Binding and Person/Number Features

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Introduction

- 1st/2nd person pronouns as bound variables:
  Only I got a question I understood
  $\forall x(x$ got a question x understood $\rightarrow x =$ speaker$)$

- Plural pronouns (apparently) ranging over singular entities:
  Both/All candidates think they can win the nomination
  $\forall x($candidate$(x) \rightarrow x$ thinks that x can win$)$

- Both phenomena at the same time:
  We both/all think we can win the nomination
  $\forall x(x \in$ WE $\rightarrow x$ thinks that x can win$)$

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- Previous literature includes:
  - Partee (1989)
  - Heim (early 1990s, 2005, 2007)
  - Kratzer (1998, 2008)
  - Schlenker (1999, 2002, 2003, 2005a,b)
  - von Stechow (2003)
  - Rullmann (2003, 2004)
  - Sauerland (2003, 2004, 2005)
  - Sauerland, Anderssen & Yatsuhiro (2006)
  - Cable (2005)
  - Déchaine & Wiltschko (2006)
  - Sternefeld (2008)

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Inert features?

- One type of approach: person/number features may be present at PF but absent at LF

- Syntactic feature manipulation mechanism
  - Feature checking (e.g. von Stechow 2003)
  - Feature transmission (e.g. Kratzer 1998, 2008; Heim 2005/07)

- Alternative: Is a purely semantic account of pronominal agreement possible? (cf. Cooper 1983, Dowty & Jacobson 1989)

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Goal of this talk

- **Explore the following hypothesis:**
  Pronominal features are never inert

Some limitations:

- Topics I won't discuss:
  - **gender agreement**
  - **context shifting** by propositional attitude predicates
    (Schlenker 1999, 2002, 2003, von Stechow 2003, Anand and Nevins 2004, Percus & Sauerland 2003)
  - **partial binding**
    (Partee 1989, Schlenker 2002, Rullmann 2003, 2004, Heim 2005/07, Kratzer 2008)

- Concentrate on **1st person**

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Outline

- *Each of us* (some new data)

- Challenges for syntactic and semantic approaches

- Intermezzo: Number and binding (Rullmann 2003)

- *We* as a bound variable

- Focus cases

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Each of us

(1) Each of us -- and the Florida Supreme Court has said this -- has a right to control our own body.
"Terri Schiavo's husband allows her family to visit", *CNN.com*, Thursday, October 23, 2003

Google search:

(2) But each of us, as an individual, faces our own edge.
(3) THE BANK TELLER explores the desire within each of us to overcome our isolation and to see and be seen by the other in a relation of authentic connectedness.
(4) Each of us has experienced a strong sense of pride as an educator when a student says that we did an excellent job of teaching and motivating him or her to learn.
(5) Each of us has our own philosophy regarding how to help India.
(6) Each of us must climb our separate mountain
To reach at last our own extended view

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Plural quantifiers

(1) Most of us as men are experts on women, until we marry one.
(2) Most of us have moments when we forget where we left the car keys or forget what we went to the grocery store for.

(3) Meniere's Disease is a progressive, incurable disease, but none of us can predict the progression of the disease in *us*.

(4) Many of us can point to one individual who has changed our life.

(5) If we are honest few of us like the signs of aging in our body.

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3rd person pronouns

- **singular**
(1) "Each of us bears his own Hell."   (Virgil)
(2) "Are not all of these men who are speaking Galileans? … Yet each of us hears them speaking in his own tongue about the marvels God has accomplished." (Acts 2)
(3) "None of us will ever accomplish anything excellent or commanding except when he listens to this whisper which is heard by him alone." (Ralph Waldo Emerson)
(4) "None of us lives to himself, and none of us dies to himself." (Romans 14:7-9)

- **plural**
(5) From within, each of us emits a light… a fragment of themselves to others.

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Some statistics

	1st pl.	3rd sg.	3rd pl.
each of us	21	2	1
none of us	9	2	0
most of us	16	0	0
all of us	1	0	0
many of us	16	0	0
(a) few of us	13	0	0
total	77	4	1

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Some Dutch data

(1) Elk van ons zou zover moeten komen dat we dat op zijn minst kunnen toegeven.
"Each of us should get to the point where we can at least admit that."

(2) Elk van ons heeft een natuurlijke apotheek (of drugs-store) in ons lichaam.
"Each of us has a natural pharmacy (or drugstore) in our body.

	1st pl.	3rd sg.
elk van ons	9	19

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A challenge for syntactic approaches

- Verbal agreement shows that e*ach of us* is 3rd pers. sing.
  - *Each of us thinks we're smart*

- Copying of features from *us* directly onto the bound pronoun?

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A challenge for semantic approaches

- Pronominal features impose presuppositions
  (Cooper 1983, Dowty & Jacobson 1989, Heim & Kratzer 1998, Schlenker 2002, 2003, 2005, Sauerland 2002, 2003, 2004, Heim 2005, 2007, a.o.)

- $\|[1^{st}]\|^c = \lambda x$: x contains speaker(c). x

- $\|[sing]\|^c = \lambda x$: x is an atom. x

- Sauerland: [plural] and [3rd] are unmarked and don't have presuppositions

- **Maximize Presupposition!**
  (Heim 1991, Sauerland 2003, 2004, 2005, Sauerland, Anderssen & Yatsuhiro 2006, Heim 2005/07)

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- **Person:** 3rd person is unmarked

(1)   a.   *I$_5$ think I$_5$'m smart*
      b.   # *I$_5$ think he$_5$'s smart*

(2)   a.   # *Every man$_5$ thinks I$_5$'m smart*
      b.   *Every man$_5$ thinks he$_5$'s smart (including me)*

- **Number:** the plural is unmarked   (cf. McCawley 1968)

- *They* is number-neutral   (Rullmann 2003)

(3)   *[None of the students]$_8$ claimed they$_8$ had solved the problem*

  – Can be used in a situation in which some students worked on the problem in groups and others individually

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Applying this approach to *each of us*:

[Each of us]$_5$ thinks we$_5$ can solve the problem

- *We* ranges over entities containing the speaker, but is number neutral

- But *each* quantifies only over singular entities

- So the quantification is restricted to the speaker

- This excludes the bound-variable reading

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- Instead, the bound-variable reading is predicted to always require a 3rd person pronoun

(1)   *Everyone of us has to call his mother*   (Sauerland 2005: 22)

(2)   *Chacun de vous est fidèle à son/#ton épouse*   (Schlenker 2005b:16)
      each of you-pl is faithful to his/#your wife

(3)   *Each of you thinks that he is / #you are the winner*
      (Schlenker 2005a: 54; but noting that in English judgements are "more liberal and more variable" than in French)

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Why not *I*?

- *I* can never be bound by *each of us*:

(1) # *[Each of us]$_8$ thinks I$_8$'m smart*

- But *I* can be a bound variable with focus particles:

(2) *[Only I]$_8$ think I$_8$'m smart*

This suggests the following:

- *We* is different than *I*

- There's something special about focus

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Towards a solution

- Two separate issues:
  - number
  - person

- The number problem is not shared by other cases of bound *we*:

(1) *All/Most/Many/None of us think we're smart*
(2) *We all think we're smart*

- The number problem is related to "singular *they*":

(3) *Every man thinks they're smart*

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Intermezzo: number and binding

Rullmann 2003:

- Sortal distinction between singular and plural entities

- Plural entities are non-empty sets of singular entities, **crucially including singleton sets**

- D_e = SING $\cup$ PLUR, where
  SING = D
  PLUR = Pow$^+$(D)

- Singular pronouns range over members of SING

- Plural pronouns range over members of PLUR

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- Singular quantifiers (*every/no student)* quantify over members of SING

- Plural quantifiers (*all/no/many/most students)* quantify over members of PLUR

- Meanings of plural and singular systematically related:
  Det$_{pl}$ (A, B) iff Det$_{sg}$ ($\cup$A, $\cup$(A$\cap$B)) (Winter 2001, 2002)

- Number agreement between pronoun and its binder results from the sortal distinction

- but exception: "singular *they*"

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- The fact that PLUR includes singleton sets explains why *they* may **appear** to range over individuals

- In such cases, *they* really ranges over singleton sets:
  – *Both candidates think they can win the nomination*

- But also cases where *they* ranges over non-singletons:
  – *Most people who think they have common interests become friends* (cf. Roberts 1987)

- Cases where *they* ranges over both singleton and non-singletons:
  – *[None of the students]$_8$ claimed they$_8$ had solved the problem*

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"Singular *they*"

- Split and partial binding ➔ set indices:
  – *Every woman$_1$ told [each of her$_1$ boyfriends]$_2$ that they$_{\{1,2\}}$ should get married*

- "Singular *they*" has a singleton set index:
  – *Everone$_2$ thinks they$_{\{2\}}$ are smart*
    (see Sauerland 2003, 2004, 2005, Sauerland, Anderssen & Yatsuhiro 2006, von Sternfeld 2008 for proposals in much the same spirit)

- This analysis can be extended to *we*:
  – *[Each of us]$_2$ thinks we$_{\{2\}}$ are smart*

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The person problem

Non-focus cases of bound *we*:

- Floated quantifier or implicit distributive operator:
  – *We each/both/all/Dist think we can win the nomination*

- Quantificational determiner + *of us*:
  – *Each/All/Most/None of us think(s) we can win the nomination*

- The deictic occurrence of *we/us* picks out a set of individuals that includes the speaker

- The bound-variable occurrence of *we* ranges over (possibly singleton) subsets of that set

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Relational component

- Deictic *we* refers to a set of individuals that stand in some contextually salient relation R_c to the speaker

- Nunberg (1993): indexicals have
  - a **deictic** component (in this case, the speaker)
  - a **relational** component (in this case, R_c)
  - a **classificatory** component (e.g., animacy, gender)

- R_c must always be reflexive (e.g., "be friends with")

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Semantics for *we*

- *We* is a variable ranging over non-empty sets of entities that stand in relation R_c to the speaker

- $\|we_i\|^{c,g} = g(i)$ if $g(i) \in PLUR$ and
$\forall x \in g(i): R_c(x, speaker(c))$ (otherwise undefined)

- **Additional pragmatic requirement:** When *we* is **free** it picks out the **maximal** set that meets its presupposition

- As R_c is reflexive, this maximal set includes the speaker

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Preventing overgeneration

(1)   # *[Each of my friends]$_5$ loves our$_{\{5\}}$ mother*

- Presupposition failure?

- But we could just pick the right R_c (e.g., "is a friend of")!

- But note that in that case the presupposition of *our* is satisfied "accidentally". It depends on the denotation of the noun *friend* and the particular choice of R_c.

- The presuppositions of grammatical features should be satisfied in every model that respects the semantics of the functional items.

(2)   # *The speaker loves my mother*

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- This means presuppositions of grammatical features are much stronger than "regular" presuppositions

- Different projection behavior:

(3)   *If John were married, his wife would have to be a saint*

(4)   *If John had been female, we would have hired him / # her in a second*

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But then again…

(1) Most Muslims have no clue what we're saying when we're reciting the Koran in Arabic. (Irshad Manji)

(2) Those who still adore the game – and there are millions of us – can only look at the stick work, the constant interference, the stultifying coaching strategies, the Michelin Man goaltenders and the silly regulations that persist and scratch our collective heads.

(3) We owe them, and their children, and our own, the most enduring monument we can build: a world of liberty and security made possible by the way America leads, and by the way Americans lead our lives. (George W. Bush)

(4) Linguists have now hammered many generations of American students with our contrary opinions about normal people's linguistic beliefs, without notable success.

(5) Thanks to those who have already made your card. (e-mail message)

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We vs. *I*

[Each of us]$_8$ thinks I$_8$'m smart

- *I* does not involve R$_c$. It can only refer to the speaker.

- $\| I_i \|^{c,g}$ = g(i)   if   g(i)=speaker(c)   (otherwise undefined)

- So *we* is not really the plural of *I* (cf. Benveniste)

- But then what about binding of *I* by a focus particle?

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The focus cases

(1)   *Only I did my homework*
(2)   *Even I did my homework*

- Binding in these cases is due to focus (Schlenker 2003, Déchaine and Wiltschko 2006, Roeper n.d.)

- In the calculation of the focus-semantic value (the set of alternatives) the presuppositions of the pronouns are ignored

- Ordinary semantics of *I*:
  $\| I_i \|^{c,g}$ = g(i)   if g(i) $\in$ SING and g(i) = speaker(c) (otherwise undefined)

- Focus semantics of *I*:
  $\| I_i \|^{c,g}$ = g(i)

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Some consequences

- Presuppositions are present in the ordinary semantic value, so agreement is still required:
  - # *Only I$_8$ love his$_8$ mother*
  - # *I$_8$ love his$_8$ mother*

- Analysis carries over to sloppy readings in ellipsis cases ("vehicle change"):
  I did my homework and I hope you did too

- Contrast pointed out by Heim (2005, 2007):
  Only I did my homework
  # *Nobody but me did my homework*

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- "the only" *constructions* have focus semantics too:

(1)   *I am the only one around here who takes care of my children*   (Partee 1989)
        = *Only I take care of my children*

- This explains the following contrast (Cable 2005):

(2)   *I am the only person who talks to my father*
        = *Only I talk to my father*

(3)   # *I met the only person who talks to my father*
        $\neq$ *Only I met the person who talks to my father*

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Kratzer's data

- Kratzer (2008): German only allows binding in the "the only" construction if verb agreement has syncretism of 1st and 3rd person:

(1)   # Ich bin der einzige der meinen Sohn versorg-**t**
        "I am the only one who takes(**3**.sg) care of my son"

(2)   Wir sind die einzigen die unseren Sohn versorg-**en**
        "We are the only ones who take(**1/3**.pl) care of our children"

- This seems to argue very for a syntactic account

- Is there a semantic explanation?

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- Suppose that in German verb agreement suffixes impose presuppositions just like pronouns:

- 1st person sing: $\| -e_i \|^{c,g} = g(i)$ if $g(i) \in$ SING and g(i) = speaker(c) (otherwise undefined)

- 3rd person sing: $\| -t_i \|^{c,g} = g(i)$ if $g(i) \in$ SING and $g(i) \neq$ speaker(c) and $g(i) \neq$ hearer(c) (otherwise undefined)

- 1st/3rd person plural: $\| -en_i \|^{c,g} = g(i)$ if $g(i) \in$ PLUR and hearer(c) $\notin$ g(i) (otherwise undefined)

- We'd have to assume that 3rd person is not unmarked

- But then why is 3rd person agreement OK as long as there is no bound 1st person pronoun in the relative clause?

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Conclusion

- Semantic account of bound *we* is promising

- But heavy burden carried by the pragmatics

- The focus-induced cases of binding are a separate phenomenon

- The greatest challenge for a semantic account are Kratzer's examples

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