Lecture 9. Pronouns and Reflexives: Syntax and Semantics

Readings: Full references and links are in References at the end. These are all on the CD.
(1) (Reinhart 1999) Binding theory
(2) Büring (2004), Chapters 4 and 5, Binding vs. Coreference, Other Cases of Semantic Binding.
(3) (Testelets 2005), St.Petersburg Lectures on Binding Theory, Lectures 1 and 4.
Optional readings:
(4) (Chomsky 1980) On binding; (5) (Bach and Partee 1980) Anaphora and semantic structure; (6) (Reinhart and Reuland 1993) Reflexivity (for next week); (7) (Grodzinsky and Reinhart 1993) The innateness of binding and coreference; (8) (Pollard and Sag 1992) Anaphors in English and the scope of binding theory (for next week); (9) (Fischer 2004) Optimal binding

1. Review of Chomsky's (syntactic) "Binding condtions".

(Review from Lecture 5)
A central question is how to describe and explain the differences in distribution between "plain pronouns" like *he, she, it* (called *pronominals*, or *pronouns*, in Chomskian Binding Theory) and reflexive pronouns *himself, herself, itself* (*anaphors* in Chomskian Binding Theory), and similar forms in other languages. Reinhart (1999) begins as follows:

> Binding theory is the branch of linguistic theory that explains the behavior of sentence-internal anaphora, which is labelled 'bound anaphora' …. The sentences in (1) each contain an anaphoric expression (she, herself), and a potential antecedent (Lucie or Lili).
>
> (1) a. Lucie thought that Lili hurt her.
> b. Lucie thought that Lili hurt herself.
> c. *Lucie thought that herself hurt Lili.
>
> The two anaphoric expressions have different anaphora options: In (1a), only Lucie can be the antecedent; in (1b), only Lili; in (1c), neither can. This pattern is universal. (Reinhart 1999, p.86)

Binding Theory is concerned primarily with the differences between the distributions of pronominals like *her* and reflexive pronouns like *herself*.

What does "binding" mean in syntax?

(2) **Syntactic binding:** NP_1 syntactically binds NP_2 iff NP_1 and NP_2 are coindexed and NP_1 c-commands NP_2.

The Binding conditions proposed in (Chomsky 1981) can be summarized as follows; what a "local domain" is must be specified; to a first approximation it's a clause. These conditions (and

alternatives to them) are known by these names, so one has to learn to associate "Condition A" with reflexives, "Condition B" with pronouns, and "Condition C" with full NPs.

(3) *Binding conditions*

Condition A: An anaphor must be bound in its local domain.
Condition B: A pronoun must be free in its local domain.
Condition C: An R-expression must be free.

These conditions rule out the impossible choices of co-indexing in (1), and also account for the contrasts in the following.

(4) a. $Felix_i$ invited $himself_i$.
b. *$Felix_i$ invited him_i. (This is a "condition B violation")

(5) a. $Felix_i$ heard $himself_i$ sing.
b. *$Felix_i$ heard him_i sing. . (A "condition B violation")

(6) a. $Lucie_i$ believes that we should elect her_i.
b. *$Lucie_i$ believes that we should elect $herself_i$. . (A "condition A violation")

It is argued that these conditions are universal, with parametric variation across languages (and perhaps even across particular subclasses of anaphors and pronominals within a language) on the relevant definition of "local domain".

Issues to focus on, especially in a semantics course like this:

- How do the syntactic binding conditions relate to the semantics of anaphora? What happens when we distinguish "bound variable anaphora" from "coreference" and/or "pragmatic anaphora"?
- More distinctions: different kinds of reflexives, various properties of anaphoric expressions in various languages. What's the full range of syntactic anaphoric expressions, what's the full range of semantic (or semantic and pragmatic) varieties of anaphora, and how do syntax and semantics correlate cross-linguistically?

We'll begin looking at some of these today, especially at the significance of the distinction between semantic bound variable anaphora and coreferential or pragmatic anaphora, and how that leads to fundamental questions about what, if anything, the syntactic binding conditions apply to. The conclusion will be: semantic binding requires syntactic binding, but coreference does not.

2. Semantic binding vs. coreference.

Bach and Partee (1980); Büring (2004), Chapter 4, Binding vs. Coreference, pp. 81-96, Chapter 5, Other Cases of Semantic Binding, pp. 104-117; Reinhart (1999).

2.1. Basics of semantic binding

Bach and Partee (1980) summarize a number of different places where coindexing is used in the literature:

(7)(i) The same pronoun appears in several places in a sentence:
He said *he* was OK.
(ii) A pronoun appears together with a referring NP:
John said that *he* was OK.
(iii) A pronoun appears together with a quantificational NP:
No woman doubts that *she* is OK.

(iv) A pronoun appears in a relative clause:
… the *woman who* said that *she* had found the answer.
(v) A reflexive or other obligatorily bound pronoun appears in a sentence:
John loves *himself.*
Oscar is out of *his* head. (idiom meaning "is crazy"; **Oscar* is out of *your* head.)

Bach and Partee: "It is really only in situation (7i) (in some sentences) and (7ii) that it seems appropriate to talk about coreference. In every other case … coindexing a pronoun with some other expression is a shorthand way of saying that the pronoun in question is being interpreted as a bound variable." The same point is emphasized by Reinhart (1982, 1983a, 1983b).

As Büring (2004, p. 82) notes, when we replace the pronouns in (7ii) and (7iii) by copies of their antecedent NP, we get very different results.

(8)*John* said that *John* was OK.
(9)*No woman* doubts that *no woman* is OK.

Sentence (8) is (usually said to be) anomalous because of its Condition C violation, but at the same time it is a semantically accurate paraphrase of (7ii).

Sentence (9), on the other hand, is not syntactically anomalous at all – it does not seem to be a Condition C violation – but it has a very different meaning from (7iii). The pronoun in (7iii) in no way "corefers" with its antecedent; the antecedent *no woman* is not a referring expression at all.

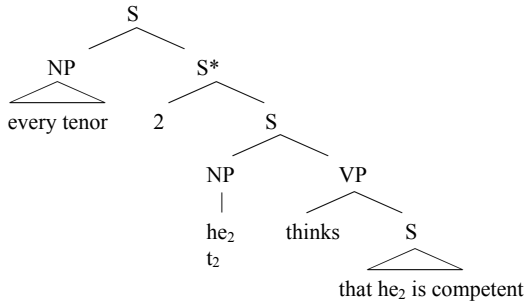
So in (7iii) we have semantic binding as well as syntactic binding: but what is it that binds the bound-variable pronoun? Think back to how the Quantifying In rule works, and the examples in Homework 2. As we've discussed before, when quantified NPs interpreted as Generalized Quantifiers are "Quantified In" (or "QR'd" in a Chomskian LF), the NP itself does not "bind" a coindexed pronoun, but rather a lambda abstractor is adjoined to its sister clause-constituent. The index on the quantified NP signals which variable we lambda-abstract on.

Take Büring's example (4.9) (p. 84):

(4.9) Every tenor$_2$ thinks that he$_2$ is competent.

By Montague's Quantifying In rule (see handout, Lecture 3), or very similarly by May's Quantifier Raising (May 1977, 1985) if augmented as argued by Heim and Kratzer (1998), the semantically relevant syntactic structure is as follows:

(10)



The interpretation of the quantified NP has nothing in it with the index 2! Quantified NPs are semantically "closed" expressions: all of their variables are bound internally to the NP interpretation.

If we treat Heimian indefinites as type <<e,t>,t>, this would not be true of them. A generalized quantifier interpretation of Heimian *a cat$_3$* would be $\lambda P(\text{cat}'(x_3) \,\&\, P(x_3))$ (note[1]). But it is equally true in this case that when such an indefinite is an antecedent of a pronoun, the indefinite does not provide any operator that could semantically bind the pronoun. Similarly for definite NPs. So we are faced with the following "paradox":

(11) **Syntactic - Semantic binding "paradox":** Syntactic binding corresponds to semantic binding only in the case of bound variable pronouns, but an NP antecedent to a bound variable pronoun never binds it!

The resolution of the "paradox" is seen in the extra node in the tree in (10): the adjoined "2" is interpreted as λx_2, and it is that lambda-operator that semantically binds both the "trace" of the QR'd subject *every tenor* (*he$_2$* in Montague's way, or *t$_2$* in a Chomskian LF) and the coindexed pronoun *he$_2$*, both of them interpreted as bound variables *x$_2$*.

(12) Interpretation of the tree in (10): **TR**(every tenor) (λx_2 **TR**(he$_2$ thinks that he$_2$ is competent))

(Büring does the details slightly differently in his book; he lets the adjoined binder, which he calls β_2, adjoin to the VP, and it simultaneously puts on a subject argument and accomplishes the lambda abstraction. But there is no real disagreement between what he does, what we have been doing, and what is done in the Heim and Kratzer textbook. All formal semanticists are in basic agreement on this issue, at least for the "standard" cases of quantified NPs like *every tenor*.)

Let's refer to the adjoined operator as a "binder prefix": it's represented as "2" in tree (10), as λx_2 in our Lecture 3 fragment, and as β_2 in Büring. I'll follow Büring and use β as a nice mnemonic for "binder".

(13) **Semantic binding:** A binder prefix β *semantically binds* an NP if and only if:
(a) β and NP are coindexed
(b) β c-commands NP
(c) there is no binder prefix β' which is c-commanded by β which meets (a) and (b).
If an NP is not bound by any binder prefix β in a structure P, we say that NP is *semantically free* in P.

A derivative notion of semantic binding: Since it is the index 2 on *every tenor$_2$* that determines the choice of index on the binder prefix β, we also say that in a derivative sense, the NP *every tenor* semantically binds the pronoun *he*. Once we admit this way of speaking, there is no longer any "paradox".

(14) **Vacuous binding**. A binder prefix that has no bound variables in its c-command domain doesn't bind anything. In such a situation we speak of *vacuous binding*.

Whether vacuous binding should be syntactically prohibited or not is debatable. We won't prohibit it, and assume that interpretations involving vacuous binding are simply avoided for Gricean (pragmatic) reasons.

[1] For reasons I cannot understand, my bibliography program (EndNote) refused to work when I had normal brackets in this lambda expression, so I had to replace them by parentheses. It's a mystery – why just this time?

2.2 The c-command requirement on semantic binding and why QNPs cannot be bound

Büring shows very nicely how two central aspects of the binding behavior of quantified NPs follow directly from their semantics.

First of all, why does semantic binding require c-command, while coreference does not?

(15) a. The secretary he_8 hired thinks that $Siegfried_8$ is despotic. (Büring (4.20), p. 90)
b. *The secretary he_8 hired thinks that each of the $tenors_8$ is despotic.

We could just stipulate it, as in Reinhart (1983a):

(16) **Bound Anaphora Condition (BAC)** (Reinhart 1983a, 122, 137)
Quantified NPs and *wh*-traces (ignore the latter for now – BHP) can have anaphoric relations only with pronouns in their c-command syntactic domain.

This rules out (15b) all right, since *each of the tenors* doesn't c-command *he*. And it leaves (15a) alone, since *Siegfried* is a referential expression and not a QNP.

But as Reinhart argues (see also Heim and Kratzer 1998, p. 264), since we know that QNPs do not refer, and therefore don't allow coreference, the only way they can enter anaphoric relations is via semantic binding. So the BAC can be reduced to the following restriction:

(17) Semantic binding requires syntactic binding (i.e. that the binder be coindexed with and c-command the pronoun.)

This is enough to distinguish between (15a) and (15b), since (15a) can just be coreference and therefore doesn't require syntactic binding.

And we can go even further in getting rid of the stipulation, because (17) actually follows from the definition of semantic binding and the way its semantics works. If a coindexed pronoun is outside of the c-command domain of a QNP, coindexing between them will be semantically vacuous. Why?

Semantic binding involves adjunction of a semantic binder prefix β. Coindexed pronouns are interpreted as bound variables only within the c-command domain of that prefix. And the c-command domain of β equals the c-command domain of the QNP before the prefix was added. Taken together this gives a "theorem".

(18) Theorem: Coindexing between a QNP and a pronoun results in semantic binding only if the QNP c-commands the pronoun.

A syntactic issue remains: since (15b) can be interpreted only as involving a free-variable ("pragmatic", or "referential") interpretation for the coindexed pronoun, i.e. as involving "vacuous binding", should it be ruled out syntactically? Different researchers have made different decisions; it's not easy to find evidence. Büring argues for allowing it, and letting pragmatics explain why we wouldn't use it. (See the end of Section 2.1.)

2.3. Binding vs. coreference with non-quantificational antecedents

(See Büring Chapter 5.) As we illustrated in Lecture 5, we can distinguish between binding and coreference even when the antecedent is a referential expression. In Lecture 5 we used the "strict vs. sloppy identity" contrast to show the distinction, using examples like the following.

(19) John loves his wife and so does Bill [~~love his wife~~]. Possible interpretations:
(i) John loves Max's wife, and Bill loves Max's wife. ("strict identity", coreference)
(ii) John loves John's wife, and Bill loves John's wife. ("strict identity", coreference)
(iii) John loves John's wife, and Bill loves Bill's wife. ("sloppy identity", binding)

There are no "mix and match" readings, with coreference in one conjunct and binding in the other. This is like VP-ellipsis with quantificational subjects, where either both pronouns are bound or both are referential, and if both are referential, they must have the same referent.

(20) Every woman in Culver City [hates her neighbor], but no woman in Los Feliz does [~~hate her neighbor~~].
(i) "strict identity", a free-variable "her" identified pragmatically: it's all about Ms. Jones's neighbor, for instance.
(ii) "sloppy identity", i.e. strict semantic identity via binding: Every woman in C.C. hates her own neighbor, but no woman in Los Feliz hates her own neighbor.

Other kinds of constructions also make it clear that referential NPs can stand in binding relations to pronouns. Focus constructions are another good example.

(21) I only said that *Tatiana* should stay in her room.
(i) I didn't say that anyone other than Tatjana should stay in Tatjana's room. (coreference; may involve one single room.)
(ii) I didn't prohibit anyone other than Tatjana from leaving his/her room. (Binding by binding prefix associated with Tatiana.)
(iii) I didn't say that anyone other than Tatjana should stay in Marina's room. (Unbound, non-coreferential pronoun, refers pragmatically.)

We can see in these cases as well that semantic binding requires syntactic binding, but coreference does not.

(22) a. Zelda bought *Siegfried* a present on *his* wedding day, and *Felix* too. (i.e. she bought Felix a present on *his* wedding day). Can be SLOPPY or STRICT.
b. Zelda thought [about *Siegfried*] on *his* wedding day, and *Felix* too. STRICT only.

3. Grodzinsky and Reinhart on the scope of binding theory.

Grodzinsky and Reinhart (1993) The innateness of binding and coreference.
Summary: This is a reply to Grimshaw and Rosen (1990). [Unlike the authors, I will use G&R for Grodzinsky and Reinhart, not for Grimshaw and Rosen!] Grimshaw and Rosen argued that the standard binding theory, as formulated in GB, is innate, in spite of some apparent counterevidence in acquisition experiments. G&R argue that the data are more supportive of Reinhart's long-standing claim that the principles that govern binding are distinct from the principles that govern coreference, which are indeed innate. Both Grimshaw and Rosen and G&R appeal to the need to carefully distinguish grammatical knowledge from performance/processing facility, and both claim that children innately have some knowledge which they have trouble applying, but the accounts of what the principles are and what the processing problems are differ.

This paper is interesting in two different ways: (1) Support from acquisition data for an interesting theoretical claim about separating different sorts of anaphora (binding and coreference; in Reinhart (1995) this is modified, following suggestions of Heim, to binding and

"covaluation"; and (2) a sample of the kind of work on anaphora which could be done by someone interested in working on acquisition.

Key definitions.
GB Binding Theory: (Chomsky 1980, 1981)
Condition A: An anaphor is bound in its governing category. [e.g. reflexive pronouns.]
Condition B: A pronoun is free in its governing category. [e.g. "plain" personal pronouns.]
Condition C: An R-expression is free. [e.g. names.]

Reinhart's Binding Theory: (Reinhart 1983a, pp. 86,91) (before Reinhart and Reuland 1993)
a. Definition:
A node A is *bound* by a node B iff A and B are coindexed and B c-commands A.
b. Conditions:
A. An anaphor is bound in its governing category.
B. A pronoun is free in its governing category.
c. Translation definition:
An NP is a variable iff either
i. it is empty and A-bar bound, or
ii. it is A-bound and lacks lexical content.
Other cases of NP coindexation are uninterpretable.
[Conditions A and B will later be replaced with Reinhart and Reuland's Reflexivity Conditions.]

Basic assumption: the only interpretation of coindexation is the bound variable one.

Coreference Rule: Rule I: Intrasentential Coreference. (Reinhart 1983a, p.91) [p79]
NP A cannot corefer with NP B if replacing A with C, C a variable A-bound by B, yields an indistinguishable interpretation.

3.1. Acquisition Findings and Their Possible Interpretations.

Children seem to know the conditions concerning bound variable anaphora much earlier than they master the conditions concerning coreference.

Test for condition A: find high performance. G&R believe it's because tests are done with anaphors like reflexives which have only bound-variable interpretation.

Test for condition B: find mixed results.
Sentence type (1a): Oscar touches him. Performance: 50% of the time "him" = Oscar.
Sentence type (1b): Every boy touches him. High performance.

Reinhart's earlier conclusion: Condition B is a condition on variable binding, and children know it. They don't know all about coreference, or have some problems with it.

Alternative interpretation: Grimshaw and Rosen 1990. Distinguish "knowing a rule" from "obeying it". Some new experiments, some reinterpretation of older ones.

Patterns of typical test data:

(2) a. This is A. This is B. *Is A washing him?*
OPTIONS
b. A washes A.
c. A washes B.

(3) B says that *A should touch him*.
OPTIONS
b. A touches A.
c. A touches B.

Types of task: "Act - out", or "grammaticality judgment" – does this sentence correctly describe this picture?

Grimshaw and Rosen's observation: Performance at 50% for (2b), near 100% for (2c). If they don't know condition B, why should there be such a difference? Grimshaw and Rosen claim they do know Condition B, and offer independent reasons for why they perform better on Condition A and on variable-binding cases of Condition B, than on the coreference cases.

G&R's competing conclusion: (2b) and (2c) are not related by any linguistic rule. We review Reinhart's analysis (Sec. 2 of G&R) in Section 3.2 below; objections raised by Grimshaw and Rosen are addressed in 3.2.4 (their 3.2). Section 3.3 (their Sec 3) returns to experimental findings and argues for G&R's interpretation of them.

3.2. Anaphora.

3.2.1. Binding and coreference.

(4) a. Lucie$_i$ adores her$_i$ friends.
b. Alfred$_i$ thinks he$_i$ is a great cook.
(5) a. Most of her$_i$ friends adore Lucie$_i$.
b. A party without Lucie$_i$ annoys her$_i$.
(6) a. *Every actress$_i$ adores her$_i$.
b. Every scholar$_i$ thinks that he$_i$ is a great cook.
(7) a. *Most of her$_i$ friends adore every actress$_i$.
b. *A party without every actress$_i$ annoys her$_i$.

Contrast (5) and (7): environments allowing coreference are not identical to those that allow bound variable anaphora. The latter is more restricted, as shown by (7). Standard Binding Theory adds extra conditions to account for (7), which it takes as the marked case.

But pronouns are the exceptional case, compared with the real "anaphoric" elements: reflexives, *wh*-traces, NP-traces, PRO. Pronouns can choose their reference freely from discourse; the others can't.

(8) a. Lucie$_i$ adores herself$_i$. (reflexive)
b. Who$_i$ t$_i$ smiled? (*wh*-trace)
c. Felix$_i$ was fired t$_i$. (NP-trace)
d. Alfred promised PRO$_i$ to cook well. (PRO)

Generalization for all anaphors except the pronouns: (p73) Except for (referentially used) pronouns, all anaphoric elements share the same syntactic generalization: to be interpretable at all, they must be syntactically bound, that is, coindexed with a c-commanding antecedent.

All the anaphoric elements in (8) are interpreted as bound variables. Reinhart's conclusion: Binding conditions regulate only bound variable anaphora.

Pronouns fall under the binding condition only when they are interpreted as bound variables. Ambiguity evidence, even when antecedent is a name: strict/sloppy identity facts. (p74). "Pronouns may be bound variables in all and only the environments where the binding conditions allow them to be syntactically bound, regardless of the semantics of the antecedent."

(9) Alfred thinks he is a great cook.
a. Alfred (λ*x* (*x* thinks *x* is a great cook))
b. Alfred (λ*x* (*x* thinks he_i is a great cook))
(10) ..., and Felix does too.

This is just like what we saw at the end of Section 2 in our examples with strict/sloppy identity and focused antecedents.

3.2.2. The Binding Theory.

See Reinhart's definitions given at the beginning of Section 3 of this handout.

Effect: Coindexation that cannot be interpreted as bound variable anaphora has no interpretation. Examples (5) and (7) above both excluded[2]; the pronouns in (5) must be interpreted referentially, choosing some reference from the context, which might be Lucie. This possibility isn't open in (7); a QNP can't be coreferential with anything.

3.2.3. The Coreference Rule.

Coindexation in the GB binding theory can be interpreted as either bound variable interpretation or coreference. For Reinhart it can mean only bound variable interpretation. How to capture coreference?

Generalizations to capture:
(i) no essential difference between how a pronoun gets its value from the non-linguistic context and how it gets its value from the linguistic context.
(ii) coreference is part of discourse-level anaphora; binding is part of sentence-level anaphora. Discourse level anaphora shouldn't be sensitive to sentence-level syntactic conditions.

So: *coreference is the assignment of identical **values** to NPs with distinct syntactic **indices**.*
[regardless of whether they occur in the same sentence or not.]

Not explained by anything so far: No coreference possible in the following: (p78)
(18) a. $Lucie_i$ adores her_k .
b. He_i adores $Alfred_k$.
c. $He/Alfred_i$ thinks that $Alfred_k$ is a great cook.
d. $Alfred_i$ thinks that the guy_k is a great cook.

This is what Conditions B and C were for. But there are problems for conditions B and C, in particular problems concerning coreference (not binding).

(19) a. (Who is this man over there?) *He* is *Colonel Weisskopf*.
b. Only *Churchill* remembers *Churchill* giving the speech about blood, sweat, toil, and tears. (Fodor 1975).

[2] Büring argues that there is no need to syntactically exclude coindexing in (5) or (7), since it's vacuous in both cases. The sentences in (5) will have the same interpretive possibilities whether the indices are same or different, if indexing is meaningful only for binding.

c. Everyone has finally realized that Oscar is incompetent. Even *he* has finally realized that *Oscar* is incompetent. (Evans 1980).
d. I know what Ann and Bill have in common. She thinks that Bill is terrific, and *he* thinks that *Bill* is terrific. (adapted from Evans 1980).
e. I dreamt that I was Brigitte Bardot and that *I* kissed *me*. (Lakoff)
f. *Oscar is sad. *He* thinks that *Oscar* is incompetent.

Attempts to amend conditions to account for these are unsatisfactory. E.g. Evans accounts for (19c,d) by saying that nondependent coreference is possible when there is a previous antecedent in the discourse. But then why is (19f) bad? Some have tried to eliminate all negative conditions on the interpretations of pronouns, but Reinhart believes that "covaluation" (coreference, suitably generalized) is definitely part of the linguistic meaning of sentences like those in (19) on their intended interpretations, and that there are indeed constraints on when it is possible.

Constraint: Condition I (see page 7, just before Section 3.1.) Look at how it rules out the examples in (18), and why the ones in (19) are OK.

Intuitive characterization: "In the standard cases the easiest way to express coreference is by means of binding. When this option is avoided without the relevant motivation, lack of coreference intention is inferred."

3.2.4. Objections and replies.

Frequent mistaken objection:

Shouldn't rule I block anaphora of the pronoun in (22), where bound anaphora is possible?

(22) a. John enjoys most stories about him/himself.
b. She pulled the blanket over her/herself.

Reply: In this case the pronoun is also interpreted as a bound variable; quantified antecedents are possible. This is a case that argues for a more sophisticated binding theory, not any problem concerning rule I. See e.g. Reinhart and Reuland 1993. Similar issues for 'long-distance anaphors.'

Grimshaw and Rosen: Wouldn't Rule I incorrectly allow coreference in (24a)?

(24) *a. *Many students* expect *them* to leave.
b. Many students expect themselves to leave.
c. Many students (λ*x* (*x* expects *x* to leave))
d. Many students expect that they will leave.

The argument rests on the assumption that the distributive vs. collective distinction (an ambiguity in (24d)) is reducible to the distinction between referential and bound pronouns. In that case, Rule I should allow coreference in (24a) on the collective interpretation, since replacing the pronoun with an anaphor gives the distributive reading only.

But is the distributive/collective ambiguity equivalent to bound/referential? No.

(25) a. Ben and Lucie consider themselves a perfect couple.
b. Ben and Lucie expect themselves to be a perfect couple.
c. Ben and Lucie consider themselves a perfect couple and Max and Lili do too.

Collective and bound. So (24b) above actually must be ambiguous. So (24a) has no reading that (24b) doesn't have, so Rule I disallows (24a).

3.3. Cutting the experimental pie.

3.3.1. Pronouns and roses: irrelevant comparisons.

Theory dependence of experimental design. Many standard experimental patterns compare sentences involving different principles. E.g. review the paradigm in (3). (But (2) *is* relevant.)

3.3.2. Knowledge of binding.

(29) *BT-grammatical sentences:*
a. Oscar_i touches himself_i .
b. Bert_i said that he_i ran behind the box.
c. Bert_i said that Gert touched him_i .

Results: 29a close to 100% correct, also 29b, and with hedges, 29c.

(30) *BT-ungrammatical sentences:*
a. *Oscar_i said that Bert touches himself_i .
b. *Every boy_i touches him_i .

These are the right examples to compare with the good examples of (29), because in these sentences, coreference is not an option, so we are testing only the Binding Theory. Results: again close to 100% performance.

So if the division of labor is done right, kids turn out to know the binding theory perfectly well. Evidence to the contrary came from bad binding theory being tested.

3.3.3. Knowledge of coreference.

(31) *Rule I ungrammatical.*
a. **Oscar* touches *him*.
b. **He* touches *Oscar*.
c. **He* said that *Oscar* touches the box.

Poorer performance, though better on Condition C violations like (31b,c). Think about what is involved in executing Rule I. Trans-derivational comparison. Work out two derivations and test whether the results are semantically equivalent. Heavy demand. Reasonable to suppose that this accounts for difficulty of children, and also of agrammatic aphasics for whom similar results have been reported.

4. Revision of next 3 weeks' schedule.

Next week, April 15, Lecture 10: we will focus on pronouns vs. reflexives and on different kinds of reflexives (and possibly different kinds of pronouns.) We'll begin to get into typological issues, and we'll make the issues of Homework 4 clearer.

> Here's one example of a possible generalization about pronouns vs. reflexives in English, probably too simple: **Reflexive pronouns, with certain exceptions, always express bound variables; they are always bound by (the β prefix of) their antecedent. Plain pronouns may express bound variables or be referential.** (Test with strict/sloppy identity.) Affixal reflexives are never referential. "Logophoric" pronouns (which we'll include next week) may be referential.

April 22, Lecture 11: Typological issues
April 29, "Lecture 12": Student presentations.
(May 6: no class)

May 13, 20, 27, June 3: Other topics to be chosen, for instance some of: Nominal and Temporal Anaphora; Pragmatics and "Pragmatic Anaphora"; Verb Phrase anaphora, anaphora involving other categories (sentential, common noun phrase, adjectival and adverbial anaphora). Participants are invited to send me e-mail telling your preferences.

Homework #4: Prepare a presentation for April 29.

Look at issues of pronouns and reflexives in Russian and/or in other language(s) that you know, and prepare to give a very short presentation in class, with a short handout, April 29. Due April 29. It would probably be a good idea to consult with me in advance and send me a draft of your handout to look at. I'll work on preparing a list of questions to help guide your presentation: I'll send that around before the April 15 class, so that we can also discuss this in Seminar on the 15th and on the 22nd.

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