



## Re-Binding and the Derivation of Parallelism Domains

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### 1 The Re-Binding Generalization

#### Sag's Observation

- (1) John said Mary hit him. Bill did too. *said Mary hit Bill*
- (2) John said Mary hit him. Bill said she did too. *\*hit Bill*
- In (1), sloppy pronoun is bound *within* VPE:
    - John<sub>1</sub>  $\lambda x.x$  said Mary hit x
    - Bill<sub>2</sub> did too.  $\lambda x. x$  said Mary hit x
  - In (2), sloppy pronoun gets *re-bound* outside of VPE:
    - John<sub>1</sub>  $\lambda x.x$  said Mary<sub>3</sub> hit x
    - Bill<sub>2</sub>  $\lambda x.x$  said she<sub>3</sub> did too. *hit x*
  - (Sag, 1976): *Re-binding* is impossible.

#### MaxElide

- (Takahashi and Fox, 2005): *Re-binding* is sometimes possible:
- (3) Every sailor thinks Sally loves him, while every SOLDIER thinks MARY does. *love him*
- *MaxElide* – ellipsis must be maximal within some *Parallelism Domain* (PD).
  - **Parallelism Domain:** A constituent C is a Parallelism Domain iff C is semantically identical to some antecedent constituent A, modulo focused elements

#### Details

- For an elided constituent C – find the smallest PD containing C.
- If PD contains an *elidable* constituent C' that contains C, the ellipsis violates MaxElide
- If C contains a sloppy pronoun *p*, the minimal PD must contain the controller for *p*
- For strict readings, MaxElide is always trivially satisfied, because elided constituent C itself is always a PD
- MaxElide rules out sloppy reading for (2):
  - Smallest containing PD is [*Bill said she did too. (hit him)*] – the containing VP *said she hit him* could have been elided.
- **Intervening Focus (IF):** a constituent containing focus can't be elided
- For (3), no larger constituent could have been elided, because of the Intervening Focus on MARY.

## Problems with MaxElide

- MaxElide incorrectly rules out a sloppy reading in (4):

(4) Nearly EVERY boy said Mary hit him. But BILL didn't say she did. *hit Bill*

- In (5), MaxElide incorrectly *permits* re-binding:

(5) Bill<sub>1</sub> believes that Sally<sub>2</sub> will marry him<sub>1</sub>, but everyone knows that she won't. [*marry him*]  
(Bach and Partee, 1980)

- No larger constituent can be elided in (5), because of the intervening focus – *won't*.
- With the following variant of (5), the sloppy reading becomes acceptable.

(6) Everyone<sub>1</sub> HOPES that Sally<sub>2</sub> will marry him<sub>1</sub>, but Bill KNOWS that she will. [*marry him*]

## Re-Binding Generalization

- Re-binding is possible only when necessary to satisfy parallelism
- In (2) and (5), the strict reading is available to satisfy parallelism. This rules out re-binding.
- In (3), (4), and (6), the strict reading is *blocked*, making re-binding available.

## 2 Derivation of Parallelism Domains

### Proposal

- **Monotonicity:** As soon as a PD can be identified during a bottom-up derivation, *indexation* takes place, and cannot be modified later in the derivation.
- **Parallelism Domain:** An (LF) constituent E is a Parallelism Domain if there is an antecedent LF A such that there is a *valid indexing* E' of E such that E' is Parallel to A.
- **Contrast Condition:** given a PD A containing a focused constituent  $\alpha$ , we require that A would not be a PD without focus on  $\alpha$
- **Valid indexing:** indexing must satisfy the *Familiarity* Constraint of File Change Semantics (Heim, 1982): a pronoun must have an index  $i$ , such that  $i \in \text{Dom}(F)$ , where  $F$  is the File representing the current state of the discourse. (This is analogous to the *accessibility* requirement in DRT (Kamp and Reyle, 1993)).
- **Pronunciation:** A PD must contain some pronounced material

### Determining Parallelism

- To determine if two LF's A and B are parallel:
  - Decompose A and B by lambda-abstracting over Parallel (Focused) Elements,  $P_A$  and  $P_B$ , giving –  $[P_A, \lambda x.A']$ ,  $[P_B, \lambda y.B']$
  - If A' is LF-identical to B' Parallelism is satisfied
  - Lambda-abstraction: substitute lambda-bound variable  $x$  for  $P_A$  in A. If A contains an element  $p$  coindexed with  $P_A$ ,  $x$  is also substituted for  $p$  (Dalrymple *et al.*, 1991)
  - If no focused elements, lambda abstraction is vacuous
- **Example**
  - A = John<sub>1</sub> said Mary<sub>2</sub> hit him<sub>1</sub>.
  - B = BILL<sub>3</sub> did too. *said Mary<sub>2</sub> hit him<sub>3</sub>*

[John<sub>1</sub>,  $\lambda x$ .x said Mary<sub>2</sub> hit x], [BILL<sub>3</sub>,  $\lambda y$ .y said Mary<sub>2</sub> hit y]

  - $\lambda x$ .x said Mary<sub>2</sub> hit x LF-identical to  $\lambda y$ .y said Mary<sub>2</sub> hit y
  - Note: LF-identity condition can sometimes involve inference – see (Hardt, 2005) for discussion, references.

## Good and Bad Re-Binding

*Bad Re-binding:*

(7) John<sub>1</sub> said Mary<sub>2</sub> hit him<sub>1</sub>. Bill said she did. *hit him*

- Smallest potential PD: [did *hit him*]
- This is indeed a PD, with valid indexing [did *hit him*<sub>1</sub>]
- Strict reading results, and re-binding is not possible.

*Good Re-binding:*

(8) Nearly EVERY boy<sub>1</sub> said Mary<sub>2</sub> hit him<sub>1</sub>. But BILL<sub>3</sub> didn't say she did. *hit him*

- Smallest potential PD: [did *hit him*]
- *Not* a PD
  - [did *hit him*<sub>1</sub>] – violates Familiarity
  - [did *hit him*<sub>3</sub>] – doesn't match antecedent [hit him<sub>1</sub>]
- First PD is [BILL<sub>3</sub> didn't say she did *hit him*<sub>3</sub>]
- This matches antecedent, with following decomposition (polarity is ignored):

[Nearly EVERY boy<sub>1</sub>], [ $\lambda$  x.x said Mary<sub>2</sub> hit x]  
BILL<sub>3</sub>, [ $\lambda$  y.y said Mary<sub>2</sub> hit y]

## 3 Focus Licensing and Parallelism Domains

### The Puzzle: Focused Pronouns

(9) Every boy likes his father, and every TEACHER likes HIS father.

- Why is focus permitted on HIS?
- (Sauerland, to appear) appeals to an E-type mechanism to provide a silent property as part of the pronoun representation
- (Jacobson, 2000) argues that pronouns can range over different domains.
- Both accounts appeal to contextually available “extra material” for pronoun representations, to account for contrast.

### Proposal: Focus Agreement

- Given a PD  $A$  containing a pronoun  $x$  with a binder  $B$ , focus on  $x$  is licensed if focus on  $B$  is licensed.
- (Sauerland, to appear) and (Jacobson, 2000) consider and reject the Focus Agreement account, because of examples like (10):

(10) Every BOY<sub>1</sub> called his<sub>1</sub> mother before every TEACHER<sub>2</sub> called \*HIS<sub>1</sub> mother. (Sauerland, to appear)

- Focus on the pronoun *HIS* is impossible, despite the fact that it has a focused binder (Every BOY<sub>1</sub>).

### Derivational View Solves Problem of Focus Agreement

- With focused HIS, the index <sub>1</sub> is not permitted on the proposed derivational account
  - [HIS<sub>1</sub> mother] fails to be a PD, because it violates the Contrast Condition – it would be a PD without focus on *his*
- Derivation continues until we construct [every TEACHER<sub>2</sub> called HIS mother] – this is a PD, with the indexing HIS<sub>2</sub>
- HIS<sub>1</sub> would violate the Contrast Condition

## Derivational Account of Focused Strict Readings

- Focus Agreement is arguably simpler than the context-based accounts of (Sauerland, to appear) and (Jacobson, 2000)
- Their accounts are subject to another problem: focused strict readings.
- Focus is *never* permitted when there is a strict reading, as in the following examples:

(11) John<sub>1</sub> likes his<sub>1</sub> father, and BILL<sub>2</sub> likes his<sub>1</sub> father too.

(12) A man<sub>1</sub> likes his<sub>1</sub> father, and ANOTHER man<sub>2</sub> likes his<sub>1</sub> father too.

- In (11) and (12), if the second *his* is interpreted strictly, it must not receive focus.

[likes HIS father] is not a PD

[likes HIS<sub>1</sub> father] violates Contrast Condition (ie., focus wasn't needed)

[likes HIS<sub>2</sub> father] violates Familiarity (index 2 not yet available)

[ANOTHER man<sub>2</sub> likes HIS<sub>1</sub> father] is not a PD – violates Contrast Condition

[ANOTHER man<sub>2</sub> likes HIS<sub>2</sub> father] *is* a PD – focus on HIS licensed by Agreement

- It's not clear how accounts of Sauerland or Jacobson could capture these facts:
  - For both these accounts, the “extra material” need merely be contextually available. The problem for (11) and (12) is that it must be ensured that *no representation* be available that would permit focus, on the strict reading.
  - But these accounts provide no such means for ensuring this.
  - For Jacobson's account, in (11), one possible domain for the first pronoun could be John and two previously mentioned individuals, while the second pronoun domain might be Bill, John and one previously mentioned individual. This would incorrectly license focus, even with the strict reading.
  - On the other hand, it's not clear what motivates a difference in domains for the sloppy reading for (12), without appeal to an explicit model of inter-sentential indexing, such as File Change Semantics. Similar problems arise for Sauerland's E-type account.

## 4 Questions/Prospects

### How is Indexing Decision Made?

- Generally, Re-binding is blocked by strict, because strict allows a PD to be determined at an earlier stage in derivation
- Re-binding becomes possible when the strict reading is structurally ruled out (because of quantifier scope)
- Could strict reading be ruled out based on pragmatic factors? Yes.

(13) MARY might admit that the criminals had been in contact with her, but SUSAN wouldn't admit that they had (been in contact with Susan/?Mary).

- Strict reading violates presupposition associated with *admit* – if A admits P, P implicates A

### What are the Facts?

- Based on a Web-based survey I performed recently (Hardt, 2006): the “bad” rebinding examples are generally given a mildly degraded status, rather than unacceptable
- More work is needed to determine exactly what the facts are

## Summing Up

- Re-Binding Generalization: possible only when needed to satisfy parallelism
- Derivational Account derives Re-Binding Generalization: PD's are determined as soon as possible in derivation; indexing cannot be changed later
- Indexing decision makes use of all information available (both structural and pragmatic)

## References

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