Binding back to the future

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Asymmetries in Language: Presuppositions and beyond – Berlin

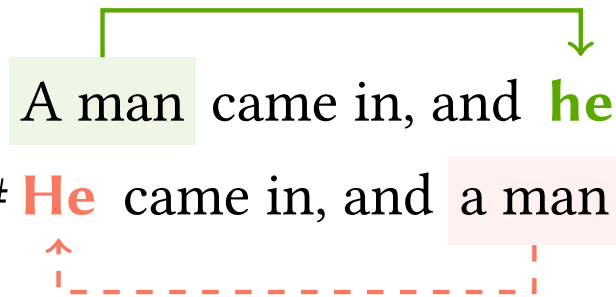
Slides:

https://patrl.keybase.pub/slides/berlin-cataphora.pdf

L-to-R asymmetry with indefinite antecedents

Anaphora with indefinite antecedents displays a left-to-right asymmetry.

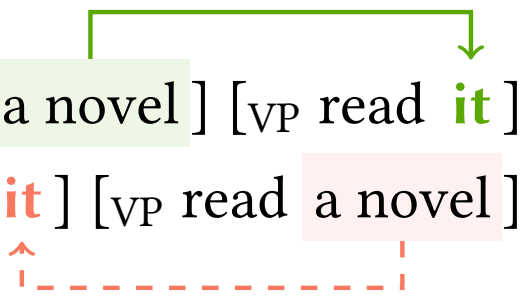
(1) **Cross-sentential anaphora**



a. A man came in, and **he** sat down.

b. # **He** came in, and a man sat down.

(2) **Donkey anaphora**



a. Every [$_{NP}$ man who had a novel] [$_{VP}$ read **it**]

b. #Every [$_{NP}$ man who had **it**] [$_{VP}$ read a novel]

Cataphora with definite antecedents

Definite antecedents seem to allow cataphora.

(3) a. The man came in, and **he** sat down.

b. **He** came in, and the man sat down.

(4) a. Every [$_{NP}$ man who had the novel] [$_{VP}$ read **it**]

b. Every [$_{NP}$ man who had **it**] [$_{VP}$ read the novel]

One might say that these cases do not involve **binding**, but **accidental coreference**.

We argue that cataphoric binding is actually possible.

Roadmap

Observations:

- Data with ellipsis with sloppy identity show that definite antecedents can semantically bind cataphoric pronouns.
- Data with ellipsis and antecedents containing bound pronouns show that this cannot be due to crossover.

Analysis:

- The existential presupposition of the definite projects and binds the pronoun.

Ellipsis, Binding, Cataphora

Elided pronouns give rise to two readings (Sag 1976, Williams 1977).

(5) Ivan met **his** student. Jorge didn't
- ⟨meet ~~**his** student~~⟩. STRICT
- ⟨meet ~~**his** student~~⟩. SLOPPY

The Sag-Williams Generalization:

Sloppy identity requires parallel binding in the antecedent clause.

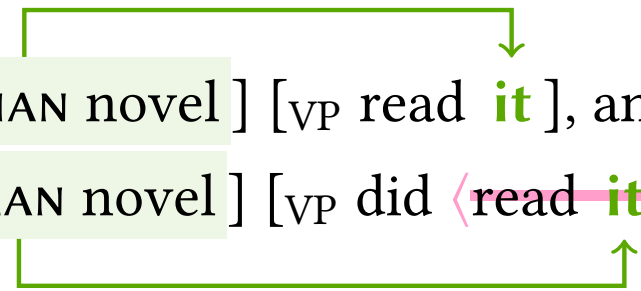
Evidence:

(6) * Ivan said [that Tanya met his student],
and she said [that Jorge did ⟨~~met his student~~⟩ too]. Rebinding

(7) * Ivan met Ivan's student, and
Jorge did ⟨~~meet Jorge's student~~⟩ too. Non-pronominal expression

Donkey anaphora licenses sloppy readings.

(8) Every [$_{NP}$ man who had a Russian novel] [$_{VP}$ read **it**], and
every [$_{NP}$ man who had a German novel] [$_{VP}$ did ⟨read **it**⟩], too.



(9) Every LINGUIST who bought **it** read Chomsky's book, and every PHILOSOPHER who did ⟨~~bought **it**~~⟩ read Yablo's book.

Since the sloppy reading is available, the pronoun can be bound.

One might wonder if the definite is taking scope over the pronoun in each sentence:

(10) Chomsky's book Every LINGUIST who bought **it** read t, and
Yablo's book every PHILOSOPHER who did ⟨bought **it**⟩ read t.

One might wonder if the definite is taking scope over the pronoun in each sentence:

(10) Chomsky's book Every LINGUIST who bought **it** read *t*, and
Yablo's book every PHILOSOPHER who did ⟨~~bought **it**~~⟩ read *t*.

But the subject quantifier can bind into the definite.

(11) Everyone who wanted ME to read **it** printed out **their** dissertation, and
everyone who wanted YOU to ⟨~~read **it**~~⟩ printed out **their** essay.

(9) Every linguist who bought **it** read Chomsky's book, and every philosopher who did ⟨bought **it**⟩ read Yablo's book.

Ellipsis with sloppy cataphora shows that cataphoric binding is possible with a definite antecedent.

An indefinite antecedent doesn't allow binding:

(12) Every linguist who bought **it** read a Russian book, and every philosopher who did ⟨bought **it**⟩ read a German novel.

Analysis

The problem

Sloppy cataphoric donkeys show that cataphora is real. How do we account for the ability of definites to bind to their left without dispensing with the core results of dynamic semantics?

Our solution

Unlike orthodox dynamic binding of a definite by an indefinite, *cataphora* involves binding by a *presupposition*.

We can't make sense of this in orthodox dynamic theories (e.g., Heim's FCS; Groenendijk & Stokhof's DPL), so we develop a system in which *presuppositions are themselves dynamic statements* in order to cash this out.

We adopt the **Sauerland notation** for presuppositions:

$$\frac{\text{Presupposition}}{\text{Assertion}}$$

Crucially, we take both the at-issue meaning and the presupposition to be *dynamic statements* – i.e., relations between information states.

We'll write dynamic statements in the syntax of First Order Logic – our formalisation is in Dynamic Predicate Logic (DPL) (Groenendijk & Stokhof 1991), which has the same syntax as FoL. See Elliott & Sudo (2018, 2019) for the details.

Bear in the mind that in DPL the scope of existentials extends across conjunction.

Orthodox theories Definites denote restricted variables (e.g., Heim 1982).

Our theory Definites are doubly indexed: they contribute a variable to the assertion, and an existential statement to the *presupposition*.

(13) The^{a}_{x} new book is sold out.

$$\frac{\exists!a[\text{newBook}\, a] \wedge x = a}{\text{soldOut}\, x}$$

N.b. since the presupposition is a DPL statement, the variable a in the equality statement is bound by the existential.

Similarly, we assume that proper names and pronominals can also have existential presuppositions.

(14) Paul^{a}_{x} sat down $\rightsquigarrow \dfrac{\exists! a[a = x] \wedge x = Paul}{\text{satDown}\, x}$

(15) He^{a}_{x} sat down $\rightsquigarrow \dfrac{\exists! a[a = x]}{\text{satDown}\, x}$

We define an accommodation operator $\mathbb{A}$ that takes a presuppositional statement (i.e., a pair consisting of a presupposition and an assertion), and returns a presuppositionless one by dynamically sequencing the presupposition and the assertion.

$$\mathbb{A}\left(\frac{\phi}{\psi}\right) := \frac{\top}{\phi \wedge \psi}$$

In the following, we simply omit the presupposition whenever it is trivial, so for the above we just write $\phi \wedge \psi$.

We now have everything we need to account for cross-sentential cataphora.

(16) He_a sat down. The new arrival^a_x yawned.

What happens to the presuppositions of the individual conjuncts? We assume that they *project*, i.e., the presupposition of the first conjunct is sequenced with the presupposition of the second.

(17) $\dfrac{\phi}{\alpha}$ and $\dfrac{\psi}{\beta} := \dfrac{\phi \wedge \psi}{\alpha \wedge \beta}$

Post-accommodation, the existential presupposition introduced by *the new arrival* binds the variable introduced by *he* in the assertive dimension.

(18) a. He_a sat down. $\rightsquigarrow \text{satDown}\, a$

b. $\text{The new arrival}^{a}_{x}$ yawned. $\rightsquigarrow \dfrac{\exists! a[\text{newArrival}\, a] \wedge x = a}{\text{yawned}\, x}$

(19) He_a sat down. $\text{The new arrival}^{a}_{x}$ yawned.

$$\rightsquigarrow \mathbb{A}\left(\frac{\exists! a[\text{newArrival}\, a] \wedge x = a}{\text{satDown}\, a \wedge \text{yawned}\, x}\right)$$

$$\rightsquigarrow \exists! a[\text{newArrival}\, a] \wedge x = a \wedge \text{satDown}\, a \wedge \text{yawned}\, x$$

We predict – correctly in the majority of cases – that cataphora with indefinite antecedents is disallowed.

(20) a. If a farmer^{x} owns a donkey^{y} he$_{x}$ beats it$_{y}$.
b. *If he$_{x}$ owns it$_{y}$, a farmer^{x} beats a donkey^{y}.

This is simply because indefinites aren't presuppositional, and we assume that crossover derivations are independently ruled out.

Cataphora with indefinite antecedents II

Chierchia (1995: p. 192) observes that cataphora with indefinite antecedents is surprisingly good in certain cases (see also Barker & Shan 2008):

(21) If John overcooks it$_a$, a hamburger^a usually tastes bad.

We think that there is something else going on here. Notice that cataphora with indefinite antecedents becomes bad in an *episodic* context.

(22) *If John overcooks it$_a$, a hamburger^a tastes bad.

We suspect that it's not a coincidence that apparent cataphora with indefinite antecedents seem to be licensed wherever the indefinite antecedent can receive a *generic* reading.

We think that this case involves a reading of *a hamburger* under which it is essentially a definite picking out a kind, although this is still a matter for future research.

Prediction: local satisfaction bleeds cataphora I

We predict that in cases where the existential presupposition associated with a definite antecedent can be locally satisfied, it fails to license cataphora.

First, observe that in a conditional statement, when the presupposition of the consequent is contextually entailed by the antecedent, the conditional statement is globally presuppositionless.

(23) If Chomsky is publishing, then his new book is sold out.

We predict therefore that cataphora should be impossible in the following sentence:

(24) Every student who pre-ordered it$_a$ knows that
[If Chomsky is publishing, then his new book^a is sold out].

We're not sure about the facts here, so this is a matter for future research.

Conclusion

Summing up I

- Empirically, *cataphoric sloppy donkeys* provide evidence for genuinely cataphoric semantic binding.
- There is a natural tension with arguably the most successful theory of anaphora – dynamic semantics – which is tailored to block semantic binding that proceeds *backwards*.
- Our goal was to account for cataphora without jettisoning the results of dynamic semantics in the domain of anaphora.

Summing up II

- Our hunch was that apparent cataphora with definite antecedents involves anaphora to the *presupposition* introduced by the definite.
- In order to cash out this intuition, we sketched a presuppositional variant of DPL, according to which presuppositions themselves are dynamic statements, and therefore can give rise to genuine dynamic binding.
- There are surely further ramifications of this move. We leave a thorough exploration of the properties of this system to future work.

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If you have any follow-up questions, you can email us at:

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