

How PRO to control PRO?

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Distribution of Infinitives/Gerunds

(1) *V/A-Complement*

- a. John promised Mary [PRO to leave early].
- b. John persuaded Mary [PRO to leave early].
- c. John wondered [when PRO to leave].
- d. Mary considered [PRO leaving early].

Sentential Subject/Intraposition

- e. [PRO to eat/eating too much lettuce] is not healthy.
- f. Mary realized that [PRO speaking of herself/himself] would embarrass John.

Extraposition

- g. Mary realized that it embarrassed John [PRO to speak about himself/*herself].
- h. Mary realized that it helped John [PRO to speak about himself/herself].

Adjunct

- i. John resigned after [PRO delivering his speech].
- j. Mary₁ helped us₂ without [PRO₁ being rewarded/*PRO₂ rewarding her].

Rationale/Purpose Clause

- k. John brought the book (in order) [PRO to read it on the flight].
- l. John brought the book (*in order) [PRO to read on the flight].

Infinitival Relative

- m. Something [PRO to eat] would be nice now.

N/P-complements

- n. We were told about the decision [PRO to evacuate the island].
- o. I read a story about [PRO falling in love with a foreign girl].

Non-Arguments for PRO

(2) *Understood Coreference* (Haegeman 1994)

- a. Poirot₁ abandoned the investigation [in order PRO₁ to save money].
- b. Poirot₁ abandoned the investigation [without PRO₁ giving an explanation].

Problem: Predication can achieve the same effect. There is no obvious entailment from understood coreference to syntactic representation. Compare:

- c. John ate the meat raw.
- d. John₁ underwent an operation (*on him₁*).
- e. We entered the room₁. The walls (*of it₁*) were covered with blood.

(3) *Together* (Haegeman 1994): “Requires a local plural NP in an A-position”.

- a. I saw the boys/*boy together.
- b. [PRO to leave together] would be stupid.

Problem: The local NP can be the controller, not necessarily PRO. This is possible in (b), with an implicit controller (*stupid of X*), though not in cases of real arbitrary control (*...would insult Mary*).

(4) *Binding*: The infinitive behaves like a binding domain (GC), hence contains a subject.

- a. John₁ wanted [PRO₁ to talk about himself₁/*him₁].

Problems: i) The argument is invalid. *If* the infinitive is a binding domain, *then* the contrast in (a) follows. But not vice versa: The contrast in (a) could also follow from the fact that the infinitive *lacks* a subject and the binding domain is the whole matrix. ii) It needs to be shown, independently, that condition A requires a syntactic and not an implicit binder (true, but not trivial, and false for conditions B & C).

- b. Mary₁ thought that John talked *(to her₁) about herself₁.
 - c. Mary₁ thought that John said (to her₁) [PRO₁ to wash herself].
 - d. John never talked (*to her₁) about Mary₁/her₁.
- (5) *Theta Criterion*: Every θ -role must be assigned to an argument.
Problem: Implicit arguments satisfy this criterion, why must PRO be projected?
- (6) *EPP*: The subject must be projected.
Problem: The reasoning is circular. The claim that the EPP is exceptionless in itself assumes that null subjects can satisfy it. But if they can't, then the EPP is violable. One cannot motivate the existence of PRO on the basis of a principle whose status crucially relies on the existence of PRO.

Genuine Arguments for PRO

- (7) *Predication* (Haegeman 1994): Secondary predicates require a local syntactic subject.
- a. [PRO to arrive exhausted at a party] is terrible.
 - b. John ate *(the meat) raw.
 - c. *Dinner was served angry at the guests. [cf. ... PRO wearing aprons].
 - d. [PRO to serve dinner angry at the guests] is not a good idea.
- (8) *Object control + embedded subject-oriented anaphor*.

Russian (Natalia Strahov, p.c.)

- a. John₁ otpravil Mary₂ k svocj_{1/*2} sestere.
John sent Mary.ACC to SELF's sister.DAT
'John sent Mary to self's_{1/*2} sister'
- b. John₁ otpravil Mary₂ navestit svoju_{1/2} sestru.
John sent Mary.ACC to-visit SELF's sister.ACC
'John sent Mary to visit self's_{1/2} sister'

- c. John₁ ubedil Mary₂ navestit svoju_{*1/2} sestru.
John persuaded Mary.ACC to-visit SELF's sister.ACC
'John persuaded Mary to visit self's_{*1/2} sister'
- (9) *Dative control + binding of embedded anaphor unbindable by a dative.*
German (Wurmbrand 1998)
- a. weil der Hans der Maria sich_{1/*2} auf dem Photo zeigte.
since the John-NOM Mary-DAT SELF in the picture showed
'since John showed Mary himself / *herself in the picture'
- b. Sie hat dem Hans erlaubt [PRO₁ sich₁ den Fisch mit Streifen vorzustellen].
She has John-DAT allowed PRO SELF the fish with stripes to-imagine
'She allowed John to imagine what the fish would look like with stripes'
- (10) *Split antecedents.* [Koster & May 1982]
- a. * John₁ suggested/showed Mary₂ to each other₁₊₂.
b. John₁ suggested to Mary₂ [PRO₁₊₂ to help each other₁₊₂].
- (11) *Case concord with quirky subjects.*
Icelandic (Sigurðsson 1991, ex.8)
- a. Strákana vantað i **alla** í skólann.
the boys.ACC lacked all.ACC.PL.MS in the school
'The boys were all absent from school'
- b. Strákarnir vonast til [að PRO vanta ekki **alla** í skólann].
the boys.NOM hope for to PRO.ACC lack not all.ACC in the school
'The boys hope not to be all absent from school'
- c. Strákana leiddist **öllum** í skóla.
the boys.DAT bored all.DAT.PL.MS in the school
'The boys were all bored in school'

- b. Strákarnir vonast til [að PRO lei þast ekki öllum í skóla].
the boys.NOM hope for to PRO.DAT bored not all.DAT in school
'The boys hope not to be all bored in school'

Distribution of PRO

(12) *PRO in case positions.

- a. * John invited PRO.
b. * John talked about PRO.
c. * John said that PRO can leave.
d. * John believed PRO to be intelligent.
e. * [For PRO to leave abruptly] would be impolite.

(13) *PRO in governed but caseless positions.

- a. * There was invited PRO.
b. * A picture PRO. (cf. a picture *(of) Mary)
c. * John's belief PRO to be innocent.
d. * It is likely PRO to be angry.
e. * John was proud PRO (cf. ...*(of) Mary)

Conclusion: PRO is ungoverned. [Chomsky 1981]

(14) *The PRO-Theorem* [Chomsky 1981]

Condition A: An anaphor must be bound in its local domain.

Condition B: A pronoun must be free in its local domain.

The local domain includes a governor and a subject.

PRO is [+anaphor,+pronoun].

∴ PRO has no local domain
PRO (in OC) has a subject

∴ PRO is ungoverned

(15) *Problems for the PRO-Theorem*

- i) Under Chomsky's (1986), the local domains of anaphors and pronouns can be different. In (a), the object DP is the minimal CFC with a governor in which the pronoun can be free, but in (b) the entire clause is the minimal CFC with a governor in which the anaphor can be bound. We therefore expect PRO to be possible there, simultaneously satisfying conditions A and B. But it is not, see (c).
 - a. They₁ like [DP their₁ pictures].
 - b. They₁ like [DP each other's₁ pictures].
 - c. * They₁ like [DP PRO₁ pictures].
- ii) The exclusion of [-Agr] Infl from the class of governors is completely ad-hoc, voiding "government" as a structural relation.
- iii) If PRO is caseless and the Visibility Condition of Chomsky (1981) obtains, then PRO violates the θ -criterion. On the other hand – why should the Visibility Condition obtain, anyway?
- iv) If PRO is caseless, and NP-movement is case-driven, then we fail to account for *John wanted [PRO to be elected]*. However, NP-movement may be driven by the PRO-theorem as well, or – more likely – by the EPP.
- v) As we have seen in (11), PRO *is* case-marked (hence governed) in some languages.

Referential properties of PRO

(16) "Weather"-*it* & extraposition-*it* vs. *there*-expletive.

- a. Sometimes it₁ rains without [PRO₁ snowing].
- b. It bothered John [PRO without actually offending him] that he wasn't elected.
- c. There occurred three more accidents without [there/*PRO being any medical help available on the premises].

(17) *PRO_{arb} is [+human]*. [Chomsky 1981]

- a. [For coffee prices to fall in August] is very unusual.
- b. [PRO to fall in August] is very unusual.

(18) *Semantic plurality in partial control.*

- a. John told Mary that he wanted to meet (*each other) at 6.
- b. John told Mary that he wanted to work together / *become partners.

(19) *De se / de re.*

- a. The unfortunate expects that he will get a medal.
- b. The unfortunate expects [PRO to get a medal].

Implicit Control

Dative Control (and locality effects)

(20) a. Mary₁ said it was difficult [PRO₁ to get herself a visa].
b. * Mary₁ said it was difficult for Bill₂ [PRO₁ to get herself a visa].

(21) a. * Mary knew that it had been decided (by John) [PRO to behave herself].
b. Mary knew it had been prohibited [PRO to reveal herself in public].

(22) *Omissibility of Controllers*

- a. John recommended *(to us) to leave.
- b. Gil himlic (lanu) la'azov. *Hebrew*

(23) *Apparent Arbitrary Control* (Williams 1980, Bouchard 1984, Huang 1989)

- a. John said (*to Mary) [PRO_{arb} to behave oneself].
- b. It is fun [PRO_{arb} to eat ice-cream].
- c. Gen_x [it is fun **for x** [for x to eat ice-cream]].

Agent Control

- (24) a. * John was promised (by Mary) [PRO to leave].
b. It was decided [PRO to leave].
c. The game was played [PRO wearing no shoes].

(25) *Rationale Clauses*

- a. The boat was sunk [PRO to collect the insurance].
b. * The boat sank [for the owner/PRO to collect the insurance].
c. * The ship was sunk to become a hero.
d. Grass is green to promote photosynthesis.

Lebeaux (1984)

(26) *Main idea*

- a. All types of PRO are anaphoric, including so-called PRO_{arb}.
b. The differences between locally bound lexical anaphors and PRO in NOC are not due to their different constitution (both are anaphors), but due to the different mechanisms of anaphor binding.

(27) Long Distance (LD) controlled PRO is *not* a pronoun

- a. His₁ / *PRO₁ having shaved already shows that Mary arrived more than 5 minutes after John₁ did.

The antecedent of PRO must command it (i.e., the first S dominating the antecedent dominates PRO).

(28) Narrowing down “anaphorhood”

Properties of anaphors are of two different types.

The dependency property

An anaphor is referentially dependent on an antecedent.

The binding properties [5]-[6]

- a. The antecedent must be local (inside GC / CFC).
- b. The antecedent must c-command the anaphor.
- c. The antecedent can't be split.
- d. The anaphor gets only sloppy reading under VP-ellipsis.

(29) Lebeaux: Only the dependency property is inherently linked with anaphors. The binding properties follow from a particular mechanism of binding (*predication*). Concretely, local binding exhibits the binding properties, non-local binding doesn't.

(30) Local binding

Lebeaux sets up the definitions [6]-[7] such that the domain of local binding for a lexical anaphor is the minimal NP/S containing it, whereas for PRO (a nonlexical anaphor) it's the minimal NP/S containing the nonfinite clause.

(31) Local binding

- a. John saw himself in the mirror. *Binding domain = matrix S*
- b. John tried [PRO to leave]. *Binding domain = matrix S*

Non-local binding

- c. John knew that [there were [pictures of himself] inside].
- d. John told Mary that [[PRO leaving early] would be a mistake].

(32) Nonlocally bound reflexives may take non-commanding or split antecedents, and allow strict readings under VP-ellipsis [10]; same for non-locally bound PRO [11].

Note: Some OC contexts allow split antecedents, cf. (10b).

Lebeaux: Since all occurrences of PRO are anaphoric (dependent), but some show binding properties (OC) and others don't (NOC), the binding properties can't be inherent to PRO.

PRO_{arb} is locally bound by an operator / PRO_{arb} is an A-bar anaphor

- (33) a. [PRO_x making a large profit as a slum landlord] requires
[PRO_x exploiting the tenants].
b. [PRO_x to know him] is [PRO_x to love him].

The interpretation of the two PRO_{arb} subjects is linked, even if pragmatics prefers otherwise:

- c. * [PRO_x becoming a movie star involves [PRO_y recognizing you].

Lexical subjects need not be linked:

- d. His getting up on time will require her setting the alarm clock.
- (34) Since neither PRO binds the other PRO, they must be both variables bound by the same operator – with universal/generic force. PRO_{arb} is similar to the indefinite pronoun *one*.

- a. $\forall x / \text{Gen}_x$ ((PRO_x making a large profit) requires (PRO_x exploiting the tenants)).

- (35) Important note: The universal operator is associated with necessity predicates – *require, entail, involve*. When the predicate doesn't imply necessity, the linked reading disappears.

- a. [PRO_x going to the movies] beats [PRO_y staying home and eating popcorn].

- (36) Linked readings obtain in clausal contexts, where PRO exists, not in nominal contexts.

- a. PRO winning games requires PRO losing games.
(winner of some games = loser of some games)
b. The winning of games requires the losing of games.
(If someone wins, someone (else) must lose).

If PRO_{arb} is an anaphor, what is its binding domain?

- (37) The binding domain of PRO is the minimal NP/S containing the nonfinite clause.
- a. * [_{BD} [PRO_x winning the trust of the populace] requires [PRO_y having to serve in the army]].
 - b. [_{BD1} [PRO_x winning the trust of the populace] requires that [_{BD2} [PRO_y having to serve in the army] be abolished]].

Unifying LD and arbitrary control

- (38) In general, NOC comprises of either long-distance or arbitrary control. If no controller is available in the binding domain of PRO, then either LD or arbitrary control is allowed. Since the choice between them is not grammatical, Lebeaux suggests to unify both cases.
- (39) a. Closure: If PRO is unbound in its binding category, adjoin a null operator Op to the binding category and coindex it with PRO.
- b. Operator interpretation: Op may be coindexed with a grammatical antecedent or a discourse referent. Otherwise, Op is generic.

See examples [35]-[38].

- (40) Problem: (39a) predicts that a local potential antecedent rules out NOC. But we've seen examples like (a), where that is possible.
- a. Mary realized that it would help John [PRO to speak about himself/herself/oneself].
 - b. Mary realized that [PRO speaking about herself/himself/oneself] would embarrass John.

Solution: Maybe *John* in (a) doesn't c-command the extraposed clause. Notice that the operator in (b) would c-command *John*, violating [43].

- (41) Prediction: Interrogative complements should fall under OC if a matrix controller is available. Paradox: Arbitrary control is allowed, LD control isn't.
- a. Mary said that John wondered
[how PRO to introduce himself/oneself/*herself].

Landau (2000: Chapter 1): The basics

- (42) What classifies a construction as OC?
- a. Classical answer: Whether or not PRO is obligatory.
b. Alternative answer: Whether or not PRO is obligatorily controlled.
- ⇒ OC may obtain even if PRO alternates with a lexical subject (e.g., *prefer*).

(43) Two types of OC: Exhaustive vs. Partial control

(We thought that...)

- a. The chair₁ preferred [PRO₁₊ to gather at 6].
b. Bil₁ regretted [PRO₁₊ meeting without a concrete agenda].
c. Mary₁ wondered [whether PRO₁₊ to apply together for the grant].
(cf... * to apply as partners).

(We thought that...)

- d. * John₁ managed [PRO₁₊ to gather at 6].
e. * The chair₁ began [PRO₁₊ meeting without a concrete agenda].
f. * Mary₁ is able [PRO₁₊ to apply together for the grant].

(44) EC-infinitives

- a) implicative (*dare, manage, forget, force...*)
b) aspectual (*begin, stop, continue...*)
c) modal (*able, capable, need, must...*)

PC-infinitives

- a) desiderative (*want, prefer, decide, demand...*)
- b) interrogative (*wonder, ask, guess, inquire...*)
- c) factive (*hate, regret, dislike, shocked...*)
- d) propositional (*believe, imagine, say, declare...*)

(45) Question: What distinguishes EC- from PC-infinitives?

Answer: The absence or presence of *tense* (Landau 2000).

EC-infinitives are untensed, PC-infinitives are tensed:

- a. * Yesterday, John managed to solve the problem tomorrow. *imp.*
- b. * Yesterday, John began to solve the problem tomorrow. *asp.*
- c. * Yesterday, John was able to solve the problem tomorrow. *mod.*
- d. Yesterday, John hoped to solve the problem tomorrow. *des.*
- e. Yesterday, John wondered how to solve the problem tomorrow. *int.*
- f. Today, John regretted having solved the problem last week. *fac.*
- g. Oggi Gianni crede di avere offeso Maria la notte scorsa. *prop.*
today John believes to have offended Mary the night last
'Today, John believes to have offended Mary last night' [Italian]

(46) Outline of the account: OC is Agree between a matrix controller and the embedded [Agr] or PRO. The C head of of PC infinitives is associated with [+T], and derivatively, [+Agr]. This [+Agr] is the target of partial control. Because it bears no specification of Semantic Plurality, it allows the controller and PRO to differ on that feature. In EC, it is PRO which is directly controlled (C bearing no [T] or [Agr]), hence it must match the semantic plurality of the controller.

Super-Equi

- (47) a. Mary knew that it disturbed John [PRO to perjure himself / *herself].
- b. Mary knew that it damaged John [PRO to perjure himself / herself].
- c. Mary knew that [PRO to perjure himself / herself] would disturb John.
- d. Mary knew that [PRO to perjure himself / herself] would damage John.

- (48) a. In a structure [... X ... [it Aux Pred Y [_S PRO to VP]], where Y and S are arguments of Pred:
- i) If Pred is psychological, Y must control PRO.
 - ii) If Pred is non-psychological, either X or Y may control PRO.
- b. In a structure [... X ... [_S [_S PRO to VP] Pred... Y]], either X or Y may control PRO.

In short, LD-control is susceptible to intervention only in extraposition, and only when the intervener bears an experiencer θ -role.

- (49) Outline of the account: In extraposition, at the relevant level where control is established, an experiencer controller will c-command the infinitive but a theme/goal controller will not. Hence, OC is linked to experiencers. In intraposition, no clausemate argument c-commands the infinitive, hence NOC.

Note: In the book I assumed that “the relevant level” is already established at DS, now I believe that the experiencer c-commands the infinitive only at LF.

- (50) A substantive correlation: The goal/theme object may fail to c-command the infinitive only if the latter is adjoined to VP. But adjuncts are islands. So we expect a correlation between NOC and islandhood.

- (51) a. It would kill the workers₁ [PRO₁ to build this dam].
b. What₂ would it kill the workers₁ [PRO₁ to build t₂ ?]
c. It would kill the forest [PRO_{arb} to build this dam].
d. * What₂ would it kill the forest [PRO_{arb} to build t₂ ?]

- (52) a. Hillary thinks it damaged Bill₁ [PRO₁ to talk about himself on the Dave Letterman show].
b. That's the talk show₂ that Hillary thinks it damaged Bill₁ [PRO₁ to talk about himself on t₂].
c. Hillary₁ thinks it damaged Bill [PRO₁ to talk about herself on the Dave Letterman show].
d. * That's the talk show₂ that Hillary₁ thinks it damaged Bill [PRO₁ to talk about herself on t₂].