Other approaches to the Williams Cycle

LING 252 · Ethan Poole · 10 February 2022

1 Introduction

1.1 The WC through a different lens

- Consider the following state of affairs:[1]
  - There are two classes of elements, both of which undergo movement: ● and ■
  - Locally, ● may precede ■, but not vice versa:

    (1) a. $[_{\text{CLAUSE}} \ldots \bullet \ldots \blacksquare \ldots]$

    b. $^{*}[_{\text{CLAUSE}} \ldots \blacksquare \ldots \bullet \ldots]$
  - Nonlocally, ● may cross ■, but ■ may not cross ●:[2]

    (2) a. $[_{\text{CLAUSE}} \ldots \bullet \ldots [_{\text{CLAUSE}} \ldots \blacksquare \ldots [\ldots \bullet \ldots \blacksquare \ldots]]]$

    b. $^{*}[_{\text{CLAUSE}} \ldots \blacksquare \ldots [_{\text{CLAUSE}} \ldots \bullet \ldots [\ldots \bullet \ldots \blacksquare \ldots]]]$
  - The restriction has nothing to do with linear precedence, because ■ may precede ● if the two occur exclusively in separate clauses:

    (3) a. $[_{\text{CLAUSE}} \ldots \bullet \ldots \bullet \ldots [_{\text{CLAUSE}} \ldots \blacksquare \ldots \blacksquare \ldots]]$

    b. $[_{\text{CLAUSE}} \ldots \blacksquare \ldots \blacksquare \ldots [_{\text{CLAUSE}} \ldots \bullet \ldots \bullet \ldots]]$
- The standard solution to the local ordering restriction in (1) is to assume a template:

  (4) $F_{\bullet} > F_{\blacksquare}$

⇒ However, Abels (2012) points out that a cartographic template has nothing to say about the nonlocal restriction in (2).

[1] Based on Abels (2012).

[2] The relative order of ● and ■ in their base-generated positions is not relevant, so this is not a nesting/crossing-path issue.

1.2 Three approaches

❶ ***Reduce locality to template***
The local restriction follows from a standard cartographic template. The nonlocal restriction follows from another constraint that references the template.
- Williams (2003, 2011, 2013); Müller (2014); Poole (to appear)

❷ ***Reduce template to locality***
Both the local and nonlocal restrictions follow from minimality in conjunction with articulated feature geometries.
- Abels (2012)

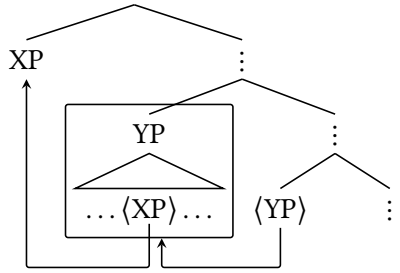
❸ ***Both locality and template***
Neither locality nor the template can be fully reduced to the other, but there are general constraints on their relationship.

– Keine (2016, 2019, 2020)

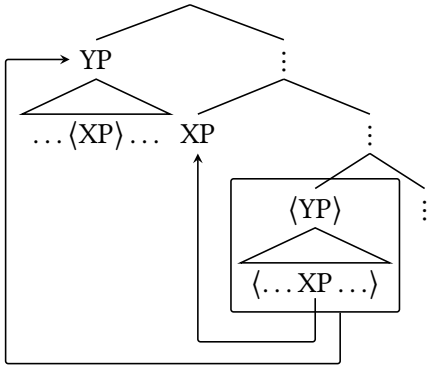
2 Abels 2007

- ***Background: Types of subextraction***

(5) **Surfing paths (smuggling)**

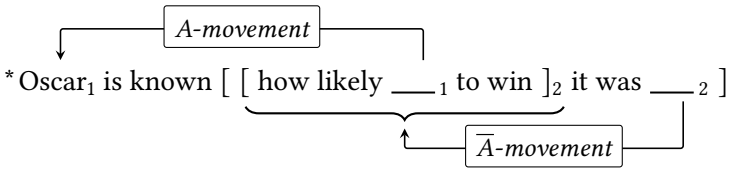


(6) **Diving paths (remnants)**

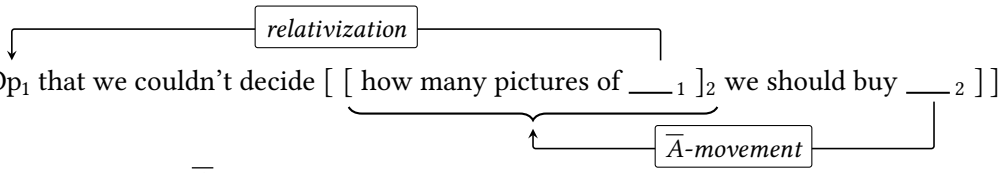


✳ ***Improper movement extends to subextraction***
Both surfing and diving paths exhibit improper-movement effects:

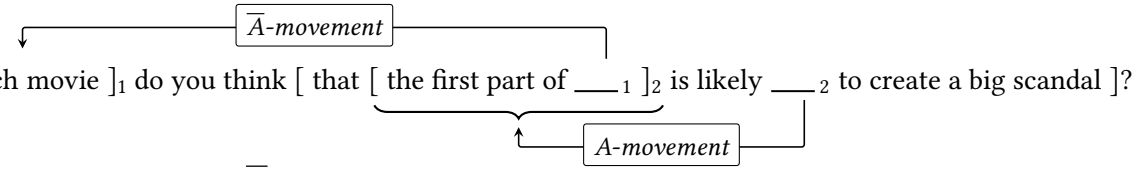
(7) **Surfing: $\overline{\text{A}}$-movement → A-movement**



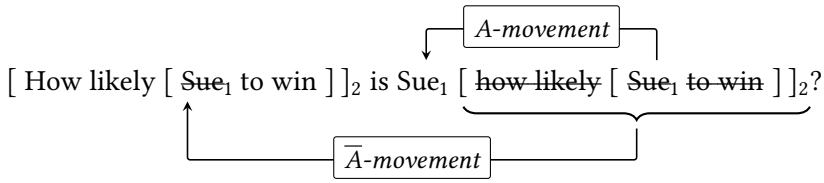
(8) **Surfing: *Wh*-movement → relativization**



(9) **Surfing: A-movement → $\overline{\text{A}}$-movement**



(10) **Diving: A-movement → $\overline{\text{A}}$-movement**



(*Surface string:* How likely to win is Sue?)

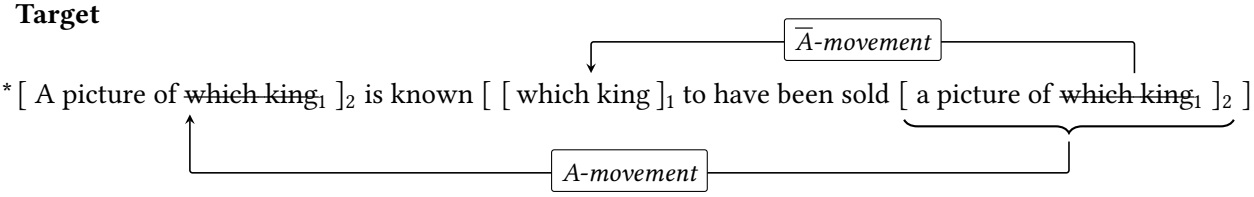
(11) **Diving: $\overline{\text{A}}$-movement → A-movement**

a. **Baseline: $\overline{\text{A}}$-movement in a finite clause**
It is known [[which king]$_1$ they sold [$_{\text{DP}}$ a picture of [~~which king~~]$_1$]]

b. **Baseline: $\overline{\text{A}}$-movement in a nonfinite clause**
It is known [[which king]$_1$ to sell [$_{\text{DP}}$ a picture of [~~which king~~]$_1$]]

c. **Baseline: A-movement into matrix clause**
Maria$_1$ is known [~~Maria~~$_1$ to be selling a picture of the king]]

d. **Target**



(*Surface string:* A picture of is known which king to have been sold.)

⇒ The traditional Ban on Improper Movement does not capture the behavior of remnant movement because it is stated in terms of the element moving:

(12) **Ban on Improper Movement**
A-movement may not proceed from an $\overline{\text{A}}$-position.

✳ ***Proposal: UCOOL***
Movement types are extrinsically ordered, and movement of a constituent 'affects' other constituents in the structure:

(13) **Universal Constraint on Operational Ordering in Language**
$\Theta \gg$ scrambling $\gg$ A-movement $\gg$ *wh* $\gg$ topicalization

(14) **Generalized Prohibition against Improper Movement**
No constituent may undergo movement of type τ if it has been affected by movement of type σ, where $\tau \ll \sigma$ under UCOOL.

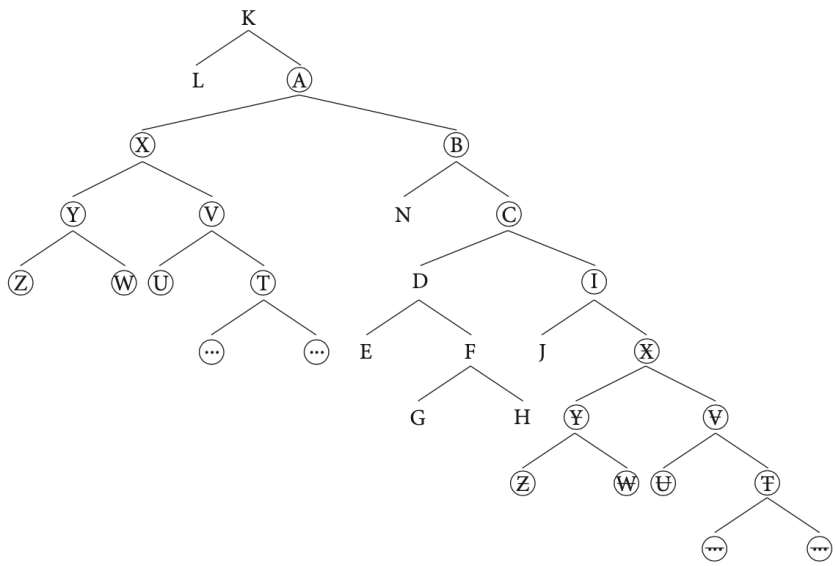
(15) A constituent α is AFFECTED by a movement operation iff:

a. α is reflexively contained in the constituent created by movement, and

b. α is in a (reflexive) domination relation with the moved constituent.

- ***Example: Affected constituents***

(16)



- ***What about the LEC?***
  The LEC also derives the remnant-movement data. Abel's argument against the LEC is that it undergenerates, e.g. ECM and hyperraising.

3 Abels 2012

3.1 The Italian left periphery

- ***Rizzi's (2004) left-peripheral template for Italian***

(17) Force > Top* > Int > Top* > Foc > Mod* > Top* > Fin > I[3]

[3] * = recursive

a. Force: complementizer *che* 'that' in head and relative operators in specifier

b. Top: topics

c. Int: interrogative complementizer *se* 'if'

d. Foc: fronted foci and *wh*-elements

e. Mod: unstressed fronted modifiers

f. Fin: nonfinite complementizer *di* 'of'

⇒ ***Nonlocal locality***
Abels shows that the template in (17) is reflected in nonlocal interactions as well.

- ***Terminology***
  - Topic = element that has undergone topicalization movement
  - Focus = element that has undergone focus movement

- ***Relative operators***
  Relative operators must precede foci, modifiers, and topics locally. They also block crossclausal movement of foci, modifiers, and topics across them:[4]

[4] See Abels (2012) for the whole gamut of data.

(18) **Local: Rel > Top**

a. un uomo a cui, il premio Nobel, lo daranno senz'altro
a man to whom the Nobel Prize they will give it undoubtedly
(Rizzi 1997:289, (12a))

b. *un uomo, il premio Nobel, a cui lo daranno senz'altro
a man the Nobel Prize to whom they will give it undoubtedly
(Rizzi 1997:289, (12b))

(19) **Nonlocal: Rel > Top**

a. Questo é l'uomo, a cui tu pensi
this is the man to whom you think
che, il premio Nobel, lo daranno senz'altro.
that the Nobel Prize they will give it undoubtedly
(Chiara D'Ippoliti, pers. comm.)

b. *A Gianni, ti parleró solo delle persone che senz'altro gli daranno
to Gianni I will talk to you only about people who undoubtedly will give him
il premio Nobel.
the Nobel Prize
(Chiara D'Ippoliti, pers. comm.)

- ***Modifiers***
  Fronting of unstressed modifiers is clausebounded. Thus, movement of Mod over Rel, Top, or Foc in a lower clause is always ungrammatical.[5]

[5] Abels does not give these examples.

- ***Foci***
  - Foci may precede or follow a topic within the same clause, and they do not interact with topics in crossclausal extraction:

(20) **Local: Top > / < Foc**

a. Credo che a Gianni QUESTO gli dovremmo dire.
I believe that to Gianni THIS we should say to him
(based on Rizzi 1997:295, (37a))

b. Credo che QUESTO, a Gianni, gli dovremmo dire.
I believe that THIS to Gianni we should say to him
(based on Rizzi 1997:298, (37b))[5]

(21) **Nonlocal: Top > / < Foc**

a. A Gianni, credo che QUESTO gli dovremmo dire.
to Gianni I believe that THIS we should say to him
(Vieri Samek-Lodovici, pers. comm.)

b. QUESTO credo che, a Gianni, gli dovremmo dire.
THIS I believe that to Gianni we should say to him
(Vieri Samek-Lodovici, pers. comm.)

  - On the other hand, foci must precede unstressed modifiers locally, mirroring the crossclausal pattern:

(22) **Local: Foc > Mod**

a. QUESTA PROPOSTA, rapidamente, tutti i deputati hanno accettato.
THIS PROPOSAL rapidly all the representatives have accepted
(Vieri Samek-Lodovici, pers. comm.)

b. Rapidamente, QUESTA PROPOSTA tutti i deputati hanno accettato.
rapidly THIS PROPOSAL all the representatives have accepted
√ with *rapidamente* a contrastive topic
* with *rapidamente* an unstressed modifier
(Vieri Samek-Lodovici, pers. comm.)

(23) **Nonlocal: Foc > Mod**
QUESTA PROPOSTA credo che, rapidamente, tutti i deputati
THIS PROPOSAL I believe that rapidly all the representatives
hanno accettato.
have accepted
(Vieri Samek-Lodovici, pers. comm.)

- ***Topics***

Topics may be freely ordered with respect to modifiers both locally and nonlocally:

(24) **Local: Top >/< Mod**
a. Rapidamente, i libri, li hanno rimessi a posto.
rapidly the books they put them in place
(Rizzi 2004b:239, (49))
b. I libri, rapidamente li hanno rimessi a posto.
the books rapidly they put them in place
(Vieri Samek-Lodovici, pers. comm.)

(25) **Nonlocal: Top > Mod**
I libri, credo che, rapidamente, li hanno rimessi a posto.
the books I believe that rapidly they put them in place
(Vieri Samek-Lodovici, pers. comm.)

- ***Wh-phrases***

– Locally and nonlocally, foci and *wh*-phrases cannot cooccur in any order:

(26) **Local: *Foc >/< *Wh***
a. *A chi IL PREMIO NOBEL dovrebbero dare?
to whom THE NOBEL PRIZE should they give
(Rizzi 1997:298, (45a))
b. *IL PREMIO NOBEL a chi dovrebbero dare?
THE NOBEL PRIZE to whom should they give
(Rizzi 1997:298, (45b))

(27) **Nonlocal: *Foc >/< *Wh***
a. ?*A chi pensi che QUESTO abbiano detto?
to whom do you think that THIS they have said
(Chiara D'Ippoliti, pers. comm.)
b. *QUESTO mi domando a chi hanno detto.
THIS I wonder to whom they have said
(Chiara D'Ippoliti, pers. comm.)

– Locally and nonlocally, topics and *wh*-phrases may be freely ordered:

(28) **Local: Top > / < *Wh***

a. Mi domando, il premio Nobel, a chi lo potrebbero dare.
I wonder the Nobel Prize to whom they could give it
(Rizzi 1997:289, (14a))

b. ?Mi domando a chi, il premio Nobel, lo potrebbero dare.
I wonder to whom the Nobel Prize they could give it
(Rizzi 1997:289, (14b))

(29) **Nonlocal: Top > / < *Wh***

a. ?Non so come pensi che, a Gianni, gli dovremmo parlare.
I don't know how you think that to Gianni we should talk to him
(Rizzi 2004b:232, (27a))

b. ?Non so a chi pensi che, queste cose, le dovremmo dire.
I don't know to whom you think that these things we should say them
(Rizzi 2004b:232, (27b))

- ***Wh-elements base-generated in the left periphery***

– Unlike ordinary *wh*-phrases, there are several *wh*-elements that are (or can be) base-generated in the left periphery. These *wh*-elements can cooccur with a focus, in which case they must precede it:

(30) **Se > Foc**

a. Mi domando se QUESTO gli volessero dire (non qualcos' altro).
I wonder if THIS they wanted to say to him (not something else)
(Rizzi 2001a:289, (7a))

b. *Mi domando QUESTO se gli volessero dire (non qualcos' altro).
I wonder THIS if they wanted to say to him (not something else)
(Rizzi 2001a:289, (7b))

– However, foci are unable to cross these *wh*-elements:

(31) *QUESTO mi domando **se** gli volessero dire (non
THIS I wonder if they wanted to say to him not
qualcos'altro).
something else

– When these *wh*-elements do undergo movement, they cannot cross a focus:

(32) a. **Ambiguous**
Perché ha detto (a Gianni) che si dimetterà?
why did he say (to Gianni) that he will resign
(Vieri Samek-Lodovici, pers. comm., based on Rizzi 2001a:295, (27))

b. **Unambiguous**
Perché A GIANNI ha detto che si dimetterà (non a Piero)?
why TO GIANNI he said that he will resign (not to Piero)
(Rizzi 2001a:295)

– Note: (32) is unexpected under the LEC. Since Int > Foc, FocP should not block movement to [Spec, IntP].

✳ ***Takeaways***

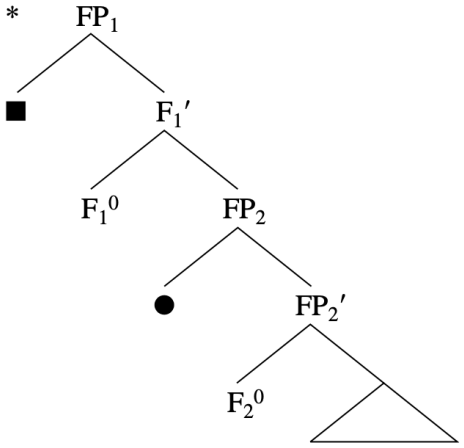
- The nonlocal locality facts are virtually identical to the local orderings.
- This is precisely the setup from above with ● and ■.
- This correlation between local orderings and nonlocal locality does not follow from a cartographic template.

3.2 Proposal

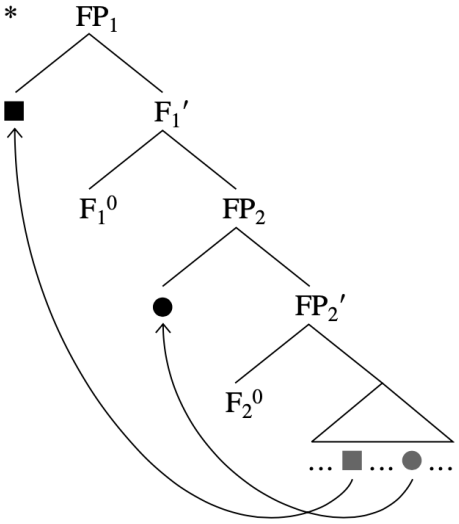
✳ ***The main idea***

The local orderings follow from a locality constraint: X cannot cross Y, thus X ≻ Y.
This constraint equally applies in nonlocal contexts, thereby deriving the correlation.

(33) a. *Violation of the template:*
F_1 does not select FP_2.



b. *Violation of locality:*
■ *cannot cross* ●



✳ ***Ingredients for the locality constraint***

1. Standard minimality:[6]

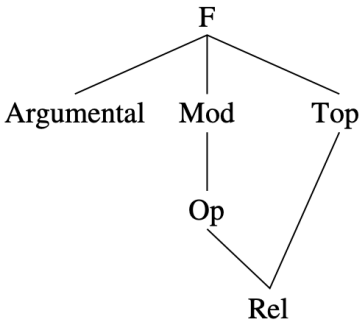
[6] Rizzi (1990)

(34) **Relativized Minimality**
An element of class Δ may not move over another element of class Δ.

2. A geometry of $\overline{\text{A}}$-features:[7]

[7] Starke (2001)

(35)



(36) a. αβ . . . α . . . αβ
b. *α . . . αβ . . . α where β is a subtype of α

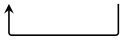
- ***Breaking down the feature geometry***
  - Foci and *wh*-phrases are of type Op
  - Op is a subtype of Mod.
  - Rel is a subtype of both Op and Top.[8]
  - Top is orthogonal to Op and Mod.

[8] Williams (2013)

⇒ ***Consequences***

1. Rel blocks Mod, Op, and Top
   ⇝ Relative operators block all other left-peripheral elements
   ⇝ Relative operators are leftmost
2. Op blocks Op
   ⇝ Foci and *wh*-elements block each other's movement
   ⇝ Foci and ordinary *wh*-phrases cannot cooccur
3. Op blocks Mod
   ⇝ Foci and *wh*-elements occur to the left of modifiers[9]
4. *Wh*-elements can occur with foci iff they can be base-generated above it, because minimality is then irrelevant:

   (37) *wh* … focus … focus

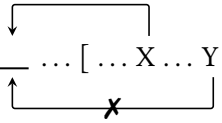


5. Top does not block Mod or Op
   ⇝ Topics can be ordered freely w.r.t. modifiers, foci, and *wh*-elements

[9] Abels doesn't seem to discuss the order of *wh*-elements and modifiers, but I'm assuming that this is true.

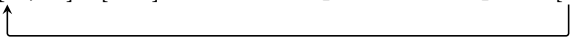
- ***Potential problem***[10]
  - If X blocks movement of Y because of minimality, then, all else equal, X should be targetable for that movement:

(38) [___ … [… X … Y …]]



  - For example, given Abels' feature geometry, a relative operator will block a matrix *wh*-probe searching past it, and thus it should be able to move for that probe:

(39) * **Who**$_{[\text{Op,Rel}]}$ C$_{[\bullet \text{op} \bullet]}$ did Alex see [the woman [~~**who**~~$_{[\text{Op,Rel}]}$ read **which book**$_{[\text{Op}]}$]]?

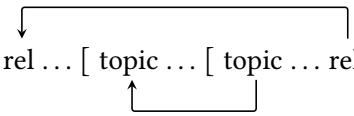


  - Such derivations could be blocked by appealing to defective intervention or criterial freezing.

[10] I believe that this is equally a problem for Starke (2001).

- ***Prediction***
  - If a relative operator and a topic cooccur, the topic must be higher in its base-generated position than the relative operator:

(40) [rel … [topic … [topic … rel]]]



  - Otherwise, the relative operator should block movement of the topic across it:

(41) *[rel … [topic … [rel … topic]]]

– Here is my quick attempt at constructing the relevant pair for English:

(42) a. He's a man [[**to whom**]$_{\text{REL}}$ [**liberty**]$_{\text{TOP}}$ we could never grant ___ TOP ___ REL].

b. Liberty's a state [[**(which)**]$_{\text{REL}}$ [**to John**]$_{\text{TOP}}$ we could never grant ___ REL ___ TOP].

- ***What does not follow from Abels' analysis***
  1. Both complementizers *che* 'that' and *di* 'of' may be crossed by moving elements. This incorrectly predicts that they should freely intersperse with left-peripheral material.
  2. The clauseboundedness of unstressed fronted modifiers

⇒ These points still require appeal to a cartographic template.

4 Keine 2019

4.1 Long-distance agreement in Hindi

- ***Background: Hindi***
  – Agreement algorithm:

  (43) Agree with the highest DP not bearing a case marker. If no such DP exists, use default agreement (masculine singular).

  – Scrambling divides into two types: A-scrambling and $\overline{\text{A}}$-scrambling.[11]

  – Only $\overline{\text{A}}$-scrambling can leave a finite clause. Scrambling within a clause or out of a nonfinite clause can be either A-scrambling or $\overline{\text{A}}$-scrambling:

  (44) a. har laṛke-ko$_1$ [*us-kii*$_1$ bahin-ne] t_1 dekh-aa
  every boy-ACC 3SG-GEN sister-ERG see-PF.M.SG
  'For every boy x, x's sister saw x.'
  b. har laṛke-ko$_1$ [*us-kii*$_1$ bahin-ne] [t_1 dekh-naa] caah-aa
  every boy-ACC 3SG-GEN sister-ERG see-INF.M.SG want-PF.M.SG
  'For every boy x, x's sister wanted to see x.'
  c. har laṛke-ko$_1$ [*us-kii*$_{2/*1}$ bahin-ne] soc-aa [ki raam-ne t_1 dekh-aa]
  every boy-ACC 3SG-GEN sister-ERG think-PF.M.SG that Ram-ERG see-PF.M.SG
  'His$_2$ sister thought that Ram saw every boy$_1$.' (*bound reading impossible*)

[11] Mahajan (1990)

∗ ***Agreement into a nonfinite clause***

– The matrix verb can agree with an embedded object across a nonfinite-clause boundary, provided that there is no closer eligible DP:[12]

[12] Mahajan (1989); Bhatt (2005); Keine (2016, 2019, 2020)

(45) laṛkõ-ne [roṭii khaa-*nii*] caah-*ii*
boys-ERG bread.F eat-INF.F.SG want-PF.F.SG
'The boys wanted to eat bread.'

⇒ This phenomenon is known as LONG-DISTANCE AGREEMENT (LDA).

– LDA is (typically) optional, alternating with default agreement:

(46) laṛkõ-ne [roṭii khaa-*naa*] caah-*aa*
boys-ERG bread.F eat-INF.M.SG want-PF.M.SG
'The boys wanted to eat bread.'

– Note: The embedded agreement on the infinitival verb is entirely parasitic on matrix agreement (for most speakers).

• ***No agreement into a finite clause***
LDA can never target a DP inside a finite clause, even when the DP occupies the edge position (i.e. [Spec, CP]):

(47) firoz-ne soc-aa/*-ii [(**ghazal**) monaa-ne (**ghazal**)
Firoz-ERG think-PFV.M.SG/*-PFV.F.SG ghazal.F Monaa-ERG ghazal
gaa-yii th-ii]
sing-PFV.F.SG be.PAST-F.SG
'Firoz thought that Mona had sung ghazal'

• ***LDA does not involve movement***

– Idiomatic objects show us that agreement in Hindi does not involve movement of the agreement controller:

(48) a. **Idiomatic objects can control agreement**
raam-ne bhains ke aage **biin** bajaa-**yii**
Ram-ERG buffalo in.front.of flute.F.SG play-PFV.F.SG
'Ram did something futile.' (*lit.* 'Ram played the flute in front of buffalo.') [Keine 2017:178]

b. **Idiomatic objects resist movement**
#**biin**$_1$ raam-ne bhains ke aage ___$_1$ bajaa-**yii**
flute.F.SG Ram-ERG buffalo in.front.of play-PFV.F.SG
'The flute, Ram played in front of buffalo.' (*idiomatic reading deviant*)
[Keine 2017:179]

– Crucially, idiomatic objects can control LDA:

(49) raam-ne [bhains ke aage **biin** bajaa-nii] caah-**ii**
Ram-ERG buffalo in.front.of flute.F.SG play-INF.F.SG want-PFV.F.SG
'Ram wanted to do something futile.' (*idiomatic reading possible*)
[Keine 2017:179]

⇒ LDA does not involve movement of the agreement controller. It is fundamentally an in-situ dependency.

∗ ***Correlation between LDA and A-scrambling***

– A-scrambling of the agreement controller renders LDA obligatory:

(50) a. **Baseline**
[us-ke$_{2/*1}$ maalik-ne] [**har billii**$_1$ ghumaa-nii/-naa] caah-ii/-aa
3SG-GEN owner-ERG every cat.F walk-INF.F.SG/-INF.M.SG want-PF.F.SG/-PF.M.SG
'His/Her$_2$ owner wanted to walk every cat$_1$.'

b. **No binding → LDA optional**
har **billii**$_1$ [us-ke$_2$ maalik-ne] [t_1 ghumaa-nii/-naa] caah-ii/-aa
every cat.F 3SG-GEN owner-ERG walk-INF.F.SG/-INF.M.SG want-PF.F.SG/-PF.M.SG
'Every cat$_1$, his/her$_2$ owner wanted to walk (it).'

c. **Binding → LDA obligatory**
har **billii**$_1$ [*us-ke*$_1$ maalik-ne] [t_1 ghumaa -nii/*-naa] caah -ii/*-aa
every cat.F 3SG-GEN owner-ERG walk-INF.F.SG/*-INF.M.SG want-PF.F.SG/*-PF.M.SG
'For every cat *x*, *x*'s owner wanted to walk *x*.'

⇒ In fact, A-scrambling of *anything* out of the embedded nonfinite clause renders LDA obligatory:

(51) a. (**har** **bacce-ko**$_1$) [us-kii$_2$ mãã-ne] [(**har** **bacce-ko**$_1$) film
every child-DAT 3SG-GEN mother-ERG every child-DAT movie.F
dikhaa-nii/-naa] caah-ii/-aa
show-INF.F.SG/-INF.M.SG want-PF.F.SG/-PF.M.SG
'His/Her$_2$ mother wanted to show a movie to every child$_1$.'

b. **har** **bacce-ko**$_1$ [*us-kii*$_1$ mãã-ne] [t_1 film dikhaa -nii/*?-naa]
every child-DAT 3SG-GEN mother-ERG movie.F show-INF.F.SG/*?-INF.M.SG
caah -ii/*?-aa
want-PF.F.SG/*?-PF.M.SG
'For every child *x*, *x*'s mother wanted to show *x* a movie.'

(52) a. (**har** **lekhak-kii**$_1$) [us-kii$_2$ patnii-ne] [[$_{DP}$ (**har** **lekhak-kii**$_1$) kitaabẽ̃]
every author-GEN 3SG-GEN wife-ERG every author-GEN books.F
paṛh-nii/-naa] caah-ĩ̃ĩ/-aa
read-INF.F.PL/-INF.M.SG want-PF.F.PL/-PF.M.SG
'His$_2$ wife wanted to read the books of every author$_1$.'

b. **har** **lekhak-kii**$_1$ [*us-kii*$_1$ patnii-ne] [[$_{DP}$ t_1 kitaabẽ̃] paṛh -nii/*-naa]
every author-GEN 3SG-GEN wife-ERG books.F read-INF.F.PL/*-INF.M.SG
caah -ĩ̃ĩ/*-aa
want-PF.F.PL/*-PF.M.SG
'For every author *x*, *x*'s wife wanted to read *x*'s books.'

- ***Summary***

(53) If A-movement of *any* element out of an embedded clause has applied, that clause is obligatorily transparent for LDA. Agreement is hence obligatory and default agreement is impossible, regardless of whether the agreement controller moves or not. $\overline{\text{A}}$-movement has no such effect.

(54) Finite clauses (including their edge) are opaque to A-movement and φ-agreement, but not to $\overline{\text{A}}$-movement.

4.2 In terms of selective opacity

✳ ***Proposal: Syntactic domains***

- **Assumption:** Nonfinite clauses divide into two types: A and B.
- **Optionality of LDA:** Agreement is obligatory (but can fail).[13] Type A blocks agreement, while Type B does not.
  ⇒ LDA is not optional. Rather, nonfinite clauses are ambiguous between structures that are opaque/transparent for agreement.
- **Correlation with A-scrambling:** Type A blocks A-scrambling, while Type B does not.
  ⇒ If an element has been A-scrambled out of a clause, then that clause must be Type B. Thus, it does not block agreement, and LDA obtains.
- **Last step:** Type A = TP, Type B = *v*P.

[13] Preminger (2011, 2014)

• ***Independent support of the size distinction***
If the embedded clause contains a temporal adverbial, LDA is ungrammatical, presumably because the adverbial forces a TP structure:

(55) *pichle hafte* raam-ne [yeh kitaab *kal* paṛh-naa/#-nii]
last week Ram-ERG this book.F yesterday/tomorrow read-INF.M.SG/#-INF.F.SG
caah-aa/#-ii th-aa/#-ii
want-PF.M.SG/#-PF.F.SG be.PST-M.SG/-#F.SG
'Last week, Ram had wanted to read this book yesterday/tomorrow.'

✳ ***Summary***

(56) *Transparency (✓) and opacity (*) by clause type and operation* (to be extended)

	Size of clause		
	CP (finite)	TP (nonfinite)	vP (nonfinite)
ϕ-agreement	*	*	✓
A-movement	*	*	✓
Ā-movement	✓	✓	✓

4.3 Horizons

✳ ***Proposal***

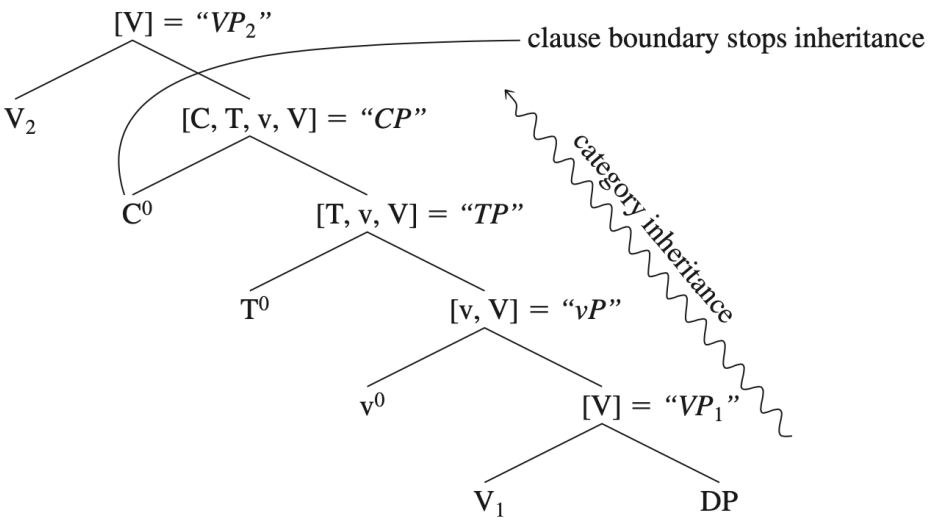
1. A probe may specify its HORIZON, a category feature that terminates its search:

   (57) **HORIZONS**
   If a category label X is a HORIZON for probe π (notated as "π ⊣| X"), then a π-initiated search terminates at a node of category X. All elements dominated by XP are therefore outside π's search space.

2. Categorial features percolate up an extended projection:

   (58) **CATEGORY INHERITANCE**
   Given an extended projection $\Phi = \langle \Pi_n > \Pi_{n-1} > \ldots > \Pi_1 \rangle$, where Π_x's are phrases, the categorial features of Π_m are inherited up to Π_{m+1}.

(59)



- ***Horizon metaphor***
  - Like real horizons, anything beyond a probe's horizon is invisible to it.
  - Analogous to how horizons in the real world differ between individuals, horizons may differ between probes, giving rise to locality mismatches.
  - Analogous to how horizons in the real world differ between locations, the syntactic position of a probe affects what its horizon may be.

✳ ***Meta-generalizations about selective opacity***
These two generalizations together are essentially a weaker version of the GBOIM.

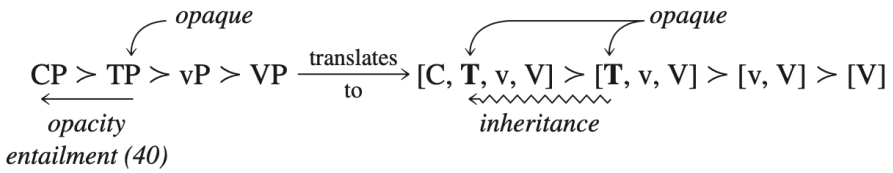
(60) **Height-Locality Connection**
The higher the structural position of a probe π, the more kinds of structures π can search into.

(61) **Upward Entailment**
If a clause of a certain structural size is opaque to an operation, then clauses that are structurally larger are likewise opaque to this operation.

- ***Deriving Upward Entailment***

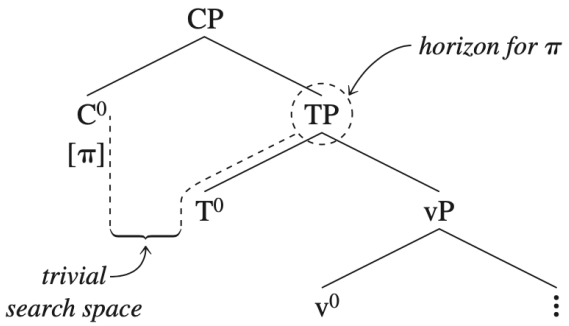
(62) **Horizon Inheritance Theorem**
Given a probe π and an extended projection $\Phi = \langle \Pi_n > \Pi_{n-1} > \ldots > \Pi_1 \rangle$, if $\Pi_m \in \Phi$ is a horizon for π, then all projections $\Pi_{m+1}, \ldots, \Pi_n$ are likewise horizons for π (due to category inheritance).

(63)



✳ ***Deriving the Height-Locality Connection***
- Consider a probe π on some projection Π_m, whose horizon is Π_{m-1}. Such a probe will have no search space:

(64)



⇒ Such probes are in principle allowed by the system, but they are VACUOUS. Thus, they underlie no actual movement or agreement relationships.

– Knowing the location of a nonvacuous probe imposes restrictions on its possible locality properties. Conversely, knowing the locality properties of a probe imposes restrictions on its possible locations.[14]

(65) **HEIGHT-LOCALITY THEOREM**
Given an extended projection $\Phi = \langle \Pi_n > \Pi_{n-1} > \ldots > \Pi_1 \rangle$, for any nonvacuous probe π:

a. **Height → locality entailment**
If π is located on Π_m, then a projection $\in \{\Pi_{m-1}, \ldots, \Pi_1\}$ cannot be a horizon for π.

b. **Locality → height entailment**
If π has Π_m as a horizon, then π cannot be located on a projection $\in \{\Pi_n, \ldots, \Pi_{m+1}\}$.

– **Example:** If π is on T, then it can only have T or C as its horizon. If its horizon were v or V, it would be vacuous.

– **Example:** If π has T as its horizon, then it can only be on T, v, or V. If it were on C, it would be vacuous.

[14] (65) is not a stipulation of the system, but rather follows from Horizons and Category Inheritance.

4.4 Application to Hindi LDA

- ***Probes and their horizons***[15]

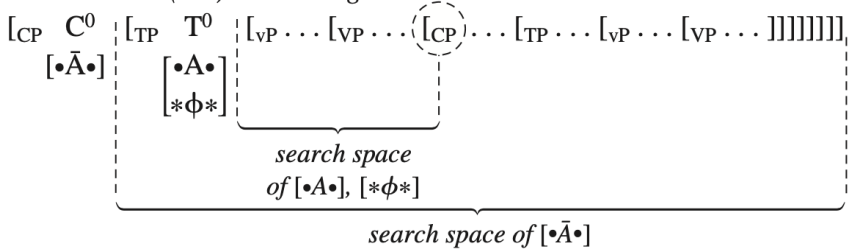
(66) a. $[\bullet \text{A} \bullet]_{\text{T}^0} \dashv\!\shortmid \text{T}$

b. $[\star \phi \star]_{\text{T}^0} \dashv\!\shortmid \text{T}$

c. $[\bullet \bar{\text{A}} \bullet]_{\text{C}^0} \dashv\!\shortmid \varnothing$

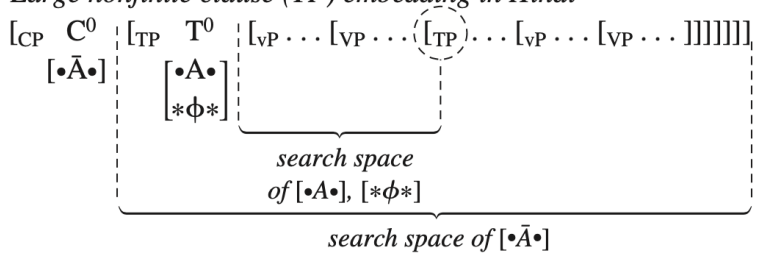
- ***Application***

(67) *Finite clause (CP) embedding in Hindi*

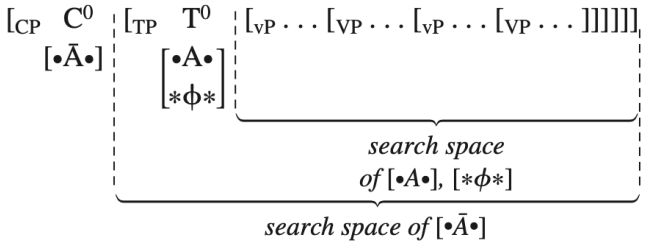


[15] See Keine (2019:29–31) for independent arguments for the positions of these probes.

(68) *Large nonfinite clause (TP) embedding in Hindi*



(69) *Small nonfinite clause (vP) embedding in Hindi*



4.5 Comparison to the GBOIM and the LEC

- ***Arriving at GBOIM***
  If every probe has as its horizon the category of the head that bears it, then we generate the same locality profile as the GBOIM (and by extension, the LEC).
  - **Example:** If π on T has T as its horizon, it can only search until it encounters a TP or larger.
  - **Example:** If π on V has V as its horizon, it can only search until it encounters a VP or larger.

∗ ***Locality mismatches: Wh-licensing in Hindi***

- In Hindi, the locality of *wh*-licensing falls between A-scrambling (and ϕ-agreement) and $\overline{\text{A}}$-scrambling.
- Let us assume *fseq* = ⟨X > C > T > *v* > V⟩ and that finite clauses can be CPs.
- On the one hand, *wh*-licensing cannot cross a finite-clause boundary.

  ⇒ [⋆WH⋆] ⊣| C
  - Given a horizon of C, [⋆WH⋆] may be on C, T, *v*, or V.
  - Crucially, [⋆WH⋆] may *not* be on X, as it would then be vacuous.
- On the other hand, *wh*-licensing may be fed by $\overline{\text{A}}$-scrambling, the probe of which is on C.

  ⇒ [⋆WH⋆] may be on C or X.
- Even though [⋆WH⋆] and [•$\overline{\text{A}}$•] are both on C, they differ in their horizons:

  (70) a. $[\bullet\overline{\text{A}}\bullet]_{\text{C}^0}$ ⊣| ∅

  b. $[\star\phi\star]_{\text{C}^0}$ ⊣| C

⇒ This kind of locality mismatch cannot be produced under the LEC. If $\overline{\text{A}}$-scrambling feeds *wh*-licensing, then *wh*-licensing should be able to probe all of the same clause types as $\overline{\text{A}}$-scrambling (and potentially more).

- ***Exceptions to the GBOIM***
  Horizons handles all of the exceptions to the GBOIM, e.g. ECM and hyperraising, by assuming that the relevant probe has no horizon.

References

Abels, Klaus. 2012. The Italian left periphery: A view from locality. *Linguistic Inquiry* 43:229–254.

Bhatt, Rajesh. 2005. Long distance agreement in Hindi-Urdu. *Natural Language and Linguistic Theory* 23:757–807.

Keine, Stefan. 2016. Probes and their horizons. Ph.D. dissertation, University of Massachusetts, Amherst, MA.

Keine, Stefan. 2017. Agreement and *v*P phases. In *A Schrift to Fest Kyle Johnson*, eds. Nicholas LaCara, Keir Moulton, and Anne-Michelle Tessier, 177–185. Amherst, MA: Linguistics Open Access Publications.

Keine, Stefan. 2019. Selective opacity. *Linguistic Inquiry* 50:13–62.

Keine, Stefan. 2020. *Probes and Their Horizons*. Cambridge, MA: MIT Press.

Mahajan, Anoop. 1989. Agreement and agreement phrases. In *Functional heads and clause structure*, eds. Itziar Laka and Anoop Mahajan, volume 10 of *MIT Working Papers in Linguistics*, 217–252. Cambridge, MA: MITWPL.

Mahajan, Anoop. 1990. The A/A-bar distinction and movement theory. Ph.D. dissertation, MIT, Cambridge, MA.

Müller, Gereon. 2014. A local approach to the Williams Cycle. *Lingua* 140:117–136.

Poole, Ethan. to appear. Improper case. *Natural Language and Linguistic Theory* .

Preminger, Omer. 2011. Agreement as a fallible operation. Ph.D. dissertation, MIT, Cambridge, MA.

Preminger, Omer. 2014. *Agreement and its failures*. Cambridge, MA: MIT Press.

Rizzi, Luigi. 1990. On the anaphor-agreement effect. *Rivista di Linguistica* 2:27–42.

Rizzi, Luigi. 2004. Locality and left periphery. In *Structures and Beyond: The Cartography of Syntactic Structures*, ed. Adriana Belletti, volume 3, 223–251. Oxford: Oxford University Press.

Starke, Michal. 2001. Move dissolves into merge: A theory of locality. Ph.D. dissertation, Université de Genève.

Williams, Edwin. 2003. *Representation theory*. Cambridge, MA: MIT Press.

Williams, Edwin. 2011. *Regimes of Derivation in Syntax and Morphology*. New York: Routledge.

Williams, Edwin. 2013. Generative semantics, generative morphosyntax. *Syntax* 16:77–108.