1. Cyclic Linearization

1.1. Assumptions

Linearization analyses of locality link conditions on movement to conditions on (PF-) shape (Fox & Pesetsky 2005; Johnson 2002, 2005; Müller 2000; Sells 2001; Williams 2003; a.o.)

(1) Ordering statement: Def a statement about the linear ordering of terminals.

(2) Assumptions (simplified from Fox & Pesetsky 2005)

AI. Ordering statements are collected at the end of each Spell-Out domain and are added to the Ordering Table.

AII. Spell-Out domains (= phases; SOD) include CP, vP and DP.

AIII. Linearization Preservation (see also Johnson, Williams, Müller)

The linear ordering of syntactic units is affected by Merge and Move within a Spell-out Domain, but is fixed once and for all at the end of each Spell-out Domain. As a consequence, the Ordering Table must not contain contradictory statements (e.g. X<Y and Y<X).

→ the Ordering Table is a partial strong order.

1.2. Consequences for movement across phases

Scenario I: Licit movement of peripheral category into higher spell-out domain (SOD) D’:

(3) [D’ :... X α [D tX Y Z]

a. Ordering in D: X < Y
   Y < Z

b. Ordering in D’: X < α
   α < D

(4) Assumption AIV. Precedence relation (Notation ‘<’): Def

An Ordering Statement of the form α<β is understood by PF as meaning that the last (pronounced) element of α precedes the first (pronounced) element of β.

(5) Ordering in D’:

a. X < α
b. α < D

c. α < Y ⇔ by (4)
d. X < Y ⇔ by transitivity of ‘<’-relation

→ consistent ordering table

1 Partial strong order: transitive, irreflexive and asymmetric relation, but not total.

2 F&P explicitly do not assume that the ordering table contains the transitive closure of all ordering statements. Only the latter is a total (strong) order. Still, the way first and last (their beginning and end) is defined yields the consequence of asymmetry.
SCENARIO II: Illicit movement of medial category into D’ results in ordering conflict.

(6) \[ D' \ldots Y \alpha [D X t, Y] \]
   a. Ordering in D: \[
   \begin{align*}
   X &< Y \\
   Y &< Z
   \end{align*}
   \]
   b. Ordering in D’:
      a. \( Y < \alpha \)
      b. \( \alpha < D \)
      c. \( \alpha < X \) \[\Leftarrow \text{by (4)}\]
      d. \( Y < X \) \[\Leftarrow \text{by transitivity of ‘<’}\]
   \[\Rightarrow \text{ inconsistent ordering table}\]

2. REPAIR STRATEGIES FOR ORDERING CONFLICTS

STRATEGY I: Evacuation of intervener restores consistent ordering table. This strategy underlies the analysis of Holmbergs Generalization:

(7) Holmbergs Generalization
   In Scandinavian, short object movement is possible only if the finite verb has moved.

(8) a. Jag kysste henne inte [vP tv to]
    I kissed her not
   b. *Jag har henne inte [vP kysst to].
    I have her not kissed

(9) a. [vP kysste henne]
    Ordering in vP: \( V < O \)
   b. [CP Jag kysste henne inte [vP tv to]]
    I kissed her not
    Ordering in CP: a. \( S < V \)
b. \( V < O \)
c. \( O < \text{Neg} \)
d. \( \text{Neg} < \text{vP} \)
e. \( \emptyset \) \[\text{(no ordering statement by (4), as vP is empty)}\]
   \[\Rightarrow \text{ consistent ordering table}\]

(10) a. [vP kysste henne]]
    Ordering in vP: \[
    \begin{array}{c}
    V < O
    \end{array}
    \]
   b. *[CP Jag har henne inte [vP kysste to]]
    I have her not kissed
    Ordering in CP: a. \( S < \text{Aux} \)
b. \( O < \text{Neg} \) ..... 
c. \( \text{Neg} < \text{vP} \)
d. \( \text{vP} < V \) \[\Leftarrow \text{by (4)}\]
d. \( O < V \) \[\Leftarrow \text{by transitivity}\]
   \[\Rightarrow \text{ inconsistent ordering table}\]
STRATEGY II: Movement to the edge in local phase repairs conflict, e.g. with wh-movement of objects to the edge of vP. Strategy II provides a way to derive successive cyclic movement.

(11) What₁ did she read t₁
(12) a. \[vP \text{What}_1 \text{she}_2 \text{read } t_1]\]
   Ordering in vP: \(S < V\)
   \(O < S\)
   b. \[CP \text{What}_1 \text{did } \text{she}_2 \text{read } t_1]\]
   Ordering in CP: a. \(X < Y\)
   b. \(Y < \alpha\)
   c. \(\alpha < D\)
   d. \(\alpha < Z\) \(\Rightarrow\) by (4)

→ consistent ordering statements

Observation: Manifestations of Scenario II and Scenario III provide an explanation for an old puzzle. A subject may be stranded in passive, but not in raising construction, even though both subjects have been shifted by the same movement operation (NP-movement).

(13) a. ...and [given a paycheck] the woman was t (Johnson, class lecture UMass 1995)
   b. ...*and [to like chocolate] John seems t

• (13)a (exemplifying Scenario III): the lower SOD (the phase vP) is fronted into the immediately dominating SOD. Thus, reversing the order does not induce a conflict in the order table:

(14) ...and [CP [vP given a paycheck] [TP the woman [T' was tvP]]]
   a. Ordering in vP: \(\text{given} < \text{a paycheck}\)
   b. Ordering in CP: \(\text{a paycheck} < \text{the woman}\)
   \(\text{the woman} < \text{was}\)

Assumptions:
   ○ \(\text{A-movement passes through SpecvP in passive as well as in raising.}\)
   ○ \(\text{Ā-movement may pass through the edge of vP in passive, but not in raising.}\)

• (13)b (Scenario II): Assume that raising \textit{seem} lacks an edge that may serve as an escape hatch for \(\text{Ā-movement operations such as TP-fronting}.^3\) Changing the linear order between \textit{seem} and TP₁ by shifting the TP into a higher SOD without an intermediate stop at the edge of \textit{seem} leads to an ordering conflict.

\(^3\)See Lechner (2005) for an alternative account for apparent reconstruction effects into SpecvP (Legate 2003; Sauerland 2003). I have not been able to verify whether raising \textit{seem} passes the tests providing evidence for vP-adjunction i.e. whether (i) is on a par with the well-formed (ii). A contrast between (i) and (ii) would confirm the absence of an intermediate (\(\text{Ā-}\))specifier with \textit{seem}:
(i) \[\text{[Which painting of him}_k \text{by } \text{Mary}_1 \text{did noone}_c \text{t}_m \text{seem to her}_t \text{to like } *t_m}\]
(ii) \[\text{[Which painting of him}_k \text{by } \text{Mary}_1 \text{did noone}_c \text{t}_m \text{ask her}_t \text{to buy } *t_m]\
(15)  

a. \([vP_1 \text{ John like chocolate}]\) 
   
   Ordering in vP1:  
   \(\text{John < like \atright < chocolate} \)

b. \([vP_2 \text{ John seems [TP to [vP_1 t_s like chocolate]]}]\) 
   
   Ordering in vP2:  
   \(\text{John < seems \atright < to} \)

   \(\text{to < like ...} \)

c. \([CP [TP to like chocolate] [TP John [vP seems t_{TP}]]] \) (TP does not move through SpecvP) 
   
   Ordering in CP:  
   \(\text{to < like \atright < chocolate} \)

   \(\text{chocolate < John \atright < seems} \)

   \(\text{John < seems \atright < to} \) by transitivity of ‘<’

   \(\rightarrow\) inconsistent ordering table

• The same results apply if fronting targets vP instead of TP. Again, the ill-formedness follows from the assumption that the vP of raising seem lacks an Ā-specifier that TP can move through, and the fact that the fronted vP is not in a peripheral position inside the

(16)  

*and \([vP \text{ like chocolate}] \text{ John seems to t}\) 

(17)  

a. \([vP_2 \text{ John seems [TP to [vP_1 t_s like chocolate]]}]\) 
   
   Ordering in vP2:  
   \(\text{to < like \atright < by (4)} \)

b. \([CP [vP \text{ like chocolate}] [TP John [vP seems to t_{TP}]]] \) ×movement through SpecvP 
   
   Ordering in CP:  
   \(\text{chocolate < John \atright < by (4)} \)

   \(\text{like < to \atright < by transitivity of ‘<’} \)

   \(\rightarrow\) inconsistent ordering table

• Similar considerations carry over to contrasts between TP fronting and CP fronting (Johnson 2001): (18)a is ill-formed because the fronted TP cannot move to the edge of seem. (18)b is licit because the fronted CP is a linearization domain, and try licenses movement to the edge of vP:

(18)  

a. *It’s \([TP t_k to eat] \text{ that Ron_k [vP seemed t]}\) ×movement through SpecvP 

b. ?It’s \([CP PRO to eat] \text{ that Ron [vP tried t]}\) ✓movement through SpecvP
STRATEGY III: ‘Salvation by Deletion’. Islands can be repaired by ellipsis (Ross 1967; see appendix for further examples).

(19) John left after he talked to a certain boy.
But I don’t remember which boy John left after he talked to.

“Assume: The AdvP (afterP) is a Spell-out Domain that lacks a left-edge landing site for movement. Consequently, in (21) after, he, talked and to will be linearized both before and after which boy. This will yield an unpronounceable structure - unless the relevant items are deleted!

(20) Properties of ellipsis of α
a. Do not pronounce any terminal element dominated by α.
b. Delete from the Ordering Table all statements that mention elements unpronounced by (a).” [Fox & Pesetsky 2003, p.21]

(21) a. [PP after he talked to which boy]
b. [vP which boy John left after he talked to]

(22) a. Ordering in PP: after < which ... 
b. Ordering in vP: which < after ...
→ inconsistent ordering table

(23) a. Ordering in PP: after < which ...
b. Ordering in vP: which < after ...
→ consistent ordering table

(24) Question: Why does ellipsis rescue violations of Linearization Preservation given that
(i) Ellipsis deletes the phonological matrix and
(ii) Ordering Statements refer to relations between pairs of expressions at the end of an spell-out domain, irrespective of whether these expressions have a phonological matrix (i.e. are silent) or not.

○ Consider e.g. the violation of HG in (10).

(10) *[CP Jag har henne inte [vP kysst [\[\]]]]

Here, the lower silent (boxed) occurrence of the object inside vP counts for the calculation of Linearization Preservation. Thus, there is no bijective relation between PF-silence and the (in)ability of a terminal to contribute to an ordering statements.

○ Similar considerations apply to Merchant (to appear) *t analysis: Why does removal of the phonological matrix (i.e. deletion) of intermediate traces (i.e. elements which lack phonetic content) have an effect at PF, turning these traces into PF-compatible objects?
A second puzzle, related to (24): what explains property (25)?

(25) Is there a connection between the fact that penetration of a phase proceeds by silent occurrences of an expression (intermediate copies), and the fact that silent expressions (ellipsis, more precisely Sluices) license penetration of islands?

**Strategy IV:** Late Merge of subjects. In V2 languages, subjects precede the finite verb inside the vP, but may precede the verb in the SOD CP, resulting in an ordering conflict.

(26) Hittade han faktiskt pengarna under sängen? (Swedish; F&Ps’ (90))

found he actually money-the under bed-the
'Did he actually find the money under the bed?'

(27) a. \[ vP he found money (under the bed)]

Ordering in vP: \[ V < O \]

\[ S < V \]

b. \[ CP found [TP he actually [vP money]]] \[ by (4) \]

Ordering in CP: \[ V < S \]

\[ S < Adv \]

\[ Adv < vP \]

\[ Adv < O \]

→ inconsistent ordering statements

Fox & Pesetsky (2003: p. 41) propose that subjects in these languages can be merged late:

“● In a language like Swedish, the subject, vP-adverbs and vP negation are not linearized within vP, because they are **merged after Linearize applies to vP**.

● Covert merge of the modifiers and specifiers of vP gives the impression of a smaller Spell-out Domain in Swedish (e.g. VP or V'), because covertly externally merged elements in D are not ordered as part of Linearize(D).

● In order for a covertly externally merged element in D to be linearized, it **must move overtly** into a higher Spell-out Domain.”

\[ (28) Swedish subjects \]

\[ \alpha_{late \ merged} \]

\[ \beta \]

\[ \gamma \]

→ In order to linearize \( \alpha_{late \ merged} \) in (28), \( \alpha_{late \ merged} \) has to move overtly into a higher phase.
Revised analysis of (26) in terms of covert Merge of subject and adverbial in Spec\(vP\):

\[(29)\]
\[
a. \quad [vP \text{ found money (under the bed)}]
\]
Ordering in v\(P\): \(V < O\)
\[
b. \quad [\text{actually he } [vP \text{ found money}]] \quad \text{Late covert Merge of subject and adverb}
\]
\[
c. \quad [CP \text{ found } [TP \text{ he actually } [vP \text{ money}]]] \quad \text{Build CP and move subject, adverb and V}
\]
\[
d. \quad \text{Ordering in CP: } \quad V < S
\]
\[
S < \text{Adv}
\]
\[
\text{Adv} < vP
\]
\[
\text{Adv} < O \quad \text{by (4)}
\]
\[\rightarrow \text{consistent ordering statements}\]

3. Ellipsis as Late Merge

Suppose that ellipsis is not produced by suppressing pronunciation, but rather comes about as the result of Late Merge of the ellipsis site (for postcyclic merger of Sluices see Chung, Ladusaw and McCloskey 1995).

(30) **Assumption:** Elliptical nodes are Late Merged with the Spell-out domain.

(See Takahashi 2006 on “Wholesale Late Merge”, i.e. Late Merge operations that may also target arguments.)

\[\rightarrow \text{VP-Ellipsis}\]

\[\rightarrow \text{Sluicing}\]

\[\rightarrow \text{Consequence I: Island Insensitivity}\]

As ellipsis is merged after the ordering statements for that phase have been computed, ellipsis does not add ordering statements. Thus, Late Merged nodes bridge islands for movement (that’s good for Sluicing, less so for VP-Ellipsis; see loose ends section.)

(33) **Observation:** TP and VP can (in contrast to CP and v\(P\)) not move.

(Abels 2003; Nakamura 2006; Wurmbrand to appear.)

\[\rightarrow \text{Consequence II: Silencing (for Ellipsis)}\]
3.1. NO MOVEMENT OF VP

- Topicalization targets vP and not VP:

(34) John wanted to buy a book,...
   a. and [vP tS buy a book] he did tvp
   b. *and [VP buy a book] he did [vP tS tVP]

- Evidence by Huang (1993): Absence of Multiple Binding Domain (MBDE) effects with fronted predicates (Bars 1986) indicates that these predicates contain subject traces. The subject is part of vP, and not VP. Hence, vP moves, and not VP:

(35) a. [Which book about herself] does she think he is reading  
       ✓MBDE Effect
   b. *... and [vP tTP reading a book about herself] she thinks he is.  
       ✗MBDE Effect

3.2. NO (LOCAL) MOVEMENT OF TP

- TPs cannot be shifted to the right (by HNPS; Abels 2003):

(36) a. Frank saw a play that was long and boring yesterday.
   b. Frank saw a play yesterday [CP that was long and boring].
   c. *Frank saw a play that t yesterday [IP was long and boring].

- Wurmbrand (to appear): TPs cannot be topicalized in German:

(37) a. *[Wahrscheinlich ein Vertreter angerufen] hat gestern   
       (Wurmbrand, t.a.; (2)b/c) 
       Probably a.NOM salesman called has yesterday
   b. [Ein Vertreter angerufen] hat erst gestern 
       a.NOM salesman called has erst gestern
       ‘It was just yesterday that a salesman called’

(38) *CP
    
    ②  
    TP  
    probably       TP  
    {a salesman} T'       hasi   TP  
    {a salesman} called  

   TP cannot move to SpecCP
Two possible consequences of Late Merge, depending on whether the category that is Late Merged may move or not:

(39) a. *Swedish subjects b. VP-Ellipsis/sluicing

\[
\alpha_{\text{late merged}} \quad \text{VP} \quad \alpha \quad \text{VP/TP}_{\text{late merged}} \\
\beta \quad \gamma
\]

\(\Rightarrow\) In order to linearize \(\alpha_{\text{late merged}}\) in (39)a, \(\alpha_{\text{late merged}}\) has to move overtly into higher SOD.

\(\Rightarrow\) In order to linearize \(\beta\) and \(\gamma\) in (39)b, VP/TP has to move overtly into a higher phase.

(NB: The same results would obtain if \(\beta\) and \(\gamma\) were to move individually.)

(40) Deriving the silence of ellipsis

a. Expressions that are Late Merged need to move into next higher phase to get linearized.

b. Elements that cannot be linearized are unpronounceable and remain silent.

c. TP and VP are merged late.

d. TP and VP cannot move (for independent reasons).

e. \(\dagger\) Late Merged VP/TP (and elements inside) cannot be linearized.

f. \(\dagger\) Elements inside Late Merged VP/TP remain silent.

A superficially related hypothesis is advanced by Nakumura (2006). (41) is substantially different in content, though, as it posits that categories that may undergo ellipsis can move if they are silent:

(41) The Ellipsis Movement Generalization: Categories that can undergo ellipsis cannot undergo movement except when phonologically null.

APPENDIX: SALVATION BY DELETION

Sluicing obviates islands (Ross 1967, Merchant 2001; from Syncom case on Sluicing by J. Merchant)

(42) Complex NP

a. They want to hire someone who speaks a Balkan language, but I don’t remember which.

b. *I don’t remember which (Balkan language) they want to hire someone [who speaks __].
(43) **Left-branch (attributive adjective case):**
   a. She bought a big car, but I don’t know how big.
   b. *I don’t know how big she bought [a __ car].

(44) **Derived position islands (subjects, topicalizations)**
   a. A biography of one of the Marx brothers is going to be published this year — guess which!
   b. *Guess which (Marx brother) [a biography of __] is going to be published this year.

(45) **COMP-trace effects (cf. Chung et al.’s 1995 (90), (91a), Perlmutter 1971:112)**
   a. It appears that someone will resign, but it’s not yet clear who.
   b. Sally asked if somebody was going to fail Syntax One, but I can’t remember who.

(46) **Coordinate Structure Constraint**
   a. They persuaded Kennedy and some other Senator to jointly sponsor the legislation, but I can’t remember which one. (Chung et al.’s 1995 (88b))
   b. Bob ate dinner and saw a movie that night, but he didn’t say which.

(47) **Adjuncts**
   a. Ben will be mad if Abby talks to one of the teachers, but she couldn’t remember which.
   b. *Ben will be mad if Abby talks to one of the teachers, but she couldn’t remember which (of the teachers) Ben will be mad [if she talks to __].
   c. Ben left the party because one of the guests insulted him, but he wouldn’t tell me which.

* Fox and Lasnik(2003): The conditions for extraction out of VPE are stricter than those for extraction out of overt VP (from Johnson 2005: (3)-(6)):

(48) a. I knew which problem the linguists said you’d solved, but I didn’t know which the philosophers said you’d solved.
   b. *I knew which problem the linguists said you’d solved, but I didn’t know which the philosophers did.

(49) a. I knew which constructions the linguists would have read books about, but I didn’t know which the philosophers would have read books about.
   b. *I knew which constructions the linguists would have read books about, but I didn’t know which the philosophers would have.

(50) a. I knew which booze the linguists would come with, but I didn’t know which the anthropologists would come with.
   b. *I knew which booze the linguists would come with, but I didn’t know which the anthropologists would.
Johnson (2005): Movement out of VPE observes the same constraints as HNPS (Johnson’s examples (11)-(12)):

(51) a. She had [read] yesterday every book by Chomsky.
b. She [considers friendly] her many friends in Boston.
c. She might [show it] today to her syntax consultants.

(52) a. *She will [say that they had read] tomorrow every book by Chomsky.
b. *She has [read books about] yesterday exotic syntactic constructions.
c. *She might [come with] tonight beer.

REFERENCES


