1 \mathsf{son\text{-}of} g_2 \,\}$

Now we can compute the meaning of ① using the special rule for sentences of the form "a^n ϕ ψ":

(8) a. $[\![①]\!] = [\![\text{some}^n]\!]\ ;\ [\![t_2 \text{ famous actress}]\!]\ ;\ [\![t_1 \text{ son of } t_2]\!]$

b. $$= \lambda c : \begin{array}{l} 1 \in \mathsf{dom}\ c \\ \wedge\ 2 \notin \mathsf{dom}\ c \end{array} .\ \left\{ \langle g'[2 \mapsto x], w\rangle \;\middle|\; \begin{array}{l} \langle g, w\rangle \in c \\ \wedge\ \mathsf{famous\text{-}acress}\ x \\ \wedge\ g_1 \mathsf{son\text{-}of} g_2 \end{array} \right\}$$

Now let's compute the interpretation of the two remaining daughters of ②:

(9) $[\![\text{a}^1]\!] \coloneqq \lambda c : 1 \notin \mathsf{dom}\ c\ .\ \{\, \langle g'[1 \mapsto x], w\rangle \mid \langle g, w\rangle \in c \wedge x \in D_{\mathrm{e}} \,\}$

(10) $[\![t_1 \text{ came}]\!] = \lambda c : 1 \in \mathsf{dom}\ c\ .\ \{\, \langle g, w\rangle \in c \mid \mathsf{came}\ g_1 \,\}$

Again, based on our interpretation rule for a sentence with an indefinite, we sequence the three daughters of ②. We get:

(11) $$\lambda c : 2, 1 \notin \mathsf{dom}\ c\ .\ \left\{ \left\langle g' \begin{bmatrix} 1 \mapsto y \\ 2 \mapsto x \end{bmatrix}, w \right\rangle \;\middle|\; \begin{array}{l} \langle g, w\rangle \in c \\ \wedge\ \mathsf{famous\text{-}actress}\ x \\ \wedge\ y\ \mathsf{son\text{-}of}\ x \\ \wedge\ \mathsf{came}\ y \end{array} \right\}$$

Now, the interpretation of ③ is easy.

(12) $③ = [\![t_1 \text{ told us about } t_2]\!] = \lambda c : 1,2 \in \mathsf{dom}\ c\ .\ \{\langle g, w\rangle \mid g_1 \text{ told-about } g_2\}$

FINALLY, we compute the meaning of ④ by sequencing ② and ③, which we already computed:

(13)
$$④ = \lambda c : 2,1 \notin \mathsf{dom}\ c\ .\ \left\{ \left\langle g' \begin{bmatrix} 1 \mapsto y \\ 2 \mapsto x \end{bmatrix}, w \right\rangle \;\middle|\; \begin{array}{l} \langle g, w\rangle \in c \\ \wedge \text{ famous-actress } x \\ \wedge\ y \text{ son-of } x \\ \wedge \text{ came } y \\ \wedge\ y \text{ told-about } x \end{array} \right\}$$

> Question
>
> In dynamic semantics, we can define a universal quantifier as follows (where p and q are CCPs):
>
> (14)
> $$\mathsf{every}^n\ p\ q \coloneqq \lambda c : i \notin \mathsf{dom}\ c \\ .\ \left\{ \langle g, w\rangle \in c \;\middle|\; \begin{array}{l} \{g'_n \mid \langle g', w\rangle \in p\ (\mathsf{a}^n\ c) \wedge g \leq g'\} \\ \subseteq \{g''_n \mid \langle g'', w\rangle \in q\ (p\ (\mathsf{a}^n\ c)) \wedge g \leq g''\} \end{array} \right\}$$
>
> (15) $g \leq g'$ iff for each $i \in dom\ g, g_i = g'_i$
>
> Compute the CCPs of the following sentences, step by step:
>
> (16) Every linguist cried.
> LF: Every^3 [t_3 linguist] [t_3 cried]
>
> (17) Every^4 farmer who owns a^7 donkey cares from it$_7$.
> LF: Every^4 [a^7 [t_7 donkey] [t_4 owns t_7]] [t_4 cares for t_7].

Let's start with "Every linguist cried":

(18) $[\![\mathrm{t}_3 \text{ linguist}]\!] = \lambda c : 3 \in \mathsf{dom}\ c\ .\ \{\langle w, g\rangle \in c \mid \mathsf{linguist}\ g_3\}$

(19) $[\![\mathrm{t}_3 \text{ cried}]\!] = \lambda c : 3 \in \mathsf{dom}\ c\ .\ \{\langle w, g\rangle \in c \mid \mathsf{cried}\ g_3\}$

Now we can simply apply our syncategorematic rule for "every^n $p\ q$":

(20)
$$[\![\text{every linguist cried}]\!] \\ = \lambda c : 3 \notin \mathsf{dom}\ c \\ .\ \left\{ \langle g, w\rangle \in c \;\middle|\; \begin{array}{l} \{g'_3 \mid \langle g', w\rangle \in \{\langle g''[3 \mapsto x], w\rangle \mid \langle g'', w\rangle \in c \wedge \mathsf{linguist}\ x\} \wedge g \leq g'\} \\ \subseteq \{h_3 \mid \langle h, w\rangle \in \{\langle h'[3 \mapsto x], w\rangle \mid \langle h', w\rangle \in c \wedge \mathsf{cried}\ x\} \wedge g \leq h\} \end{array} \right\}$$

Note importantly that this sentence doesn't result in an updated context with an extended domain, capturing the fact that *every*, unlike *some* doesn't license cross-sentential anaphora.