RECONSTRUCTION II: CEC, ETA AND WLM

Topics & Goals

- CEC and consequences for the architecture of the grammar
- ETA and consequences (small clauses, subjects)
- Accounting for scope flexible vs. scope rigid langauges
- (Anti)-reconstruction and scope

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1. CEC

Last time, we encountered the CEC:

(1) *Condition on Extraction out of Copies* (***CEC***): Covert subextraction out of silent copies is local.

The CEC can be seen as a manifestation of the *Freezing Principl*e of Wexler & Culicover (1980).

(2) *Freezing Principle*
Movement out of a moved node or out of a copy of a moved node is illicit.

SynR does not create transparent readings. CEC eliminates reconstructed *de re* readings by blocking LF representation (4), in which the s-variable of the lower subject is bound across *seem*:

(3) [*Each others*$_2$'s height] seemed to *the boys*$_2$ to exceed their actual height.
(consistent *de dicto*/*contradictory *de re*)

(4) $\underline{\underline{\lambda s_0}}$ [seemed-in-s_0 [to *the boys*$_2$ [λs_1 [*each others*$_2$'s height-in-$\underline{\underline{s_0}}$] to exceed-in-$s_1$ their height-in-s_0]]]

No scope shifting movement out of lower VP-copies

(5) a. .... and [$_{vP}$ teach ***every student$_\alpha$]$_\beta$, noone$_\gamma$*** will t_β ($\neg\exists \succ \forall$ / *$\forall \succ \neg\exists$)
b. .... and noone$_\gamma$ will [$_{vP}$ teach every student$_\alpha$]$_\beta$ (subsequent to reconstruction of vP)

No scope shifting movement out of lower DP-copies

(6) [$_\gamma$ Two policemen] spy on [$_\beta$ someone from [$_\alpha$ every city]]
a. $2 \succ \underline{\underline{\forall \succ \exists}}$ (inverse linking, wide scope for subject)
b. $\underline{\underline{\forall \succ \exists}} \succ 2$ (inverse linking, narrow scope for subject)
c. *$\underline{\underline{\forall}} \succ 2 \succ \underline{\underline{\exists}}$ (inverse linking, intermediate scope for subject)

Question: How to account for the CEC?

(7) a. The silence of lower copies
(not likely, because elliptical VPs are silent, but are not scope island.)
b. Linearization
☞ c. ***Architecture:*** certain movements types need to me maximally local.

1.1. THE DEDUCTIVE SYSTEM

General idea:

- Logical entailments are computed in a separate cognitive model that systematically interacts with the grammar
- Some logical truths/contradictions result in inacceptability.

Fox (2000, 2009): Scope Economy calculated in the *Deductive System* (DS; Fox and Hackl 2006).

Gajewsky (2002): Definiteness restriction and well-formedness conditions on exceptives are not determined by model theoretic interpretation of sentences, but make reference to properties of the logical structure (*logical skeleton*), which is obtained by replacing all non-logical (non-permutation invariant) constants by variables of identical type ((8)b). If the skeleton yields a tautology/contradiction under all assignments, ungrammaticality ensues (*L*[ogical]-*analyticity*; Gajewsky 2002; see also Barwise and Cooper 1981 for (8); von Fintel 1994 for (9); and Chierchia 2013 on NPIs):

(8) a. There is no man/a man/*every man
b. Logical skeleton: [$there_e$ [*be* [$P_{1<e,t>}$]]] ($[\![\text{there}]\!] = D$)

(9) a. Every man/no man/*a man/*most men except Bill left
b. Logical skeleton: [*every* [$P_{1<e,t>}$ [*but* $P_{2<e,t>}$]] $P_{3<e,t>}$]

1.2. CEC AND THE ARCHITECTURE

Two types of covert movement (Reinhart 2006, i.a.):

(10) a. *Scope shifting QR*: optional, generates new readings
b. *Adjustment rules*: obligatory, render output interpretable for semantic component; include type driven QR, binding of free variables, relative clause formation,...

Suppose that scope shifting QR and adjustment rules are computed in separate components (***DS-LF Model***)

(11) a. Scope shifting QR applies at DS (Fox 2000; Fox and Hackl 2005; Gajewsky 2002, 2009).
b. Adjustment rules apply in post-syntactic LF.

DS-LF Model

$$\underbrace{\text{Deductive System}}_{\substack{\text{optional rules, operate on}\\ \text{logical skeleton}\\ \text{(scope shifting QR, ...)}}} \rightarrow \underset{\text{(roots \& f-morphemes)}}{\overset{\text{Lexical}}{\text{insertion I}}} \rightarrow \text{Overt Syntax} \rightarrow \underset{\text{(Case features, Agr-heads)}}{\overset{\text{Lexical}}{\text{insertion II}}} \rightarrow \text{PF}$$

$$\text{Overt Syntax} \downarrow \underbrace{\text{LF}}_{\substack{\text{obligatory adjustment rules}\\ \text{(type driven QR, capturing unbound variables,...)}}} \rightarrow \text{Model theoretic interpretation}$$

(12) *Aspects*: PS-Rules → Lexical insertion → Deep Structure → Transformations → Surface Structure
Deep Structure ↓ semantics

(13) *Minimalism*: Lexicon → Overt Syntax → PF
Overt Syntax ↓ LF → Semantic interpretation

(14) *DM*: Roots & f-morphemes → Overt Syntax → Vocabulary items → PF
Overt Syntax ↓ LF → Semantic interpretation

(11)a follows the general idea that certain principles of syntax may operate on impoverished representations, which lack parts of descriptive content (Lebeaux 1995; Sportiche 2006; Takahashi 2007; a.o.) or categorial specification (Richards 2010; Moro 2000; Lechner 2004).

(15) *Hypothesis*: Locality condition expressed by CEC is a reflex of local LF-adjustment rules and the DS-LF model.

2. Consequences of the ETA

The conjunction of the ETA and assumption (16) has three empirically verified consequences.

(16) *Assumption (fairly standard):* vPs denote properties of situations/events, i.e. are of type $<s,t>$.

3.1. Small clauses

Small clause subjects do not reconstruct for scope or referential transparency (Stowell 1991; Williams 1983; Moulton 2010, 2013; Lechner 2011, to appear):

(17) It appears that the imposter who performed plastic surgery using kitchen utensils in his kitchen is in the audience. We know this because we have heard that...

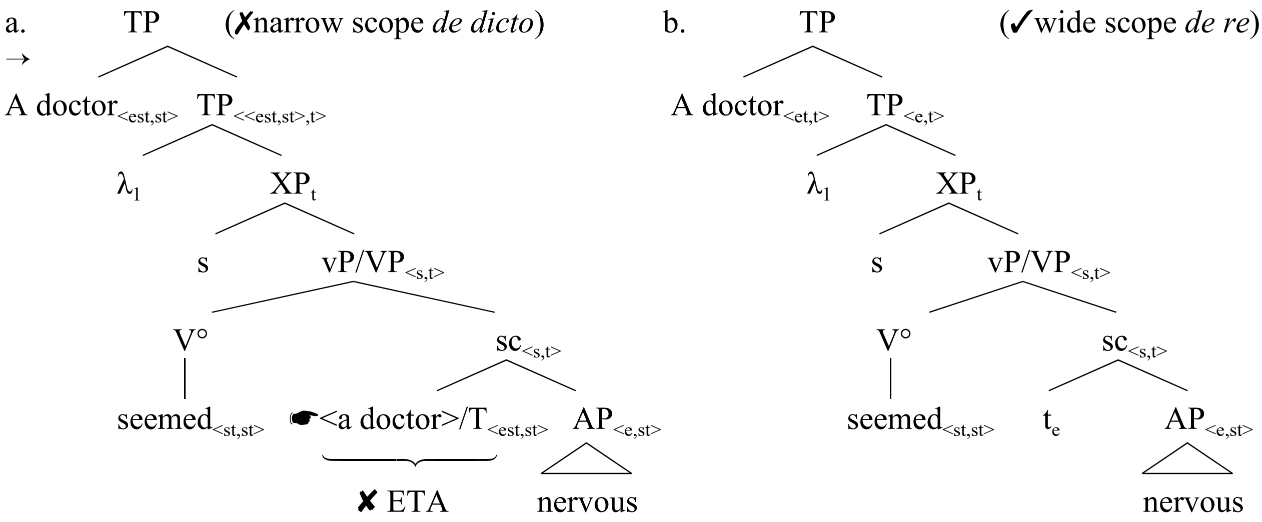
a. #***A doctor seemed*** nervous. (*a doctor ≻ seem / *seem ≻ a doctor*)
b. ***A doctor seemed*** to be nervous. (*a doctor ≻ seem / seem ≻ a doctor*)

(18) There are several empty seats in our otherwise totally full classroom. (Moulton 2013: (3))

a. #***Two students seemed*** sick today. (*two students ≻ seem / *seem ≻ two students*)
b. ***Two students seemed*** to be sick today. (*two students ≻ seem / seem ≻ two students*)

(19) *Assumptions*
a. Small clauses consist of a predicate only and lack functional structure (Johnson 2001, a.m.o.).
b. The lowest s-variables in the spine of the tree are located outside vP (fairly standard).

Corollary 1 of ETA: Quantificational subjects cannot be interpreted in subject position of small clauses.

(20)


➜ ETA blocks narrow scope *de dicto* for small clause subjects.

Exceptional narrow scope subjects: Moulton (2010) observes that wide scope requirement for small clause subjects is canceled if the subject serves as the argument of an intensional predicate.

(21) a. A new fridge seems necessary. (*seem ≻ a fridge / a fridge ≻ seem*)
b. $\lambda s.\forall s'[R_{seem}(s)(s') \rightarrow \exists x[new\_fridge(x)(s)]]$

Lexical scope analysis of *necessary* in (22):

(22) $[\![\textbf{necessary}]\!] = \lambda P_{<e,st>}.\lambda s.\forall s'[R_{seem}(s)(s') \rightarrow \exists x[P(x)(s)]]$

(21) is compatible with the present system. The ETA licenses property type (<e,st>) copies, which can directly combine with (22).

Problem: It is known that vP-fronting does not bleed Condition C (Heycock 1995; Takano 1995).

(23) *...and [t_2 proud of ***John**$_1$*] she thinks that ***he**$_1$* said Mary_2 is <[t_2 proud of ***John**$_1$*]>

Given that on current assumptions, vPs denote properties of situations/events ((16), why can vP-movement not undone in semantics, as in (24), obviating the Condition C effect?

(24) *...and [$_{<s,t>}$ t_2 proud of ***John**$_1$*] λ_3 she thinks that ***he**$_1$* said Mary_2 is $T_{3,<s,t>}$

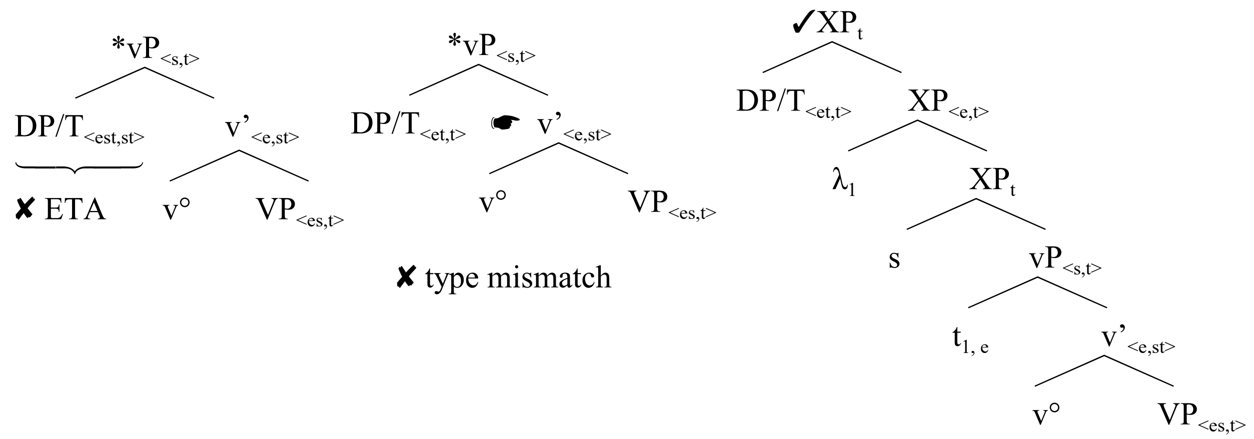
Towards a response: The predicate contains a world variable that needs to be bound locally (*Generalization X* in Percus 2000). But SemR only produces representations in which the situation variable is bound in its surface location. Somehow, this conflict renders SemR unavailable.

2.2. Quantificational subjects must not be interpreted *in-situ*

Corollary 2 of ETA: ETA offers an account for the observation quantificational subjects are not interpreted in their thematic position (this is crucial for the analysis of scope rigidity; see also Johnson & Tomioka 1997).

Subject in-situ prohibition: (25)a violates ETA, which bars intensional traces. (25)b abides by the ETA but results in a type mismatch. (25)c succeeds, provided that the computation combines with a vP-external (see small clauses) s-variable first, followed by short subject QR.

(25) a. *Subject* in-situ *I* b. *Subject* in-situ *II* c. *Subject interpreted* ex-situ



2.3. Intensional transitive verbs (ITV)

Objects of ITVs can only be read *de re* (Zimmermann 1993):

(26) John was looking for every unicorn (#even though such animals do not exist). (**de dicto*/✓*de re*)

Suppose that objects are reconstructed into VP-internal base position by SemR, not by SynR (on why this might be so see section 5.3 and 5.4). Then, this follows from the ETA, which only creates *de re* readings.

3. A CALCULUS FOR SCOPE AND RECONSTRUCTION

(27) a. *Extension Condition* (Chomsky 1995)
All movement in the overt component - including Overt Covert Movement - extends the tree.

b. *Strict Cycle*
Movement proceeds bottom up, affecting lower nodes first.

☞ c. *Timing of movement* (Diesing 1992, i.a.)
In German, all movement operations apply in the overt component. English admits post-syntactic dislocation at LF. (This entails that in German, QR proceeds by *Overt Covert Movement* [OCM]; Bobaljik 1995; Groat and O'Neil 1996; Pesetsky 2000, i.a.)

NB: Assumptions (27)a/b are standard. (27)c derives (i) scope rigidity (German, Japanese, etc...); (ii) flexible scope for inverted orders in scope rigid languages; (iii) scope flexibility in English, i.a.

3.1. SCOPE RIGID VS. SCOPE FLEXIBLE LANGUAGES

Scope rigid languages, canonical word order: German transitive clauses with canonical word order are scope rigid ((28)). Cycle determines that object movement (by OCM; (28)b) precedes subject movement ((28)c). Subject movement has to extend the tree, resulting in an order preserving representation (further raising to SpecTP, which in inconsequential for the analysis, not represented).

(28) a. $[_{XP,\,t}\ s\ \ [_{vP,\,<s,t>}\ QP_{Subject}\ [_{VP,\,<e,st>} \ldots QP_{Object} \ldots]]]$

b. *OCM of object in overt syntax (subject to Extension Condition)*
$[_{XP}\ QP_{Object}\ \ [_{XP,\,t}\ s\ \ [_{vP,\,<s,t>}\ QP_{Subject}\ [_{VP,\,<e,st>} \ldots t_{Object} \ldots]]]]$

c. $[_{XP}\ \underline{\underline{QP}}_{Subject}\ \ [_{XP}\ \underline{\underline{QP}}_{Object}\ \ [_{XP,\,t}\ s\ \ [_{vP,\,<s,t>}\ t_{Subject}\ \ [_{VP,\,<e,st>} \ldots t_{Object} \ldots]]]]]$
(Subject ≻ Object / *Object ≻ Subject)

Neither subject nor object can reconstruct to a position below XP: higher type traces are blocked by ETA for the subject and type restrictions for the object (on why SynR is not possible see §5.2). It follows that canonical, non-inverted word orders functionally translate into surface scope order.

Analysis without ETA overgenerates: The ETA matters. The alternative analysis (29), where the subject is interpreted *in-situ* and the object QP has QRed, derives the unattested inverse scope order.

(29) *Scope rigid languages, non-inverted orders (incorrect analysis)*
a. $[QP_{Subject}\ \ [_{vP,\,t}\ DP/T_{Subject}\ [_{VP,\,<et>} \ldots QP_{Object} \ldots]]]$
b. $[QP_{Subject}\ \ [_{vP}\ \underline{\underline{QP}}_{Object}\ \ [_{vP,\,t}\ \underline{\underline{DP/T}}_{Subject}\ [_{VP,\,<et>} \ldots t_{Object} \ldots]]]]$ (Object ≻ Subject)

Scope rigid, scrambled/inverse orders: further movement of the object feeds ambiguity since subject can be interpreted below QP_{Object} by SemR on SynR see §5.3).[1]

(30) *Scope rigid languages, inverted orders*
a. $[_{XP,\,t}\ s\ \ [_{vP,\,<s,t>}\ QP_{Subject}\ [_{VP,\,<e,st>} \ldots QP_{Object} \ldots]]]]$
b. $[_{XP}\ QP_{Object}\ \ [_{XP,\,t}\ s\ \ [_{vP,\,<s,t>}\ QP_{Subject}\ [_{VP,\,<e,st>} \ldots t_{Object} \ldots]]]]$
c. $[_{XP}\ \underline{\underline{QP}}_{Subject}\ \ [_{XP}\ \underline{\underline{QP}}_{Object}\ \ [_{XP,\,t}\ s\ \ [_{vP,\,<s,t>}\ t_{Subject}\ \ [_{VP,\,<e,st>} \ldots t_{Object} \ldots]]]]$
(Subject ≻ Object)
d. $[_{ScrP}\ \underline{\underline{QP}}_{Object}\ \ [_{XP}\ \underline{\underline{T}}_{Subject}\ \ [_{XP}\ t_{Object}\ \ [_{XP,\,t}\ s\ \ [_{vP,\,<s,t>}\ t_{Subject}\ \ [_{VP,\,<e,st>} \ldots t_{Object} \ldots]]]]$
(Object ≻ Subject)

Double object constructions: canonical orders are scope rigid ((31)a). Inversion by scrambling feeds ambiguity because DO may undergo SemR ((31)b):

(31) *Scope rigid languages, inverted orders among objects*

a. $[_{XP}$ IO $[_{XP}$ DO $[_{XP,\,t}$ s $[_{vP,\,<s,t>}$ $t_{Subject}$ $[_{VP,\,<e,st>}$ … $[t_{IO}$ … $[t_{DO}$ …]]]]
(IO ≻ DO / *DO ≻ IO)

b. $[_{ScrP}$ $\underline{\underline{QP}}_{DO}$ $[_{XP}$ IO $[_{XP}$ $\underline{\underline{t/T}}_{DO}$ $[_{XP,\,t}$ s $[_{vP,\,<s,t>}$ $t_{Subject}$ $[_{VP,\,<e,st>}$ … $[t_{IO}$ … $[t_{DO}$ …]]]]
(IO ≻ DO / DO ≻ IO)

Scope flexible languages: In English, object QR can be delayed to LF. QR is then no longer subject to the Extension Condition as it is not processed in the overt part of the derivation. Hence, the object can - unlike in German - land *above* the lowest interpretable position of the subject ((32)d). The subject can accordingly be interpreted in SpecTP ((32)d), or reconstruct to its vP-external, ETC-licensed position XP, either by SynR or SemR; (32)e). It follows that canonical word orders are ambiguous:

(32) *Scope flexible languages*

a. $[_{XP,\,t}$ s $[_{vP,\,<s,t>}$ $QP_{Subject}$ $[_{VP,\,<e,st>}$ … QP_{Object}…]]]]

b. $[_{XP}$ $QP_{Subject}$ $[_{XP,\,t}$ s $[_{vP,\,<s,t>}$ $t_{Subject}$ $[_{VP,\,<e,st>}$ … QP_{Object}…]]]]

c. $[_{TP}$ $QP_{Subject}$ … $[_{XP}$ $t_{Subject}$ $[_{XP,\,t}$ s $[_{vP,\,<s,t>}$ $t_{Subject}$ $[_{VP,\,<e,st>}$ … t_{Object}…]]]]]]

d. *Object QR at LF (not subject to Extension Condition)*
$[_{TP}$ $\underline{\underline{QP}}_{Subject}$ … $[_{XP}$ $\underline{\underline{QP}}_{Object}$ $[_{XP}$ $t_{Subject}$ $[_{XP,\,t}$ s $[_{vP,\,<s,t>}$ $t_{Subject}$ $[_{VP,\,<e,st>}$ … t_{Object}…]]]]]]
(Subject ≻ Object)

e. $[_{TP}$ $QP_{Subject}$ … $[_{XP}$ $\underline{\underline{QP}}_{Object}$ $[_{XP}$ $\underline{\underline{QP/T}}_{Sub.}$ $[_{XP,\,t}$ s $[_{vP,\,<s,t>}$ $t_{Subject}$ $[_{VP,\,<e,st>}$ … t_{Object}…]]]]]]
(Object ≻ Subject)

➜ The timing difference (27)c together with the ETA derives cross-linguistic contrast between scope rigid (German) and scope flexibile (English) languages.

3.2. WLM AND INVERTED WORD ORDERS IN GERMAN

Question: Why does short scrambling not reconstruct for the computation of binding relations?

(33) *Counter-cyclical Merge of common noun*
*Which picture of ***John₂*** does ***he₂*** $[_{VP}$ like best]

a. $[_{VP}$ like best which <u>picture of ***John***$_2$</u>]

b. $[_{v'}$ $v°_{Case}$ $[_{VP}$ like best which picture of ***John***$_2$]]

(34) *Case Constraint on WLM* (adopted from Takahashi 2007)
A restrictor argument R can be merged with a determiner D only if
R is within the c-command domain of its Case-assigning head.

(35) *$[_{CP}$ which <u>picture of ***John***$_2$</u> $[_{TP}$ ***he***$_2$ $[_{v'}$ $v°_{Case}$ $[_{VP}$ like best <which>]]]]

Short scrambling does not reconstruct into base, but below the subject (Frey 1989, 1993; Haider 1993).

(36) *WCO I: DO reconstructs below subject* (Frey 1989, 1993)

a. weil ***jeder***$_2$ [***seinen***$_2$ Vater] liebt
since everone his father$_{ACC}$ loves
"since everyone loves his father"

b. *weil [***sein***$_2$ Vater] ***jeden***$_2$ liebt (base order, WCO)
since his father everone$_{ACC}$ loves
"since his father loves everyone"
c. weil [***seinen***$_2$ Vater]$_1$ ***jeder***$_2$ t$_1$ liebt (medium object scrambling reconstructs)
since his father$_{ACC}$ everyone loves
"since everyone loves his father"

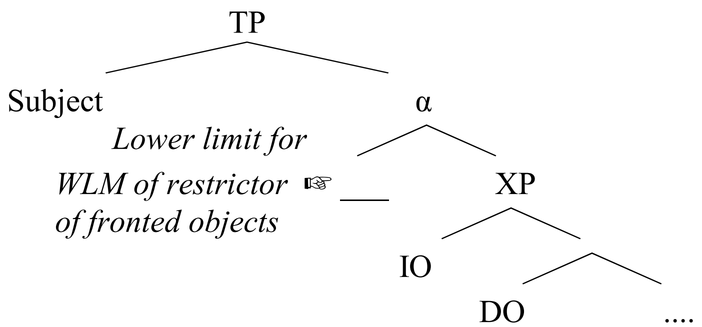
(37) *WCO II: DO does not reconstruct below IO* (Frey 1989, 1993)
a. weil wir ***jedem***$_2$ [***seinen***$_2$ Vater] zeigten
since we everyone$_{DAT}$ his father$_{ACC}$ showed
"since we showed everyone his father"
b. *weil wir [***seinem***$_2$ Vater] ***jeden***$_2$ zeigten (base order, WCO)
since we his father$_{DAT}$ everyone$_{ACC}$ showed
"since we showed his father everyone"
c. *weil wir [***seinen***$_2$ Vater]$_1$ ***jedem***$_2$ t$_1$ zeigten (DO does no reconstruct below IO)
since we his father$_{ACC}$ everyone$_{DAT}$ showed
"since we showed everyone his father"
d. weil uns [***seinen***$_2$ Vater]$_1$ ***jeder***$_2$ t$_1$ zeigen wollte (DO reconstructs below subject)
since us$_{DAT}$ his father$_{ACC}$ everyone show wanted
"since everyone wanted to show us his father"

(38) *Corerefence with IO: obviation of Principle C*
a. *Ich schenke ***ihm***$_2$ [dieses Buch von ***Peter***$_2$] sicherlich nicht (base order)
I gave him this book of Peter certainly not
b. [Dieses Buch von ***Peter***$_2$]$_1$ schenke ich ***ihm***$_2$ t$_2$ sicherlich nicht (no reconstruction below IO)
this book of Peter gave I him certainly not
"I certainly didn't give him this book of Peter"

(39) *Corerefence with subject: Principle C*
a. ****Er***$_2$ soll uns [diesen alten Freund von ***Peter***$_2$] vorstellen (base order)
he should us$_{DAT}$ this old friend of Peter$_{ACC}$ introduce
b. *[Diesen alten Freund von ***Peter***$_2$]$_1$ soll ***er***$_2$ t$_1$ uns vorstellen
his old friend of Peter$_{ACC}$ should he us$_{DAT}$ introduce
"He should introduce to us this old friend of Peter" (DO reconstructs below subject)

➜Objects reconstruct right below surface position of subjects (SpecTP; a re-statement of Frey 1993).

On the WLM analysis, this entails that the restrictor of fronted objects is merged above XP (α in (40)):

(40)


Challenge for WLM: Why can objects not be merged within VP?

Observation: What is missing is a ***lower limit constraint*** on WLM.

3.3. STRENGTHENING THE LICENSING CONDITION ON WLM

Assume that WLM is licensed by agreeing Φ-features on abstract *Φ-head* (Kratzer 2009), instead of Case.

(41) ***Φ-Constraint on WLM***
A restrictor argument R can be merged with a determiner D at stage S of a derivation only if R is within the c-command domain of an agreeing Φ-head at S.

Position of Φ: Φ is located inbetween TP and the landing site of short scrambling (ScrP).

(42) $[_{TP} \ldots [_{\Phi P} \ldots [_{ScrP} \ldots [_{XP,\, t} \ldots$ *s-variable* $[_{vP,\, <s,t>} \ldots [_{VP} \ldots]]]]]]$

Conceptual advantage: (41) leads to simpler relation between licensing condition and WLM. On Case Constrain (34), restrictor insertion is not linked to *actual* Case assignment but to presence of higher Case assigning head. In (43), the subject restrictor is merged within TP_1, even though $T_1°$ lacks Case features!

(43) a. Pictures of ***himself₂*** seem to ***him₂*** to be boring
b. $[_{TP2}$ Pictures of himself$_2$ $[T_2°_{[NOM]}$ seem to ***him***$_2$ $[_{TP1}$ pictures <u>of ***himself***$_2$</u> $T_1°$ [to be boring]]]

Case analysis (Takahashi 2007: 125): restrictors bear unvalued Case features which are counter-cyclically licensed under Agree by c-commanding higher Case heads.

Φ-analysis: Cyclic restrictor insertion, licensed by clausemate Φ-head. In (43), licensing Φ-head resides within non-finite TP_1. That non-finite clauses indeed contains Φ-heads can e.g. be seen in Greek:

(44) Ta pedia archizun na $[_{TP}$ pezoun] (Alexiadou and Anagnostopoulou 1999)
the children$_{[3pl]}$ start$_{[3pl]}$ C° play$_{[3pl]}$
"The children start to play"

➜ Φ-analysis supports local formulation of the relation between WLM and licensing condition.

3.4. IMPLEMENTATION

Canonical word order: Given the Φ-Constraint on WLM (41), restrictors can be merged only if their licensing Φ-heads are present. The Φ-head is VP-external. Thus, objects always start out as bare D°s ((45)a). In the next relevant step, the Φ-head is merged ((45)b), which in turn licenses WLM of restrictor in (45)c):[2]

(45) a. $[_{VP} \ldots [_{DO}$ D° ...]]
b. $[_{\Phi P}$ $\Phi_{[F]} \ldots$ $[_{VP} \ldots [_{DO}$ D° ...]]]
c. $[_{\Phi P}$ $\Phi_{[F]} \ldots$ $[_{VP} \ldots [_{DO}$ D° restrictor$_{[F]}$ ...]]]

Scrambled/inverse word orders: ΦP is located above ScrP. Hence, short scrambling moves the determiner only ((46)b). WLM of restrictor follows insertion of Φ-head ((46)c):

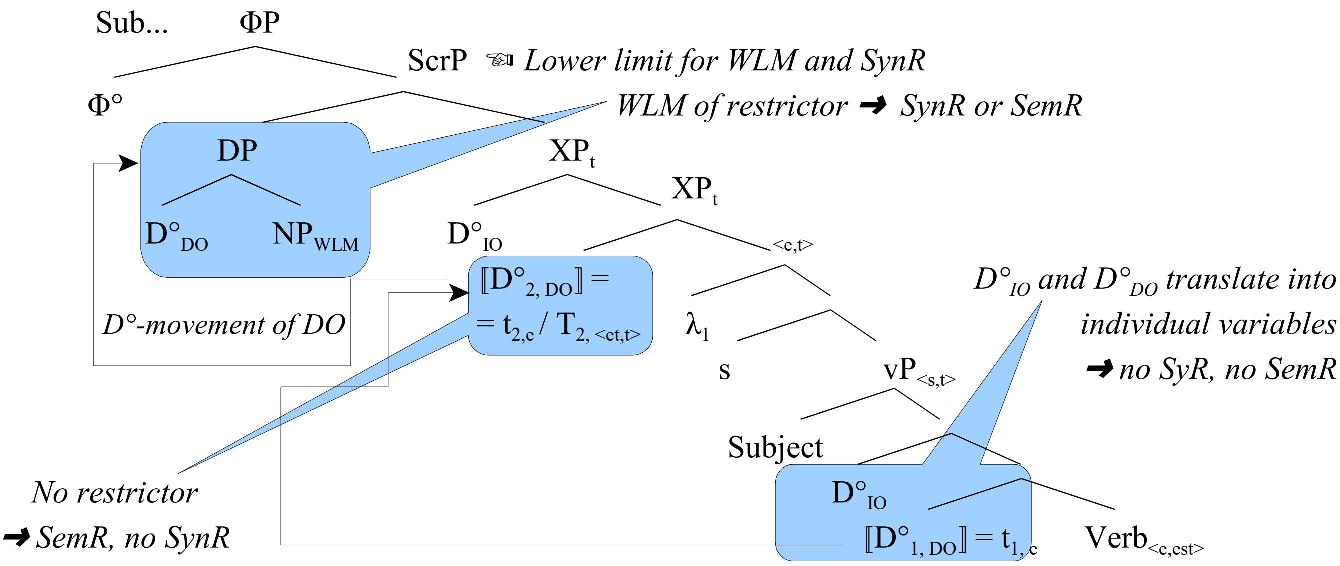
(46) a. $[_{ScrP}$ D° $[_{VP} \ldots [_{DO}$ D° ...]]
b. $[_{\Phi P}$ $\Phi_{[F]} \ldots$ $[_{ScrP}$ D° $[_{VP} \ldots [_{DO}$ D° ...]]]]
c. $[_{\Phi P}$ $\Phi_{[F]} \ldots$ $[_{ScrP}$ D° restrictor$_{[F]}$ $[_{VP} \ldots [_{DO}$ D° ...]]]]

➜ The lowest node containing an object copy with descriptive content is the node located to the immediate right of ΦP. This derives generalization (40).

Blocking alternative derivations: Assume the restrictor is inserted low, inside VP ((47)b), followed by scrambling ((47)c). This would wrongly legitimize SynR into the base position of the object. However, this derivation is weeded out by the Extension Condition.

(47) a. $[_{VP} \ldots [_{DO}\ D° \ldots]]$
b. $[_{\Phi P}\ \Phi_{[F]} \ldots\ [_{ScrP}\ [_{VP} \ldots [_{DO}\ D°\text{restrictor}_{[F]} \ldots]]]]$
c. $[_{\Phi P}\ \Phi_{[F]} \ldots\ [_{ScrP}\ D°\ \text{restrictor}_{[F]}\ [_{VP} \ldots [_{DO}\ D°\text{restrictor}_{[F]} \ldots]]]]$ (✗Extension Condition)

(48) *Summary: reconstructive options for moved direct object QPs*



4. TRACE CONVERSION FOR GQ-TRACES

Lower copies of determiners are interpreted by Trace Conversion (Fox 1999; Sauerland 1998, 2004). New version for generalized quantifier type traces (49)b applies to a GQ-type trace and returns the set of sets which contains the singleton set with the index as its only member.

(49) *Trace Conversion (generalized version)*

a. $[(\text{Det})\ (\text{Pred})]_n$ → the ([(Pred) $\lambda x.x = n$]) (Standard e-type version)

☞ b. Det_n → the $(\lambda \wp_{<et,t>}.\wp = \lambda Q_{<et>}.Q = \lambda x.x = n)$
→ $\equiv T_n$, for all $T \in D_{<et,t>}$ (Generalized Quantifier version)

c. Det Pred → $f_{ch} \in D_{<et,e>}$ (Pred) (Choice function version; Takahashi 2011)

Application: Weak DPs such as *some boy* can be converted into an individual variable, a variable of type <et,t> (this time without restrictor) or a choice function:

(50) a. $[\text{some boy}]_2$ → the (boy and $\lambda x.x = 2$) (e-type)
b. some_2 → the $(\lambda \wp_{<et,t>}.\wp = \lambda Q_{<et>}.Q = \lambda x.x = 2)\ \equiv T_{2,\ <et,t>}$ (GQ)
c. some_2(boy) → $f_{ch} \in D_{<et,e>}$ (boy) (Choice function)

SemR without SynR ((51)): $D°_{DO}$ moves to XP, and then up to ScrP ((52)a). WLM of restrictor above IO, in ScrP ((52)b). Fully assembled DO binds T_2, resulting in SemR (see (53)).

(51) weil wir$_1$ [einige Freunde von ***einander***$_{1/*3}$]$_2$ ***allen Kollegen***$_3$ [t_2/T_2 vorstellen wollten
since we some friends$_{ACC}$ of each other all colleagues$_{DAT}$ introduce wanted
"since we wanted to introduce some friends of each other to every colleague"
($\exists \succ \forall$ / $\forall \succ \exists$)

(52) a. *Move D° to ScrP*
we$_1$ introduced [$_{ScrP}$ [$_{DP}$ some$_2$ [λ_2 [to every coll.$_3$ [some$_2$ ...]]]]

b. *Late Merge of restrictor*
we$_1$ introduced [$_{ScrP}$ [$_{DP}$ some friends of each other$_1$]$_2$ [λ_2 [to every coll.$_3$ [some$_2$ ...]]]]

c. *Trace Conversion*
we$_1$ introduced [$_{ScrP}$ [$_{DP}$ some friends of each other$_1$]$_2$ [λ_2 [to every coll.$_3$ [T$_{2,<et,t>}$ ...]]]]

d. *Input to semantic computation*
we [λ_1 [$_{ScrP}$ [some friends of e.o.] [λ_2 [$_{XP}$[every coll.] [λ_3 [$_{XP}$ some$_2$ [λ_4[$_{XP}$s [$_{VP}$ t$_1$ t$_3$ t$_4$ introduce]]]]]

(53) a. ⟦[$_{XP}$ **some$_2$** [λ_4 [$_{XP}$ s [$_{VP}$ **t$_1$ t$_3$ t$_4$ introduce**]]]]⟧ =
the ($\lambda\wp_{<et,t>}[\wp = \lambda Q_{<et>}[Q = \lambda x[x = 2]]]$) ($\lambda_4$.introduce(t$_4$)(t$_3$)(t$_1$)) =
T$_2$ (λ_4.introduce(t$_4$)(t$_3$)(t$_1$))

b. ⟦[$_{XP}$ [**every colleague**] [λ_3 [$_{XP}$ **some$_2$** [λ_4 [$_{XP}$ s [$_{VP}$ **t$_1$ t$_3$ t$_4$ introduce**]]]]]⟧ =
$\forall$y[colleague(y) → T$_2$ (λ_4.introduce(t$_4$)(y)(t$_1$))

c. ⟦[$_{ScrP}$ [**some friends of e.o.**] [λ_2 [$_{XP}$ [**every coll.**] [λ_3 [$_{XP}$ **some$_2$** [λ_4[$_{XP}$s [$_{VP}$ **t$_1$ t$_3$ t$_4$ introduce**]]]]]]⟧=
λ_2.$\forall$y[colleague(y) → T$_2$ (λ_4.introduce(t$_4$)(y)(t$_1$))] ⟦[some friends of e.o.]⟧ =
$\forall$y[colleague(y) → λP$\exists$x[friends of e.o.(x) $\wedge$ P(x)](λ_4.introduce(t$_4$)(y)(t$_1$))]] =
$\forall$y[colleague(y) → $\exists$x[friends of e.o.(x) $\wedge$ introduce(x)(y)(t$_1$))]]

WLM and SemR is a DoY:

(54) a. ① *(A → B)*: Move D°$_{DO}$ in overt syntax
b. ② *(B)*: WLM of restrictor
c. ③ *(B → A)*: Restore pre-movement scope of DP by SemR

Object Ā-movement in German: just like scrambling derivation (46) (immaterial difference: object stops in vP, instead of ScrP). Since movement is involved, object restrictor is merged *above* thematic position of subject ((55)b):

(55) a. [$_{\Phi P}$ $\Phi_{[F]}$... [$_{vP}$ D° [$_{vP}$ t$_{Subject}$ [$_{VP}$ ... [$_{DO}$ D° ...]]]]
b. [$_{\Phi P}$ $\Phi_{[F]}$... [$_{vP}$ D° ***restrictor$_{[F]}$*** [$_{vP}$ t$_{Subject}$ [$_{VP}$ ... [$_{DO}$ D° ...]]]]

Wrong prediction? Wh-movement has the option of making disjoint reference effect disappear by total reconstruction of subject into vP.

(56) a. *Welches Bild von ***Hans$_1$*** kaufter ***er$_1$***
"*Which picture of John$_1$ did he$_1$ buy"

b. [$_{\Phi P}$ $\Phi_{[F]}$... [$_{vP}$ which picture of John$_1$ [$_{vP}$ he$_1$ [$_{VP}$ ... [$_{DO}$ which like ...]]]]

Solution: Subject related Φ-features are located in T° (or even C°; Chomsky 2008; Pesetsky and Torrego 2001). Hence, subject restrictors are merged in SpecTP. It follows that subjects do not reconstruct below TP. (Pronouns are treated as hidden definite descriptions; Elbourne 2005).

5. LATE MERGE AND HIGHER TYPE TRACES

Narrow scope feeds Condition C effects. In (57), *build* is for pragmatic reasons compatible with the narrow scope reading only, which in turn feeds Condition C. (58) also has a wide scope reading, which bleeds

Condition C (ex. from Fox 1999: 167; see discussion in Ruys 2015, section 5 and Heycock 1995).

(57) *[How many houses in ***John's$_1$*** city]$_2$ does ***he$_1$*** think you should build t_2.

a. Narrow scope *n-many*
"For what number n: in all deontic alternatives s in s_0, there are n-many houses in John's city in s that John builds in s."

b. #Wide scope *n-many* (non sensical)
"For what number n: there are n-many houses x in John's city in s_0 and in all deontic alternatives s in s_0, John builds x in s."

(58) [How many houses in ***John's$_1$*** city]$_2$ does ***he$_1$*** think you should demolish t_2.

a. Narrow scope *n-many*
"For what number n: in all deontic alternatives s in s_0, there are n-many houses in John's city in s that John demolishes in s."

b. *Wide scope *n-many* (non sensical)
"For what number n: there are n-many houses x in John's city in s_0 and in all deontic alternatives s in s_0, John demolishes x in s."

Nothing blocks conjunction of SemR and Late Merge. Thus, the Hybrid Theory overgenerates. The problem for SynR/SemR: It should be possible to obviate Principle C by Late Merge and generate a narrow scope reading by SemR, as in derivation (59).

(59) a.	$[\alpha_1$	$[\mathit{pronoun}_2 \ldots$	$[\gamma \ldots$	$[T_1 \ldots$	$\gamma \succ \alpha$
b.	$[[\alpha_1$ [... <u>name$_2$</u>...]$_{\text{Late Merge}}$]	$[\mathit{pronoun}_2 \ldots$	$[\gamma \ldots$	$[T_1 \ldots$	$\gamma \succ \alpha$, Principle C obviation

Solution: As was seen last time, Condition C does not track scope but referential opacity (see also discussion in Ruys 2015: fn. 27).

Observation: LM is compatible with SemR in a wider variety of contexts than previously recognized.

5.1. LATE MERGE INTO <u>WIDE SCOPE</u> ANTECEDENTS OF HIGHER TYPE TRACES

There are other contexts in which narrow scope does not entail binding reconstruction, indicating that Late Merge into antecedents of higher type traces should not generally banned. (60) and (61) admit pair list and functional interpretations.

(60) Which project on ***Bill Gates$_1$'*** agenda did each NGO commend ***him$_1$*** for t?

a. Pair list: *Greenpeace* commended Gates for his call for zero emission, *Medicines sans frontiers* commended him for his malaria campaign, etc...

b. Functional: The most pertinent one.

(61) I think I know which book on ***John$_1$'s*** desk ***he$_1$*** proudly showed to each visitor t.

a. Pair list: John showed Mary his autobiography, Bill his monograph on mole rats in art, ...

b. Functional: His latest one.

Pair list readings involve skolemized choice function (Guilliot 2007; Sauerland 1998; a.o.):

(62) f is a skolemized choice function (type <et,ee>) iff for any $P_{<et>}$, $f(P)(x) \in P$

(63) Which project on *Bill Gates$_1$'* agenda did each NGO commend *him$_1$* for $t_{<et,ee>}$?

a. Pair list: What is the function $f_{<et,ee>}$ s.t. every NGP x commended Bill Gates for f(project on Bill Gates' agenda)(x)
(possibly different NGO - project relation for each NGO)

b. (irrelevant)

Principle C obviation in (60) indicates that the adjunct PP has been late merged:

(64) a. Which project did every NGO commend *him*$_1$ for <which project>
b. Which project <u>on ***Bill Gates***$_1$' agenda</u>$_{LM}$ did every NGO commend ***him***$_1$ for <which project>
c. Which project <u>on ***Bill Gates***$_1$' agenda</u>$_{LM}$ did every NGO commend ***him***$_1$ for $t_{<et,ee>}$

(60) cannot be derived by deleting the higher copy of *which project,* as in (65)a; the Late Merged PP would be 'left dangling'. Thus, functional readings are not contingent upon SynR of the restrictor.

(65) a. * <u>on ***Bill Gates***$_1$' agenda</u>$_{LM}$ did every NGO commend ***him***$_1$ for <project>$_{<et,ee>}$
b. intended: <u>on ***Bill Gates***$_1$' agenda</u>$_{LM}$ did every NGO$_2$ commend *him*$_1$ for f(project)(x$_2$)

➜ Late Merge a category to an expression that binds a non-individual-type trace.

5.2. Late Merge into <u>narrow scope</u> antecedents of higher type traces

In the above cases, the choice function is assigned wide scope. But Late Merge seems possible even if the operator takes narrow scope. (66) and (67) admit narrow scope readings:

(66) [Many Greeks who live in *Mary$_2$'s* village]$_1$ seem to *her$_2$* t$_1$ to blame *each$_1$ other* for the crisis

(67) [Greeks who live in *Mary$_2$'s* village]$_1$ seem to *her$_2$* t$_1$ to blame *each other$_1$* for the crisis

Crucially, narrow scope cannot be produced by standard SynR mechanisms since attaching the adjunct PP and eliding the higher copy leaves the PP 'dangling' ((68)b):

(68) a. Many Greeks who live in Mary$_2$'s village seem to her$_2$ <many Greeks> to blame ...
b. * who live in Mary$_2$'s village seem to her$_2$ <many Greeks> to blame ...

➜ Late Merge of category to an expression that binds a non-individual-type trace.

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6. Summary

(69)
- □ WLM is licensed by Φ-agreement, not by Case
  - ○ Analysis of binding properties of short and medium scrambling in terms of WLM.
  - ○ Analysis of scope properties in terms of SemR.
- □ Conditions on SemR are derived from conditions on possible types of traces&copies (ETA)
- □ ETA is independently motivated
  - ○ Derives ban on reconstruction of small clause subjects
  - ○ Fundamental for analysis of scope rigidity vs. scope flexibility.
- □ Three different instantiations of Duke York derivations consolidate the derivational model:
  - ○ syntactic, intra-componental DoY (§2)
  - ○ cross-componental DoY: SemR and s-variable binding
  - ○ cross-componental DoY: SemR and WLM.
- □ Consequences for the model of the grammar:
  - ○ Duke of York: grammar is *derivational*
  - ○ SemR: grammar is *syntacto-centric*
  - ○ DS-LF model

Notes

1. Order preserving scrambling of both objects does not feed new scope options (Yatsuhiro 1996). This can be made to follow from a minimality condition on binding (Aoun and Li 1993):

(i) *T_{QP1} is closest potential binder for t_{QP2}, in violation of minimality requirement*

*QP1 - QP2 - T_{QP1} - ☞ t_{QP2} (*QP2 ≻ QP1)

(ii) *t_{QP2} observes minimality:* (QP2 ≻ QP1)

✓QP2 - QP1 - t_{QP1} - T_{QP2}

2. Restrictor insertion in (45)c is not fully cyclic, but reaches into the tree to a limited extent. Such a proviso is independently required for counter-cyclic merge of adjuncts in Ā-movement (*Which picture near John$_2$ did he$_2$ like*), where adjuncts are added below the root node (see Nissenbaum 2000).

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