IGRA 02: Syntax II
Gradient Symbolic Representations in Syntax
Gereon Müller (Universität Leipzig), November 9, 2017

1. Background

Gradient Harmonic Grammar (Smolensky & Goldrick (2016)):

- Constraints are neither categorical nor ranked; they are associated with weights (Harmonic Grammar).
- Symbols in linguistic expressions are not categorical; they are associated with weights (Gradient Symbolic Representations).

Claim:
Gradient Harmonic Grammar can be used to model reanalysis phenomena in syntax, i.e., phenomena where it looks as though two different representations of a linguistic expression must be postulated.

2. Evidence for Reanalysis

2.1. Passive in German

1. Control by DP_{ext} into purpose clauses and complement clauses (Roberts (1987), van Urk (2013)):
   a. Der Reifen wurde DP_{ext} aufgepumpt [CP PRO1 um die Fahrt the tire was inflated in order the journey fortzusetzen] to continue
   b. Es wurde DP_{ext} versucht [CP PRO1 zu schlafen] it was tried to sleep

2. Principle A and DP_{ext}:
   a. Hier wurde DP_{ext} sich nicht geprügelt here was REFL not hit
   b. Es wurde DP_{ext} einander1 gedankt it was each other thanked

   a. *Er versucht [CP DP_{ext} gearbeitet zu werden] he tries worked to be
   b. *weil [CP bald DP_{ext} geschlafen zu werden] gewünscht wird because soon slept to be wished is

4. Absence of A-intervention (minimality) effects with optional movement to Spec T (Collins (2005)):
   a. dass der Karl1 ihm3 [vP DP_{ext} v' [VP t3 t2 vorgestellt] v'] wurde that the Karl1nom herdat introduced was
   b. dass ihr3 [vP DP_{ext} v' [VP t3 der Karl2 vorgestellt] v'] wurde that herdat the Karl2nom introduced was

Conclusion:
(1) and (2) show that DP_{ext} is accessible; (3) and (4) imply that DP_{ext} is not accessible.

2.2. Restructuring in German

Generalization:
- Non-restructuring control infinitives in German behave in all relevant respects like finite embedded clauses and thus uniformly demand a biclausal analysis in terms of CP embedding.
- Restructuring control infinitives in German exhibit both evidence for monoclausality (i.e., for the absence of a CP shell and a TP shell) and evidence for biclausality.

5. Scrambling and unstressed pronoun fronting in restructuring environments presupposes accessibility of C:
   a. dass der Fritz1 keiner [t1 zu küssen] versuchte that the Fritz1acc no-one nom to kiss tried
   b. *dass die Maria es1 gestern [CP t1 zu kennen] gelegnet hat that the Maria1nom itacc yesterday to know denied has
   c. *dass der Fritz1 keiner gesagt hat [CP dass wir t1 einladen sollen] that the Fritz1acc no-one nom said has that wiracc invite should

6. Scope of negation in restructuring contexts presupposes accessibility of C:
   a. dass Maria ihm [das Buch nicht zu lesen] empfiehlt that Maria1nom himdat the bookacc not to read recommends
   b. dass Maria ihm [CP das Buch nicht zu lesen] auffordert that Maria1nom himacc the bookacc not to read requests

7. Local unstressed pronoun fronting presupposes accessibility of C:
   a. dass sie mir1 schon letzte Woche [t1 es2 zu geben] versuch hat that she1nom meacc already last week itacc to give tried has
   b. dass sie mir1 schon letzte Woche versuch hat [t1 es2 zu geben] that she1nom meacc already last week tried has itacc to give

a. dass sie ihn zu küssen versucht [CP, PRO t zu küssen] that sheAcc himAcc tries to kiss
b. dass das Buch den Mann zu geben versucht [CP, PRO t zu geben] that the book to give tried has
c. dass sie Maria verspricht [CP, PRO t zu lesen] that sheAcc Maria promises to read
d. dass Fritz ihm empfohlen hat [CP, PRO t zu lesen] that FritzAcc himAcc recommended has to read

Conclusion: (5) and (6) show that CP is inaccessible; (7) and (8) show that CP is accessible.

3. Structure Removal

3.1. The Approach

Refs.: Müller (2016; 2017a,b)

Assumptions about Remove:

(i) Remove is feature-driven. It is triggered by designated [–F–] features, which are ordered on lexical items.

(ii) Remove may apply to heads or phrases: [–F0–], [–F2–].

(iii) Remove obeys the Strict Cycle Condition.

(iv) Remove can be external or internal.

(9) Strict Cycle Condition (SCC):
Within the current XP $\alpha$, a syntactic operation may not exclusively target some item $\delta$ in the domain of another XP $\beta$ if $\beta$ is in the domain of $\alpha$.

(10) Domain (Chomsky (1995)):
The domain of a head $X$ is the set of nodes dominated by XP that are distinct from and do not contain $X$.

3.2. Remove and phrases: complements

a. Merge($X'$, $\bullet$, $Y$) in the domain of $X$:

b. Remove($X$ in the domain of $X$):

Note: ZP, WP cannot be removed by $X$ because of the Strict Cycle Condition.

3.3. Remove and phrases: specifiers

a. Merge($X'$, $\bullet$, $Y$) in the domain of $X$:

b. Remove($X$ in the domain of $X$):

Note: Since [–F0–] removes the head, it takes away the highest projection, and only this. More deeply embedded material (like ZP) is attached to the head responsible for removal and replaces the original item (YP). If there are two or more items in YP (e.g., ZP, WP), they reassemble in their original structural and linear order in the XP domain. Such a reassociation is not an instance of Merge.

(14) **Remove and heads: complements with specifiers**
   a. Merge($X \downarrow Y \downarrow [\neg Y_0 \neg Y ] \uparrow YP)$:
   
   ![Diagram a](image)

   b. Remove($X [\neg Y_0 \neg Y ] \uparrow Y)$:
   
   ![Diagram b](image)

**Note:**
This opens up the possibility of dislocation without movement.

(15) **Remove and heads: specifiers w/o specifiers**
   a. Merge($X' \downarrow [\neg Y_0 \neg Y ] \uparrow YP)$:
   
   ![Diagram a](image)

   b. Remove($X' [\neg Y_0 \neg Y ] \uparrow Y$):
   
   ![Diagram b](image)

(16) **Remove and heads: specifiers with specifiers**
   a. Merge($X' \downarrow [\neg Y_0 \neg Y ] \uparrow YP)$:
   
   ![Diagram a](image)

   b. Remove($X' [\neg Y_0 \neg Y ] \uparrow Y$):
   
   ![Diagram b](image)

**Prediction:**
Structure that is affected by Remove is predicted to be accessible in its minimal XP (i.e., from below) but inaccessible outside of its minimal XP (i.e., from above).

3.2. **Analysis via Structure Removal**

**Strategy:**
Accessibility of corresponds to presence of $X$; inaccessibility corresponds to absence of $X$.

(17) **Passive:**
   
   Passive = $[-D_2]$ on $v$.

**Analysis:**
1. $DP_{ext}$ is merged as $Specv$ and can effect control and binding into its c-command domain.
2. Because of the Strict Cycle Condition, $DP_{ext}$ must be removed by $v$ before the derivation merges vP with T.
3. Therefore, $DP_{ext}$ is not accessible anymore for operations that involve items outside the minimal vP (like control or binding from above, or movement to $SpecT$).

(18) **Restructuring:**
   
   Restructuring = $[-C_0] > [-T_0]$ on $V$.

**Analysis:**
1. CP and TP are present in the infinitival control clause. C licenses unstressed pronoun fronting to Specv in the infinitive, and its presence makes CP extraposition possible.
2. Because of the Strict Cycle Condition, CP and TP are removed by V before the derivation merges matrix VP with matrix v.
3. Therefore, CP and TP are not accessible anymore for operations outside of matrix VP, like movement to the matrix Specv domain or determination of the scope of negation.
4. Multidimensional Representations

Note:
An alternative approach to reanalysis phenomena makes use of multidimensional represen-
tations or coanalysis, i.e., the simultaneous presence of two (or more) separate structure for a
given string of lexical items (Huybregts (1982), Bennis (1983), Haegeman & Riemsdijk (1986),
Di Sciullo & Williams (1987), Sadock (1991), Pesetsky (1995)).

Problem:
It needs to be stipulated which operations use the top tree (with DP_{ext}) in (19), and which
access the bottom tree (without DP_{ext}). This follows under structure removal without fur-
ther ado. The same problem also shows up for the presence vs. absence of CP (TP) with
restructural control verbs.

5. Gradient Harmonic Grammar

5.1. Background Assumptions

Strategy:
Reanalysis phenomena in syntax are not accounted for by postulating two representations
where some piece of structure X is present in one and absent in the other (as with structure
removal and multidimensional representations), but rather by postulating that X is not
categorical but active only to some degree, which is captured by assigning to X some real
number between 0 and 1. Operations for which X is active are triggered by constraints with
a sufficiently large weight; operations for which X is inactive are triggered by constraints
with a lower weight.

Assumptions:

- In contrast to what is assumed in much (all?) work in Gradient Harmonic Grammar
  approaches to phonology (see, e.g., Smolensky & Goldrick (2016), Zimmermann (2017)),
  I do not assume that all categories need to have a weight of 1.0 in the final output
  representation; by assumption, the interfaces can interpret a D_{[0.6]} or a C_{[0.5]} as complete,
  fully regular, discrete D and C items. (And there is no way how the weight of some
  symbol can be increased from input to output.)

- In contrast to Smolensky & Goldrick (2016) (but in line with Zimmermann (2017)), I
  assume that constraints other than faithfulness constraints can refer to gradient struc-
  ture.

5.2. Passive

Basic assumption:

DP_{ext} in the passive is (headed by a) D which has a reduced weight, e.g., 0.5 instead of 1.0.

(20) Control by DP_{ext} into purpose clauses: Verbal passive vs. adjectival passive

a. Der Reifen wurde DP_{ext} aufgepumpt [CP PRO nom die Fahrt the tire was/got inflated in order the journey
  fortzusetzen] to continue

b. *Der Reifen war DP_{ext} aufgepumpt [CP PRO nom die Fahrt the tire has nomination inflated in order the journey
  fortzusetzen] to continue

c. Den Reifen hat sie inflatet [CP PRO nom die Fahrt the tire has she nomination inflated in order the journey
  fortzusetzen] to continue

(21) Constraints

a. INCLUSIVENESS:
  All material that shows up in an output is present in the input.

b. CONTROL:
  *DP if DP minimally c-commands PRO but does not Agree with it.

Note:

(i) CONTROL triggers control, conceived of as establishing the controller’s binding index on
the controlled PRO.
(ii) **INCLUSIVENESS** for present purposes amounts to DEP(Index): Every Agree operation that adds (orvaluates) a feature violates **INCLUSIVENESS**.
(iii) Assumption: If an optimal candidate violates CONTROL and PRO does not receive a binding index, ungrammatical results (ineffability: the optimal candidate crashes at the LF interface).

(22) **Strength of DP**

a. $\text{DP}_{\text{ext}}$ in active sentences: [1.0]

b. $\text{DP}_{\text{ext}}$ in the verbal passive: [0.5]

c. $\text{DP}_{\text{ext}}$ in the adjectival passive: [0.2]

(23) $\text{DP}_{\text{ext}}$ in the verbal passive and control into purpose clauses:

<table>
<thead>
<tr>
<th>I: [DP1;[0.5] ... PRO]</th>
<th>Inclusiveness</th>
<th>Control</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ast\ast O_1$: [VP $\text{DP1}_{\text{ext}}$:[0.5] $\ldots$ [CP PRO1 $\ldots$ ]]</td>
<td>$w = 1.0$</td>
<td>$w = 3.0$</td>
<td>-1.0</td>
</tr>
<tr>
<td>$\ast\ast O_2$: [VP $\text{DP1}_{\text{ext}}$:[0.5] $\ldots$ [CP PRO $\ldots$ ]]</td>
<td>$w = 1.0$</td>
<td>$w = 3.0$</td>
<td>-0.5</td>
</tr>
</tbody>
</table>

(24) $\text{DP}_{\text{ext}}$ in an active environment and control into purpose clauses:

<table>
<thead>
<tr>
<th>I: [DP1;[1.0] ... PRO]</th>
<th>Inclusiveness</th>
<th>Control</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ast\ast O_1$: [VP $\text{DP1}_{\text{ext}}$:[1.0] $\ldots$ [CP PRO1 $\ldots$ ]]</td>
<td>$w = 1.0$</td>
<td>$w = 3.0$</td>
<td>-1.0</td>
</tr>
<tr>
<td>$\ast\ast O_2$: [VP $\text{DP1}_{\text{ext}}$:[1.0] $\ldots$ [CP PRO $\ldots$ ]]</td>
<td>$w = 1.0$</td>
<td>$w = 3.0$</td>
<td>-1.0</td>
</tr>
</tbody>
</table>

(25) $\text{DP}_{\text{ext}}$ in the adjectival passive and control into purpose clauses:

<table>
<thead>
<tr>
<th>I: [DP1;[0.2] ... PRO]</th>
<th>Inclusiveness</th>
<th>Control</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ast\ast O_1$: [VP $\text{DP1}_{\text{ext}}$:[0.2] $\ldots$ [CP PRO1 $\ldots$ ]]</td>
<td>$w = 1.0$</td>
<td>$w = 3.0$</td>
<td>-1.0</td>
</tr>
<tr>
<td>$\ast\ast O_2$: [VP $\text{DP1}_{\text{ext}}$:[0.2] $\ldots$ [CP PRO $\ldots$ ]]</td>
<td>$w = 1.0$</td>
<td>$w = 3.0$</td>
<td>-0.2</td>
</tr>
</tbody>
</table>

(26) **Absence v.s. presence of A-intervention (minimality) effects with optional movement to SpecT** (Collins (2005)):  
a. dass der Karl$_2$ ir$_3$ $\text{VP}$ $\text{DP}_{\text{ext}}$ $\text{VP}$ t$_3$ t$_2$ vorgestellt $\text{v}$ $\|$. wurde  
   that the Karl$_{norm}$ her$_{dat}$ introduced was  

b. dass den Karl$_2$ ir$_3$ $\text{VP}$ die Maria$_1$ $\text{VP}$ t$_3$ t$_2$ vorgestellt $\text{v}$ $\|$. hat  
   that the Karl$_{acc}$ her$_{dat}$ the Maria$_{norm}$ introduced has  

(27) **Constraints**

a. **RELMIN** (Relativized Minimality, Rizzi (1990)):  
   *DP if
   (i) DP occupies a position of type $\Gamma$,  
   (ii) DP c-commands $\beta_i$ of a movement chain $\delta$,  
   (iii) DP does not m-command $\beta_{i-1}$ of $\delta$, and  
   (iv) $\beta_{i-1}$ occupies a position of type $\Gamma$.

b. MC (Merge Condition; Chomsky (1995; 2001),Heck & Müller (2013)):  
   Structure-building features ($\ast\ast\ast\ast\ast\ast$) participate in Merge.

**Note:**  
(i) RELMIN excludes a movement step of a DP in VP across $\text{DP}_{\text{ext}}$ in Specv to SpecT (here, $\Gamma$ of (27-a) stands for A-position; note that derived specifiers of v do not qualify as A-positions, so scrambled items and untested fronted pronouns don’t intervene).
(ii) MERGE CONDITION triggers movement. Assumption: Optional movement to SpecT in German is brought about by an $\ast\ast\ast\ast\ast\ast$ feature that is optionally present on T in the numerator, and that is discharged after it has triggered the operation. Further assumption (to simplify exposition): This feature is then also instantiated pre-syntactically on some DP.

(28) $\text{DP}_{\text{ext}}$ as a non-intervener in passive contexts:

<table>
<thead>
<tr>
<th>I: [TP [VP $\text{DP1}<em>{\text{ext}}$:[0.5] $\ldots$ $\text{DP2}</em>{\text{ext}}$,EPP$\ldots$] $\ldots$ T [EPP$\ldots$]]</th>
<th>RELMIN</th>
<th>MC</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ast\ast O_1$: [TP $\text{DP1}_{\text{ext}}$:[0.5] $\ldots$ t$_2$ ... T ]</td>
<td>$w = 3.0$</td>
<td>$w = 2.0$</td>
<td>-1.0</td>
</tr>
<tr>
<td>$\ast\ast O_2$: [TP $\text{DP1}<em>{\text{ext}}$:[0.5] $\ldots$ $\text{DP2}</em>{\text{ext}}$,EPP$\ldots$] $\ldots$ T [EPP$\ldots$]]</td>
<td>$w = 3.0$</td>
<td>$w = 2.0$</td>
<td>-1.0</td>
</tr>
</tbody>
</table>

(29) $\text{DP}_{\text{ext}}$ as an intervener in active contexts:

<table>
<thead>
<tr>
<th>I: [TP [VP $\text{DP1}<em>{\text{ext}}$:[1.0] $\ldots$ $\text{DP2}</em>{\text{ext}}$,EPP$\ldots$] $\ldots$ T [EPP$\ldots$]]</th>
<th>RELMIN</th>
<th>MC</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ast\ast O_1$: [TP $\text{DP1}_{\text{ext}}$:[1.0] $\ldots$ t$_2$ ... T ]</td>
<td>$w = 3.0$</td>
<td>$w = 2.0$</td>
<td>-3.0</td>
</tr>
<tr>
<td>$\ast\ast O_2$: [TP $\text{DP1}<em>{\text{ext}}$:[1.0] $\ldots$ $\text{DP2}</em>{\text{ext}}$,EPP$\ldots$] $\ldots$ T [EPP$\ldots$]]</td>
<td>$w = 3.0$</td>
<td>$w = 2.0$</td>
<td>-3.0</td>
</tr>
</tbody>
</table>

5.3. **Restructuring**

**Basic assumption:**  
Control predicates that optionally trigger restructuring optionally take a CP complement whose C head has a reduced weight, e.g., 0.5 instead of 1.0. Environments with obligatory restructuring can now be assumed to also involve CP, but with a C head with even less weight (e.g., 0.2).

(30) **The third construction:**

a. dass sie ihn$_2$ t$_1$ versucht [CP$_1$ PRO$_2$ t$_2$ zu küssen]  
   that she$_{norm}$ him$_{acc}$ tries to kiss  

b. *dass sie ihn$_2$ t$_1$ sagt [CP$_1$ dass sie t$_2$ mag]  
   that she$_{norm}$ him$_{acc}$ says that she likes  

c. *dass sie ihn$_2$ t$_1$ liest [CP$_1$ t$_2$ schafen]  
   that she$_{norm}$ him$_{acc}$ reads  

**Analysis:**  
C:[0.5] of a restructuring infinitive of a control predicate is too weak to block long-distance
scrambling (via the PIC, which talks about it) but strong enough to participate in extraposition (via ExtrCrit, which also talks about it).

(31) Constraints
   a. ExtrCrit:
      *C[extr] that is not the head of a CP that is right-adjointed to vP.
   b. Inclusiveness:
      All material that shows up in an output is present in the input.

Note:
(i) ExtrCrit is a simplification.
(ii) Inclusiveness, among many other things, also prohibits the occurrence of traces (or copies), and thereby blocks movement.

(32) CP extraposition in the third construction:

<table>
<thead>
<tr>
<th>I: [vP [vP C[extr]:[0.5] V] v]</th>
<th>ExtrCrit</th>
<th>Inclusiveness</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>**O1: [vP [vP C[extr]:[0.5] V] v]</td>
<td>w = 3.0</td>
<td>w = 1.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>O2: [vP [vP C[extr]:[0.5] V] v]</td>
<td>-0.5</td>
<td>-1.5</td>
<td></td>
</tr>
</tbody>
</table>

(33) CP extraposition without restructuring:

<table>
<thead>
<tr>
<th>I: [vP [vP C[extr]:[1.0] V] v]</th>
<th>ExtrCrit</th>
<th>Inclusiveness</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>**O1: [vP [vP C[extr]:[1.0] V] v]</td>
<td>w = 3.0</td>
<td>w = 1.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>O2: [vP [vP C[extr]:[1.0] V] v]</td>
<td>-1.0</td>
<td>-3.0</td>
<td></td>
</tr>
</tbody>
</table>

(34) No CP extraposition with obligatory restructuring:

<table>
<thead>
<tr>
<th>I: [vP [vP C[extr]:[0.2] V] v]</th>
<th>ExtrCrit</th>
<th>Inclusiveness</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1: [vP [vP C[extr]:[0.2] V] v]</td>
<td>w = 3.0</td>
<td>w = 1.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>**O2: [vP [vP C[extr]:[0.2] V] v]</td>
<td>-0.2</td>
<td>-0.6</td>
<td></td>
</tr>
</tbody>
</table>

(35) Constraints:
   a. PIC (Phase Impenetrability Condition, Chomsky (2001)):
      *C that c-commands \( \alpha \) of a dependency \( \Delta \) but does not m-command \( \alpha_{i-1} \) of \( \Delta \).
   b. MC (Merge Condition; Chomsky (1995; 2001), Heck & Müller (2013)):
      Structure-building features ([φφ]) participate in Merge.

Note:
(i) PIC is a reformulation of Chomsky’s original concept. A dependency can be one established by Agree, or by movement; only the latter is relevant in the present context (i.e., \( \langle \alpha_{i-1}, \alpha_i \rangle \) is a link of a movement chain).
(ii) The relevant feature for MC in the present context is [scr]; Optionally, [scr] shows up on v in the numeration, and must be matched by a [scr] feature on some XP.

(36) Scrambling/unstressed pronoun fronting in the third construction:

<table>
<thead>
<tr>
<th>I: [vP ... [CP C[0.5] ... DP[scr] ... v] v]</th>
<th>PIC</th>
<th>MC</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>**O1: [vP DP[scr] [CP C[0.5] ... tDP ... v] v]</td>
<td>w = 3.0</td>
<td>w = 2.0</td>
<td>-0.5</td>
</tr>
<tr>
<td>O2: [vP ... [CP C[0.5] ... DP[scr] ... v] v]</td>
<td>-1.0</td>
<td>-2.0</td>
<td></td>
</tr>
</tbody>
</table>

Note:
(i) It is presupposed here that long-distance scrambling cannot proceed via SpecC. This follows from various theories of improper movement (e.g., Müller (2014), Wurmbrand (2015)).
(ii) Inclusiveness is ignored here. Ultimately, this constraint implies that the weight for PIC will have to be decreased to 1.0 (and the two constraints yield a gang (cumulative) effect).

(37) Scrambling/unstressed pronoun fronting without restructuring:

<table>
<thead>
<tr>
<th>I: [vP ... [CP C[1.0] ... DP[scr] ... v] v]</th>
<th>PIC</th>
<th>MC</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>**O1: [vP DP[scr] [CP C[1.0] ... tDP ... v] v]</td>
<td>w = 3.0</td>
<td>w = 2.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>O2: [vP ... [CP C[1.0] ... DP[scr] ... v] v]</td>
<td>-1.0</td>
<td>-3.0</td>
<td></td>
</tr>
</tbody>
</table>

(38) Scrambling/unstressed pronoun fronting with obligatory restructuring:

<table>
<thead>
<tr>
<th>I: [vP ... [CP C[0.2] ... DP[scr] ... v] v]</th>
<th>PIC</th>
<th>MC</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>**O1: [vP DP[scr] [CP C[0.2] ... tDP ... v] v]</td>
<td>w = 3.0</td>
<td>w = 2.0</td>
<td>-0.2</td>
</tr>
<tr>
<td>O2: [vP ... [CP C[0.2] ... DP[scr] ... v] v]</td>
<td>-1.0</td>
<td>-2.0</td>
<td></td>
</tr>
</tbody>
</table>

5.4. Discussion

5.4.1 Arguments against Gradient Harmonic Grammar Approaches to Reanalysis

Problem no. 1:
Recall that it correctly follows from the Remove-based approach that the relevant pieces of structure are accessible from below but inaccessible from above. There is no obvious way how one could express this generalization by means of gradient representations; the relative weights of the categories in the representations remain identical throughout, and it’s only the varying weights of the constraints that determine whether some piece of structure is accessible or not for a given operation.

Problem no. 2:
There is a conceptual issue: It looks as though constraints must be rephrased so as to talk about the relevant items with strength variation: They are now licensing conditions for these items. Can there be more than one category that a given constraint is a licensing condition
for? It seems that this would be required for cases like (3), and the formulation of the constraint CONTROL (for PRO and for the higher external argument DP).

**Problem no. 3:**
Reassociation after removal gives rise to new c-command relations (see particularly Müller (2017b)). This can never happen in Gradient Harmonic Grammar because structural relations remain the same throughout. The only way out here, it seems, would be to make c-command sensitive to strength of the intervening items (where a small weight of a category implies that it can be ignored; see Ross (1973b, 393) for a proposal).

5.4.2. **Arguments for Gradient Harmonic Grammar Approaches to Reanalysis**

**Argument no. 1:**
In a structure removal approach, the eventual output representation does not contain all items that are needed for semantic interpretation (DP_{ext} is recoverable via existential closure but missing if it does not return from the workspace as a by-phrase). This issue does not arise with the gradient representation approach: DP_{ext} is always present.

**Argument no. 2:**
Iconicity: The more weight a category has, the more likely its lexical realization is. This could straightforwardly be handled in a system where lexical realization (e.g., vocabulary insertion as in Distributed Morphology) is also subject to gradient representations (i.e., it is more likely to be successful if the weight associated with the abstract syntactic head that insertion is to take place into is higher).

**Argument no. 3:**
An empirical argument: The Remove-based approach predicts that the third construction behaves identically to ordinary restructuring. However, it is known to be somewhat more restricted (Wöllstein-Leisten (2001)); e.g., some verbs (for some speakers) permit restructuring but not the third construction. Moreover, scope of negation is always clause-bound in the third construction (Santorini & Kroch (1991)). In the Remove-based approach, it is unclear why this should be so. However, in the gradient representations approach, it can be postulated that a C head of a regular restructuring CP has a weight that is somewhat smaller than that of a restructuring CP that undergoes extraposition. The slightly larger weight of the latter CPs then still does not block long-distance scrambling and long-distance unstressed pronoun fronting, but suffices to block long-distance scope of negation.

(39) **Scope of negation in regular restructuring vs. third construction contexts:**

a. dass ich seinen neusten Roman [CP C nicht zu lesen beschlossen habe] that I his newest novel decided have (ambiguous scope)

b. dass ich seinen neusten Roman beschlossen habe [CP C nicht zu lesen] that I his newest novel decided have not to read (only narrow scope)

6. **Squishy Grammar**

Gradient Harmonic Grammar is extremely similar to Squishy Grammar (Ross (1973a;b; 1975)).

(40) **Basic assumptions of Squishy Grammar** (Ross (1973b, 387-388)):

a. “We must allow constituent class membership to a degree.”

b. Instead of standard category symbols like [X], there are weighted category symbols of type [αX], where α ranges over the real numbers in [0,1].”

c. Rules, filters, and other types of semantic processes, are given upper and lower threshold values of α between which they operate.

d. In addition, whereas the system permits a determination of categorical grammaticality status, Ross actually embraces a fine-grained system of gradient output judgements (as in MaxEnt grammar or Noisy Harmonic Grammar, and as systematically assumed in Lakoff’s (1973) Fuzzy Grammar).

**Consequence:**
The approach to reanalysis in passive and restructuring constructions sketched above can directly be transferred to a Squishy Grammar analysis; in fact, Ross is concerned with very similar kinds of evidence (and much more fine-grained distinctions reflected in different weight assignments), based on the concepts of “nouniness” (passive) and “clausematiness” (restructuring).

**References**


