Reducing Pronoun Accessibility to Presupposition Satisfaction

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Introduction

The meaning of certain sentences maps neatly to classical logic.

(1) a. There was a phone-book.

b. $\exists x, \textbf{phone-book}(x) \wedge \textbf{there}(x)$

(2) a. A dog chased its tail.

b. $\exists x, \textbf{dog}(x) \wedge \textbf{chased}(\textbf{tail}(x))(x)$

But pronouns referring to indefinites are more liberal than the variables of classical logic:

(3) a. There was a phone-book. It was in the cabinet.

b. $(\exists x, \textbf{phonebook}(x) \wedge \textbf{there}(x)) \wedge (\textbf{cabinet}(x))$

Accessibility conditions for pronouns

When can a pronoun refer to a given antecedent?

A number of sentences are surprising from the perspective of classical logic:

(4) a. There was a phone-book and it is in the cabinet.
(cross-conjunction)

b. If there was a phone-book, it is in the cabinet.
(donkey conditional)

c. Either there wasn't a phone-book or it is in the cabinet.
(bathroom sentences)

d. There might be a phone-book. It would be in the cabinet.
(modal subordination)

But not everything goes:

(5) a. # There wasn't a phone-book and it is in the cabinet.

b. # If there was a phone-book, all is good. It is in the cabinet.

c. # Either there was a phone-book or it is in the cabinet.

d. # There might be a phone-book. It is in the cabinet.

Old intuition: pronoun accessibility is connected to presupposition satisfaction.
[Heim, 1982, Kamp et al., 2011, among many others]

(6) a. There was a phone-book and it was in the cabinet.

b. If there was a phone-book, it would be in the cabinet.

c. There might be a phone-book ; it would be in the cabinet.

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b. If there was a phone-book, it would be in the cabinet.

c. There might be a phone-book ; it would be in the cabinet.

(7) a. # There wasn't a phone-book and it is in the cabinet.

b. # If there was a phone-book, our quality of life would improve. It is in the cabinet.

c. # Either there is a phone-book or it is in cabinet.

You can only refer to the phone book if the existence of the phone-book can be presupposed when the pronoun is used?

Parallels pronouns/presuppositions

(8) a. There was a phone-book and it was in the cabinet.

b. There was a phone-book and there still is.

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b. If there was a phone-book, there still is.

(10) a. There might have been a phone-book and it would have been in the cabinet.

b. There might have been a phone-book and there would still be one.

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(10) a. There might have been a phone-book and it would have been in the cabinet.

b. There might have been a phone-book and there would still be one.

(11) a. Either there wasn't a phone-book or it was in the cabinet.

b. Either there wasn't a phone-book or there still is.

Parallels pronouns/presuppositions

(12) a.# There wasn't a phone-book and it is in the cabinet.

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Parallels pronouns/presuppositions

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b.# There wasn't a phone-book and there still is.

(13) a.# There might have been a phone-book and it was in the cabinet.

b.# There might have been a phone-book and there still is.

(14) a.# Either there was a phone-book or it was in the cabinet.

b.# Either there was a phone-book or there still is.

Accessibility Generalization

In a context "*...a/some restriction scope ...it*", *it* may co-refer with *a NP* if and only if the presupposition that there is a NP that VP's is satisfied.

(Cf also [Mandelkern and Rothschild, 2019])

Accessibility conditions for pronouns

When can a pronoun refer to a given antecedent?

Reduces to:

Presupposition satisfaction for presuppositions

When is a presupposition met?

Upshot of the talk

- Propose a system in which pronouns are interpretable as soon as the existence presupposition is met.

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- Propose a system in which pronouns are interpretable as soon as the existence presupposition is met.
- Although intuitive, this is typically not true in other theories of pronoun accessibility, typically Dynamic Semantics.

Benefits

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- It does not require significantly altering the semantics.

Precursor: Dynamic Semantics

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Founding assumption of Dynamic Semantics

The meaning of an expression *is* its effect on context.

Pronoun in Dynamic Semantics

(15)✓ A photographer$_{12}$ came in and they$_{12}$ sat down.

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b. *update the context with* $[\![CP_1]\!]$,
then update the context with $[\![CP_2]\!]$

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(17) a. a photographer$_{12}$

b. *add a photographer at index 12 of the context*

(18) a. they$_{12}$

b. *fetch the entity at index 12 from the context*

(19) ✓ Jane was here this morning and she's still here.

(20) a. CP_1 and CP_2

b. *update the context with* $[\![CP_1]\!]$,
then update the context with $[\![CP_2]\!]$

(21) a. Jane was here this morning.

b. *add to the common ground the fact that Jane was here this morning*

(22) a. She's still here.

b. *crash if the fact that Jane was here before isn't part of the common ground*

(23) a. # She$_{12}$ came in and a photographer$_{12}$ sat down.

b. # She's still here and Jane was here this morning.

(24) a. CP_1 and CP_2

b. *update the context with* $[\![CP_1]\!]$,
then update the context with $[\![CP_2]\!]$

Two problems:

1. **The explanatoriness problem:** [Soames, 1989]
   the space of possible dynamic meanings is too rich.
2. **The under-generation problem:**
   [Groenendijk and Stokhof, 1991]
   certain felicitous pronouns are predicted not to be.

The explanatoriness problem

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(26) a. CP_1 *wand* CP_2

b. update the context with $[\![CP_2]\!]$,
then update the context with $[\![CP_1]\!]$

(27) a. They came in *wand* a photographer sat down.

b. # A photographer came in *wand* they sat down.

In a nutshell: *wand* would only allow cataphora.

(28) a. Jane is still here *wand* she was here before.

b. # Jane was here before *wand* she's still here.

In a nutshell: *wand* would only allow right-to-left presupposition satisfaction.

Cross-linguistic: is *wand* ever attested? if not, why?

Acquisition: do we see a stage where children have acquired the truth-conditional effect of *and*, but not its "*direction*"? if not, why?

A theoretical desideratum:
A theory with the following architecture would be desirable:

$$\text{syntax + truth-conditional semantics} \Rightarrow \text{context effects}$$

For the case of presuppositions, alternative theories of presuppositions have met the explanatoriness challenge [Schlenker, 2009, George, 2008, Rothschild, 2011].

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Attempts to extend this to propose a similar theory for pronouns have been made[Elliott, 2020a, Mandelkern, 2020].

Two problems:

1. The explanatoriness problem:
   the space of possible dynamic meanings is too rich.
2. **The under-generation problem:**
   certain felicitous pronouns are predicted not to be.

Under-generation

Vanilla Dynamic Semantics [Groenendijk and Stokhof, 1991] does not predict the following sentences to be acceptable:

(29) Predicted #

a. Either there wasn't a phone-book or it was in the cabinet. (bathroom sentences)

b. It's not true that there isn't a phone-book. It's hidden in the cabinet. (double negation)

Under-generation

Full generalization

In a context "…*a/some NP VP* …*it*", *it* may co-refer with *a NP* if and only if the presupposition that there is a NP that VP's is satisfied.

(Cf also [Mandelkern and Rothschild, 2019])

(30) Predicted #

a. Either there wasn't a phone-book or it was in the cabinet. (bathroom sentences)

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Dynamic Semantics only validates one direction of the generalization: when *it* is used, the existence of the phone-book can be presupposed.

Fixes [Elliott, 2020b, Krahmer and Muskens, 1995] exist, typically at two costs:

- …richer spaces of meaning.
- …leave other empirical gaps open [Hofmann, 2019].

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(31) The claim that there is a phone-book in this house is surprising.
If this is true, where would one find it?

Proposal

- Pronouns carry an existence presupposition.
- As soon as the presupposition is met, the pronoun will be interpretable.
- Building on any theory of presuppositions satisfaction, including "*explanatory*" theories [Schlenker, 2009, Fox, 2013, George, 2008, Rothschild, 2011].

Pronoun structure

(32) $[\![\text{it}_i]\!]^w = f_i(G_i(w))(w)$

Where D and f are parameters of interpretation:

- for every i and w, $G_i(w)$ is the witness set.
  (e.g. the set of phone-books)
- for every i, $f_i(w)$ is a choice function: $\forall S, f(S) \in S$
  (e.g. the phone-book we want to pick)

There are pragmatic principles constraining f_i and G_i. For now:

Rule for G_i

- For any property P, there is an i such that $G_i(w) = P(w)$
- If there is a constituent "*[a NP]*$_i$ *VP*" in the neighboring linguistic context, then it has to be the case that $G_i(w) = [\![\text{NP}]\!]^w \cap [\![\text{VP}]\!]^w$ for all w.

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(33) There was a phone-book$_i$ …
$\rightsquigarrow G_i(w) = [\![\text{phone-book}]\!]^w \cap [\![\text{there}]\!]^w$

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(33) There was a phone-book$_i$ …
$\rightsquigarrow G_i(w) = [\![\text{phone-book}]\!]^w \cap [\![\text{there}]\!]^w$

Provisional rule for f_i

No constraint apart from it being a choice function.

Anaphora in conjunction

(34) a. There was a phone-book$_i$ and it$_i$ was in the cabinet.

b. $[\![\text{it}_i]\!] = f_i(G_i(w))(w)$

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(34) a. There was a phone-book$_i$ and it$_i$ was in the cabinet.

b. $[\![\text{it}_i]\!] = f_i(G_i(w))(w)$ ← choice functions can't apply to empty sets!

(34) a. There was a phone-book$_i$ and it$_i$ was in the cabinet.

b. $[\![\text{it}_i]\!] = f_i(G_i(w))(w)$ $\leftarrow$ $G_i(w)$ should not be empty!

c. **Presupposition:** $G_i(w) = [\![\text{phone-book}]\!]^w \cap [\![\text{there}]\!]^w \neq \varnothing$

Anaphora in conjunction

(35) There is a phone-book$_i$ and it$_i$ is in the cabinet .

pres: there is a phone-book

(35) There is a phone-book$_i$ and it$_i$ is in the cabinet.

pres: $\varnothing$

From theories of presuppositions satisfaction:
p and $\underline{p}q$ does not carry a presupposition.

Anaphora in conjunction

(35) There is a phone-book$_i$ and it$_i$ is in the cabinet.

pres: $\varnothing$

$\approx$ *there is a phone-book and a certain phone-book that there is is in the cabinet*

Cataphora in conjunction

(36)# It$_i$ is in the cabinet and there is a phone-book$_i$.

pres: there is a phone-book

From theories of presupposition satisfaction:
The presupposition of *p'p and q* is *p'*
[Schlenker, 2009, Fox, 2013, George, 2008].

Cataphora in conjunction

(36)# It$_i$ is in the cabinet and there is a phone-book$_i$.

pres: there is a phone-book

From theories of presupposition satisfaction:
The presupposition of *p'p and q* is *p'*
[Schlenker, 2009, Fox, 2013, George, 2008].

Cataphora in conjunction

The ban on cataphora is related to the impossibility of right-to-left presupposition satisfaction [Mandelkern et al., 2020].

(37) a. There is a phone-book$_i$ and it$_i$ is in the cabinet.

b. There was a phone-book and there still is a phone-book.

(38) a. # It$_i$ is in the cabinet and there is a phone-book$_i$.

b. # There still is a phone-book and there was a phone-book.

Exceptions to the ban on cataphora

But there are exceptions to the ban on right-to-left presupposition satisfaction:

(39) Jane's no longer in Norway but she was there at some point.

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(39) Jane's no longer in Norway but she was there at some point.

NB: *but* is not *wand*

(40) Jane was in Norway at some point but she's no longer there.

Exceptions to the ban on cataphora

But there are exceptions to the ban on right-to-left presupposition satisfaction:

(39) Jane's no longer in Norway but she was there at some point.

Such configurations also license cataphora:

(40) She$_i$ isn't in Norway now but one of my students$_i$ studied there.

Bathroom sentences

(41) Either there wasn't a phone-book$_i$
or it$_i$ was in the cabinet .

pres.: there was a phone-book

Bathroom sentences

(41) Either there wasn't a phone-book$_i$
or it$_i$ was in the cabinet .
pres.: there was a phone-book

From theories of presupposition satisfaction:
either p or not pq does not carry a presupposition.

Bathroom sentences

These cases raise no particular issues in this theory.

Accessibility via pragmatic inferences

(42) Bill believes that I don't have a sister$_i$.
$\rightsquigarrow$ *I have a sister.*

Maximize Presupposition: [Heim, 1991, Chemla, 2008]
When speaker is likely well-informed about *p*, "*Bill believes p*" conveys *p* is false.

A presupposition can be satisfied by such a pragmatic inference:

(43) Bill believes that I don't have a sister$_i$.
Yet, he's met my sister$_i$ several times.

So can pronouns:

(44) Bill believes I don't have a sister$_i$.
Yet, he's met her$_i$ several times.

The inference is defeasible; when defeated, the pronoun becomes unavailable:

(45) Bill believes, and he's correct, that I don't have a sister$_i$.
Yet, he's met her$_i$ several times.

The following example looks problematic (A. Anvari, p.c.)

(46) They$_i$ know that there is someone$_i$ in the lobby.
$\rightsquigarrow$ *# a certain person in the lobby knows that there is someone in the lobby.*

- The sentence as a whole presupposes that there is someone in the lobby.
- No reason to assume we can't accommodate it.
- The sentence should receive the meaning listed.

Point taken! There are more constraints on pronouns than simply an existence presupposition.

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$\rightsquigarrow$ *independent need for condition C.*

Outside of condition C:

(47) ✓ The person that placed it_i there knows that there is a phone-book_i in the cabinet.

Precedents and inspirations

This theory finds parallels in:

1. E-type approaches
2. [Hofmann, 2019]'s ICDRT

Precedents and inspirations: E-type approaches

E-type theories assume:

- Pronouns are definite descriptions:
  it = the phone-book that there was.
- Fregean treatment of definite descriptions (existence **+ uniqueness**).
- Accessibility conditions reduced to presupposition satisfaction.

[Evans, 1977, Geach, 1964, Parsons, 1978, Neale, 1990, Heim, 1990, Büring, 2004, Elbourne, 2005, Elbourne, 2001]

Precedents and inspirations: E-type approaches

Two long standing issues:

- Formal link: which description is recovered?

(48) a. Exactly nine of the ten marbles have been found.
We're still looking for it.

b. Exactly one of the ten marbles is missing.
We're still looking for it.

Precedents and inspirations: E-type approaches

Two long standing issues:

- Formal link: which description is recovered?
- Pronouns can be interpreted even when no uniqueness inferences can be derived.

(48) (Since sage plants are sold in packs of 8,)
Every client who bought a sage plant has bought seven others along with it.

Precedents and inspirations: E-type approaches

By contrast, in this theory:

- Formal link: there is formal co-indexation.
- No commitment to uniqueness (through choice functions).
- We don't equate pronouns with definites.

Precedents and inspirations: [Hofmann, 2019]

[Hofmann, 2019]'s ICDRT:

- Indefinites introduce individual concepts in a dynamic system and carry existence presuppositions.
- Pronouns' accessibility conditions are duplicated: they are dictated by both dynamic meanings and presupposition satisfaction.

Interim summary

- Pronouns' interpretation contains two parts: the witness set W and a choice function f.
- A general principle specifies the nature of W.
- Pronouns are interpretable iff W is not empty.
- Building on a theory of presupposition satisfaction, predicts:
  - Simple conjunctions.
  - Ban on cataphora.
  - Exceptions to the ban.
  - Bathroom sentences
  - Intrusion of pragmatic inferences in pronoun's accessibility conditions

Quantificational cases

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(49) Every farmer owns a donkey$_i$.
Few of them feed it$_i$ oats.

(50) Every farmer who owns a donkey$_i$ feeds it$_i$ oats.

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Few of them feed it$_i$ oats.

(50) Every farmer who owns a donkey$_i$ feeds it$_i$ oats.

Why these cases have garnered a lot of interest:

- co-variation without c-command.
- the speaker has no particular donkey in mind.

(51) Every farmer owns a donkey$_i$.
Few of them feed it$_i$ oats.

a. Every farmer owns a donkey$_i$.

b. [every farmer] λx. [a donkey]$_i$ λy. x owns y

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Few of them feed it$_i$ oats.

a. Every farmer owns a donkey$_i$.

b. [every farmer] λx. [a donkey]$_i$ λy. x owns y

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If there is a constituent "*[a NP]$_i$ VP*" in the context, then $G_i(w) = [\![\text{NP}]\!]^w \cap [\![\text{VP}]\!]^w$ for all w.

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Rule for G_i

If there is a constituent "*[a NP]$_i$ VP*" in the context, then $G_i(g)(w) = [\![\text{NP}]\!]^{w,g} \cap [\![\text{VP}]\!]^{w,g}$ for all w.

(51) Every farmer owns a donkey$_i$.
Few of them feed it$_i$ oats.

a. Every farmer owns a donkey$_i$.

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Rule for G_i

If there is a constituent "*[a NP]$_i$ VP*" in the context, then $G_i(g)(w) = [\![\text{NP}]\!]^{w,g} \cap [\![\text{VP}]\!]^{w,g}$ for all w.

In this case: $G_i(g)(w) = \left\{ y \;\middle|\; \begin{array}{l} y \text{ is a donkey in } w \\ g(x) \text{ owns } y \text{ in } w \end{array} \right\}$

(52) a. Few of them feed it_i oats.

b. Few of them $\lambda x.$ x feed it_i oats.

c. $G_i(g)(w) = \left\{ y \;\middle|\; \begin{array}{l} y \text{ is a donkey in } w \\ g(x) \text{ owns } y \text{ in } w \end{array} \right\}$

(52) a. Few of them feed it_i oats.

b. Few of them λx. $\underset{\text{pres.: } G_i(g)(w) \neq \varnothing}{\underline{x \text{ feed } \text{it}_i \text{ oats}}}$

c. $G_i(g)(w) = \left\{ y \;\middle|\; \begin{array}{l} y \text{ is a donkey in } w \\ g(x) \text{ owns } y \text{ in } w \end{array} \right\}$

(52) a. Few of them feed it_i oats.

b. Few of them λx. $\underset{\text{pres.: } g(x) \text{ owns a donkey in } w}{\underline{x \text{ feed } \text{it}_i \text{ oats}}}$

c. $G_i(g)(w) = \left\{ y \;\middle|\; \begin{array}{l} y \text{ is a donkey in } w \\ g(x) \text{ owns } y \text{ in } w \end{array} \right\}$

Universal presupposition projection out of *few*:

(53) a. Few of the farmers still have a donkey.
$\rightsquigarrow$ *all of them had a donkey*

b. Few of the farmers $\lambda x.$ x still have a donkey.
pres.: $g(x)$ had a donkey

c. Few of the farmers $\lambda x.$ x still have a donkey.
pres.: all farmers had a donkey

(54) a. Every farmer owns a donkey$_i$ and few of them feed it$_i$ oats.

b. Few of them λx. $\underbrace{x \text{ feed it}_i \text{ oats}}_{\text{pres.: } g(x) \text{ owns a donkey in } w}$

c. $\underbrace{\text{Few of them } \lambda x.\ x \text{ feed it}_i \text{ oats}}_{\text{pres.: all of them own a donkey in } w}$

The same reasoning applies to the donkey sentence.

(55) a. Every farmer who owns a donkey$_i$
$\lambda x.$ $\underline{x \text{ feeds it}_i \text{ oats}}$
pres.: $G_i(g)(w) \neq \varnothing$

b. $G_i(g)(w) = \left\{ y \;\middle|\; \begin{array}{l} y \text{ is a donkey in } w \\ g(x) \text{ owns } y \text{ in } w \end{array} \right\}$

The same reasoning applies to the donkey sentence.

(55) a. Every farmer who owns a donkey$_i$
$\lambda x.$ $\underbrace{x \text{ feeds it}_i \text{ oats}}_{\text{pres.: } g(x) \text{ owns a donkey in } w}$

b. $G_i(g)(w) = \left\{ y \;\middle|\; \begin{array}{l} y \text{ is a donkey in } w \\ g(x) \text{ owns } y \text{ in } w \end{array} \right\}$

The same reasoning applies to the donkey sentence.

(55) a. Every farmer who owns a donkey$_i$
$\lambda x.$ $\underline{x \text{ feeds it}_i \text{ oats}}$
pres.: $g(x)$ owns a donkey in w

b. $G_i(g)(w) = \left\{ y \;\middle|\; \begin{array}{l} y \text{ is a donkey in } w \\ g(x) \text{ owns } y \text{ in } w \end{array} \right\}$

c. *Every farmer who owns a donkey feeds a certain donkey they own oats.*

Takeaway: the set G_i may depend on the value of certain binders.

(56) Every French tourist visited [a museum they liked]$_i$.
Every English tourist surprisingly avoided it$_i$.

$$W_1(g)(w) = \left\{ y \;\middle|\; \begin{array}{l} y \text{ is a museum in } w \\ g(x) \text{ liked } y \text{ in } w \end{array} \right\}$$

$\rightsquigarrow$ *accommodating that every English tourist likes some museum should be ok!*

What's next

- **Determining f_i:** what happens when a DP has multiple witnesses?
- **Determining G_i:** what referent does a DP make available?

Determining f_i

Pronoun structure

(57) $[\![\text{it}_i]\!]^{g,w} = f_i(w)(G_i(g)(w))$

If there is just one witness, different choice functions will yield the same truth-conditions: $f(\{p\}) = p$

(58) There is a phone-book and it is in the cabinet.

What if there are multiple phone-books?

(59) There is a phone-book$_i$ and it$_i$ is in the cabinet.

Empically, is the sentence true if:

- there are two phone-books
- one is in the cabinet, the other isn't ?

What if there are multiple phone-books?

(59) There is a phone-book$_i$ and it$_i$ is in the cabinet.

Empically, is the sentence true if:

- there are two phone-books
- one is in the cabinet, the other isn't ?

$\rightsquigarrow$ *intuitions are not sharp!*

A vexed question:

- [Mandelkern, 2020]: "*This is a complicated issue, which I won't explore in detail here.*"
- [Elliott, 2020b] : "*How to capture existential vs. universal readings is a thorny issue, and [...] therefore we leave a more thorough exploration of donkey anaphora [...] to future work.*"

$\rightsquigarrow$ likewise, my answer will be incomplete!

(60) There is a phone-book$_i$ and it$_i$ is in the cabinet.

Three hypothetical readings have been discussed:

- $\forall$-reading : *every phone-book that there is is in the cabinet*
- $\exists$-reading : *at least one phone-book is in the cabinet*
- uniqueness reading: *there is just one phone-book and it's in the cabinet*

Which readings obtain?

Note: although typically discussed for donkey sentences [Kanazawa, 1994], the question is raised in *all* environments.

(61) a. If there is a phone-book, it is in the cabinet.

b. Either there isn't a phone-book or it's in the cabinet.

c. Every person that has a phone-book puts it in their cabinet.

What we know about the readings of anaphora

The presence of a default reading has been confirmed experimentally many times in donkey sentences.
[Foppolo, 2008, Denić and Sudo, 2022, Sun et al., 2020]

(62) a. Some farmer who has a donkey feeds it oats.
$\rightsquigarrow$ *feeds one of their donkeys oats* ($\exists$, 90%)

b. Every farmer who has a donkey feeds it oats.
$\rightsquigarrow$ *feeds all of their donkeys oats* ($\forall$, 60%)

c. No person who has a donkey feeds it oats.
$\rightsquigarrow$ *feeds any of their donkeys oats* ($\exists$, 90%)

But certain lexical items are biased and can override the "*default*" reading.

(63) a. No person who had an umbrella left it at home today.
$\rightsquigarrow$ *left all of their umbellas in the cabinet* ($\forall$)

b. Jane has an umbrella and she left it at home.
[Chatain, 2018]

There remain some knowledge gaps:

- What about other environments (*and*, bathroom sentences)?
- What about intuitions of uniqueness?
- Are these truly readings?

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- **What about other environments (*and*, bathroom sentences)?**
- **What about intuitions of uniqueness?**
- Are these truly readings?

$\rightsquigarrow$ *joint work with Benjamin Spector and Nina Gregorio*

Generalizing to the worst case, we try to derive all possible readings, not accounting for "*default readings*".

Choice of f

A sentence S containing pronouns is:

- definitely true if true for all choices of f
- definitely false if false for all choices of f
- undetermined otherwise

Generalizing to the worst case, we try to derive all possible readings, not accounting for "*default readings*".

Choice of f

A sentence S containing pronouns is:

- definitely true if true for all choices of f
- definitely false if false for all choices of f
- undetermined otherwise

Depending on the question under discussion and other pragmatic factors, undetermined may resolve to true or may resolve to false [Kriz, 2015, Champollion et al., 2017].

(64) Every farmer who has a donkey$_i$ feeds it$_i$ oats.
where $G_i(g)(w) =$ the set of donkeys owned by $g(x)$ in w

a. **Definitely true:**
for all f,
every farmer who has a donkey
feeds f(donkey of $g(x)$) oats

b. **Definitely false:**
for no f,
every farmer who has a donkey
feeds f(donkey of $g(x)$) oats

This determines the following truth-/falsity-conditions.

(65) Every farmer who has a donkey$_i$ feeds it$_i$ oats.

a. …feeds all of them oats (true, $\forall$)

b. …feeds some but not all of them oats (undetermined)

c. …feeds none of them oats (false, $\neg\exists$)

Depending on the pragmatics, the reading can oscillate between $\exists$ and $\forall$.

Positive: we predict $\exists$ and $\forall$ readings for all sentence types.

Positive: we predict $\exists$ and $\forall$ readings for all sentence types.
Negative: we don't predict or expect there to be default readings, nor their preponderance.

Determining G_i

Rule for G_i

If there is a constituent "*[a NP]$_i$ VP*" in the context, then $G_i(g)(w) = [\![\text{NP}]\!]^{w,g} \cap [\![\text{VP}]\!]^{w,g}$ for all w.

How does a language know what *a NP* is?
$\rightsquigarrow$ *this can't be a general syntactic/semantic principle.*

There must be a general recipe for determining whether and what (quantifier) DPs can antecede pronouns:

(66) a. Some donkey brayed and then it ran away.

b. Every donkey brayed and then they ran away.

(67) a. Some donkey brayed and then it ran away.

b. Every donkey brayed and then they ran away.

Intuition

A quantified statement allows one to refer to the smallest individual which served to make the statement true.

Adjacent ideas: *minimal situations*
[Kratzer, 2002, Elbourne, 2005], exact truth-makers [Fine, 2017], …

Intuition

A quantified statement allows one to refer to the smallest individual which served to make the statement true.

(68) a. Some donkey brayed.

b. Some donkey brayed and is a part of *X*.

(69) a. **Witnesses:** any *X* containing some braying donkeys

b. **Smallest witnesses:** *x* where *x* is a braying donkey

Intuition

A quantified statement allows one to refer to the smallest individual which served to make the statement true.

(70) a. Every donkey brayed.

b. Every donkey brayed and is a part of *X*.

(71) a. **Witnesses:** any *X* containing all the braying donkeys

b. **Smallest witness-∅:** the plurality of braying donkeys

With some amendments and simplifications [Szabolcsi, 2012]:

Witness set

X is a witness for $Q(A)(B)$, if $Q(A)(B \cap \{x \mid x \prec X\})$ and $X \subset A \cap B$.

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Witness set

X is a witness for $Q(A)(B)$, if $Q(A)(B \cap \{x \mid x \prec X\})$ and $X \subset A \cap B$.

Determining G_i

If there is a constituent "*[D NP]*$_i$ *VP*" in the context, then G_i must be the set of smallest witnesses of $[\![\text{D}]\!]([\![\text{NP}]\!])([\![\text{VP}]\!])$

Interim summary

- What referents a quantifier makes available can be systematically derived from its truth-conditions.
- Specifically, a quantified statement allows one to refer to the individuals which bear witness to its truth.

Conclusion

Summary

- With the proposed theory, pronoun accessibility fully reduce to presupposition satisfaction.

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- With the proposed theory, pronoun accessibility fully reduce to presupposition satisfaction.
- No need for enrichment ; the semantics is kept mostly intact.
- **Predictions:**
  - Bathroom sentences.
  - Donkey, modal subordination.
  - Availability and unavailability of cataphora.
  - Intrusion of pragmatic inferences in pronoun accessibility.

Thank you!

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