Champollion 2016 cont.

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Contents

1 Recap Exercises

1.1 Backround on collective conjunction of individuals

(Winter 2001) develops an account of *collective conjunction of individuals* based on the idea that the core semantic contribution of *and* is boolean conjunction.

(1) John, Mary, and Sue gathered in the hallway.

Winter's account made use of four essential ingredients; generalized boolean conjunction is the meaning of *and*, whereas the other three ingredients are "type shifters".

- Montague lift.
- (Generalized) boolean conjunction (i.e., set intersection).
- Minimization.

- Existential raising.

Step-by-step, the story is as follows:

1. Apply *Montague* lift to the type E coordinands (result: $(E \to T) \to T$).
2. Conjoin the resulting expressions using generalized boolean conjunction (result: $(E \to T) \to T$).
3. Apply minimization to the result (result: $(E \to T) \to T$).
4. Apply existential raising to create a quantifier over pluralities (result: $((E \to T) \to T) \to T$).
5. Apply the resulting quantifier to the collective predicate.

1.2 Exercise 1

Let's compute the meaning of "John, Mary and Sue gathered", in terms of *sets*.

I'll provide you with the meaning of each atomic expressions:

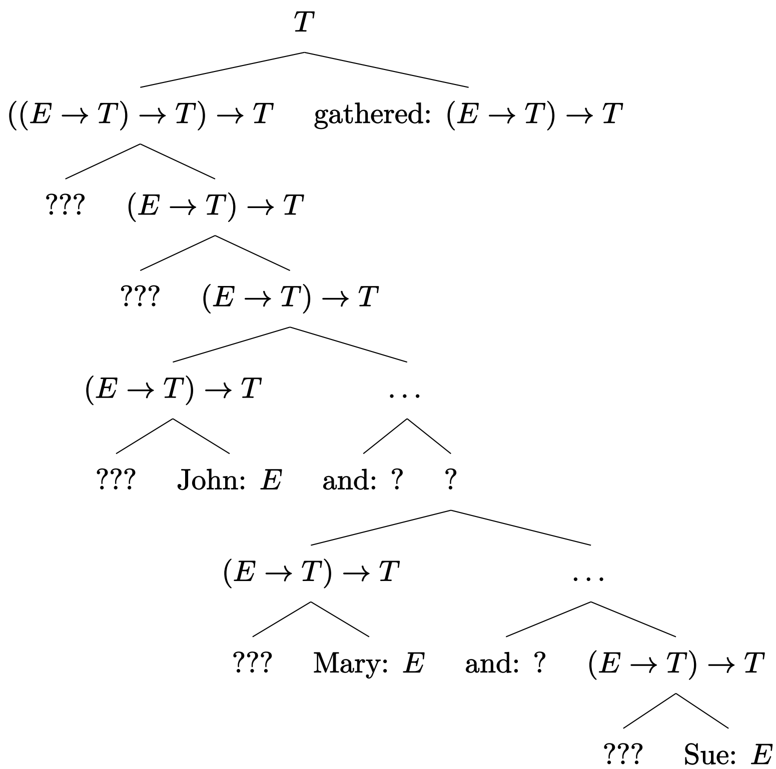
- $[\![\textbf{John}]\!], [\![\textbf{Mary}]\!], [\![\textbf{Sue}]\!] = j, m, s$
- $[\![\textbf{gathered}]\!] = \{\, x \in \textbf{Dom}_E \mid x \text{ gathered} \,\}$
- $[\![\textbf{and}(P_{ET})(Q_{ET})]\!] = \{\, x \in \textbf{Dom}_E \mid x \in [\![P]\!] \text{ and } x \in [\![Q]\!] \,\}$

In addition, we'll need to make use of the following type-shifters:

- $[\![\textbf{LIFT}(x_E)]\!] = \{\, P \subseteq \textbf{Dom}_E \mid x \in P \,\}$
- $[\![\textbf{MIN}(Q_{(\sigma \to T) \to T})]\!] = \{\, P \in [\![Q]\!] \mid \forall P'[P' \subset P \to \neg(P' \in [\![Q]\!])] \,\}$
- $[\![\textbf{ER}(P)]\!] = \{\, Q \subseteq \textbf{Dom}_E \mid Q \cap [\![P]\!] \neq \emptyset \,\}$

You may assume the following structure for our collective coordination example.

(2)



- Fill in the missing type-shifters.
- Fill in the missing type-signatures, and verify that the structure is well-typed.
- Give the interpretation (as a set) for every non-atomic node (except for those labelled "...").
- What are the truth-conditions for the sentence?

Now, provide a concrete *model* at which:

1. The sentence is true (explain why).
2. The sentence is false (explain why).

This involves specifying a concrete domain of individuals and an extension for the lexical constants.

1.3 Background on collective conjunction of predicates

(Champollion 2016) builds on (Winter 2001), by developing an account of collective conjunction of predicates, as in the following:

(3) Every **linguist and philosopher** who disagreed with each other walked in together.

- (Generalized) boolean conjunction (i.e., set intersection).
- Minimization.
- Existential raising.

Step-by-step, the story is as follows:

- In order to avoid immediately deriving an intersective reading, the coordinated predicates are *existentially raised* (result: $(E \to T) \to T$).
- The resulting raised predicates are intersected via generalized boolean conjunction. (result: $(E \to T) \to T$)
- The resulting quantifier is *minimized*, in order to derive a predicate of collective individuals (result: $(E \to T) \to T$).
- The resulting predicate composes as the restrictor of a more type-general determiner.

1.4 Exercise 2

We'll go through the following example:

(4) An ill-matched linguist and philosopher gave a talk together.

We'll go through the composition of (4) in terms of sets. A couple of important assumptions:

- We'll treat "ill-matched" as a modifier of collective individuals, that is only true of *pairs* (type $((E \to T) \to T) \to (E \to T) \to T$).
- We'll treat "gave a talk together" as a predicate of collective individuals (type $(E \to T) \to T$).

Here's the interpretation of the constants in terms of sets:

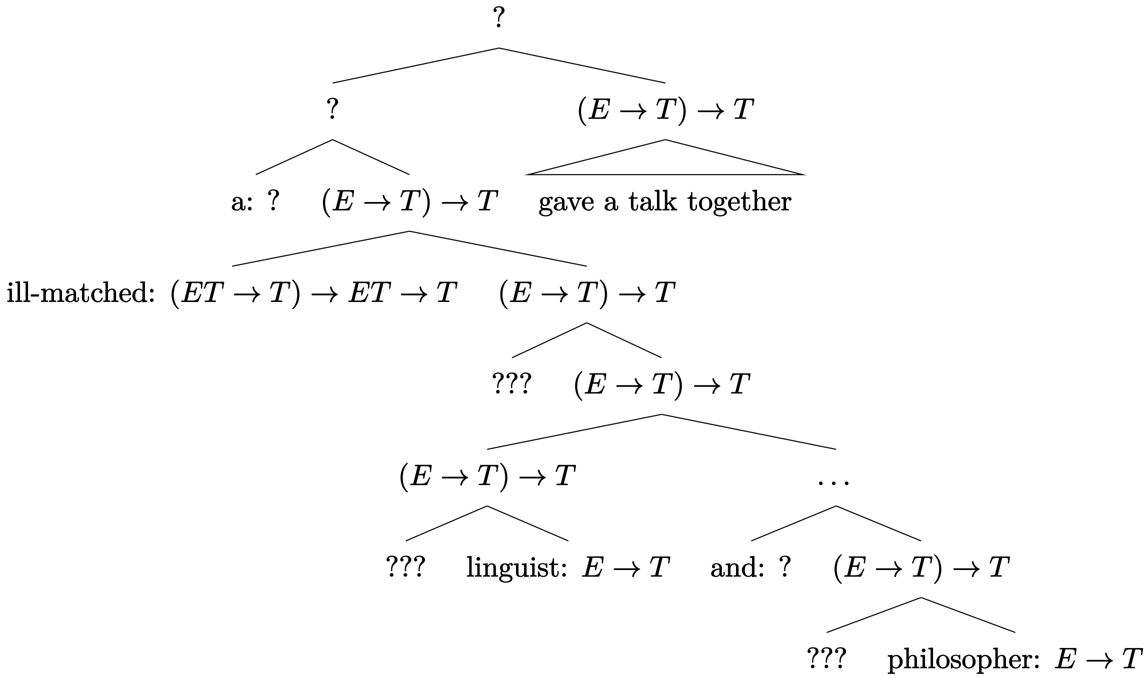
- $[\![\mathbf{illMatched}(Q_{(ET \to T)})]\!] = \{\, P \in Q \mid P = \{\, x, y \,\} \text{ and } x \text{ doesn't match } y \,\}$
- $[\![\mathbf{linguist}]\!] = \{\, x \in \mathbf{Dom}_E \mid x \text{ is a linguist} \,\}$
- $[\![\mathbf{philosopher}]\!] = \{\, x \in \mathbf{Dom}_E \mid x \text{ is a philosopher} \,\}$
- $[\![\mathbf{gaveTalkTogether}]\!] = \{\, P \subseteq \mathbf{Dom}_E \mid P = \{\, x, y \,\} \text{ and } x \text{ gave a talk with } y \,\}$

We'll also need a collective counterpart of the indefinite determiner *a*:

- $[\![\mathbf{a}(Q_{ET \to T})]\!] = \{\, Q' \subseteq \mathbf{Dom}_E \mid Q \cap Q' \neq \emptyset \,\}$

Here's the structure you can assume for our example sentence:

(5)



- Fill in the missing type-shifters.
- Fill in the missing type-signatures, and verify that the structure is well-typed.
- Give the interpretation (as a set) for every non-atomic node (except for those labelled "...").
- What are the truth-conditions for the sentence?

Now, provide a concrete *model* at which:

1. The sentence is true (explain why).
2. The sentence is false (explain why).

This involves specifying a concrete domain of individuals and an extension for the lexical constants.

2 Justifying existential raising

- $[\![\mathbf{ER}(P)]\!] = \{\, Q \subseteq \mathbf{Dom}_E \mid Q \cap [\![P]\!] \neq \emptyset \,\}$

Existential raising is a silent operator that lifts its restrictor into an existential quantifier.

Evidence that this should be available as a silent type-shifter comes from *bare plurals.*

(6) Dogs are barking outside now.

(7) Dogs aren't barking outside now.

Furthermore, some languages (Russian, Hebrew, etc.) don't typically pronounce the indefinite article at all.

Indefinite noun phrases can be used in predicate position, and conjoined with adjectives:

(8) Lucas is an authority on unicorns.

(9) Lucas is competent in semantics and an authority on unicorns.

One conclusion that has been drawn on this basis is that the basic denotation of an indefinite noun phrase is type $E \to T$.

(10) $\{\, x \in \mathbf{Dom}_E \mid x \text{ is an authority on unicorns} \,\}$

If this is right, then we need existential raising to interpret indefinite noun phrases in argument position, even for English.

(11) An authority on unicorns is teaching this class.

A similar point can be made for numerals, which can seemingly occur in predicate position:

(12) Those are two dolphins.

We can extend an *existential raising* analysis to numerals in argument position:

(13) $[\![\text{two dolphins}]\!] = \{\, X \subseteq \mathbf{Dom}_{ET} \mid X \text{ are dolphins and } \mathbf{card}(X) = 2 \,\}$

(14) Two dolphins are swimming over there.

Note this means that we can simply treat **two** as an adjectival modifier of collections:

(15) $[\![\text{two}]\!] = \{\, X \subseteq \mathbf{Dom}_{ET} \mid \mathbf{card}(X) = 2 \,\}$

3 Overlap and choice raising

The sets encoded by **doctor** and **lawyer** may overlap but not completely coincide.

(16) A doctor and lawyer met.

We can't conclude from this sentence that the two people who met aren't also lawyers and doctors respectively.

Minimization gives rise to a problem. We end up with a set of sets S with the following properties:

- S contains a doctor d.
- S contains a lawyer (who may be identical or distinct from d).
- S has no proper subset that contains a lawyer and a doctor.

This means that the resulting sets can only either be:

- Singleton sets containing an individual who is both a lawyer and a doctor.
- Pairs of single-profession doctors and lawyers.

If the two professions coincide then (16) is predicted to just be deviant for the same reason that "John met" is.

Winter has a similar problem with cases like the following:

(17) John and some man met.

References

Champollion, Lucas. 2016. Ten men and women got married today - Noun Coordination and the Intersective Theory of Conjunction. *Journal of Semantics* 33(3). 561–622. `https://academic.oup.com/jos/article/33/3/561/1753639`.

Winter, Yoad. 2001. *Flexibility principles in boolean semantics - the interpretation of coordination, plurality, and scope in natural language* (Current Studies in Linguistics 37). Cambridge Massachussetts: The MIT Press. 297 pp.