Opaque interaction of Merge and Agree: on two types of Internal Merge

**Claim**: I present an empirical argument for a strictly derivational syntax based on timing of operations. **Empirical evidence**: Opacity effects show that internal Merge (IM) must be split into IM triggered by edge features and IM triggered by non-edge features (e.g. the wh-feature on C, the EPP on T). When both types of IM are triggered by the same head $H$, they apply at different points in the derivation. This becomes visible once they interact with Agree: In some languages, non-edge feature-driven IM feeds/bleeds Agree initiated by $H$, whereas IM triggered by edge features counter-feeds/counter-bleeds Agree. **Derivation**: Features inducing elementary operations are ordered on $H$: One type of IM applies before and the other after Agree. **Consequence**: Agree not only needs to be ordered wrt. Merge; a more fine-grained approach is needed that distinguishes between different types of (internal) Merge.

1 Introduction

1.1 Rule interactions in grammar

**TWO TYPES OF RULE INTERACTIONS**: transparent and opaque interactions (cf. Kiparsky [1968; 1971; 1973].

(1) **Transparent rule interactions**:
   a. Feeding:
      (i) A rule $R_1$ creates the context for the application of a rule $R_2$.
      (ii) $R_1$: $A \rightarrow B$, $R_2$: $B \rightarrow C$
   b. Bleeding:
      (i) A rule $R_1$ destroys the context for the application of a rule $R_2$.
      (ii) $R_1$: $A \rightarrow B$, $R_2$: $A \rightarrow C$

(2) **Opaque rule interactions**:
   a. Counter-feeding:
      (i) A rule $R_1$ creates the context for the application of a rule $R_2$ and should thus feed $R_2$.
      (ii) However, empirical evidence shows that $R_2$ has not applied although $R_1$ has.
      (iii) On the surface: A rule has not applied although its context is given.
      (iv) $R_2$: $B \rightarrow C$, $R_1$: $A \rightarrow B$
   b. Counter-bleeding:
      (i) A rule $R_1$ destroys the context for the application of a rule $R_2$ and should thus bleed $R_2$.
      (ii) However, empirical evidence shows that $R_2$ has applied although $R_1$ has as well.
      (iii) On the surface: A rule has applied although its context is not given.
      (iv) $R_1$: $A \rightarrow C$, $R_2$: $A \rightarrow B$

- Rule interactions have been a major topic in phonology and syntax since the earliest days of generative grammar. Opacity was first described by Chomsky (1951) (on Hebrew phonology).
- For an overview of interactions of phonological rules see e.g. Chomsky and Halle (1968); Anderson (1969; 1974); Koutsoudas et al. (1974); Kenstowicz and Kisseberth (1977; 1979); Baković (2011).
- On rule interaction in morphology see Embick (2010); Arregi and Nevins (2012).
In syntax, the most comprehensive treatment of this topic is Pullum (1979); see also Ross (1967); Williams (1974); Kayne (1975); Perlmutter and Soames (1979), McCawley (1984; 1988), ˇRezaˇc (2004).

Rule interactions have been taken as evidence for the Linear Order Hypothesis: Rules apply sequentially. A rule R is only applicable once the immediately preceding rule has applied, neither before nor after that point. Each rule takes as its input the output of the immediately preceding rule.  

1.2 Conflicts in the derivation: rule ordering in Minimalism

**Rule ordering in Minimalism:**

- Minimalism (Chomsky (1995) et seq.): strictly derivational approach to syntax, structures are built up incrementally in a bottom-up fashion. Rule ordering is thus (again) an important topic.
- There are two elementary operations Chomsky (2000; 2001):

  1. Merge and Agree:
     a. Merge (internal and external Merge) is a structure-building operation. Merge is triggered by structure-building features \[
     \{ \ast F \ast \}\n     
     b. Agree relates functional heads and arguments. It is (among other things) responsible for argument encoding: (i) \( \phi \)-features are copied from DPs onto functional heads and (ii) case values are assigned by functional heads to DPs. Agree is triggered by probe features \( \ast F \ast \).

- These operation-inducing features can be ordered. This assumption is needed independently because some functional heads trigger more than one operation:
  - v: triggers Agree and (external) Merge of the external argument: \( v \{ \{ \ast D \ast \}, \{ \ast \phi \ast \} \}\)
  - T (e.g. in English): triggers Agree with the subject DP and (internal) Merge to SpecT (EPP property): \( v \{ \{ \ast D \ast \}, \{ \ast \phi \ast \} \}\)

- Evidence for ordering of elementary operations: see van Koppen (2005); Béjar and ˇRezaˇc (2009); Halpert (2012); Assmann and Heck (2012) for a strict ordering; see Heck and Müller (2007); Müller (2004a); Assmann et al. (2012) for consequences of different orders of Merge and Agree on v and T.
- Assumption: The order of operation-inducing features on a head is free, determined language-specifically (on variation see section 5).

**A simple example of counter-bleeding: subject-verb-agreement in English:**

- T agrees with the subject in \( \phi \)-features.
- Agree applies under c-command.
- EPP property: the subject is located in SpecT on the surface, i.e., it is not in the c-command domain of T, nevertheless there is overt subject-verb-agreement.
- Counter-bleeding: \( \phi \)-Agree has applied although its context is not given in the output structure.
- Standard assumption: T agrees with the subject DP before it moves to SpecT. At the point where Agree applies, the DP is still in the c-command domain of T. Order of features on T: \( \{ \{ \ast \phi \ast \} > \{ \ast D \ast \} \}\)

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1 Alternative hypotheses: (i) simultaneous application of all rules to the underlying structure (Direct Mapping Hypothesis), (ii) sequential but unordered application of rules (Unordered Rule Hypothesis). The former can handle opaque interactions but not transparent interactions; the latter overgenerates since it always predicts any possible ordering between rules to be possible. Pullum (1979) proposes a mixture of the Direct Mapping Hypothesis and ordered sequential application of rules: All rules apply simultaneously unless a universal principle enforces an order. This must be the case for any transparent interaction.
Surface representation of the TP in English:

\[
\begin{align*}
& [\text{TP} \text{DP}_{\text{ext}} \{[\varphi;2\text{SG}]\} \{v' \text{T} \{[\varphi;2\text{SG}] \} \{v_p \text{DP}_{\text{ext}} \{v' \text{VP} \text{VP}_{\text{int}} \}]]]\end{align*}
\]

\(\text{① Agree} \quad \text{② Move}\)

Opacity in the present data:

- A head H triggers Agree and internal Merge.
- XPs that are internally merged to SpecH do not show a uniform behaviour with respect to Agree: Sometimes IM feeds/bleeds Agree initiated by H and sometimes it has the opposite effect in exactly the same position (counter-bleeding/counter-feeding).
- The split between movement types is not random: If SpecH is an intermediate landing site for XP (triggered by edge features) it counter-feeds/counter-bleeds Agree triggered by H; if SpecH is the final position of a movement chain (triggered by other features) it feeds/bleeds Agree by H.
- Pattern: Intermediate movement of XP to SpecH behaves as if the DP is not moved at all wrt. Agree (opaque); final movement to SpecH patterns differently wrt. Agree (transparent interaction).
- Analysis: ordering of operations

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IM to the final landing site > agreement > IM to an intermediate landing site
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2 Assumptions

- strictly derivational syntax, structure is built up incrementally in a bottom-up fashion
- Clause structure \([\text{CP} \text{CP} \{\text{TP} \text{TP} \{v_p \text{DP}_{\text{ext}} \{v' \text{VP} \text{VP}_{\text{int}} \}]]]\)
- All operations are feature-driven: Agree is triggered by probe features \([*\text{F}]*\), Merge is triggered by structure-building features \([*\text{F}]*\) (notation: Sternefeld (2006); Heck and Müller (2007)).
- Intermediate movement steps are triggered by edge features \([*\text{X}]*\) (categorially underspecified structure-building features).
- Agree: A probe P on a head H searches for the closest goal G in its c-command domain with a matching feature. Result: G values P (φ-Agree) or P values G (case assignment) (Chomsky 2000; 2001).
- case probes: \([*\text{c:value}]*\); φ-probes: \([*\varphi;\square]*\)
- Insertion of default values if Agree fails (cf. Béjar 2003; Preminger 2011): φ-Agree: [3sg], case Agree: [c:nom].
- Traces are not visible for Agree (or: movement does not leave behind a trace).
- The Activity Condition holds (Chomsky 2001): A DP that has received a case value cannot be the goal for an Agree relation.
- Movement is sensitive to the PIC, but Agree is not PIC-sensitive (Bošković 2007).
3 Abstract patterns of opaque interactions

**Bleeding:**

(5) XP
\[ X \{ [\phi*] \} \rightarrow \downarrow \]
\[ \text{DP} \quad \text{Y'} \]
\[ \text{Agree} \]

(6) XP
\[ \text{DP} \rightarrow \text{X'} \]
\[ X \{ [\text{MERGE}] \rightarrow [\phi*] \} \rightarrow \downarrow \]
\[ \text{YP} \]
\[ t_{DP} \quad \text{Y'} \]
\[ \text{① Move} \]

- Movement of the DP to SpecX applies before Agree initiated by X.
- At the point where Agree applies, the DP is not in the c-command domain of the probe on X; Agree X – DP is thus bled.
- Bleeding occurs for example on T if the order of Internal Merge and Agree is the reverse of what happens in English, cf. [4] If the subject DP moves to SpecT before T probes, subject-verb-agreement is bled.

**Counter-bleeding:**

(7) XP (output representation):
\[ \text{XP} \]
\[ \text{DP} \{ [\phi: 2S_G] \} \rightarrow \text{X'} \]
\[ X \{ [\phi: 2S_G] \} \rightarrow \downarrow \]
\[ \text{YP} \]
\[ t_{DP} \quad \text{Y'} \]

- Same surface representation as in (6): DP is in SpecX and it is thus expected that Agree T – DP is bled, but Agree is indeed successful.
- Analysis: The order of operation-inducing features on X is reversed: \[ X \{ [\phi*] \rightarrow [\bullet X] \} \]
- Consequence: DP is still in its base position when X probes. Y thus finds a goal in its c-command domain as is the case when the DP is not moved at all.
Feeding:

(8) $\text{XP} \quad \text{YP} \\
X \{ [\ast \phi \ast] \} \\
\text{DP}_1 \quad Y' \\
Y \quad ZP \\
\text{DP}_2 \quad Z' \\
\ast \text{Agree} \\

(9) $\text{XP} \quad \text{YP} \\
\text{DP}_1 \\
X' \quad \text{DP}_2 \quad Z' \\
\text{t}_{\text{DP}_1} \quad Y' \\
Y \quad ZP \\
\text{DP}_2 \quad Z' \\

• $\text{DP}_1$ is a defective intervener: It blocks Agree between X and the lower DP$_2$ and it cannot be a goal for the probe on X itself.

• If DP$_1$ moves to SpecX before X initiates Agree, it is no longer in the c-command domain of X and hence, does not block Agree $X - \text{DP}_2$ anymore.

Counter-feeding:

(10) $\text{XP (output representation):}$

$\text{XP} \\
\text{DP}_1 \quad X' \\
\text{t}_{\text{DP}_1} \quad Y' \\
Y \quad ZP \\
\text{DP}_2 \quad Z'$

• Same surface representation as in (9): DP$_1$ is in SpecX and it is thus expected that Agree $X - \text{DP}_2$ is fed, but is isn't (the $\phi$-probe in (10) is not discharged).

• Analysis: reverse order of operation-inducing features on X: $X \{ [\ast \phi \ast] > [\bullet \bullet \ast] \}$

• Consequence: DP$_1$ is still in its base position when X probes. DP$_1$ thus intervenes for Agree, as is the case when DP$_1$ is not moved at all.

Order of operation-inducing heads that produces opacity effects:

$X: [\bullet \bullet \ast] > [\ast \phi \ast] > [\bullet \bullet \ast]$
4 Data

4.1 (Counter-)Bleeding: The Anti-agreement effect (AAE)

Data:

- In a number of languages, φ-Agree between the verb and the subject DP reduces to default agreement (3sg) if the subject is extracted to the minimal SpecC (questioned, relativized, clefted), cf. (11-b) and (13).
- If, however, the subject undergoes long-distance extraction to SpecC of a higher clause, there is full subject-verb agreement in the clause from which the subject is extracted, as if the subject is not extracted at all, cf. (11-d) and (12).
- Languages: Berber, Breton, Welsh, Kinande, Kikuyu, Palauan, Turkish, etc. (cf. Ouhalla (1993); Phillips (2001); Richards (1997) for an overview)

(11) Anti-agreement in Berber, wh-movement (Ouhalla 1993: 479f.):

a. zri-n imhdarn Mohand
   saw-3PL students Mohand
   ‘The students saw Mohand.’
   no extr., full agr.

b. man tamghart ay yzrin Mohand
   which woman COMP see.PART Mohand
   ‘Which woman saw Mohand?’
   short extr., default agr.

c. *man tamghart ay t-zra Mohand
   which woman COMP 3SG.FEM-saw Mohand
   ‘Which woman saw Mohand?’
   short extr., full agr.

d. man tamghart ay nna-n qa t-zra Mohand?
   which woman COMP said-3PL that 3SG.FEM-saw Mohand
   ‘Which woman did they say saw Mohand?’
   long extr., full agr.

(12) \[ \text{CP} \quad [\text{TP} \quad \text{DP} \quad [t' \ldots ]]] \\
\quad \checkmark \text{Agree} \quad \uparrow \\

(13) \[ \text{CP} \quad \text{DP} \quad [\text{TP} \quad t_{DP} \quad [t' \ldots ]]] \\
\quad *\text{Agree} \quad \uparrow \\

Rule Interactions

- Short Ā-movement of the subject DP to the minimal SpecC bleeds φ-Agree with that DP.
- Long-distance Ā-movement of the subject passes through the local SpecC position, too, but it does not bleed φ-Agree. Hence, long Ā-movement of the subject counter-bleeds φ-Agree.
- For syntactic, morphological and semantic evidence for the successive-cyclic nature of long Ā-movement through the local SpecC position see McCloskey (1979); Cole (1982); Clements et al. (1983); Torrego (1984); Bars (1986); Lebeaux (1990); Chung (1994); Cole and Hermon (2000); Fox (2000); Lahne (2008) among many others. Another argument from variation in AAE languages will be presented below.

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2The verb form in (11-b) is glossed as ‘participle’, but Ouhalla (1993) argues that this form contains the default 3rd person masculine form of agreement. In many other languages with the AAE, the verb form under short Ā-extraction is completely identical to 3rd person singular agreement.
Analysis:

- Assumption: subject-verb agreement in AAE languages is mediated by C (cf. Ouali (2008); Henderson (2009)).
- Reason: Short and long movement can be distinguished by the nature of their trigger on the minimal C head; the former ends in the local SpecC (triggered by \([\bullet WH\bullet]\)) whereas the latter uses SpecC only as an intermediate landing site (triggered by \([\bullet X\bullet]\), an edge feature).
- Consequence if the morphological reflex of Agree is visible on T: Either the verb picks up the inflection in C by V-to-C movement (cf. Sproat (1985); Jouitteau (2005) on Celtic) or the inflection is lowered to T in the morphological component.
- Local Â-movement to SpecC is triggered by \([\bullet WH\bullet]\) (or \([\bullet REL\bullet], [\bullet TOP\bullet]\)) and applies before Agree.
- Long-distance Â-movement uses the local SpecC only as an intermediate landing site. It is triggered by an edge-feature \([\bullet X\bullet]\) and applies after Agree.

(14) Order of features on C:
\[
C \{ \left[ \bullet WH\bullet \right] \succ \left[ \bullet \phi\bullet \right] \succ \left[ \bullet X\bullet \right] \}
\]
- Consequence: A locally Â-moved DP is not in the c-command domain of C anymore when C probes and hence, C does not find a goal; a long-distance Â-moved DP is still in its base position when C probes.

(15) No Â-extraction of the subject DP, \(\phi\)-probe discharged:
\[
[CP \{[\bullet \phi\bullet] \succ [\bullet \phi\bullet] \succ [\bullet X\bullet]\} \{TP DP[T \ldots]]\] \]

(16) Local Â-extraction of the subject DP:

a. Step 1: Movement of the subject to SpecC, wh-feature discharged:
\[
[CP DP_{wh} C[\bullet WH\bullet] \succ [\bullet \phi\bullet] \{TP \{TP \{T \ldots\}\}\}] \]

b. Step 2: \(\phi\)-Agree initiated by C, default valuation of the probe:
\[
[CP \{[\bullet \phi\bullet] \succ [\bullet \phi\bullet] \succ [\bullet X\bullet]\} \{TP \{TP \{T \ldots\}\}\}] \]

(17) Long Â-extraction of the subject DP:

a. Step 1: \(\phi\)-Agree initiated by C, \(\phi\)-probe discharged
\[
[CP C\{[\bullet \phi\bullet] \succ [\bullet X\bullet]\} \{TP \{TP \{T \ldots\}\}\}] \]

b. Step 2: Movement of the subject DP to the local SpecC, edge feature discharged
\[
[CP DP_{wh} \{C\{[\bullet \phi\bullet] \succ [\bullet X\bullet]\} \{TP \{TP \{T \ldots\}\}\}] \]

Lowering of the inflection is reminiscent of Affix-Hopping (Chomsky 1957). Furthermore, it seems plausible given Feature Inheritance, i.e., \(\phi\)-feature transfer from C to T (cf. Chomsky (2004); Richards (2007)); the only difference is that I assume that this transfer may apply late, in the morphological component (cf. morphological merger in Embick and Noyer (2001)). See also Ouali (2008) on variation in the application of Feature Inheritance.
Evidence from variation for SpecC as an intermediate landing site:

- If long Ā-extraction does not make a stop-over in the minimal SpecC position but moves directly to the matrix SpecC, it follows why there is no bleeding effect: the subject DP is still in its base position when the minimal C head probes.
- However, assuming that long Ā-extraction does not stop in the local SpecC position causes problems for AAE languages in which both short and long Ā-extraction bleed subject-verb-agreement (e.g. Fiorentino and Trentino (Brandi and Cordin 1998)).
- Wrong prediction: There should be no bleeding under long-extraction in these languages, the DP is moved too late to have this effect. $\rightarrow$ cyclicity problem
- Assuming that languages do not vary wrt. to the availability of the minimal SpecC position as an intermediate landing site, the minimal C head must thus have an edge feature in these languages.
- But then the AAE data in Berber are indeed opaque: Both short and long Ā-extraction of the subject go through the minimal SpecC position, but have different consequences for Agree.
- Proposal: Long and short extraction always go through the minimal SpecC. Berber and Trentino simply differ in the order of operation-inducing features on T. In the Trentino type languages, the order is as in (18).
- Consequence: The subject DP always moves before C starts probing, regardless of whether the DP will stay in the minimal SpecC or move on to the matrix clause later on. Extraction of the subject thus always bleeds Agree with C.

(18) Order of features on C in Trentino type languages:

\[
\text{C} \{ [*\text{WH} \ast], [*\text{X} \ast] \succ [*\varphi \ast] \}
\]

Remarks on (some) previous analyses:

- Ā-binding approach (see e.g. Brandi and Cordin 1998; Ouhalla 1993):
  1. Basic idea: Subject extraction leaves behind a pro in the subject position that must not be bound by its antecedent from an Ā-position (Principle B). It is, however, bound under short subject extraction. Solution: pro must not be licensed in the first place. It is licensed by rich agreement; dropping agreement (=anti-agreement) makes pro unavailable.
  2. Conceptual problem: a lot of theoretical devices are needed (empty elements, licensing conditions on empty categories, the vague concept of “rich agreement”, etc.) to account for the AAE; at least some of these are to be avoided in a minimalist analysis.
  3. Variation: Long extraction leads to the AAE in some languages but not in others. This is accounted for in a rather stipulative way. Ouhalla (1993) assumes that a trace in the minimal SpecC position can serve as an antecedent for pro in some but not in other languages.

- Anti-locality approach (Cheng 2006; Schneider-Zioga 2007):
  - Basic idea: Short extraction of the subject is too local in the sense of Grohmann (2003) (at least in some AAE languages). Repair: Lower copy of the subject is spelled out differently, this is the special agreement morphology found in this context. Long extraction does not go through the minimal SpecC but directly targets the matrix clause and is thus not too local.
  - Empirical problem: That the base position of the subject and its landing site in the minimal clause are in the same local domain (i.e., the left periphery under a split CP analysis) only holds for some languages.
  - Conceptual problem: Why does the spell-out of a reduced copy rescue too local movement steps?
– **Variation:** No account of the Trentino type languages. probably, one would have to say that long A-movement goes through the minimal SpecC position in some languages but not in others (cf. the binding approaches).

→ Present approach:
no need for empty categories + licensing conditions for them and for copy reduction; variation is easily accounted for by reordering of operation-inducing features on a head; languages thus do not have to differ in the locality of long-distance movement; ordering of operation-inducing features is needed in a minimalist framework anyway if only a single operation can apply at once.

**REMAINING ISSUES:**

- If the subject is locally extracted, why can the probe on C not Agree with the object (if there is one)?
  Answer: The object gets its case value early in the derivation from v. It is then inactive (Activity Condition), i.e., it cannot be a goal for $\phi$-Agree.

- The AAE does not occur with object extraction. If T is a phase head, there is, however, a stage in the derivation at which the object is at the edge of T and above the subject DP. Why can’t the $\phi$-probe Agree with the closer object DP? Under long object extraction, the object DP is in the c-command domain of C when C starts probing.
  Answer: As before, this is impossible because the object is inactive at that point of the derivation.

- If $\phi$-Agree and case assignment go hand in hand, where does a subject that undergoes short A-movement to the minimal SpecC get its case value from (Agree with C is bled)?
  Answer: default valuation happens just as with $\phi$-features; nominative is valued on the subject DP.

### 4.2 (Counter-)Feeding: Intervention effects in Icelandic B

**Data:**

Sigurðsson and Holmberg ([2008](#)) describe three Icelandic dialects that pattern differently with respect to intervention effects caused by dative experiencers. Opaque interaction of Agree and Internal Merge is found in Icelandic B for number agreement as shown in (19) (see also Holmberg and Hróarsdóttir ([2003](#))):

(19)  *Raising constructions in Icelandic:

a. |að virðist/*virðast einherjum manni [hestarnir vera seinir] there seem.3SG/seem.3PL some man.DAT the-horses.NOM be slow ‘It seems to some man that the horses are slow.’
b. Mér virðast t$_{NP}$ [hestarnir vera seinir] me.DAT seem.3PL the-horses.NOM be slow ‘It seems to me that the horses are slow.’
c. Hvaða manni veist |ú að virðist/*viðast t$_{wh}$ [hestarnir vera seinir] which man.DAT know you that seem.3SG/seem.3PL the-horses be slow ‘To which man do you know that the horses seem to be slow?’

4As [Sigurðsson and Holmberg ([2008](#))] show, person agreement patterns differently from number agreement. Agreement in 1st and 2nd person is blocked in all three dialects, regardless of the position of the dative experiencer. In what follows, I confine myself to number agreement. The facts on person agreement can be integrated into the present analysis if person and number are separate probes, as Sigurðsson and Holmberg ([2008](#)) have argued, and if the person probe, searching for local person arguments, probes before any movement operation has taken place; i.e., the person probe is the feature on T which is discharged before all other operation-inducing features.
• $\phi$-Agree between $T$ and a lower subject DP is blocked by an intervening experiencer (defective intervention), see (19-a) and (20).

• If the experiencer is moved to Spec$T$ (EPP-driven movement), Agree between $T$ and the lower DP becomes possible, see (19-b) and (21).

• If, however, the experiencer is wh-moved to Spec$C$, Agree between $T$ and the lower DP is still blocked, see (19-c) and (22).

• On the surface, the experiencer does not intervene between $T$ and the DP in both (21) and (22). Nevertheless, a wh-experiencer behaves as if it did intervene, just as if it is not moved at all.

(20) $\left[TP \begin{array}{c}T' \vP \begin{array}{c}\text{Exp} \begin{array}{c}V \begin{array}{c}V \begin{array}{c}T' \ldots \text{DP} \ldots \text{T}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\right]$ *Agree

(21) $\left[TP \begin{array}{c}T' \vP \begin{array}{c}t_{Exp} \begin{array}{c}V \begin{array}{c}V \begin{array}{c}T' \ldots \text{DP} \ldots \text{T}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\right]$ ✓ Agree

(22) $\left[CP \begin{array}{c}C' \begin{array}{c}\text{Exp} \begin{array}{c}V \begin{array}{c}V \begin{array}{c}\text{T} \begin{array}{c}\vP \begin{array}{c}t_{Exp} \begin{array}{c}V \begin{array}{c}T' \ldots \text{DP} \ldots \text{T}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\right]$ *Agree

RULE INTERACTIONS:

• EPP-driven movement ([D•]) of the experiencer to Spec$T$ feeds Agree between $T$ and the lower DP.

• Assuming that movement to Spec$C$ makes a stop over in Spec$T$ (see below for justification), a wh-experiencer passes through Spec$T$ as well (IM triggered by an edge feature), but it does not feed Agree between $T$ and the lower DP in this position: Hence, wh-movement of the experiencer counter-feeds Agree between $T$ and the lower DP.

• Looking at the TP, the two cases are identical on the surface: The experiencer is in Spec$T$ (IM triggered by the EPP or an edge feature), but the consequences for possible Agree relations differ.

(23) Surface representation of the TP:

a. feeding b. counter-feeding

$\begin{array}{c}\text{Exp} \begin{array}{c}T' \vP \begin{array}{c}t_{Exp} \begin{array}{c}V \begin{array}{c}V \begin{array}{c}T' \ldots \text{DP} \ldots \text{T}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}$

$\begin{array}{c}\text{Exp}_{wh} \begin{array}{c}C' \begin{array}{c}T' \vP \begin{array}{c}t_{Exp} \begin{array}{c}V \begin{array}{c}V \begin{array}{c}T' \ldots \text{DP} \ldots \text{T}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}$

ANALYSIS:

• EPP-driven movement to Spec$T$ is applies before Agree initiated by $T$; therefore, the experiencer does not intervene anymore when $T$ starts probing.

• A wh-experiencer uses Spec$T$ only as an intermediate landing site; this movement is driven by an edge feature and applies after Agree. The experiencer thus still intervenes at the point of the derivation where $T$ starts probing.

(24) Order of features on $T$ (Icelandic B):

$T \{[\bullet D•] > [\bullet \phi•] > [\bullet X•]\}$

(25) No movement of the experiencer: Agree fails, default agreement:

$\left[TP T [\bullet \phi•] \begin{array}{c}\vP \begin{array}{c}V \begin{array}{c}V \begin{array}{c}\text{T} \begin{array}{c}\vP \begin{array}{c}t_{Exp} \begin{array}{c}V \begin{array}{c}T' \ldots \text{DP} \ldots \text{T}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\end{array}\right] \ldots$
EPP-movement of the experiencer:

a. Step 1: movement of the experiencer to SpecT, EPP discharged

\[
\text{Move}
\]

b. Step 2: Agree between T and the lower DP, \( \phi \)-probe discharged:

\[
\text{✓ Agree}
\]

wh-movement of the experiencer:

a. Step 1: Agree initiated by T fails, Exp\(_{wh}\) still intervenes, default agreement

\[
\text{*Agree}
\]

b. Step 2: Intermediate movement step to SpecT, edge feature discharged:

\[
\text{Move}
\]

Evidence from variation for SpecT as an intermediate landing site:

- The interaction of Agree and Internal Merge in Icelandic B is only opaque if wh-movement makes a stop-over in SpecT. Without this stop-over the wh-experiencer is still in its base position when T probes since it will only be attracted by the head C, which is merged later (this is the solution proposed by Holmberg and Hróarsdóttir (2003)).

- However, assuming that wh-movement does not stop in SpecT causes problems for Icelandic A: Both wh-movement and EPP-driven movement feed Agree, i.e., \([T_{9-10}]\) is grammatical with 3rd person plural agreement on the verb.

- If the wh-experiencer does not move through SpecT, it is unclear why it does not block Agree T – DP. → cyclicality problem

- Solutions in the literature (for the Icelandic A pattern):
  - Weakening of the Strict Cycle Condition (Anagnostopoulou 2003): phase-internal counter-cyclicity; Agree between T and the lower DP can take place after the wh-experiencer has been moved to SpecC.
  - Give up standard locality constraints (McGinnis 2001): Intervention is evaluated at the phase-level (MLC is a representational constraint). On the surface, the wh-experiencer does not intervene anywhere between T and the lower DP.

---

5One might wonder why the wh-experiencer does not check the EPP. In contrast to the wh-feature on the local C head in the AAE derivation with long A-extraction, the EPP is always present on T in Icelandic. If the wh-experiencer checked the EPP in Icelandic B, this would feed agreement, contrary to fact. I do not have an answer why the wh-experiencer cannot check the EPP, but it is clear for Icelandic that it doesn’t, because in exactly this configuration the EPP can be checked by a different phrase, as Holmberg and Hróarsdóttir (2003) show.

6For a similar pattern in Romance languages and Greek (although without an obvious Agree relation in \( \phi \)-features or case involved) see McGinnis (1998); Anagnostopoulou (2003) and references cited there: An experiencer blocks movement of the lower subject DP to SpecT. If, however, the experiencer is criticized to T or questioned, movement to SpecT becomes possible. The cyclicity problem is the same as in Icelandic A: The experiencer must be moved before T can attract the lower subject DP; however, this presupposes a counter-cyclic operation if the experiencer is wh-moved to SpecC without a stop-over in SpecT.
Covert movement + relativized minimality \cite{Legate2002}: Operator phrases are moved to an $\bar{A}$-position between VP and TP. When T probes for $\phi$-features it ignores elements in $\bar{A}$-positions.

no solution \cite{Rezac2004}: data are a puzzle given a strictly derivational approach to syntax and assuming that the MLC and the Strict Cycle Condition hold.

- **Proposal**: Movement to SpecC makes a stop over in SpecT. Hence, T is a phase head: it triggers intermediate movement steps to its edge.$^7$

- Icelandic B and Icelandic A simply differ in the order of operation-inducing features on T. In the latter it is as in (28).

- **Consequence**: The experiencer always moves before T starts probing, regardless of whether it will stay in SpecT or move on to another specifier later on. Movement of the experiencer thus always feeds Agree between T and the lower DP.

\begin{equation}
\text{(28) Order of features on T in Icelandic A:}
\begin{align*}
\text{T \{ [\star D \star], [\star X \star] \succ [\star \phi \star] \}}
\end{align*}
\end{equation}

- Assuming that the phase status of heads does not vary between languages, wh-movement of the experiencer makes a stop-over in SpecT in Icelandic B as well. In this case, the Icelandic B data in (19) are indeed opaque.

$\hookrightarrow$ The present account neither needs to give up standard assumptions on locality nor does it have to weaken the Strict Cycle Condition;\footnote{The present analysis is cyclic given the standard definition of the Strict Cycle Condition \cite{Chomsky1973} in which every phrase is a cyclic domain. Feeding and bleeding would be excluded in the first place for reasons of cyclicity if every projection was a cyclic domain.} variation is easily accounted for by reordering of operation-inducing features.

### 4.3 (Counter-)Bleeding: Possessor case and agreement in Hungarian

**Data:**

Properties of the possessor construction in Hungarian:

- the possessor precedes the possessum
- the possessum agrees with the possessor in $\phi$-features
- possessor case: dative or nominative
- linear order: Poss.dat $>$ D $>$ Poss.nom $>$ Det $>$ Adj $>$ N-Agr
- Poss.dat and Poss.nom are in complementary distribution; Poss.dat precedes D, Poss.nom follows D (cf. [29-b] and [29-c])
- D and Det may co-occur
- N agrees with possessor (nom and dat) in person and number
- Poss.dat can be moved out of the DP; Poss.nom cannot
- the position that Poss.dat occupies is an operator position; wh-phrases must move there and must be in dative case
- no semantic/pragmatic difference between a DP with Poss.nom and Poss.dat

\footnote{For the same conclusion that TP is a phase see \cite{Gallego2006}; the assumption is also made in \cite{Chomsky2003} and in \cite{BoeckxGrohmann2007}, as well as in all accounts that assume that successive-cyclic movement goes through all intermediate phrase edges (see \cite{Mullic2004a} and references cited there).}
(29) Szabolcsi (1994):
  a. az én kalap-om
     the I.NOM hat-POSS.1SG
     'my hat'
  b. (a) Mari kalap-ja
     the Mari.NOM hat-POSS.3SG
     'Mari’s hat'
  c. Mari-nak a kalap-ja
     Mari.DAT the hat-POSS.3SG
     'Mari’s hat'
  d. a te valamenyi
     the you.NOM each
     tiik-od
     secret-POSS.2SG
     'your every secret'

(30) Extraction data Szabolcsi (1994):
  a. Mari-nak nem ismert-em [t’ t
     Mari.DAT not knew-1SG
     növér-é-t]
     sister-POSS.3SG-ACC
     'I never knew any sister of Mari’
  b. *ki kalap-ja
     who.NOM hat-POSS.3SG
     'whose hat?’
  c. ki-nek a t kalap-ja
     who-DAT the hat-POSS.3SG
     'whose hat?’

Structure of the Hungarian DP

(31) Structure:
  [DP □ [DP [N′ [det [NP [Poss [n′ [N′ [Det [N′ [Poss] N]]]]]]]]]]
                ▲  Move ▲  Move ▲

  • Poss is merged as a sister of N (for reasons of theta-role assignment, cf. Delsing (1998); de Vries (2006); Georgi and Salzmann (2011))
  • Poss must move to Specn to derive the surface sequence: n [ [•EPP• ] ]
  • N-Poss-agreement is mediated by n: n [ [ •φ• ] ]
    (N-to-n movement leads to spell-out of the agreement features on N)
  • n assigns dative case: n [ [•dat• ] ]
  • Poss.dat moves further to SpecD: D [ [•Fdat• ] ]
  • nominative: default case instantiated on a DP if it does not Agree in case with n

Rule Interactions

  • EPP-driven movement of Poss to Specn bleeds dative case assignment.
  • Movement to SpecD must go through Specn, too, but it does not bleed dative case assignment by n, i.e., it counter-bleeds Agree.

Analysis

  • EPP-driven movement to Specn ends in Specn; it applies before Agree in case. Poss is no longer in the c-command domain of N after movement to Specn and hence Agree is bled.
  • Movement of Poss to SpecD uses Specn as an intermediate landing site; this movement is driven by an edge feature and applies after Agree. Poss can be assigned case by n since it is still in the c-command domain of n when n probes; movement to Specn applies afterwards.
  • n-Poss-Agree in φ-features is not influenced by the case of the possessor. Conclusion: φ-Agree applies before all other operations, it is the first operation that n triggers.
(33) Nominative possessor:
   a. Step 1: EPP-movement of Poss to Spec
   \[
   \text{Move}
   \]
   b. Step 2: Agree initiated by n fails, default case on Poss, case-probe discharged:
   \[
   \text{*Agree}
   \]

(34) Dative possessor:
   a. Step 1: Agree, n assigns dative to Poss, case-probe discharged:
   \[
   \checkmark \text{Agree}
   \]
   b. Step 2: Edge-feature-driven Internal Merge of Poss to Spec:
   \[
   \text{Move}
   \]

   - Side note: This is also evidence for the separation of case assignment and \(\phi\)-Agree since the two apply at different points in the derivation in Hungarian. For the same conclusion see Marantz (1991); Bobaljik (2008); Baker and Vinokurova (2010); Keine (2010); Preminger (2011).

5 Variation

Since the order of operation-inducing features on a head is free (extrinsic ordering), we expect the following four permutations (ignoring the possible orderings between the two types of features that trigger internal Merge):

1. \([\text{\textbullet FINAL\textbullet}], \text{\textbullet X\textbullet}] > [\phi\textbullet] \) (transparent)
2. \([\phi\textbullet] > [\text{\textbullet FINAL\textbullet}], \text{\textbullet X\textbullet}] \) (transparent)
3. \([\text{\textbullet FINAL\textbullet}] > [\phi\textbullet] > [\text{\textbullet X\textbullet}] \) (opaque)
4. \([\text{\textbullet X\textbullet}] > [\phi\textbullet] > [\text{\textbullet FINAL\textbullet}] \) (opaque)

GENERALIZATION:

- Pattern 4 does not seem to be attested for any of the phenomena I have looked at.
- Hence, there is a 3-out-of-4 pattern in the order of probe and structure-building features.
- Edge-feature-driven movement steps seem to apply after all other kinds of movements. Future research will show whether this is indeed confirmed for other instantiations of opaque interactions.

(35) Unattested order of operations:
   \(*[\text{\textbullet X\textbullet}] > [\phi\textbullet] > [\text{\textbullet D\textbullet}] \)

AN EXPLANATION:

- Proposal: the absence of this pattern is due to specificity (for the application of this concept in syntax see Lahme (2008); van Koppen (2005)).
- The two types of IM are ordered in a way such that the more specific feature is discharged before the less specific feature.
• Non-edge-features that trigger IM are more specific than edge-features.
• The former attract elements of a certain category or with a certain effect on interpretation (e.g. \([\text{*D*}],[\text{*WH*}],[\text{*TOP*}]\)).
• Edge features are underspecified structure-building features; they just demand attraction but do not ask for a certain category or interpretative property of the attracted item.
• The order of IM triggers relative to probe features is free (language-specific).

**Variation: Anti-agreement**

(36) *Attested and unattested patterns:*

<table>
<thead>
<tr>
<th></th>
<th>pattern 1</th>
<th>pattern 2</th>
<th>pattern 3</th>
<th>pattern 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAE</td>
<td>Trentino</td>
<td>English</td>
<td>Celtic Berber</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Fiorentino</td>
<td>(neither IM type bleeds Agree)</td>
<td></td>
<td>(IM types have different effects)</td>
</tr>
<tr>
<td></td>
<td>Ibibo</td>
<td>(both IM types bleed Agree)</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>(both IM types bleed Agree)</td>
<td>(neither IM type bleeds Agree)</td>
<td></td>
<td>(IM types have different effects)</td>
</tr>
<tr>
<td>Interv.</td>
<td>Icelandic A</td>
<td>Icelandic C</td>
<td>Icelandic B</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>(both IM types feed Agree)</td>
<td>(neither IM type feeds Agree)</td>
<td>(IM types have different effects)</td>
<td>?</td>
</tr>
<tr>
<td>Poss</td>
<td>?</td>
<td>Hungarian ((\phi)-Agree)</td>
<td>Hungarian (case)</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>(both IM types bleed Agree)</td>
<td>(neither IM type bleeds Agree)</td>
<td>((\phi)-Agree)</td>
<td>(IM types have different effects)</td>
</tr>
</tbody>
</table>

• On variation in AAE see [Ouhalla 1993; Ouali 2008; Phillips 2001] and references cited there.
• On variation in intervention effects see [Anagnostopoulou 2003; Sigurðsson and Holmberg 2008].
• On variation in possessor case/agreement see [Nikolaeva 2002] and references cited there.

### 6 Conclusion

• Internal Merge does not always apply before or after Agree. A more fine-grained approach with two types of IM is needed because they apply at different points in the derivation wrt. Agree.
• Empirical evidence: If a single head triggers both types of IM and Agree, IM has different consequences for Agree, although the moved DP occupies the same surface position SpecH.
• The split is between edge-feature-driven and non-edge-feature-driven IM, i.e., intermediate vs. final movement steps in a chain.
• Pattern: Edge-feature-driven IM patterns with no movement wrt. Agree, non-edge-feature-driven IM patterns differently.
• Final IM feeds/bleeds Agree whereas intermediate IM counter-bleeds/counter-feeds Agree.
• The analysis presupposes a strictly derivational model of syntax.
• Furthermore, the variation argues for the need of extrinsic (parochial) ordering of operations (contra Pullum 1979; 1992; McCawley 1988). 
• However, there seems to be a gap in the predicted reorderings: pattern 4 is not attested for the data presented in section 4. This gap may be due to Specificity.
• The attested variation with intervention effects provides evidence for the phase status of T.
• It has been independently argued that (i) elementary operations in syntax need to be ordered and (ii) that intermediate movement steps are triggered by a special kind of IM trigger: edge features. It is thus expected that edge-feature-driven IM may be ordered differently from other types of IM.
References


