

Reducing order-insensitivity in anaphora to accommodation

Keny Chatain (MIT) : kchatain@mit.edu

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Motivations

- (1) a. The person that interviewed him₁ likes the candidate₁.
- b. #The person that interviewed him₁ likes some candidate or other₁.

- (1) a. The person that interviewed him₁ likes the candidate₁.
b. #The person that interviewed him₁ likes some candidate or other₁.
- (2) a. The person that interviewed the candidate₁ likes him₁.
b. The person that interviewed some candidate₁ or other likes him₁.

- (3) a. Every farmer who owns a donkey₁ cherishes it₁.
- b. # Its₁ strength impresses every farmer who owns a donkey₁
(Chierchia, 1995)

(4) Backwards donkey

- a. # Every applicant who filed it₁ on time got [some paperwork]₁ through quickly

- (5) a. Every applicant who filed it₁ on time got [the paperwork]₁ through quickly.
- b. Every applicant who filed it₁ on time got through [the paperwork they wanted to do]₁ quickly₁.

- (5) a. Every applicant who filed it_1 on time got [the paperwork] $_1$ through quickly.
- b. Every applicant who filed it_1 on time got through [the paperwork they wanted to do] $_1$ quickly $_1$.
- c. The fool that spent it_1 mocked the wise man_3 that saved [his $_3$ paycheck] $_1$.

Two classes

- **Referential antecedents:** do not obey order constraints¹
- **Quantificational antecedents:** obey order constraints

¹Not everything goes: condition C and other pragmatic principles.

Under DS, order constraints are natural and expected:

$$g \xrightarrow{\text{antecedent update}} g[+i] \xrightarrow{\text{pronoun update}} \dots$$

The case of referential antecedents seems more threatening.

Worse: no amount of reordering can yield a configuration where all antecedents precede their pronouns

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(6) **Bach-Peters sentences**

[The pilot who shot at it₂ from above]₁ took down [the MIG that was chasing him₁]₂. (Karttunen, 1971; Jacobson, 2000)

A venerable tradition of reply (Heim, 1982; Roberts, 2003)²:

One possible reply.

- Definites (and referential expressions at large) are variables, i.e. are anaphoric.
- In the absence of a referent in the context, their referent may be accommodated.

²And also Hackl (5h ago)

(7) **Referential antecedents:** ...the donkey_i ...pro_i

$$g \xrightarrow{\text{ACCOMMODATION}} g[+i] \xrightarrow{\text{...the donkey}_i\text{...}} g[+i] \xrightarrow{\text{...pro}_i\text{...}} \dots$$

(8) **Quantificational antecedents** ...a donkey_i ...pro_i ...

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Main contribution

Develop and make more explicit the accommodation procedure
(for functional anaphor in particular)

Theoretical benefits

- Allow for a uniformly order-sensitive view on the grammar for anaphora

Empirical benefits

- Account for lack of order constraints
- Account of paycheck pronouns and restrictions on them
- Account for the **subordination constraint**

Configuration:

$$Q(\dots \text{ant}_i \dots) \dots Q'(\dots \text{pro}_i \dots)$$

(9) Referential antecedents: *paycheck sentences*

- a. Every child got the toy she wanted but some got it late.

(10) Quantificational antecedents

- a. Every child got a toy and some got it as early as Tuesday.

(some children $\subset$ every child)

Configuration:

$$Q(\dots \text{ant}_i \dots) \dots Q'(\dots \text{pro}_i \dots)$$

(11) Referential antecedents: *paycheck sentences*

- a. Every French tourist visited her favourite museum.
Every English tourist surprisingly avoided it.

(12) Quantificational antecedents

- a. Every French tourist visited a museum she liked.
#Every English tourist surprisingly avoided it.

(Assuming **English'** $\not\subset$ **French'**)

Subordination constraint

In a configuration like :

$$Q(\dots \text{ant}_i \dots) \dots Q'(\dots \text{pro}_i \dots)$$

It must be that **Restr**(Q) $\subset$ **Restr**(Q')

Simple anaphors and definites

Definite descriptions are “*anaphors with descriptive content*”

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- (13) a. The chancellor of Germany₁ was a chemist.
- b. **assertion:** $g(1)$ was a chemist
presuppositions: $g(1)$ is chancellor of Germany

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(13) a. The chancellor of Germany₁ was a chemist.

b. **assertion:** $g(1)$ was a chemist

presuppositions: $g(1)$ is chancellor of Germany

If the input context g does not provide a referent for 1, it must be accommodated.

Accommodation principle

If current g fails to meet the conditions on context imposed by S , replace g with g' where g' is the minimal extension of g that satisfies these conditions.

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If no such unique minimal extension exists, the accommodation cannot take place.

Extension : version 1

g_2 extends g_1 iff $g_2|_{\text{dom}(g_1)} = g_1$



With extension V1, the rule is: *“add as few referents as possible to satisfy the constraints imposed by the sentence”*

(14) a. # The king of France₁ is bald

b. **pres.:** $g(1)$ is king of France

$\rightsquigarrow$ no extension of input context can meet the presupposition

- (14) a. # The Roman consul₁ wants to take over the Senate.
b. **pres.:** $g(1)$ is consul of Rome

$\rightsquigarrow$ there are two minimal extensions, $g[1 \rightarrow \text{Caesar}]$ and $g[1 \rightarrow \text{Mark Anthony}]$

(14) a. ✓ The chancellor of Germany₁ was a chemist

b. **pres.:** $g(1)$ is chancellor of Germany

$\rightsquigarrow$ there is one minimal extension, $g[1 \rightarrow \text{Angela Merkel}]$

- (15) a. The person that interviewed him₁ liked [the candidate]₁
pres.: $g(1)$ is a candidate
- b. The person that interviewed [the candidate]₁ liked him₁
pres.: $g(1)$ is a candidate

(16) [The pilot who shot at it₂ from above]₁ took down [the MIG that was chasing him₁]₂.

Presuppositions of the sentence

- $g(1)$ is a pilot
- $g(2)$ is a MIG
- $g(1)$ shot at $g(2)$ from above
- $g(2)$ was chasing $g(1)$

Crossed dependencies in Bach-Peters sentences

(16) [The pilot who shot at it₂ from above]₁ took down [the MIG that was chasing him₁]₂.

Accommodation will be possible if and only if there is unique pair (x, y) such that:

- x is a pilot
- y is a MIG
- x shot at y from above
- y was chasing x

(16) [The pilot who shot at it₂ from above]₁ took down [the MIG that was chasing him₁]₂.

A standard Fregean presupposition predicts a markedly different presupposition:

- there is a unique x such that x shot at $g(2)$ from above
- there is a unique y such that y was chasing $g(1)$

Claim: under no value of $g(1)$ and $g(2)$ is this equivalent to the presupposition predicted by the current approach.

Subordination and paycheck sentences

Configuration:

$$Q(\dots \text{ant}_i \dots) \dots Q'(\dots \text{pro}_i \dots)$$

(17) Referential antecedents: *paycheck sentences*

- a. Every child got [the toy she wanted] but some got it late.

(18) Quantificational antecedents

- a. Every child got [a toy] and some got it as early as Tuesday.

Configuration:

$$Q(\dots \text{ant}_i \dots) \dots Q'(\dots \text{pro}_i \dots)$$

(19) English' $\not\subset$ French'

- a. Every French tourist visited her favourite museum.
Every English tourist surprisingly avoided it.
- b. Every French tourist visited a museum she liked.
Every English tourist surprisingly avoided it.

Configuration:

$$Q(\dots \text{ant}_i \dots) \dots Q'(\dots \text{pro}_i \dots)$$

(19) English' $\not\subset$ French'

- a. Every French tourist visited her favourite museum.
Every English tourist surprisingly avoided it.
- b. Every French tourist visited a museum she liked.
Every English tourist surprisingly avoided it.

A simpler example

(20) Jenny got her paycheck last night and Jody got it two days ago.

Functional anaphor : a functional treatment

Inspired from Sudo (2014)

$$\begin{array}{cc} 1 & 2 \\ \text{Billy} & \left\{ \begin{array}{l} \text{Billy} \mapsto \text{Mario} \\ \text{Angela} \mapsto \text{Puddle} \\ \text{Jenny} \mapsto \text{Lego} \end{array} \right. \end{array}$$

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$$(21) \quad \llbracket \text{pro}_{i(j)} \rrbracket^g = g(i) [g(j)]$$

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$$(21) \quad \llbracket \text{pro}_{i(j)} \rrbracket^g = g(i) [g(j)]$$

Indices store **partial functions**.

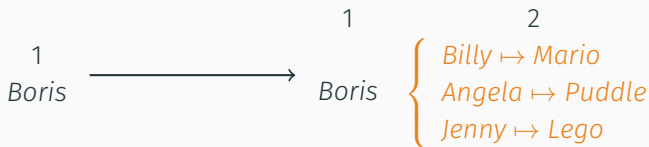
- (22) a. Every child¹ got [the toy they₁ wanted]₂₍₁₎
- b. Some¹ got it₂₍₁₎ as early as Tuesday
- c. **pres. of (22a):** for every child x , $g(2)(x)$ = the toy that x wanted

Many minimal accomodations under extension V1:

- f_1 : maps children to the toy they wanted
- f_2 : maps children to the toy they wanted and Angela Merkel to my puddle.
- ...

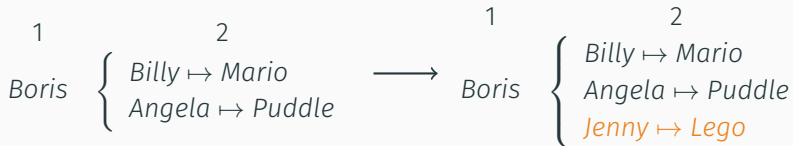
Extension : version 2

g_2 extends g_1 iff $\text{dom}(g_1) \subset \text{dom}(g_2)$
and for every i , either $g_1(i) = g_2(i)$
or $g_2(i)|_{\text{dom}(g_1)} = g_1(i)$



Extension : version 2

g_2 extends g_1 iff $\text{dom}(g_1) \subset \text{dom}(g_2)$
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or $g_2(i)|_{\text{dom}(g_1)} = g_1(i)$



With extension V2, the rule is: *“add as few referents as possible to satisfy the constraints on referents ; if you accomodate functions, accomodate a function with the smallest domain.”*

Is this *ad hoc*?

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Subsumed under maximal informativity (not shown here).

- (23) a. Every child¹ got [the toy they₁ wanted]₂₍₁₎
b. Some¹ got it₂₍₁₎ as early as Tuesday.
c. **pres.:** for every child x , $g(2)(x) =$ the toy that x wanted

Exactly one minimal accomodations under extension V2:

- f_1 : maps children to the toy they wanted
- $\#f_2$: maps children to the toy they wanted and Angela Merkel to my puddle.
- ...

Our rule of accommodation can only account for subordinated sentences!

(24) Jenny¹ got [her paycheck]₃₍₁₎ last night } accommodation domain
and Jody² got it₃₍₂₎ two days ago.

a. **pres.:** $g(3)(\text{Jenny}) = \text{Jenny's paycheck}$

Accommodated referent cannot be used in second conjunct

(25) Jenny¹ got [her paycheck]₃₍₁₎ last night
 and Jody² got it₃₍₂₎ two days ago. } accommodation domain

a. **pres.:** $g(3)(\text{Jenny}) = \text{Jenny's paycheck}$ and $\text{Jody} \in \text{dom}(g(3))$.

No unique minimal extension (under both V1 and V2)

Keshet (2011)

- (26) John deposits his paycheck in the bank.
 ??Mary sent it to me an hour ago.

- (27) a. ?? The man who handed in his thesis was happier than the woman who read it.
- b. The man who handed in his thesis was happier than the woman who read her thesis.

(28) [JENNY¹ got [her paycheck]₃₍₁₎ LAST NIGHT] ~7
and [JODY² got it₃₍₂₎ TWO DAYS AGO] ~7.

Presuppositions of anaphoric expressions:

- $g(3)(\text{Jenny}) = \text{Jenny's paycheck}$ (her paycheck)
- $\text{Jody} \in \text{dom}(g(3))$ (it)

- (28) [JENNY¹ got [her paycheck]₃₍₁₎ LAST NIGHT] $\sim$ 7
 and [JODY² got it₃₍₂₎ TWO DAYS AGO] $\sim$ 7.

Presuppositions of squiggles

- $g(7) \subset \{ \lambda w : g(3)(x) \text{ is } x\text{'s paycheck. } x \text{ got } g(3)(x) \text{ at } t \mid x, t \}$

(first $\sim$)

- $\lambda w : g(3)(x) \text{ is Jenny's paycheck. Jenny got } g(3)(x) \in g(7)$

(first $\sim$)

- $\lambda w. \text{ Jody got } g(3)(x) \in g(7)$

(second $\sim$)

Together, these presupposition ensure the existence of a minimal accommodation.

Summary

- The order-insensitivity of referential antecedents is problematic for DS.
- If referential expressions do not introduce discourse referents, we can keep DS's basic tenet.
- Empirical bonuses:
 - Some constraints on the distribution of paycheck sentences.
 - Difference in subordination constraint.
 - Referential expressions vs. Quantificational expressions in cases of wide-scope distributivity (not shown here, see [Chatain \(2019\)](#))

Thank you!

- (29)
- a. Every ad which praised the great location of a flat failed to mention what was so great about it.
 - b. Every ad which praised a flat for its convenient location failed to mention what was so convenient about it.

If X is type e ,

$$(30) \quad \llbracket X_i \rrbracket^g = \llbracket X \rrbracket^g \quad (\text{pres.: } g(i) = \llbracket X \rrbracket^g)$$

We don't lose anything except for the crossed presupposition of Bach-Peters sentences.

Comparisons

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