1. OPAQUE Y RECONSTRUCTION

Opacity: Information can be packaged and manipulated by ordered sets of operations. Opacity effects arise if the output forms either hide the effects or the contexts of an operation (Kiparsky 1968, 1971; McCarthy 2007; Brody 1995; Mascaro 2012; Williams 1974; a.m.o.)

(1) a. Overapplication (a.k.a. counter-bleeding; cf. caveat in Baković 2011)
   Principle applies even though context is not visible any more in surface form.
   b. Underapplication (counter-feeding; ibid.)
   Principle should have applied according to surface form, but it didn’t.

(2) A rule is opaque “if the fact that it applied [underapplication/counter-feeding] or the context that it determines [overapplication/counter-bleeding] are not visible in the surface form”
   (McCarthy 2008: 270)

Assume “rule” in (2) is understood as an acceptance condition (identity map) for inputs that meet a requirement $X \in \{\text{principle of Binding Theory, c-command condition for pronominal variable binding, ...}\}:

(3) a. Feeding b. Bleeding c. Counter-feeding d. Counter-bleeding
   ① $A \rightarrow B$ $A \rightarrow B$ $B \rightarrow B$ if $X$ $A \rightarrow A$ if $X$
   ② $B \rightarrow B$ if $X$ $A \rightarrow A$ if $X$ $A \rightarrow B$ $A \rightarrow B$

Reverse order results in Feeding Bleeding

Opacity

Opacity comes in two flavors: opacity that involves two operations, and more complex interactions. The prototypical case of syntactic two-step syntactic opacity is reconstruction.

1.1. INTRA-COMPONENTAL TWO-STEP OPACITY: SYNR

Principle A reconstruction is a manifestation of overapplication/counter-bleeding (Chomsky 1981):

(4) [Which book about himself$_1$, did he$_1$ like t$_2$
   ① Evaluation of Principle A
   ② Movement destroys the context for Principle A. Reversing the order would have bled Principle A $\rightarrow$ counter-bleeding.

Theory of syntactic reconstruction (SynR) captures correlations among binding, coreference and movement. SynR has three components: (i) Copy Theory; (ii) (Whole Sale) Late Merge; (iii) Trace Conversion.

Copy Theory: Copies provide a device for modeling overapplication opacity.

(5) Overapplication resolved by Copy Theory
    Which book about himself$_1$, did he$_1$ like <which book about himself$_1$>

Copies have the effect that in anti-reconstruction contexts (6), Principle C underapplies:
(6) Anti-reconstruction as underapplication: Principle C fails to apply
   a. Which seat next to John, did he, try to keep a reservation for <which seat next to John>
   b. Which seat next to John, did he, try to keep a reservation for <which seat next to John>

Late Merge: Underapplication can be resolved by delaying lexical insertion of the offending term. Late Merge (LM; McCawley 1968; Lebeaux 1988) results in counter-feeding relation between Merge and Move:

(7) Underapplication resolved by Late Merge
   a. Which seat did he, try to keep a reservation for <which seat>  (Move DP)
   b. Which seat next to John, did he, try to keep a reservation for <which seat>  (LM of PP)

1. Movement
   - A movement: Principle C obvation with arguments
     Every picture of John seems to him, to be great
     a. Every, seems to him, <every> to be great  (Move determiner)
     b. [Every picture of John], seems to him, <every> to be great  (WLM of restrictor)

2. Trace Conversion: (Fox 2002; Sauerland 1998, 2004; (10)c).
   [(Det) (Pred)]n → the([Pred] λx[x = n])

3. Trace Conversion: [Every picture of John], seems to him, every to be great
   a. Trace conversion: [Every picture of John], seems to him, [the λx.x = 2] to be great

1.2. THREE-STEP OPACITY: DUKE OF YORK DERIVATIONS

Duke of York derivations (Pullum 1976): A feeding step is followed by an independent rule (e.g. movement) and a step that obliterates the changes effected by the first step.

(11) Duke of York (DoY) derivation
   ① A → B  (Feeds context for R)
   ② B → Y/{B}__{B}  (Independent rule R applies in context B)
   ③ B → A  (Counter-feeding: effects of Step 1 are undone)

All DoYs involve a final opaque step. Phonological DoYs typically combine feeding with counterfeeding (‘fed counterfeeding’), while syntactic DoYs will be seen to be more complex.

1.3. OPACITY ACROSS COMPONENTS: SEMANTIC RECONSTRUCTION

Semantic Reconstruction (Cresti 1995; Rullmann 1995; von Stechow 1991): reconstruction is delayed to the semantic component. The binder of the moved category α abstracts over a trace of the same type as α.

(12) Semantic Reconstruction (SemR)
   In context [α λ₁[...T₁...]], α is β-converted into T₁, where T₁ is a variable of the same type as α.

Together with a device for underapplication across components such as post-syntactic Late Insertion (Distributed Morphology), the combination of SynR, SemR and WLM yield the Square of Opacity:

(13) | intra-componental | SynR (Copy Theory) | (Whole Sale) Late Merge |
    | cross-componental | SemR (higher type traces) | Late Insertion (DM) |
(14) **Claims**

a. The grammar includes both SynR and SemR (*Hybrid Theory of reconstruction*; Lechner 1998; Wurmbrand 2010; Truswell 2015; Keine 2017, i.a.; *contra* Romero 1998; Fox 1999; Ruys 2015, i.a.)

b. DoY opacity indicates that grammar is *derivational* in two respects:
   (i) inside components (*contra* representationalism; Brody 1995; Haider 1993; Koster 1986)
   (ii) across components (*contra* parallel architecture; Bach 1976, Jackendoff 2002).

c. It is possible to give an *algorithmic account of scope and binding reconstruction* for scope flexible (English) and scope rigid languages (German).

(15) **Outline of the presentation**

- Evidence for Duke of York derivations in syntax ➔ DoY I
- Hybrid theory of reconstruction (SynR and SemR)
  - Challenges for hybrid theory: Trapping effects
  - Containing overgeneration 1: Extensional traces and antecedents (*ETA*) ➔ DoY II
  - Containing overgeneration 2: a locality condition
- Consequences of ETA
  - Small clauses
  - Scope rigidity
- Calculus for scope and (anti-)reconstruction
  - Modifying the conditions on WLM: accounting for binding and scope ➔ DoY III
  - Synthesis: Cross-linguistic typology of scope and the hybrid theory of reconstruction

2. **Duke of York derivations**

Beck (1996): quantifiers induce barriers for operations that connect *wh-in-situ* phrases with their scope positions (intervener **bold**, nodes to undergo covert movement marked by **italics**).

(16) **a.** Sie fragte, was wer wann verstanden hat
    She asked what who when understood has
    “She asked who understood what when”

**b.** *Sie fragte, was niemand wann verstanden hat*
    She asked, what nobody when understood has
    “*She asked what nobody understood when*”

Sauerland and Heck (2003; S&H): interveners also include degree particles such as *genau*/*exactly*:

(17) **a.** *?Sie fragte, wer gestern genau wann angekommen ist* (adapted from Sauerland and Heck 2003)
    She asked who yesterday exactly when arrived is
    “She asked who arrived yesterday and when exactly”

**b.** Sie fragte, wer gestern *wann genau* angekommen ist
    She asked who yesterday when exactly arrived is
    “She asked who arrived yesterday and when exactly”

(18) **a.** *Sie fragte, wer gestern genau mit *wem* gesprochen hat*
    She asked who yesterday exactly with whom spoken has

**b.** *?Sie fragte, wer gestern mit genau *wem* gesprochen hat* (adapted from Sauerland and Heck 2003)
    She asked who yesterday with exactly whom spoken has

**c.** (?)Sie fragte, wer gestern mit *wem genau* gesprochen hat
    She asked who yesterday with whom exactly spoken has
    “She asked who spoke yesterday with whom exactly”
S&H notice that intervention effects are also attested with pied-piping and relative clauses:

(19) a. Maria sprach [_{pp} über genau zwei Freunde] Mary talked about exactly two friends
b. die Freunde, [_{pp} über die] Maria sprach the friends, about who Mary talked
c. *die Freunde, [_{pp} über genau die] Maria sprach the friends, about exactly who Mary talked “the friends (exactly) who Mary talked about”

This supports, S&H conclude, the silent relative pronoun movement analysis of von Stechow (1996):

(20) a. LF: the friends [who λ₃ Mary talked [_{pp} about t₃]]
   (Intervention effect triggered by covert relative pronoun movement)

   b. LF: the friends [who λ₃ Mary talked [_{pp} exactly about t₃]]

Observation: Constellations such as (21) instantiate a Duke of York derivation:

(21) Das ist etwas [[_{CP₂} [_{pp} über das]₄ auch nur mit einem seiner]₁ Freunde t₄ zu sprechen]₂
   this is something about which even only with a single his₁ GEN friends-GEN to speak
   wohl keiner, t₃ wagen würde] (relative pronoun may cross lower intervener nobody)
   “This is something OP₃ that nobody₁ would dare to talk about t₃ [to even a single one of his₁ friends]₃ NPI”

(22) *Das ist etwas [[_{CP₂} [_{pp} über genau das]₄ auch nur mit einem seiner]₁ Freunde t₄ zu sprechen]₂
   this is something about exactly which even only NPI with a single of his₁ friends-GEN to speak
   wohl keiner, t₃ wagen würde] (relative pronoun movement blocked by exactly)
   particle nobody danger would

(23) Properties of (21) to be accounted for
   a. Obligatory covert movement of which₃ out of topicalized CP₂ (2)¿
   b. Intervention effect: relative pronoun must not cross nobody (see (16))
   c. nobody binds variable and licenses NPI inside CP₂, indicating reconstruction of CP₂

(24) DoY Derivation of (21)
   ... something CP

\[ \lambda₃ \]
\[ CP₂ \]
\[ VP \]
\[ nobody₁ \]
\[ TP \]
\[ VP \]
\[ CP₂ \]
\[ would dare \]
\[ 2 \]
\[ 3 \]
\[ 1 \]

\[ \text{about which with even a single of his₁ friends} \]
Option A. Representational theories (Koster 1986; Haider 1993, a.m.o.) fail to explain contrast (21) vs. (22). In both structures, nobody intervenes between pronoun inside lower copy of CP₂ and its binder λ₃.

Option B. Orthodox, monotone derivational analyses maintain that movement and binding operate on a single occurrence of a node. For (21), this can neither be the higher copy of CP₂ (because of (23)c) nor the lower one (because of (23)d; see (25)).

(25) a. Overt syntax: 
   \[
   [[\text{CP}_2 \text{which}_3 \text{his}_1]]\ 
   [[\text{nobody}_1 \text{[CP}_2 \text{which}_3 \text{his}_1]]]
   \]
   b. Reconstructed: 
   \[
   *\text{which} \ [\lambda_3] \ 
   [[\text{nobody}_1 \text{[CP}_2 \text{t}_3 \text{his}_1]]]
   \]

Option C. Duke of York derivation (26): Movement of the CP₂ places relative pronoun in position above the intervener (‘smuggling’; Collins 2005), followed by reconstruction for NPI-licensing & variable binding.

(26) a. \(\text{\( \text{A} \rightarrow \text{B} \): which} \) pied-pipes CP₂. Movement feeds (and counterbleeds) relative pronoun movement in Step 2 by obliterating context for intervention effect.
   \[
   [[\text{CP}_2 \text{which}_3 \text{his}_1]]\ 
   [[\text{nobody}_1 \text{[CP}_2 \text{which}_3 \text{his}_1]]]
   \]
   b. \(\text{\( \text{B} \rightarrow \text{A} \): which} \) out of CP₂. Counterbleeding relation with reconstruction in Step 3.
   \[
   \text{\( \text{which} [\lambda_3 \ 
   [[\text{CP}_2 \text{t}_3 \text{his}_1]]\ 
   [[\text{nobody}_1 \text{[CP}_2 \text{which}_3 \text{his}_1]]]
   \)]
   \] (covert movement of which)
   c. \(\text{\( \text{B} \rightarrow \text{A} \): which} \) feeds pronominal variable binding (\text{his}_1) and NPI-licensing (\text{even a single}), but reintroduces context for intervention effect
   \[
   \text{\( \text{which} [\lambda_3 \ 
   [[\text{CP}_2 \text{t}_3 \text{his}_1]]\ 
   [[\text{nobody}_1 \text{[CP}_2 \text{t}_3 \text{his}_1]]]]
   \)]
   \]

→ A Duke of York argument for derivations (feeding(counterbleeding - counterbleeding)

Puzzle I: How is the information that the higher occurrence of CP₂ contains a bound variable passed on to the lower copy of CP₂ (assuming that reconstruction does not consist in lowering).

The problem is not isolated, it also affects remnant movement analyses in which categories are extracted out of moved nodes (Müller 1998; Collins 2005; Abels 2007, i.a.).

(27) a. John₃ [\text{VP \(t\_3 \text{seems}\)_2} to Mary \(t\_2 \text{to be nice}\) \text{(Collins 2005)}
   b. LF: John₂ \text{VP \(t\_3 \text{seems}\)_2} to Mary \text{VP \(t\_3 \text{seems}\)_2} to be nice \text{(How is lower \(t\_3 \text{bound}\)?)}

Response: (i) resumption (Guilliot 2007); (ii) alternative semantic analysis of intervention effects (Beck 2006, 2012; Abels and Martí 2011; Meyer 2012; Tomioka 2007):

(28) a. Intervention effects are the result of illicit embeddings of operators inducing focus alternatives.
   b. Focus is surface phenomenon, so only surface syntax is sensitive to intervention effects.

Covert relative pronoun movement out of lower CP₂ can be delayed to LF and (21) ceases to be a DoY.

Problem: Alternative semantics is not defined for relative clauses. Hence, (21) seems to be a DoY after all.

Puzzle II: Why are DoY-derivations so rare? Why, for example, can QR in (29)b not target higher the VP, producing unattested object wide scope (Barss 1986)?
Response: The impression is misleading, DoYs also come under the guise of SemR and WLM (see below.)

Conclusion: There are manifestations of syntactic DoY derivations → the system employs derivations.

3. Semantic Reconstruction (DoY II)

Hybrid Theory of Reconstruction

The grammar includes both SynR and SemR (Lechner 1996, 1998, to appear; Wurmbrand 2010; Truswell 2015; Keine 2017; i.a.).

Structure of arguments for Hybrid Theory

(Scope order β > α by SemR)

3.1. Evidence for a Hybrid Theory of Reconstruction

3.1.1. Short scrambling

Condition A: Scope reconstruction does not entail binding reconstruction. (33)b admits narrow scope reading, while the anaphor does not reconstruct for Condition A (Lechner 1996, 1998; based on Frey 1993):

Analysis: Scope diminishment in (33)b follows verification of Principle A. QP₁ binds generalized quantifier type trace (T₁), resulting in inverse scope by SemR ((34)b):

(34) a. Principle A: we,...[some friends of each other₁₁₃₁₂]₂ to every colleague₃, T₂ introduced
   b. SemR: we,... to every colleague₃ [some friends of each other₁₁₃₁₂] introduced ( ∀ > ⊃ )
   → Short scrambling can be undone by SemR, but not by SynR. (For semantics see (56) and 5.5.)
SynR precedes SemR: In (35), the anaphor reconstructs inside the relative clause (indicating that it is not a logophor). The reflexive cannot be restored to a position below the object it has crossed over, though.

(35)  a. weil ich [zwei [Porträts von sich] die Martin gemalt hatte] jedem T₂ zeigen wolle „since I wanted to show two portraits of himself that Martin painted to everybody”
       \[\exists x_1 > \forall y \forall z \exists y_2\]
       (35)  b. ... [two [portraits of himself] that Martin had painted] showed everyone T₂  (head raising inside relative clause and SemR in main clause)

WCO: Short scrambled DOs do not reconstruct for variable binding ((36)b) but for scope ((36)c):

(36)  a. Man beschuldigte die Staatsanwaltschaft jedem Angeklagten nur einen seiner Anwälte vorgestellt zu haben „the DA’s office was accused of having introduced each defendant to only one of his lawyers”

b. ??[nur einen seiner Anwälte] jedem angeklagten T₁ vorgestellt zu haben
   “The DAO was accused of having introduced only one of his lawyers to each defendant”

(37)  a. weil er ja wohl ein Buch gelesen hat “since he has indeed read a book”

b. weil er ein Buch ja wohl t₁ gelesen hat “since he a book indeed read has”

Scrambled indefinites admit narrow scope but retain ‘strong’ interpretation (modulo raising - falling focus):

(38)  a. weil ja wohl jeder ein Buch gelesen hat “since everybody has indeed read a book”

b. weil [Ein Buch] ja wohl fast jeder T₁ gelesen hat “since a book indeed everybody read has”

→ Mapping effects follow if short scrambling can be undone by SemR, but not by SemR.

3.1.3. Principle C and scope in Hindi (Keine 2017)
Long scrambling (out of finite clauses) in Hindi obligatorily reconstructs for calculation of Binding Theory Condition A ((39)) and scope ((40)), but not for Condition C ((40)):
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(39) [raam aur prataap]-ko, [ek-duusre-kii, bahinō-ne] socaa [cp ki sangiitaa-ne t, maaraa] Ram and Pratap -ACC each other’s -SG-ERG thought that Sangita -ERG hit ‘Each other,’s sisters thought that Sangita had hit [Ram and Pratap], (Keine 2017: (4))

(40) [har kitaab jo raam/ko pasand hai] us/ne Kisii lakiis-e kahaa (Keine 2017: (43))

Every book that Ram likes, he told some girl that Mind sold yesterday’

→ Long scrambling does not reconstruct in syntax but only by (obligatory) SemR.

Conclusion: The grammar includes two mechanisms of reconstruction, as expressed by the Hybrid Theory.

3.2. Challenges for the Hybrid Theory

Scope Trapping phenomena indicate that SynR and SemR systematically co-vary. This finding has been taken as evidence for a pure SynR approach (Fox 1999; Lebeaux 1991, 1995, 2009; Romero 1998; Ruys 2015)

(41) Trapping I: Scope reconstruction ↔ reconstruction for Binding Theory (Fox 1999)
a. One soldier, seems to Napoleon [t₁ to be likely to die in every battle]. (∃ > ∀ / ∄ > ∃)
b. #One soldier, seems to himself, [t₁ to be likely to die in every battle]. (∃ > ∀ / ∄ > ∃)

(42) Trapping II: Scope reconstruction ↔ reconstruction for variable binding [Each colleague of his₁]₁ seemed to some composer₂ t₁ to be underrated (∃ > ∀ / ∄ > ∃)

In (43), the name can be construed coreferentially with the pronoun only if the subject is interpreted transparent/de re (i.e. the speaker considers the subject denotation to consist of nudes of Marilyn):

(43) Trapping III: de dicto ↔ reconstruction for Binding Theory (Romero 1997: 363)
A nude of Marilyn, seems to her, to be a good emblem of the exhibit. (∃ > seem / *seem > ∃)

Hybrid theory and Trapping I: Trapping I falls out from the assumption that anaphors are/include individual variables, which can’t be bound by the λ-binder of a higher type trace:

(44) a. *[a₁, λ₁, ... T₁, anaphor₁ ...] (α scopes below pronoun)
b. [a₁[λ₁, ... T₁, anaphor₁ ...] (α scopes above pronoun)

Hybrid theory and Trapping II: unproblematic since scope diminishment by SemR comes too late for his₂ to be captured by some composer₂ (variables can’t be accidentally bound; but see Sternefeld 2011).

(45) a. [Each colleague of his₂] λ₁ seemed to some composer₂ T₁ to be underrated (∄ > ∃)
b. SemR: seemed to some composer₂ [each colleague of his₂] to be underrated

Hybrid theory and Trapping III:

(46) Reconstruction of nominal quantifiers affects (see von Fintel and Heim 2000-10):
a. Quantifier scope  
b. e-binding (Binding Theory, pronominal variable binding, ...): involves entities of type e  
c. s-binding (referential opacity): binding of covert situation/world object language variables

The three properties of (46) are neither monolithic nor do they combine freely (Romero 1998; Sharvit 1998; Lechner 2007, t.a.), but follow (47). Today, I will only pursue (47)a. (For (47)b see Lechner 2011, to appear.)
(47) s/e - Conjecture
Reconstruction for s-binding ⇒ Reconstruction for e-binding

a. s-binding reconstruction (de dicto) ⇒ e-binding reconstruction
   If a dislocated DP is construed de dicto it reconstruct for the evaluation of Binding Theory, etc...

b. e-binding reconstruction ⇒ s-binding reconstruction (de dicto)
   If a dislocated DP reconstructs for Binding Theory it admits opaque de dicto construal only.

(48) a. Evidence for Hybrid Theory
    b. s-binding ⇒ e-binding
    c. e-binding ⇒ s-binding

New evidence for (47)a (s-binding reconstruction ⇒ e-binding reconstruction): In a variant of Russell’s yacht-sentences, consistency tracks de dicto readings of raising subjects.

(49) [John’s height] seemed to us [t, to exceed his actual height].

   a. It seemed to us that [John's height] de dicto exceed his actual height de re
      (consistent de dicto)
   b. [John’s height] de re seemed to us to exceed his actual height de re
      “We obtained the following impression: John is taller than he is.”

(50) documents that (47)a is valid. In (50)a, John can be construed coreferentially with the pronominal experiencer him only on contradictory de re reading of the subject containing John. This follows on the assumption that consistent de dicto construal is contingent upon subject reconstruction below seem ((51)b):

(50) a. [John’s height] seemed to him to exceed his actual height.
    (*consistent de dicto / ✓ contradictory de re)

b. [His height] seemed to him to exceed his actual height.
    (✓ consistent de dicto / ✓ contradictory de re)

(51) Consistent de dicto reading of (50)a: Condition C violation

   a. *[John’s height] de dicto seemed to him to exceed his actual height de re
      “It seemed to John that John is taller than he actually is.”
   b. *λs0 [seemed [λs1 to him] [John’s height-in-s1] to exceed his height-in-s0]

(52) Contradictory de re reading of (50)a: no Condition C effect

   a. [John’s height] de re seemed to him to exceed his actual height de re
      “John obtained the following impression: I am taller than I am.”
   b. λs0 [[John’s height-in-s0] seemed [λs1 to him] to exceed his height-in-s0]

   s-binding reconstruction entails e-binding reconstruction

Evidence for (47)a from wh-movement: (53) admits coreferential reading only if the relative clause inside the narrow scope degree predicate n-many is construed de re w.r.t. hope (Sharvit 1998):
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(53) How [many students] who hate Anton did he hope will buy him a beer? (*de dicto/\check{de} re)
   a. Narrow scope n-many, opaque de dicto:
      “For what number n: in all of Anton’s bouletic alternatives s in s₀, there are n-many students
      who hate Anton in s which will buy him a beer in s.”
   b. Narrow scope n-many, transparent de re:
      “For what number n: in all of Anton’s bouletic alternatives s in s₀, there are n-many students
      who hate Anton in s₀ that will buy him a beer in s.”
   → s-binding reconstruction entails e-binding reconstruction

Evidence for (47)b (e-binding reconstruction \Rightarrow s-binding reconstruction): binding requirement on reciprocal renders contradictory interpretation unavailable.

(54) [Each others’s height] seemed to the boys to exceed their actual height.
        (consistent de dicto/*contradictory de re)
   a. de dicto: “It seemed to each boy that the others are taller than they actually are.”
   b. de re: “Each boy had the following impression: the other boys are taller than they are.”
   → e-binding reconstruction entails e-binding reconstruction

Conclusion: s-binding reconstruction ⇔ e-binding reconstruction

3.3. DERIVING THE LEFT-TO-RIGHT DIRECTION OF S/E-CONJECTURE

Clause (47)a of s/e-conjecture falls out of an independent condition on the logical type of traces and QPs:

(55) Extensional Traces and Antecedents (ETA)¹

The denotation of quantificational DPs and their traces do not include situation variables.

Possible types for traces and copies include <et,t> but not e.g. <<e,st>,t>, <<e,st>,st> or <s,<et,t>>.

NB1: Limiting ETA to "quantificational DPs" is necessary to admit property denoting indefinites of type <e,st>, e.g. in the object position of intensional transitive verbs.

NB2: The assumption that generalized quantifiers are extensional is standard (Peters and Westerståhl 2006).

Consequence of (55): T lacks an argument slot for situations. Hence, s-variables inside a fronted restrictor (see (56)b) cannot be bound by lower operators (λ₁) subsequent to SemR, but have to be captured by the higher binder (λ₀) instead ((56)a). Hence, SemR generates narrow scope de re readings only, blocking narrow scope de dicto readings with wide binding scope (see also Heim and von Fintel 2005; Lechner 2007).

(56) ETA: SemR only generates transparent de re readings
   a. LF:
      \[
      [\lambda₀ ... [[DP .. s₀*s₁ ...]₂ ... [\text{seem } [\lambda₁ ... T₂,<et,t> ... ]]_2]]
      \]
   b. After SemR:
      \[
      [\lambda₀ ... [\ldots [\text{seem } [\lambda₁ ... [DP ... s₀*s₁ ... ]_1]]_2]]
      \]
   \(\check{de 
  \text{dicto/}\check{de 
  \text{re}}\)

(57) ETA ensures that SemR results in narrow scope transparent de re readings
   a. A friend seemed to be sick
   b. \([\lambda₀ \text{TP}_2 \text{[a friend-s₀]}] [\lambda₂ \text{[VP seem \ldots]} \lambda₃ \text{[TP T₂,\ldots]} \lambda₄ \text{[VP,t₁ to be sick-s₃]}]]]]
   c. \([\text{TP}_2] = \lambda₂ \forall s[R_{\text{seem}}(s₀)(s) \rightarrow T₂(\lambda₂[sick(s)(t₁))]) (\lambda Q \exists x[\text{friend}(s₀)(x) \land Q(x)]) = \forall s[R_{\text{seem}}(s₀)(s) \rightarrow \lambda Q \exists x[\text{friend}(s₀)(x) \land Q(x)] (\lambda[sick(s)(t₁)]) = \forall s[R_{\text{seem}}(s₀)(s) \rightarrow \exists x[\text{friend}(s₀)(x) \land \lambda[sick(s)(t₁)(x)]) = \forall s[R_{\text{seem}}(s₀)(s) \rightarrow \exists x[\text{friend}(s₀)(x) \land sick(s)(x))]
   \rightarrow ETA ensures that SemR results in narrow scope transparent de re readings
As a consequence, narrow scope *de dicto* readings can only be produced by Copy Theory. It follows that s-binding reconstruction entails e-binding reconstruction, as expressed by (47)a.

**ETA & SemR instantiates DoY:** On present views, SemR fixes s-variable binding in the surface position and restores scope at a later point of the derivation. The ETA version of SemR manifests a Duke of York derivation *across* two components (syntax and semantics).

(58) a. ① \((A \to B)\): Move DP in overt *synt*ax
b. ② \((B)\): Bind s-variable in higher copy
c. ③ \((B \to A)\): Restore pre-movement scope of DP in *sem*antics

**Consequence:** ETA-DoY presents an argument for serial architecture, in which the output of syntax feeds semantics, contra parallel architecture (categorial grammar; Bach 1976; Jackendoff 2002, a.o.).

SemR and variable binding (Puzzle I; (21)): SemR does not restore previously established variable binding relations. Hence, SemR does not provide a solution to variable binding problem noted for (21) (i.e. CP\(_2\) cannot be reconstructed by SemR).

Next:
- Empirical support for ETA (and the assumption that there are cross-componental DoYs)
- ETA is fundamental for analysis of scope rigidity

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### 4. Consequences of the ETA

The conjunction of ETA and assumption (59) has three empirically verified consequences.

(59) **Assumption (standard):** vPs denote properties of situations (type <s,t>)

#### 4.1. Small Clauses

Small clause subjects do not reconstruct for scope or referential transparency (Stowell 1991; Williams 1983)

(60) a. A doctor seemed nervous (*narrow scope *de dicto*/✓ *wide scope *de re*)
b. *Context:* It is obvious why. He was the imposter Dr. Moos, who performed plastic surgery using kitchen utensils in his kitchen in Dubai.

(61) A doctor seemed to be nervous (✓ *de dicto*/✓ *de re*)

Assume that small clauses consist of the predicate only and exclude functional structure that could host s-variables or their binders (Johnson 2001, a.m.o.). ETA accounts blocks narrow scope *de dicto* for (60):

(62) a. TP  (✓Narrow scope *de dicto*)b. TP  (✓Wide scope *de re*)

![Diagram of small clauses](attachment:image.png)
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.

(63) a. A new fridge seems necessary. 
   b. \( \lambda s \forall s'[\text{Accessible}(s)(s') \rightarrow \exists x[\text{new_fridge}(x)(s)] \)

Lexical scope analysis of necessary in (64): 

(64) \[ \text{necessary} \] = \( \lambda P \langle e, st \rangle \lambda s \forall s'[\text{Accessible}(s)(s') \rightarrow \exists x[P(x)(s)]] \)

(63) is compatible with the present system. The ETA licenses property type \(<e, st>\) copies, which can directly combine with (64).

Problem: Why can vP-fronting not be undone in semantics, obviating Condition C effects?

(65) *...and [t₁ proud of John₁] she thinks that he₁ said Mary₂ is (Heycock 1995; Takano 1995)

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, Generalization X overrides SemR.

4.2. Quantificational subjects must not be interpreted in-situ

ETA offers an account for the observation quantificational subjects cannot be interpreted in their thematic position (Johnson & Tomioka 1997).

Subject in-situ prohibition: (66)a violates ETA, which bars intensional traces. (66)b abides by the ETA but results in a type mismatch. Hence, the situation/world variable needs to be added outside vP first and quantificational subjects move to a vP-external position, as in (66)c.

(66) a. Subject in-situ (excluded by ETA) 
   b. Subject in-situ (type mismatch) 
   c. Subject interpreted ex-situ 

Observation: Prohibition on in-situ subject QPs is instrumental for any account of scope rigidity.
5. A calculus for scope and reconstruction

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

   b. *Strict Cycle*
   Non-feature driven movement proceeds bottom up, affecting lower nodes first.

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

NB: Assumptions (67)a/b are standard. (67)c derives: (i) scope rigidity of German; (ii) flexible scope for German inverted word orders; (iii) scope flexibility of English. (For binding relations and SynR, see §5.2.)

5.1. Scope rigid vs. scope flexible languages

ETA ensures that subject quantifiers are always interpreted in a derived position ((68)a). Moreover, from (67) it follows that objects land below the subject ((68)b). Hence, canonical orders result in surface scope.

(68)  a. \[
\begin{array}{l}
[XP, QP_{\text{Subject}} \\
[XP, _{\text{t}}s [VP, _{\text{s}}, _{<t>} t_{\text{Subject}} [VP, _{<t>,} QP_{\text{Object}}]]]
\end{array}
\] (Subject > Object)

Scope rigid languages, canonical word order: Transitive German clauses with canonical word order are scope rigid ((69)). Cycle determines that object movement by OCM ((69)b) precedes subject movement ((69)c). Subject movement has to extend the tree, resulting in an order preserving representation:

(69)  a. \[
\begin{array}{l}
[XP, t_s [VP, _{<t>,} QP_{\text{Subject}} [VP, _{<t>,} QP_{\text{Object}}]]]
\end{array}
\] (Subject > Object)

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

Analysis without ETA (incorrect): To see why ETA is relevant, note that the alternative analysis (70), where the subject is interpreted in-situ and the object QP has QRed, derives the unattested inverse scope order.

(70)  Scope rigid languages, non-inverted orders (incorrect analysis)

   a. \[
\begin{array}{l}
[QP_{\text{Subject}} \\
[VP, _{<t>,} T_{\text{Subject}} [VP, _{<t>,} QP_{\text{Object}}]]]
\end{array}
\] (Object > Subject)

Scope rigid, scrambled/inverse orders: further movement of the object feeds ambiguity since subject may reconstruct below object by SemR (subject movement to SpecTP not represented; on SynR see below):

(71)  Scope rigid languages, inverted orders

   a. \[
\begin{array}{l}
[QP_{\text{Object}} \\
[VP, _{<t>,} QP_{\text{Subject}} [VP, _{<t>,} QP_{\text{Object}}]]]
\end{array}
\] (Subject > Object)

   b. \[
\begin{array}{l}
[QP_{\text{Object}} \\
[VP, _{<t>,} {\text{t}}_{\text{Object}} [VP, _{<t>,} {\text{t}}_{\text{Object}}]]
\end{array}
\] (Object > Subject)

   c. \[
\begin{array}{l}
[QP_{\text{Object}} \\
[VP, _{<t>,} t_{\text{Subject}} [VP, _{<t>,} t_{\text{Object}}]]
\end{array}
\] (Subject > Object)

   d. \[
\begin{array}{l}
[QP_{\text{Object}} \\
[VP, _{<t>,} t_{\text{Subject}} [VP, _{<t>,} t_{\text{Object}}]]
\end{array}
\] (Object > Subject)
Double object constructions: canonical orders are scope rigid ((72)a). Inversion by scrambling feeds ambiguity because DO may undergo SemR ((72)b):

(72) Scope rigid languages, inverted orders among objects
   a. \[
   \begin{array}{c}
   [\text{XP}] \\
   [\text{IO}] \\
   [\text{XP}] \\
   [\text{DO}] \\
   [\text{XP}, <s,t>] \\
   [\text{t}].
   \end{array}
   \quad
   \begin{array}{c}
   [\text{VP}, <e,st>] \\
   [\text{Subject}] \\
   \end{array}
   \quad
   \begin{array}{c}
   [\text{IO} \\
   *\text{DO} \quad \text{IO})
   \end{array}
   \]

   b. \[
   \begin{array}{c}
   [\text{ScrP}] \\
   [\text{QP}] \\
   [\text{DO}] \\
   [\text{XP}] \\
   [\text{IO}] \\
   [\text{XP}] \\
   [\text{t/T}] \\
   [\text{DO}] \\
   [\text{XP}, <s,t>] \\
   [\text{t}] \\
   [\text{Subject}] \\
   \end{array}
   \quad
   \begin{array}{c}
   [\text{VP}, <e,st>] \\
   [\text{Object}] \\
   \end{array}
   \quad
   \begin{array}{c}
   [\text{IO} \\
   *\text{DO} \quad \text{IO})
   \end{array}
   \]

Scope flexible languages: In English, object QR can be delayed to LF. Thus, QR is not subject to the extension condition, because it is not processed in the overt part of the derivation. Hence, the object can - unlike in German - land below the lowest interpretable position of the subject. The subject can be interpreted in SpecTP ((73)c), or reconstruct, either by SynR or SemR; (73)d). Hence, canonical orders are ambiguous:

(73) Scope flexible languages
   a. \[
   \begin{array}{c}
   [\text{VP}] \\
   [\text{t}].
   \end{array}
   \quad
   \begin{array}{c}
   [\text{Subject}] \\
   \end{array}
   \quad
   \begin{array}{c}
   [\text{QP}] \\
   [\text{Object}] \\
   \end{array}
   \]

   b. \[
   \begin{array}{c}
   [\text{v'}] \\
   [\text{v°}] \\
   [\text{Case}] \\
   [\text{VP}] \\
   [\text{like best which picture of John}_2]
   \end{array}
   \quad
   \begin{array}{c}
   [\text{IO} \\
   *\text{DO} \quad \text{IO})
   \end{array}
   \]

   c. \[
   \begin{array}{c}
   [\text{TP}] \\
   [\text{Subject}] \\
   [\text{QP}] \\
   [\text{Object}] \\
   [\text{XP}] \\
   [\text{t}] \\
   [\text{Subject}] \\
   \end{array}
   \quad
   \begin{array}{c}
   [\text{VP}, <e,st>] \\
   [\text{Subject}] \\
   \end{array}
   \quad
   \begin{array}{c}
   [\text{IO} \\
   *\text{DO} \quad \text{DO})
   \end{array}
   \]

   d. \[
   \begin{array}{c}
   [\text{TP}] \\
   [\text{Subject}] \\
   [\text{QP}] \\
   [\text{Object}] \\
   [\text{XP}] \\
   [\text{t/T}] \\
   [\text{Subject}] \\
   \end{array}
   \quad
   \begin{array}{c}
   [\text{VP}, <e,st>] \\
   [\text{Subject}] \\
   \end{array}
   \quad
   \begin{array}{c}
   [\text{IO} \\
   *\text{DO} \quad \text{DO})
   \end{array}
   \]

   ➔ The timing difference (67)c together with the ETA derives cross-linguistic contrast between scope rigid (German) and scope flexible (English) languages.

5.2. WLM and Phi-features

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

(74) 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.

(75) Counter-cyclical Merge of common noun
*Which picture of John does he like best?
   a. \[
   \begin{array}{c}
   [\text{VP}] \\
   [\text{like best which picture of John}_2]
   \end{array}
   \]

   b. \[
   \begin{array}{c}
   [\text{v°}] \\
   [\text{Case}] \\
   [\text{VP}] \\
   [\text{like best which picture of John}_2]
   \end{array}
   \]

(76) *[\text{CP} which picture of John}_2 \quad [\text{TP he}_2 \quad [\text{v°} \quad [\text{CP like best which}]])]

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

(77) WCO I: DO reconstructs below subject
   a. weil jeder [seinen Vater] liebt
      since everyone his fatherACC loves
      “since everyone loves his father”

   b. *weil [sein Vater] jeden liebt
      since his father everyoneACC loves
      “since his father loves everyone”

   c. weil [seinen Vater], jeder t liebt
      since his fatherACC everyone loves
      “since everyone loves his father”

   (Frey 1989, 1993)

(base order, WCO)

(medium object scrambling reconstructs)
(78) \textit{WCO II: DO does not reconstruct below IO} (Frey 1989, 1993)
a. \textit{weil wir jedem, \textit{seinen} Vater \textit{zeigten}}
        since we everyone, his father showed
        “since we showed everyone his father”

b. \textit{*weil wir \textit{seinem} Vater \textit{jeden} \textit{zeigten}} (base order, WCO)
        since we his everyone showed
        “since we showed his everyone”

c. \textit{*weil wir \textit{seinen} Vater, \textit{jedem} \textit{zeigten}} (DO does no reconstruct below IO)
        since we his everyone showed
        “since we showed everyone his father”

d. \textit{weil uns \textit{seinen} Vater, \textit{jeder} \textit{zeigen wollte}} (DO reconstructs below subject)
        since us his everyone show wanted
        “since everyone wanted to show us his father”

(79) Corereference with IO: obviation of Principle C
a. \textit{*Ich schenke \textit{ihm} \textit{dieses Buch von Peter}} sicherlich nicht (base order)
        I gave him this book of Peter certainly not
        “I certainly didn’t give him this book of Peter”

b. \textit{[Dieses Buch von Peter], schenke ich \textit{ihm} 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”

(80) Corereference with subject: Principle C
a. \textit{*Er, soll uns \textit{diesen alten Freund von Peter} vorstellen} (base order)
        he should us introduce this old friend of Peter
        “He should introduce to us this old friend of Peter”

b. \textit{*[Diesen alten Freund von Peter], soll \textit{er} t_{1} uns vorstellen} (DO reconstructs below subject)
        his old friend of Peter should he us introduce
        “He should introduce to us this old friend of Peter”
→ Objects reconstruct right below the surface position of subjects (SpecTP; this is a re-statement of Frey 1989/1993).

On the WLM analysis, this entails that the restrictor of fronted objects is merged above XP (α in (81)):

(81)
\[\text{TP} \quad \begin{array}{c}
\text{Subject} \\
\text{Lower limit for} \\
\text{WLM of restrictor} \\
\text{of fronted objects}
\end{array} \quad \alpha \quad \begin{array}{c}
\text{XP} \\
\text{IO} \\
\text{DO}
\end{array} \quad \ldots
\]

\textit{Challenge for WLM}: Why can objects not be merged within VP?
\textit{Observation}: What is missing is a \textit{lower limit constraint} on WLM.

5.3. \textbf{STRENGTHENING THE LICENSING CONDITION ON WLM}

Assume that WLM is licensed by agreeing \(\Phi\)-features on abstract \(\Phi\)-\textit{head} (Kratzer 2009), instead of Case.

(82) \textbf{\(\Phi\)-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 \(\text{c}\)-command domain of an agreeing \(\Phi\)-head at S.
Position of $\Phi$: $\Phi$ is located inbetween TP and the landing site of short scrambling (ScrP).

(83) $[[TP \ldots \Phi \ldots [ScrP \ldots [XP, \ldots s-variable [vP, \ldots \_s, \ldots [VP \ldots \_s]]]]]]$

Conceptual advantage: (82) leads to simpler relation between licensing condition and WLM. On Case Constrain (74), restrictor insertion is not linked to actual Case assignment but to presence of higher Case assigning head. In (84), the subject restrictor is merged within TP$_1$, even though T$_1$ lacks Case features!

(84) a. Pictures of himself seem to him to be boring
b. $[[TP_2 \text{ Pictures of himself; } T_2 \text{ (nom)} \text{ seem to } \text{ him; } T_1 \text{ pictures of himself; } T_1 \text{ [to be boring]}]]$

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

$\Phi$-analysis: Cyclic restrictor insertion, licensed by clausemate $\Phi$-head. In (84), licensing $\Phi$-head resides within non-finite TP$_1$. That non-finite clauses indeed contains $\Phi$-heads can e.g. be seen in Greek:

(85) Ta pedia archizun na [TP pezoun] the children$_{[3pl]}$ start$_{[3pl]}$ C° play$_{[3pl]}$

“The children start to play”

$\Phi$-analysis supports local formulation of the relation between WLM and licensing condition.

5.4. IMPLEMENTATION

Canonical word order: Given the $\Phi$-Constraint on WLM (82), restrictors can be merged only if their licensing $\Phi$-heads are present. The $\Phi$-head is VP-external. Thus, objects always start out as bare D°s ((86)a). In the next relevant step, $\Phi$-head is merged ((86)b), which in turn licenses WLM of restrictor ((86)c):$^3$

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

Scrambled/inverse word orders: Restrictors can be merged only once $\Phi$-head has been added. Hence, short scrambling moves the determiner only ((87)b). WLM of restrictor follows insertion of $\Phi$-head ((87)c):

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

$\Rightarrow$ The lowest node containing an object copy with descriptive content is the node located to the immediate right of $\Phi$. This derives generalization (81).
(88) Reconstructive options for moved direct object QPs

\[ \Phi^\circ \]

No restrictor → SemR, but no SynR

Blocking alternative derivations: assume that the Φ-head is merged low ((89)b). Then the restrictor is inserted low, inside VP ((89)b), followed by scrambling ((89)c). This would wrongly legitimize SynR into the base position of the object. However, this derivation is weeded out by the Extension Condition.

(89) a. \[(\Phi_P) ... [\text{ScrP} ... [\text{VP} ... D_\circ \text{DO} ...]]]\n
b. [\Phi_P \Phi_{[F]} ... [\text{ScrP} ... [\text{VP} ... D_\circ \text{Restrictor}_{[F]} ...]]]

c. [\Phi_P \Phi_{[F]} ... [\text{ScrP} D_\circ \text{Restrictor}_{[F]} [\text{VP} ... D_\circ \text{Restrictor}_{[F]} ...]]] (XExtension Condition)

5.5. INTERPRETATION: TRACE CONVERSION FOR GQ-TRACES

Lower copies of determiners are interpreted by Trace Conversion (Fox 1999; Sauerland 1998, 2004). Extension to GG-traces ((90)b; <et,e>-version (90)c from Takahashi 2011)).

(90) Trace Conversion (generalized version)

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

b. \[\text{Det}_n \rightarrow (\lambda \varphi <\text{et},t> [\varphi = \lambda Q_{<\text{et},t>} [Q = \lambda x [x = n]])]

\[\rightarrow \equiv T_n, \text{where } T \in D_\circ \text{et},t> \] (Generalized Quantifier version)

c. \[\text{Det Pred} \rightarrow f_{<\text{ch}>} \in D_\circ \text{et},t> (\text{Pred}) \] (Choice function version)

some can be converted into an individual variable, a variable of type <et,t> or a choice function:

(91) a. \[\text{some boy}_2 \rightarrow \text{the} (\text{boy and } \lambda x [x = 2])\]

b. \[\text{some}_2 \rightarrow (\lambda \varphi <\text{et},t> [\varphi = \lambda Q_{<\text{et},t>} [Q = \lambda x [x = 2]]) \equiv T_{<\text{et},t>}\]

c. \[\text{some}_2 (\text{boy}) \rightarrow f_{<\text{ch}>} \in D_\circ \text{et},t> (\text{boy})\]

SemR without SynR ((33)b): D_\circ \text{DO} moves to XP, and then up to ScrP ((92)a). WLM of restrictor above IO, in ScrP ((92)b). Fully assembled DO binds T_2, resulting in SemR (see (93)).

(33) b. weil wir [einige Freunde von \text{einander}_{[F]}]_2 allen Kollegen_{[F]} [t_2/T_2] vorstellen wollten

"since we wanted to introduce some friends of each other to every colleague"

(∃ > ∀ / ∀ > ∃)
(92)  

a. \( \text{we}_1 \) introduced \([\lambda_2 [\text{to every coll.} [T_{2, <et, >} ...]]]] (\text{Move D°})

b. \( \text{we}_1 \) introduced \([\lambda_2 [\text{to every coll.} [T_{2, <et, >} ...]]]] (\text{WLM})

c. \( \text{we} [\lambda_1 [\text{some friends of e.o.}] [\lambda_2 [\text{to every coll.} [\lambda_3 [\text{XP} [\text{some} [\lambda_4 [\text{XP} [\text{t}_1 \, \text{t}_3 \, \text{t}_4 \, \text{introduce}]]]]]]]]]]

(93)  

a. \( [\lambda_4 [\text{XP} [\text{some} [\lambda_4 [\text{XP} [\text{t}_1 \, \text{t}_3 \, \text{t}_4 \, \text{introduce}]]]]]] = \)

the \( (\lambda_4 [\text{introduce}(t_4)(t_3)(t_1))] = T_2 (\lambda_4 \text{.introduce}(t_4)(t_3)(t_1)) \)

b. \( [\lambda_4 [\text{XP} [\text{every colleague} [\lambda_3 [\text{XP} [\text{some} [\lambda_4 [\text{XP} [\text{t}_1 \, \text{t}_3 \, \text{t}_4 \, \text{introduce}]]]]]]]] = \)

\( \forall y [\text{colleague}(y) \rightarrow T_2 (\lambda_4 \text{.introduce}(t_4)(y)(t_1))] \)

c. \( [\lambda_4 [\text{XP} [\text{some friends of e.o.} [\lambda_3 [\text{XP} [\text{some} [\lambda_4 [\text{XP} [\text{t}_1 \, \text{t}_3 \, \text{t}_4 \, \text{introduce}]]]]]]]] = \)

\( \forall y [\text{colleague}(y) \rightarrow \exists x [\text{friends of e.o.}(x) \land \text{introduce}(x)(y)(t_1))] \)

WLM and SemR is a DoY:

(94)  

a.  \( (A \rightarrow B) \): Move D°\(_{DO}\) in overt syntax

b.  \( (B) \): WLM of restrictor

c.  \( (B \rightarrow A) \): Restore pre-movement scope of DP by SemR

Object \( \ddot{A}\)-movement in German: just like scrambling derivation (87) (immaterial difference: object stops in vP, instead of ScrP). Since movement is involved, object restrictor is merged above thematic position of subject ((95)b):

(95)  

a. \( [\Phi_p \Phi_{[f]}... [\text{VP D°} [\text{VP t}_{\text{subject}} [\text{VP ... [DO D° ... ]]]]]] \)

b. \( [\Phi_p \Phi_{[f]}... [\text{VP D° restrictor}_{[f]} [\text{VP t}_{\text{subject}} [\text{VP ... [DO D° ... ]]]]] \)

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

(96)  

a. *Welches Bild von \( \text{Hans}_j \) kaufter \( \text{er}_j \)

"*Which picture of John, did he buy"

b. \( [\Phi_p \Phi_{[f]}... [\text{VP which picture of John}_i [\text{VP he}_i [\text{VP ... [DO which like ... ]]]]] \)

Solution: Subject related \( \Phi \)-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).
6. Summary

(97) □ 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

An open issue: Late Merged adjuncts correlate with wide scope of the hosting NP (Fox 1999: 167; Ruys 2015: 477). So far, nothing blocks conjunction of SemR and Late Merge.

(98) # [How many houses in John’s, city], does he, think you should build t₂.
  a. Narrow scope n-many
     “For what number n: in all deontic alternatives s in s₀, 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 s₀, and in all deontic alternatives s in s₀, John builds x in s.”
     (build is, for pragmatic reasons, only compatible with narrow scope reading)

(99) [How many houses in John’s, city], does he, think you should demolish t₂.
  a. Narrow scope n-many
     “For what number n: in all deontic alternatives s in s₀, 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 s₀, and in all deontic alternatives s in s₀, John demolishes x in s.”

Notes
2. It is not obvious how Mouton’s analysis can be generalized to different NP types that also admit de dicto readings (two fridges, exactly seven fridges,...).
3. Restrictor insertion in (86)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 A-movement (Which picture near John, did he, like), where adjuncts are added below the root node (see Nissenbaum 2000).
4. Unlike <et,t>-type traces, <et,e> traces require the presence of their restrictor; see Takahashi (2011).
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