The Emergence of PRO as Repair Strategy

Silke Fischer (Universität Stuttgart)
GGS 38, Universität Freiburg im Breisgau
May 17, 2012

1. Introduction

1.1 State of Affairs

Former approaches to control:

Recent syntactic discussions about control compare in particular two main approaches: PRO-based theories of control versus the movement theory of control (as put forward, for instance, by Hornstein 1999, 2001).

A. PRO-based theories of control

Traditional assumptions:

in the 1980s: PRO-Theorem
in the early 1990s: null Case approach (cf. in particular Chomsky & Lasnik 1993)

B. Movement theory of control (MTC) (cf. in particular Hornstein 1999, 2001)

Central assumptions:

- the control module with the formative PRO and the θ-Criterion are dispensed with
- PRO = DP-trace (of the controller, which gets two θ-roles)
- obligatory control = A-movement
- non-obligatory control involves the insertion of pro as last resort

1.2 Some Objections[1]

1.2.1 To PRO-based analyses

(i) complication of the grammar by invoking a control module
→ increasement of the inventory of empty categories by stipulating PRO

(ii) stipulative nature of many properties of control (e.g. locality requirements concerning the controller in obligatory control structures)

(iii) G&B-approach:
PRO = pronominal anaphor → problematic assumption; it rather seems to be the case that in obligatory control (OC) structures, PRO behaves like an anaphor, whereas in non-obligatory control structures (NOC), PRO behaves like a pronoun/logophor.

[1]As to discussions concerning the pros and cons of the two theories, cf., among others, Hornstein (1999), Culicover & Jackendoff (2001, 2006), Landau (2003), Boeckx & Hornstein (2003, 2004, 2006a, 2006b), Landau (2007). Note, however, that some of the objections that are raised in the literature depend on concrete technical assumptions that are made (and might not be problematic once slightly different premises are adopted).

(iv) early minimalist approach:
stipulative nature as regards the occurrence of null Case → it is licensed in exactly those positions where we find PRO

(v) empirically:
backward control might be more difficult to handle; cf. also section 8

(1) *Backward control:*
$[_{matr.clause}$ PRO_1 ... $[_{inf.clause}$ DP_1 ...]]

1.2.2 To the MTC

(i) application of sideward movement:

A. control into adjuncts: requires sideward movement or movement to a non-c-commanding position

B. the permission of sideward movement seems to involve the risk of overgeneration[2]

(ii) obligatory versus non-obligatory control:

A. the distinction seems to be based *on the results* of the analysis (i.e., wherever the movement analysis cannot be applied, NOC is assumed to occur); an independent definition is missing

B. therefore: inconsistent handling of islands

→ control into adjuncts: classified as OC; a movement analysis must be viable, hence sideward movement is adopted
→ subject islands: since movement is excluded, it is argued to involve NOC
→ *wh*-islands: originally classified as NOC by Hornstein (cf. Landau 2003:482); but as a reply to Landau's objections, Boeckx & Hornstein (2004:443f.) argue that control into *wh*-islands could also be treated as OC, since movement might not be blocked due to the weak island status and control being A-movement

Some minor points

(iii) empirically:

Control/binding asymmetry in implicit control structures (cf. Landau 2003:478ff; Boeckx & Hornstein 2004:438f.): Although the implicit dative functions as controller in (2-a), it cannot bind the anaphor in (2-b).

(2) a. John said/shouted (to the visitors) to return later.
→ *to the visitors:* implicit dative controller
b. *John said (to the visitors) [to wash themselves].

Considering (2), Boeckx & Hornstein (2004) propose that the anaphor cannot be lexicalized

[2]Cf. also Landau's (2003) objections; in their reply from 2004, Boeckx & Hornstein only provide a relatively specific analysis of the data brought up by Landau involving possessive DPs.

Note also that Boeckx & Hornstein (2004:fn.13) remark that the "discussion of sideward movement is interesting but in some sense orthogonal to the main issue. The MTC could be correct for standard cases of movement even if sideward movement does not exist." However, a theory of control should not only be able to derive the "standard cases".

if its antecedent is not (= pro in (2-b)). However, then what about examples like (3)?

(3) [To shave oneself] is dangerous.

(iv) technical details in Hornstein's (1999) analysis of adjunct control
→ some questions that arise in concrete derivations are not (satisfactorily) answered

1.3 An Alternative

What I would like to propose is an alternative account of control which combines aspects of both former analyses. I argue that a feature mismatch in the numeration gives rise to the emergence of a phonetically empty argument (which can be called PRO); i.e., the insertion of PRO in the numeration is a *repair strategy*. Since PRO is referentially defective, it must be syntactically licensed in the derivation: in OC structures under Agree by the first available DP argument; in NOC structures it is assigned an arbitrary interpretation as last resort (although other non-syntactic factors – like discourse etc. – can enforce a specific reading; cf. in particular section 5 and 6).[3]

In the spirit of the MTC:

• Movement is involved insofar as PRO has to move to a position where it can enter into an Agree relation with its controller.
• Attempt to motivate the existence of PRO by evaluating the numeration and inserting PRO as a repair strategy to compensate for a feature mismatch in the numeration.
• θ-roles are syntactically encoded as features.
• No independent control module is needed to regulate PRO's interpretation.
• Non-obligatory control = last resort (cf. section 6)

In the spirit of PRO-based theories:

• PRO is an argument of its own.
• The θ-Criterion is not dispensed with (a step which, in Hornstein's approach, seems to lead to a bunch of licit derivations yielding ungrammatical structures that then have to be ruled out in different ways).
• Similar to Landau (2000 and subsequent work), Agree is a basic licensing mechanism of control.

2. The Proposal

General idea:

The analysis of control outlined here combines properties of both former accounts, the PRO-based theory and the MTC. I do not assume that PRO is a copy left behind by its controller when it moves away from its base position; i.e., control is not the residue of A-

[3]Landau (2000, 2001, 2004) also proposes an analysis of OC in terms of Agree. It relies on multiple Agree relations via the functional heads T (subject control) or v (object control) with the controller on the one hand and PRO/Agr on the other hand. However, in contrast to the present proposal, it does not say anything about the origin of PRO (here: repair strategy), relies on downward probing of functional heads and a relaxation of the Phase Impenetrability Condition, treats control into adjuncts as NOC, and focuses a lot on the distinction between exhaustive and partial control (the relevant feature of the Agree relation being semantic number).

movement. Instead, I propose that due to a feature mismatch in the numeration, an incomplete copy/phonetically empty argument is generated in the numeration which has to be licensed in the syntactic derivation by another argument under Agree.

Assumptions:

(i) Following Hornstein (1999, 2001), θ-roles are encoded as features; the assignment of a θ-role by a predicate to its argument corresponds to feature checking, which can take place as soon as an argument merges with its predicate.

(ii) Predicate-argument relations are encoded in the numeration by the features $[*\theta*]$ (associated with predicates) and $[\theta]$ (associated with arguments), respectively:
$\rightarrow$ predicate = probe, argument = goal (cf. also footnote 5 as to the direction of probing)

(iii) The number of $[\theta]$-features must match the number of $[*\theta*]$-features, and one argument cannot bear more than one $[\theta]$-feature (i.e., some version of the θ-Criterion holds).

Illustration:

(4) a. Peter likes strawberries.
b. *Underlying numeration:*
Num = $\{\text{Peter}_{[\theta,Nom]}, \text{T}_{[*Nom*]}, \text{likes}_{[*\theta*,*\theta*]}, \text{strawberries}_{[\theta,Acc]}, \text{v}_{[*Acc*]}\}$

(5) a. John hopes to win.
b. *Underlying numeration:*[4]
Num = $\{\text{John}_{[\theta,Nom]}, \text{T}_{[*Nom*]}, \text{hopes}_{[*\theta*,*\theta*]}, \text{CP}_{[\theta]}, \text{to}, \text{win}_{[*\theta*]}\}$

Feature mismatch & repair by PRO insertion:

In contrast to (4-b), the numeration in (5-b) reveals that there is a feature mismatch concerning $[*\theta*]$-features on predicates (total number = 3) versus $[\theta]$-features on arguments (total number = 2). In order to rescue the derivation, I propose that a phonetically empty argument with the needed $[\theta]$-feature can be generated (cf. Assmann 2011 for a similar proposal as far as the doubling of [wh]-phrases/-features is concerned to license parasitic gaps).[5] This empty argument is PRO.

The interpretation:

Semantically, PRO depends on one of the other arguments for interpretation and must therefore be syntactically licensed under Agree (cf. also the implementation of binding configurations in Fischer 2004). Technically, I assume that PRO bears a feature called [REF], which is valued under Agree by any other DP in the derivation. As a result, PRO and this DP are then interpreted as coreferent.

Upward probing:

Formally, this can be considered to be an instance of upward probing with PRO being the

[4]This is a simplified representation of the numeration as far as the embedded clause is concerned.

[5]I do not assume that it is a full copy of one of the given arguments since this would already specify its interpretation; in oder to account for intervention effects (along the lines of the MLC effects discussed by Hornstein 1999, 2001), other co-arguments must have the possibility to block certain interpretations on the basis of locality considerations in the derivation.

probe that is looking for a suitable c-commanding goal up the tree to value the former's [REF]-feature.[6]

Movement:

The licensing of PRO under Agree requires that the licensing argument and PRO be in the same accessible domain at some point in the derivation (given that the *Phase Impenetrability Condition* holds). This requires that PRO move successive-cyclically to the edge of a phase which is accessible when a potential licensor enters the derivation; however, PRO is not identical with the licensor ($\neq$ MTC). Hence, the approach combines aspects of both earlier approaches – the MTC and the PRO-based theory of control.

Question concerning upward probing (in general):

How is unwanted downward probing by PRO in the case of an embedded ditransitive verb excluded? (A DP-argument in the embedded SpecV position would also be an accessible goal when PRO is inserted in Specv.)

(6) a. John tried to give the letter to Mary.
b. *PRO insertion:*
[$_{vP}$ PRO give [$_{VP}$ the letter t_{give} ~~to Mary~~]].
(~~to Mary~~: inaccessible due to the PIC)

Assumption:

[REF] can only be valued when all other featuers have been checked; i.e., θ-marking must take place first: (i) θ-feature checking; (ii) [REF]-valuation $\rightarrow$ violates a narrow version of the Strict Cycle Condition if we go back to SpecV (since θ-feature checking takes place inside the vP)

3. Consequences

(i) It follows that there is a controller which c-commands PRO $\rightarrow$ the licensing argument.

(ii) It follows that in control structures with two nominal arguments the object functions as licensor $\rightarrow$ it is the first DP which can value the [REF]-feature on PRO.

(iii) In adjunct control, PRO does not need to move out of the adjunct; it suffices to be at the edge of the adjunct to be licensed by its controller (i.e., the first available argument) under Agree $\rightarrow$ solves the island/sideward movement problem of the MTC.

(iv) A control module to specify the interpretation of PRO is not needed; the interpretation of PRO is regulated by an Agree relation between PRO and the first available DP-argument.

[6] This is similar to Schäfer's (2008, 2010) analysis of anaphoric binding, where the anaphor's ϕ-features are also valued via upward probing by the c-commanding antecedent acting as the goal. (As to further analyses involving upward probing, see the references cited in Schäfer 2010.)

Note that upward probing might also be involved in the case of [$*\theta*$]/[θ]-features checking, when a predicate θ-marks an argument in its specifier position (i.e. under minimal m-command). (Although the question does not arise if we follow the old assumption that subjects receive their θ-roles not by the verb alone but by the verb plus the object.)

(v) On the origin of PRO:
emergence of PRO = repair strategy because of a feature mismatch in the numeration

(vi) On the nature of PRO:
It can be considered to be an incomplete, phonetically empty "copy" of a DP-argument (incomplete in the sense that it does not inherit automatically the argument's referential properties; it can be considered to be referentially defective and must therefore be licensed in the syntactic derivation)[7] → might also explain why it is phonetically empty.[8]

4. The Derivation of OC

4.1 Subject Control

(7) John_1 hopes PRO_1 to win.

Step 1: Feature mismatch & repair by PRO insertion

To prevent a crash because of feature mismatch, PRO insertion takes place; cf. (8).[9]

(8) a. *Underlying numeration:*
Num = $\{\text{John}_{[\theta]}, \text{hopes}_{[*\theta*]}, \text{to}, \text{win}_{[*\theta*]}\}$ → feature mismatch
b. *PRO insertion:*
Num = $\{\text{John}_{[\theta]}, \text{hopes}_{[*\theta*]}, \text{to}, \mathbf{PRO}_{[\theta,REF]}, \text{win}_{[*\theta*]}\}$

Step 2: deriving the embedded clause

In Specv, PRO is inserted as external argument of *win* and can check the latter's $[*\theta*]$-feature. Then it moves to the embedded SpecT position to check the EPP, and finally to the edge of the embedded CP in order to remain accessible, since it still needs to value its [REF]-feature; cf. (9).

(9) a. $[_{\text{vP}}\ \text{PRO}_{\cancel{[\theta,REF]}}\ \text{win}_{\cancel{[*\theta*]}}\ [_{\text{VP}}\ t_{win}]]$
b. $[_{\text{TP}}\ \text{PRO}_{[REF]}\ \text{to}_{\cancel{[EPP]}}\ [_{\text{vP}}\ t_{PRO}\ \text{win}\ \cancel{[_{\text{VP}}\ t_{win}]}]]$
c. $[_{\text{CP}}\ \text{PRO}_{[REF]}\ [_{\text{TP}}\ t'_{PRO}\ \text{to}\ \cancel{[_{\text{vP}}\ t_{PRO}\ \text{win}\ [_{\text{VP}}\ t_{win}]]}]]$

Step 3: deriving the matrix clause

After having merged the matrix verb *hope*, the matrix subject *John* enters the derivation in Specv and checks the $[*\theta*]$-feature of the matrix predicate.

A note on phases:

Nothing hinges on the question of whether phases are restricted to vPs/CPs/DPs or include all phrases, as assumed in Fischer (2004) following a proposal by Müller (2004). For the sake of concreteness, I adopt the latter hypothesis, i.e. all phrases are phases.

With respect to PRO, this means that it has to move successive-cyclically from ph(r)ase edge to ph(r)ase edge to remain accessible until its controller enters the derivation.

[7] Another parallel between OC PRO and anaphors.

[8] I.e., PRO is not phonetically null because of a lack of Case features, but due to the unvalued [REF]-feature. This answer would also be in accordance with the Icelandic Case facts, where PRO can bear Case but is phonetically empty.

[9] In this and the following examples, only the relevant features are indicated.

Step 4: Agree between John *and PRO*

Due to successive-cyclic movement, PRO is still accessible when *John* is merged into the structure (*John* is then in Specv and PRO in SpecV of the matrix clause), and the [REF]-feature can finally be valued by the matrix subject under Agree. Thus, PRO inherits the referential features of *John*, i.e., the two arguments corefer; cf. (10).

(10) $[_{vP}$ **John**$_{\sout{[\theta]}}$ hopes$_{\sout{[*\theta*]}}$ $[_{VP}$ **PRO**$_{\sout{[REF]}}$ t_{hopes} $\sout{[_{CP}\ t''_{PRO}\ [_{TP}\ t'_{PRO}\ \text{to}\ [_{vP}\ t_{PRO}\ \text{win}\ t_{win}]]]}]]]$

Question 1:

What rules out the derivations in (11)?

(11) a. *John hopes Bill/himself/him to win.
b. *John likes PRO.

Answer 1: Case

In (11-a), the overt embedded subjects bear Case features which cannot be successfully checked; in (11-b), the verb bears an [Acc]-Case feature, which cannot be checked either.

Question 2:

How is the derivation ruled out in which *John* is merged in the embedded clause and PRO in the matrix clause (cf. (12))?

(12) *PRO hopes John to win.

Answer 2: Principle C

The unchecked Case feature on *John* would force the latter to move successive-cyclically from edge to edge to get into a position where it could finally check its [Nom]-feature against $T_{[*Nom*]}$. As shown in (13), there is a point in the derivation (= Specv of the matrix clause) where it thereby reaches a position from which it can value PRO's [REF]-feature with the effect that the two DPs are coreferent. However, since PRO also c-commands *John*, this results in a violation of Principle C.

(13) $[_{vP}$ John$_{[Nom]}$ PRO$_{[REF]}$ hopes $[_{VP}$ t_{John} t_{hopes} $\sout{[_{CP}\ \ldots\ \text{to win}\ \ldots]}]]$,
Num = $\{T_{[*Nom*]}, \ldots\}$

A note on backward control:

Note, however, that this ordering of argument insertion is only ruled out because *John* has to raise for reasons of Case checking. Hence, the scenario might not be ruled out under other conditions involving a different Case scenario (as long as PRO can value its [REF]-feature otherwise). This might be the case in languages involving backward control (cf. also section 8).

4.2 Object Control

(14) John_1 persuaded Bill_2 $\text{PRO}_{*1/2}$ to leave.

Step 1: Feature mismatch & repair by PRO insertion

To prevent a crash because of feature mismatch, PRO insertion takes place; cf. (15) (where only external θ-roles are considered).

(15) a. *Underlying numeration:*
Num = {$\text{John}_{[\theta]}$, $\text{persuaded}_{[*\theta*]}$, Bill, to, $\text{leave}_{[*\theta*]}$} → feature mismatch
b. *PRO insertion:*
Num = {$\text{John}_{[\theta]}$, $\text{persuaded}_{[*\theta*]}$, Bill, to, $\mathbf{PRO}_{[\theta,REF]}$, $\text{leave}_{[*\theta*]}$}

Question:

Why can *Bill* not take over the missing [θ]-feature?

Answer: θ-Criterion

Bill already bears an internal [θ]-feature, which classifies it as internal argument of *persuade*, and it is only allowed to bear one θ-role.

Step 2: deriving the embedded clause

Specv: insertion of PRO; checking of *leave*'s [$*\theta*$]-feature
SpecT: checking of the EPP
SpecC: movement to the edge (the [REF]-feature still needs to be valued)

(16) a. $[_{\text{vP}}\ \text{PRO}_{\sout{[\theta,REF]}}\ \text{leave}_{\sout{[*\theta*]}}\ [_{\text{VP}}\ t_{leave}]]$
b. $[_{\text{TP}}\ \text{PRO}_{[REF]}\ \text{to}_{\sout{[EPP]}}\ [_{\text{vP}}\ t_{PRO}\ \text{leave}\ \sout{[_{\text{VP}}\ t_{leave}]}]]$
c. $[_{\text{CP}}\ \text{PRO}_{[REF]}\ [_{\text{TP}}\ t'_{PRO}\ \text{to}\ \sout{[_{\text{vP}}\ t_{PRO}\ \text{leave}\ [_{\text{VP}}\ t_{leave}]]}]]$

The matrix VP:

Step 3: deriving the matrix clause

(i) *persuaded* merges with the embedded CP; (ii) in SpecV, *Bill* enters the derivation and checks the second internal [$*\theta*$]-feature of *persuade*.

(17) $[_{\text{VP}}\ \text{Bill}_{\sout{[\theta]}}\ \text{persuaded}_{\sout{[*\theta*]}}\ [_{\text{CP}}\ \text{PRO}_{[REF]}\ \sout{[_{\text{TP}}\ t'_{PRO}\ \text{to}\ [_{\text{vP}}\ t_{PRO}\ \text{leave}\ [_{\text{VP}}\ t_{leave}]]]}]]$

Step 4: Agree between Bill *and PRO*

At this point in the derivation, PRO is in the accessible domain and *Bill* c-commands it (cf. (17)); hence, *Bill* can value PRO's [REF]-feature under Agree (cf. (18)). As a result, PRO inherits the referential features of *Bill* and we get object control.[10]

(18) $[_{\text{VP}}\ \textbf{Bill}\ \text{persuaded}\ [_{\text{CP}}\ \mathbf{PRO}_{\sout{[REF]}}\ \sout{[_{\text{TP}}\ t'_{PRO}\ \text{to}\ [_{\text{vP}}\ t_{PRO}\ \text{leave}\ [_{\text{VP}}\ t_{leave}]]]}]]$
Num = {John, ...}

[10] Object control can be ruled out with ditransitive control verbs if the object cannot agree with PRO due to a lack of c-command; this could be assumed to be the case with *promise*-verbs, as Hornstein (1999) proposes. (He suggests that in these cases the non-clausal internal argument is not a DP but a PP heading an empty preposition.) For a critical review of this point of view, cf., for instance, Kiss (2005).

Question:

Why is it not possible for *John* to value PRO's [REF]-feature?

Answer:

The first argument DP which can value this feature will do so; and *Bill* is in the appropriate position before *John* even enters the derivation.

4.3 Control into Adjuncts

Observation:

In examples like (19), we can observe subject control; object control is not allowed.

(19) John$_1$ heard Mary$_2$ [without PRO$_{1/*2}$ entering the room].

Step 1: Feature mismatch & repair by PRO insertion

To prevent a crash because of feature mismatch, PRO insertion takes place; cf. (20).

(20) a. *Underlying numeration:*
Num = {John$_{[\theta]}$, heard$_{[*\theta*]}$, Mary, without, entering$_{[*\theta*]}$, the, room}
$\rightarrow$ feature mismatch
b. *PRO insertion:*
Num = {John$_{[\theta]}$, heard$_{[*\theta*]}$, Mary, without, **PRO**$_{[\theta,REF]}$, entering$_{[*\theta*]}$, the, room}

Step 2: deriving the adjunct

Specv: insertion of PRO; checking of the [$*\theta*$]-feature of *entering*[11]
SpecT: checking of the EPP
SpecC: movement to the edge (the [REF]-feature still needs to be valued)

(21) a. [$_{\text{vP}}$ PRO$_{\cancel{[\theta,REF]}}$ entering$_{\cancel{[*\theta*]}}$ [$_{\text{VP}}$ t$_{entering}$]]
b. [$_{\text{TP}}$ PRO$_{[REF]}$ T$_{\cancel{[EPP]}}$ [$_{\text{vP}}$ t$_{PRO}$ entering $\cancel{[_{\text{VP}}\ t_{entering}]}$]]
c. [$_{\text{CP}}$ PRO$_{[REF]}$ [$_{\text{TP}}$ t$'_{PRO}$ T $\cancel{[_{\text{vP}}\ t_{PRO}\ \text{entering}\ [_{\text{VP}}\ t_{entering}]]}$]]

Note:

Unlike Hornstein (1999, 2001), I assume that material *cannot* be extracted out of adjuncts (since they are islands); however, it is of course possible for PRO to move to the edge of the adjunct, where it can enter into an Agree relation with a DP in the main clause as long as both are accessible at the same time.[12]

Step 3: deriving the main clause

in VP: *heard* merges with *Mary*; the latter moves to SpecV to remain accessible (for Case checking)
in vP: (i) *heard* moves to v; (ii) v and *Mary* check Acc. Case; (iii) *John* is merged into Specv; cf. (22).

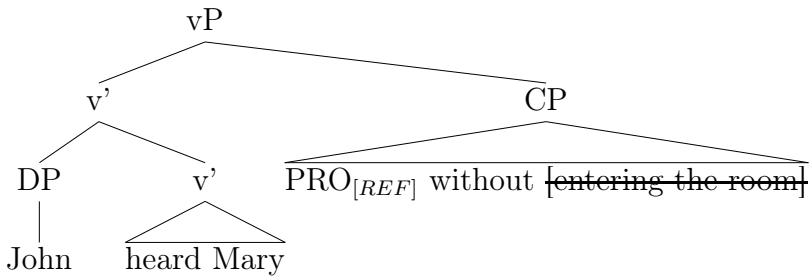
[11] I ignore the question of how gerunds are built.

[12] Recall that extraction out of islands is assumed to be possible in Hornstein's approach by means of sideward movement in the case of adjuncts, but not if other types of islands are involved; cf. also section 6.

(22) [$_{vP}$ John heard [$_{VP}$ Mary t_{heard} ~~t_{Mary}~~]]

Step 4: merging the adjunct with the main clause

(23)



Note 1:

Constituents at the edge of a phase c-command each other; i.e., *John* c-commands in particular the adjunct and hence PRO in the adjunct's edge domain.

Step 5: Agree between John *and PRO*

As a result, *John* can value PRO's [REF]-feature.

Note 2:

Note that Agree into the adjunct takes place when the vP has not yet been left (cf. (23)). Therefore, PRO is still accessible and can participate in the Agree relation. Since PRO is in the specifier of the adjunct (i.e., the edge of the adjoined CP), it becomes inaccessible as soon as the vP is left. After the completion of the vP, only material at its own edge (plus the phase head) remain accessible (i.e., the adjunct itself, for instance, but not the adjunct's edge, where PRO is located).[13]

→ Hence, control into an adjunct is possible, but extraction out of the latter is illicit.

Note 3:

In the derivation described above, there is no point at which the object c-commands the adjunct (and thus PRO), since Acc. Case checking is assumed to take place under Agree when *Mary* is in SpecV. However, as Hornstein (1999) points out, it is possible for objects in these constructions to bind variables inside the adjunct (as in (24)).

(24) John read every book$_1$ without reviewing it$_1$.

Hence, there must be a point in the derivation of (24) at which the object c-commands the adjunct and can thus bind the variable. However, since *John* is the first argument DP in Specv, it immediately values the [REF]-feature of PRO and the object cannot qualify as controller, even if it ends up in a c-commanding scope position at LF.[14]

[13]Cf. also Müller's (2010, 2011) discussion of CED effects as a consequence of the PIC.

[14]In fact, nothing hinges on the assumption that Accusative Case is checked under Agree; if it is checked in Specv at LF, the same line of reasoning holds.

5. Arbitrary Control

(25) [PRO$_{arb}$ to shave oneself] is dangerous.

General idea:

If there is no DP-argument which can value PRO's [REF]-feature (either due to the lack of such a DP-argument or due to the lack of c-command), PRO is assigned an arbitrary interpretation. This is a last resort strategy to prevent a crash of the derivation because of an unvalued [REF]-feature, which needs to be valued ($\rightarrow$ i.e., we get a default valuation).

Step 1: Feature mismatch & repair by PRO insertion

To prevent a crash because of feature mismatch, PRO insertion takes place; cf. (26) (where only the external θ-roles are indicated).

(26) a. *Underlying numeration:*
Num = {to, shave$_{[*\theta*]}$, oneself, is, CP$_{[\theta]}$, dangerous$_{[*\theta*]}$}
$\rightarrow$ feature mismatch
b. *PRO insertion:*
Num = {to, **PRO**$_{[\theta,REF]}$, shave$_{[*\theta*]}$, oneself, is, CP$_{[\theta]}$, dangerous$_{[*\theta*]}$}

Step 2: deriving the subject clause

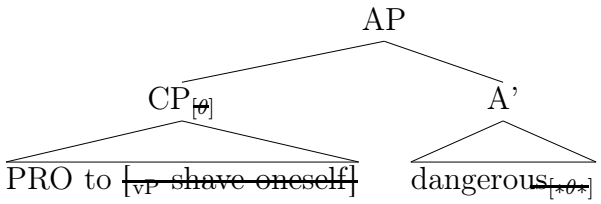
Specv: insertion of PRO; checking of the [$*\theta*$]-feature of *shave*; binding of the anaphor[15]
SpecT: checking of the EPP
SpecC: movement to the edge (the [REF]-feature still needs to be valued)

(27) a. [$_{vP}$ PRO$_{\cancel{[\theta,REF]}}$ shave$_{\cancel{[*\theta*]}}$ [$_{VP}$ t$_{shave}$ ~~oneself~~]]
b. [$_{TP}$ PRO$_{[REF]}$ to$_{\cancel{[EPP]}}$ [$_{vP}$ t$_{PRO}$ shave ~~[$_{VP}$ t$_{shave}$ oneself]~~]]
c. [$_{CP}$ PRO$_{[REF]}$ [$_{TP}$ t'$_{PRO}$ to ~~[$_{vP}$ t$_{PRO}$ shave [$_{VP}$ t$_{shave}$ oneself]]~~]]

Step 3: merging the subject clause into the main clause

Cf. (28): At this point, the subject CP checks the external θ-feature of *dangerous*.

(28)



Accessibility:

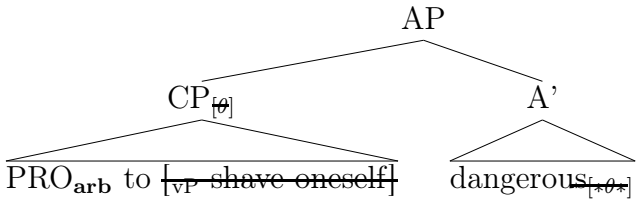
Note that this is the last point in the derivation at which PRO is accessible. As soon as the phase AP is completed, only the edge of the AP, plus A, remain accessible. Since PRO is located at the edge of the CP (= the edge of an edge), it is rendered inaccessible (because the notion of edge is not recursive; cf. also note 2 in the previous section/Müller 2010, 2011.)

[15]For the sake of simplicity, I ignore movement of the anaphor to the phase edge to license Case and binding in (27-a).

Step 4: default valuation

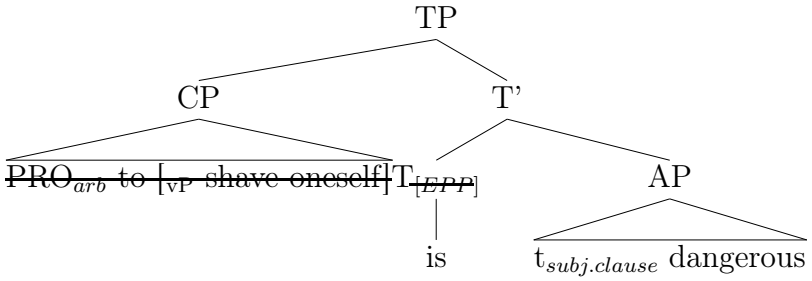
Since the [REF]-feature of PRO is still unvalued at this point in the derivation, it is valued as *arbitrary* as a last resort option to prevent a crash of the derivation (since it is clear at this point that there is no other way to license PRO).

(29)



Step 5: moving the subject clause to SpecT

(30)



6. On Islands and the Distinction between OC and NOC

Assumption:

Obligatory vs non-obligatory control is exclusively defined on the basis of the available interpretation:[16]

(31) a. In obligatory control structures, the antecedent of PRO is uniquely determined: it is another DP-argument in the sentence (and an arbitrary interpretation is not available).
b. In non-obligatory control structures, an arbitrary reading is available.

Examples:

(32) a. John hopes to win the race.
only possibility: PRO = *John* → OC
b. John hopes for William to win the race.
only possibility: PRO = *William* → OC
c. John promised Mary to win the race.
only possibility: PRO = *John* → OC
d. John persuaded William to take part in the race.
only possibility: PRO = *William* → OC

[16] In the literature, various proposals have been made as far as this distinction is concerned. For different views, cf., for instance, Rosenbaum (1967), Williams (1980), Landau (2000), among many others.

(33) a. To shave oneself is dangerous.
arbitrary interpretation of PRO is available → NOC
b. Amy thinks that dancing with Dan might be fun.
arbitrary interpretation of PRO is available → NOC
c. Mary knows how to hold oneself erect at a royal ball.
arbitrary interpretation of PRO is available → NOC

Optionality:

How are the two readings in (34-a) and (34-b) derived?[17]

(34) a. Mary_1 knows [how $\text{PRO}_{1/arb}$ to behave at a royal ball].
b. Amy_1 thinks that [$\text{PRO}_{1/arb}$ dancing with Dan] might be fun.

Observation:

Both examples involve islands – (34-a) a *wh*-island, (34-b) a subject island. On the assumption that PRO cannot leave these islands, there is no way for PRO to get its [REF]-feature valued by the matrix subject, since PRO is no longer accessible when the latter enters the derivation.

Consequence:

As a result, PRO is assigned an arbitrary interpretation as last resort strategy (cf. section 5). This accounts straightforwardly for one of the interpretations of (34-a) and (34-b) (i.e., PRO_{arb}).

Logophoric aspects:

It has been observed before that NOC PRO behaves in many respects like a logophor (cf., for instance, Landau 2003 and older references cited there); hence, it is not surprising that the default interpretation (PRO_{arb}) we get from the syntactic derivation might be overridden by another discourse-prominent reference.

OC vs NOC: technical derivation

OC: The reference of PRO is syntactically determined under Agree by another DP-argument.

NOC: PRO is assigned an arbitrary interpretation as last resort (by default valuation), since there is no DP-argument accessible which could value PRO's [REF]-feature; however, in this case, pragmatic or discourse factors might have an additional influence on the interpretation of NOC PRO (cf. the widely observed similarity between NOC PRO and logophors).

Adjuncts versus subjects and wh-islands

Why is control into adjuncts OC, whereas control involving subjects or *wh*-islands NOC?

Empirical difference:

Control into adjuncts does not permit an arbitrary interpretation (cf. (37-b)); control involving subjects or *wh*-islands does (cf. (35-b), (36-b)).

[17]Cf. Culicover & Jackendoff (2006) for similar examples.

(35) a. John said that [shaving himself] was not worthwhile.
b. John said that [shaving oneself] was not worthwhile.

(36) a. John wondered [how to shave himself].
b. John wondered [how to shave oneself].

(37) a. John does not like leaving the house [without shaving himself].
b. *John does not like leaving the house [without shaving oneself].

The status of PRO inside an island:

I assume that PRO cannot leave any of these structures that are classified as islands (unlike Hornstein, who allows movement out of adjuncts (sideward movement), maybe out of *wh*-islands, but not out of subjects (because they *are* islands...); cf. also section 1.2.2).

Syntactic difference:

(i) The crucial difference is that in (37-b) there is a point in the derivation when both the potential controller *John* and PRO are accessible at the same time (cf. also section 4.3). Hence, they can agree with each other, and PRO's [REF]-feature can be valued. OC is derived.

(ii) In (35-b) and (36-b), this is excluded; when *John* enters the derivation in the matrix vP, PRO (which is stuck inside the island in the embedded clause) is no longer accessible; hence, PRO's [REF]-feature cannot be valued by *John*
→ PRO is assigned an arbitrary interpretation by default valuation as last resort strategy.

A note on the anaphoric forms in (38):

The structures in (38) are classified as NOC (cf. the discussion above), and depending on the respective interpretation, the corresponding anaphoric form is chosen – i.e., *oneself* reflects the arbitrary interpretation, whereas *herself/himself* reflect the non-arbitrary reading that can be triggered by a logophor-licensing antecedent.

(38) a. Mary_1 knows [how $\text{PRO}_{1/arb}$ to hold herself_1/oneself erect at a royal ball].
b. John_1 said that [$\text{PRO}_{1/arb}$ shaving himself_1/oneself] was not worthwhile.

7. A Note on Split and Partial Control

(39) a. *Partial control:*
John_1 wanted [PRO_{1+} to meet at six]. (cf. Landau 2000:28)
b. *Split control:*
John_1 promised his son_2 [PRO_{1+2} to go to the movies together].
(cf. Landau 2000:31)

Partial control: PRO must include the controller.
Split control: Two matrix arguments jointly control (a plural) PRO. (cf. Landau 2000:3)

Like Landau (2000) (and unlike traditional literature like Williams 1980), I assume that these are instances of OC.

Considerations:

Unlike Landau (2003), however, I do not assume that these are counterexamples to the MTC;

instead, I assume that the syntactic controller in these examples is the matrix subject. However, non-syntactic factors might have an additional influence on the reading.[18]

ad (39-a) – partial control:

Boeckx & Hornstein (2004) argue that it seems to be a special lexical property of *meet*-like verbs that allows them to give rise to a partial control reading (which means that it is not a property of control as such); cf. (40).

(40) John is really a busy professor. His days are filled with meetings, with students, deans, colleagues, lunch appointments, etc. Can you imagine?! Yesterday John met at 8 a.m., 9 a.m., 10 a.m., noon, and 7 p.m. His wife told me, "John seems to be meeting all the time!" (cf. Boeckx & Hornstein 2004:449)

ad (39-b) – split control:

In (39-b), the split control reading seems to be enforced by the use of *together*. In (41-a), both interpretations seem to be available (PRO = *John*; PRO = *John* + son); in (41-b), the context has been manipulated in such a way that the former reading is strongly preferred.

(41) a. John promised his son to go to the movies
b. His son wanted to have a party with his friends. So John promised his son to go to the movies.

Conclusion:

Syntactically, *John* turns out to be the controller in these cases; however, pragmatic factors (introduced, for instance, by the use of words like *together*) enforce or allow for an additional controller (cf. (39-b), (41-a)).

8. A Note on Backward Control

Observation:

In some languages, control structures like (42) can be observed.

(42) *Backward control:*
$[_{matr.clause}\ \mathrm{PRO}_1 \ldots [_{inf.clause}\ \mathrm{DP}_1 \ldots]]$

Options:

(i) phonetic shift

not a syntactic issue, but a PF story: syntactically, the DP-argument precedes PRO, but when the [REF]-feature of PRO is valued, the phonetic realization shifts as well in these cases to a lower copy of PRO

(ii) different valuation strategy (cf. also remark in section 4.1)

As long as the overt DP stays inside the embedded clause, it is no longer accessible when PRO enters the derivation in the matrix clause (cf. (43)). Hence, no Principle C violation arises if

[18] Cf. also Boeckx & Hornstein (2004) as far as partial control is concerned; moreover, Hornstein (2003) provides an alternative syntactic account in terms of covert adjunction of a comitative.

PRO turns out to be coreferent with this DP in the end. However, the question needs to be clarified as to how the [REF]-feature is valued in this case. (So far, the analysis would predict an arbitrary interpretation in this scenario.)

(43) $[_{vP}\ PRO_{[REF]}\ v{+}V\ [_{VP}\ V\ \sout{[_{CP}\ \ldots\ DP_{subject}\ \ldots]}]]$

(iii) remnant movement (cf. also Fischer 2010)

- first, PRO is c-commanded by its controller → valuation takes place
- then, PRO moves inside a remnant to a position preceding the controller
- result: PRO linearly precedes its controller, but it does not c-command it (and thereby obviates a Principle C violation)

(44) $[[_{XP}\ \ldots\ PRO_1\ \ldots]\ \ldots\ DP_1\ \ldots\ t_{XP}]$
XP = remnant constituent → PRO_1 does not c-command DP_1

Note:

Note, however, that even in the languages that display BC, it only occurs with specific control predicates (which vary from language to language). "With the majority of verbs, all respective languages display forward control, which reflects the marked character of backward control" (cf. Stiebels 2007:48) – hence, whichever strategy licenses BC, it must be restricted to these particular occurrences.

9. Summary & Outlook

Summary:

- emergence of PRO = repair strategy
  → PRO insertion because of θ-feature mismatch in the numeration
- PRO is referentially defective:
  its [REF]-feature must be valued in the course of the syntactic derivation
- option 1 (OC):
  licensing via Agree by a c-commanding DP-argument in the same accessible domain → OC
- option 2 (NOC):
  if option 1 fails, default valuation takes place as a last resort strategy → NOC

Outlook:

What remains to be discussed (among other things):

- backward control: explicit analysis
- Case concord facts in Icelandic[19]
- control in nominals
- control/binding asymmetry in implicit control structures (cf. section 1.2.2)
- control shift[20] (cf., for instance, Bresnan 1982, Petter 1998):

[19]In Icelandic, PRO can bear Case: the same Case as the subject controller if it is structural Case; a Case distinct from the subject controller's if it is quirky Case; cf., among others, Boeckx & Hornstein (2006a); Sigurðsson (2008); Bobaljik & Landau (2009); Boeckx, Hornstein & Nunes (2010).

[20]Thanks to Patrick Grosz for pointing this out to me.

(45) *object → subject control:*

a. John persuaded Mary$_1$ [PRO$_1$ to call his parents].
b. John$_1$ persuaded Mary [PRO$_1$ to be allowed to call his parents].

(46) *subject → object control:*

a. John$_1$ never promised Mary [PRO$_1$ to call her parents].
b. John never promised Mary$_1$ [PRO$_1$ to be allowed to call her parents].

References

Assmann, Anke. 2011. A New Solution to the Island Paradox with Parasitic Gaps. Handout GGS 37, University of Stuttgart.

Bobaljik, Jonathan & Idan Landau. 2009. Icelandic Control Is Not A-Movement: The Case from Case. *Linguistic Inquiry* 40: 113-132.

Boeckx, Cedric & Norbert Hornstein. 2003. Reply to "Control Is Not Movement". *Linguistic Inquiry* 34: 269-280.

Boeckx, Cedric & Norbert Hornstein. 2004. Movement under Control. *Linguistic Inquiry* 35: 431-452.

Boeckx, Cedric & Norbert Hornstein. 2006a. Control in Icelandic and Theories of Control. *Linguistic Inquiry* 37: 591-606.

Boeckx, Cedric & Norbert Hornstein. 2006b. The Virtues of Control as Movement. *Syntax* 9: 118-130.

Boeckx, Cedric, Norbert Hornstein & Jairo Nunes. 2010. Icelandic Control Really Is A-Movement: Reply to Bobaljik and Landau. *Linguistic Inquiry* 41: 111-130.

Bresnan, Joan. 1982. Complementation and Control. *Linguistic Inquiry* 13: 343-434.

Chomsky, Noam & Howard Lasnik. 1993. The Theory of Principles and Parameters. In *Syntax: An International Handbook of Contemporary Research*, Joachim Jacobs, Arnim von Stechow, Wolfgang Sternefeld & Theo Vennemann (eds), 506-569. Berlin: Mouton de Gruyter.

Culicover, Peter W. & Ray Jackendoff. 2001. Control Is Not Movement. *Linguistic Inquiry* 32:493-512.

Culicover, Peter W. & Ray Jackendoff. 2006. Turn over Control to the Semantics! *Syntax* 9: 131-152.

Fischer, Silke. 2004. *Towards an Optimal Theory of Reflexivization.* Doctoral dissertation, University of Tübingen.

Fischer, Silke. 2010. Alles außer Kontrolle. Handout GGS 36, Freie Universität Berlin.

Hornstein, Norbert. 1999. Movement and Control. *Linguistic Inquiry* 30: 69-96.

Hornstein, Norbert. 2001. Movement and Control. In *Move! A Minimalist Theory of Construal*, 24-71. Oxford: Blackwell.

Hornstein, Norbert. 2003. On Control. In *Minimalist Syntax*, Randall Hendrick (ed.), 6-81. Oxford: Blackwell.

Kiss, Tibor. 2005. On the Empirical Viability of the Movement Theory of Control. Ms., University of Bochum.

Landau, Idan. 2000. *Elements of Control: Structure and Meaning in Infinitival Constructions.* Dordrecht: Kluwer.

Landau, Idan. 2001. Control and Extraposition: The Case of Super-Equi. *Natural Language and Linguistic Theory* 19: 109-152.

Landau, Idan. 2003. Movement out of Control. *Linguistic Inquiry* 34: 471-498.

Landau, Idan. 2004. The Scale of Finiteness and the Calculus of Control. *Natural Language and Linguistic Theory* 22: 811-877.

Landau, Idan. 2007. Movement-Resistant Aspects of Control. In *New Horizons in the Analysis of Control and Raising*, William D. Davies & Stanley Dubinsky (eds), 293-325. Dordrecht: Springer.

Müller, Gereon. 2004. Phrase Impenetrability and Wh-Intervention. In *Minimality Effects in Syntax*, Arthur Stepanov, Gisbert Fanselow & Ralf Vogel (eds), 289-325. Berlin: Mouton de Gruyter.

Müller, Gereon. 2010. On Deriving CED Effects from the PIC. *Linguistic Inquiry* 41: 35-82.

Müller, Gereon. 2011. *Constraints on Displacement. A Phase-Based Approach.* Amsterdam: Benjamins.

Petter, Marga. 1998. *Getting PRO under Control.* The Hague: Holland Academic Graphics.

Rosenbaum, Peter. 1967. *The Grammar of English Predicate Complement Constructions.* Cambridge, MA: MIT Press.

Schäfer, Florian. 2008. *The Syntax of (Anti-)Causatives. External Arguments in Change-of-State Contexts.* Amsterdam: Benjamins.

Schäfer, Florian. 2010. Passives of Reflexive Verbs: The Repair of a Principle A Violation. Ms., Universtiy of Stuttgart.

Sigurðsson, Halldór. 2008. The Case of PRO. *Natural Language and Linguistic Theory* 26: 403-450.

Stiebels, Barbara. 2007. Towards a Typology of Complement Control. In *ZAS Papers in Linguistics 47: Studies in Complement Control*, Barbara Stiebels (ed.), 1-59. Berlin: ZAS.

Williams, Edwin. 1980. Predication. *Linguistic Inquiry* 11: 203-238.