# A derivational account of locality effects in gapping

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- layered derivations: the output of a subderivation is opaque (cf. also Toyoshima 1997, Johnson 2003)
- locality: reduces to derivation layering
- locality without movement: gapping

## 1. Layered derivations

### 1.1 Merge

(1) *Minimally needed*
a. a set of elements N (Numeration)
b. a procedure yielding relations among the members of N = structure (Merge)

(2) *Simplest merge* (Zwart 2004, 2008, 2009; Fortuny 2008)
a. Top-down: split

N = { a, b, c }

| | *N* |
|---|---|
| > | ⟨ a, { b, c } ⟩ |
| | ⟨ a, ⟨ b, { c } ⟩⟩ |
| | ⟨ a, ⟨ b, ⟨ c, { } ⟩⟩⟩ |
| > | ⟨ a, b, c ⟩ |

b. Bottom-up: transfer

N = { a, b, c }

| | *N* | workspace |
|---|---|---|
| > | { a, b, c } | ∅ |
| | { b, c } | ⟨ a, ∅ ⟩ |
| | { c } | ⟨ b, ⟨ a, ∅ ⟩⟩ |
| | { } | ⟨ c, ⟨ b, ⟨ a, ∅ ⟩⟩⟩ |
| > | ⟨ c, b, a ⟩ | |

(3) *Unary merge*
a. each step creates an ordered pair
b. derivation yields an ordered n-tuple

(4) *Linear Correspondence Axiom (redefined)*
⟨ a, b ⟩ = / a b / (where slashes indicate a string)

(5) *Structure and order*
a. Structure in any domain (syntax, morphology) is always a function of Merge
b. Order is always established at the interfaces

## 1.2 Layered derivations

(6) *Starting point*
Members of N may be of any type (features, morphemes, words, phrases, clauses)
e.g. Dutch *vader en moeder-tje* [father and mother-DIM] 'playing house'

(7) $N_1$ = { vader, en, moeder }

*yielding* 〈 vader, en, moeder 〉

*spelled out as* **vader en moeder**

$N_2$ = { [vader en moeder], -tje }

*yielding* 〈 vader en moeder, tje 〉

*spelled out as* **vader en moeder-tje**

(8) *(complex) specifiers/adjuncts must stem from a separate derivation layer*

a. N = { the, man, hit, the, ball } > 〈 the, { man, hit, the, ball } 〉 **not a constituent*
*

b. N = { [the man], hit, the, ball } > 〈 [the man], hit, the, ball } 〉

(9) *Recursion*
A derivation D, containing subderivations ($D_i$, $D_k$) with numerations ($N_i$, $N_k$), is recursive iff a member of $N_i$ is the output of $D_k$.

## 1.3 What happens between derivation layers

(10) derivation → interfaces → derivation → interfaces

(11) *Interface effects between derivation layers*
a. **atomization**: given a derivation $D_i$ with numeration $N_i$, parts of members of $N_i$ are not merged in $D_i$ (Generalized Integrity) (section **1.4**)
b. **linearization**: conversion of structure (ordered N-tuple) to linear order (string) (Zwart 2009)
c. **conventionalization**: idiosyncratic sound/meaning pairing (e.g. idioms)
d. **grammaticalization/recategorization/reanalysis** (section **2**)
e. morphological **realization** of dependency ('morphology after syntax')

(12) *Generalization*
The interfaces turn the output of a derivation into a single item ('lexical item'), which
a. potentially has idiosyncratic properties, and
b. may be used as an atom in another derivation.

(13) *'Lexical'*
a. α is a **lexical item** iff α is a member of a numeration
b. P is a **lexical property** iff P is a property of a lexical item
c. a construction is a lexical item

### 1.4 Opacity

(14) *Left branch extraction*
a. **Whose father** did you say [ **[e]** left ] ?
b. * **Whose** did you say [ [ **[e]** father ] left ] ?

(15) Whose father left

a. N ≠ { whose, father, left } > 〈 whose 〈 father 〈 left 〉 〉 〉 (cf. (8))

b. N = { [whose father], left } > 〈 [whose father] 〈 left 〉 〉

(16) a. *whose father* in (14/15) is a **lexical item** in N
b. opacity follows from Lexical Integrity, now generalized (17)

(17) *Generalized Integrity*
Given a derivation D of a Numeration N, operations in D manipulate only members of N.

## 2. Reanalysis as an interface effect

### 2.1 Recategorization

(18) a. far from simple (adjective) b. far from home (PP)
(19) a. a far from simple solution b. *a far from home cowboy

(19) Reanalysis: PP > A

(20) $\text{Derivation}_1$ N = { far, from, simple } > 〈 far, from, simple 〉
Interface / far from simple / = 'not simple (by far)' = a kind of simple = A

(21) $\text{Derivation}_2$ N = { a, $[\text{far from simple}]_A$, solution } > 〈 a, [far from simple], solution 〉

### 2.2 Focusing

(19) He left for I think BUDAPEST clause > noun

(20) $\text{Derivation}_1$ N = { I, think, Budapest } > 〈 I, think, Budapest 〉
Interface / I think Budapest / = 'Budapest, I think' = N

(21) $\text{Derivation}_2$ N = { he, left, for, $[\text{I think Budapest}\}_N$ } > 〈 he, left, for, [I think B] 〉

(22) *Effect of focusing*
At the meaning interface, the output of a derivation can be reduced to its focused elements

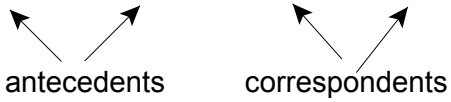
(23) a. He left for I think he said it was BUDAPEST
b. He left for what many took to have been BUDAPEST
c. *He left for the capital of Hungary is BUDAPEST

(24) *Condition*
Reduction at the interface is possible only with zero-semantics material
(e.g. modal or evidential hedging in (19) and (23))

## 3. Gapping

(25) JOHN saw MARY and BILL SUE (sc. Bill saw Sue)

(26) *Standard analysis: clausal coordination + ellipsis*
[ John saw Mary ] and [ Bill ~~saw~~ Sue ]




(27) *Ellipsis analyses*
a. deletion of the verb (+ additional nonfocused material)
(Ross 1970, Hartmann 2000)
b. deletion of a remnant VP (after movement of focused material)
(Jayaseelan 1990, Coppock 2001)

(28) *Movement analysis*
ATB-movement of a remnant VP (after externalization of focused material)
(Johnson 1994, 2009)

(29) *Combinatorial categorial grammar analysis (WYSIWYG)*
Correspondents combined with the first conjunct's VP directly (Steedman 1990)

### 3.1 Locality

(30) *Locality conditions on gapping (cf. Neijt 1979:23f)*
a. **Coordinate Structure Constraint**
* Alphonse cooked [ the rice and the beans ] and Harry ~~cooked [ the rice and~~ the potatoes ]

b. **Sentential Subject Constraint**
* [ That Alphonse ate the rice ] is fantastic and [ ~~that~~ Harry ~~ate~~ the beans ] ~~is fantastic~~

c. **Complex NP Constraint**
* Alphonse discussed [ the question of which rice we would eat ] and Harry ~~discussed [ the question~~ (of) which beans ~~we would eat~~ ]

d. **Left Branch Condition**
* [ People from New York ] love the beach and [ ~~people from~~ LA ] ~~love~~ the theater

e. **Wh-Island Condition**
* John wondered [ when I had fixed the car ] and Bill ~~wondered [ when I had fixed~~ the bike ]

f. **Adjunct Island Condition**
* John saw Mary [ after he fixed the car ] and Bill ~~saw Mary [ after he fixed~~ the bike ]

### 3.2 Ellipsis?

(31) *Problems*
1. no gap-remnant interactions (Ross 1970:250)
2. differences with VP-deletion/pseudogapping (Hartmann 2000, Johnson 2009)
3. typological distribution (cf. Carrera 2006)

*Gap-remnant interactions*

(32) a. *I want Bob TO SHAVE HIMSELF and MARY ~~wants Bob~~ TO WASH HIMSELF
b. *JOHN heard noone OBJECT and BILL ~~heard noone~~ SAY ANYTHING$_{NPI}$
c. #JOHN kicked THE BALL and BILL ~~kicked~~ THE BUCKET

*Differences with VP-deletion/pseudogapping*

(33) *subordination*
a. John kissed Mary before Bill did (VP-deletion)
b. *John kissed Mary before Bill ~~kissed~~ Sue (gapping)
c. John kissed Mary on the mouth before Bill did on the cheek (pseudogapping)

(34) *embedding*
a. John kissed Mary, and I'm pretty sure (that) Bill did, too (VP-deletion)
b. *John kissed Mary, and I'm pretty sure (that) Bill ~~kissed~~ Sue (gapping)
c. John kissed Mary on the mouth, and I'm pretty sure (that) Bill will on the cheek (ps.gapping)

(35) *additional material*
a. John kissed Mary, but Bill hardly did (VP-deletion)
b. *John kissed Mary, but Bill hardly ~~kissed~~ Sue (gapping)
c. John kissed Mary on the mouth, but Bill hardly even did on the cheek (pseudogapping)

(36) *voice mismatches*
a. Mary was kissed by John (even) before Bill did Sue (VP-deletion)
b. *Mary was kissed by John and Bill ~~kissed~~ Sue (gapping)
c. Mary was kissed by John on the mouth before Bill could Sue (even) on the cheek (ps.gapping)

*Typological distribution*

(37) Gapping common in languages without VP-deletion (e.g. Dutch)

(38) *Carrera's generalization (Carrera 2006)*
Languages with different conjunctions for clauses and NPs have no (forward) gapping

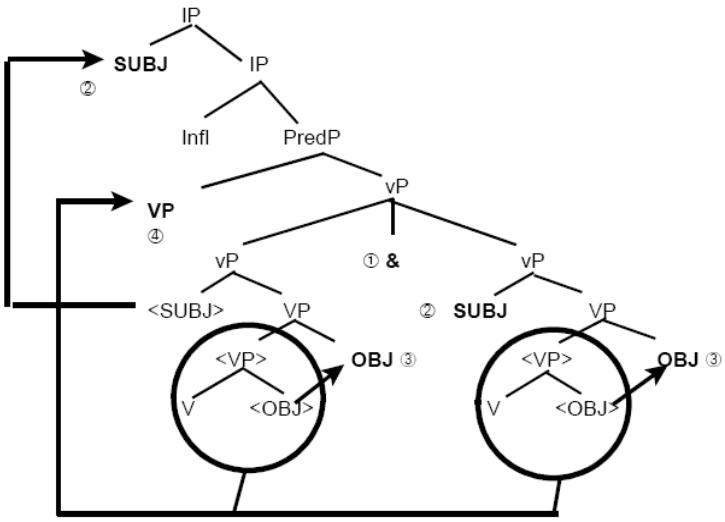
(39) *Wolof: clausal coordinator **te**, NP-coordinator **ag/ak***
* Jënd naa woto te yow mobilette
to.buy PERF:1SG car and you motorbike
(intended) 'I bought a car and you a motorbike.'

### 3.3 Movement?

(40) *Johnson (2009)*
a. low coordination (at vP level) ①
b. subject antecedent moves to subject position; subject correspondent stays in vP ②

c. objects move out of VP via Heavy NP Shift ③
d. Across The Board remnant VP-movement to PredP (above vP) ④

(41) John saw Mary and Bill Sue
② ④ ③ ① ② ③




(42) *Accounts for locality effects (30)*
a. CSC: object movement ③ violates CSC
b. SSC: no low coordination ①
c. CNPC: object movement ③ violates CSC
d. LBC: left branch material ② not part of VP
e. Wh-island: object movement ③ violates Wh-island condition
f. Adjunct Island: object movement ③ out of adjunct + adjunct not part of VP

(43) *Problems*
a. subject movement violates Coordinate Structure Constraint
b. object is not a heavy NP (focus is not enough for Heavy NP Shift)
c. does not cover gapping in Dutch

(44) *Gapping coordination is not asymmetric > CSC-violation is serious*
a. Federer wins Wimbledon and Tiger Woods wins the Masters
(i) symmetric: both events just happen
(ii) asymmetric: consecutive events (*as soon as F wins W, TW wins the M*)
b. Federer wins Wimbledon and Tiger Woods the Masters (only symmetric)
c. Federer wins the US Open and Tiger Woods does too (symmetric/asymmetric)

(45) *Focus not enough for HNPS*
John saw (MARY) yesterday (*MARY)

(46) *The problems with Dutch*
a. No rightward object movement (V-final language) > VP vacated by leftward object shift
b. Then the subject in the second conjunct (*Cook* in (47a)) cannot stay in vP
c. Then the coordination cannot be low and we are looking at clausal coordination again
d. Then ATB-remnant VP-movement cannot be what derives gapping (the verb/VP would have to move higher than the subject to get out of the coordination structure, predicting VS word order)
e. interaction with extraposition (Vanden Wyngaerd 1993) (47b): no object movement out of CP, so remnant VP-movement of verb+infinitive impossible

(47) a. ... dat Tasman Tasmanië ontdekte en Cook de Cook-eilanden
that Tasman Tasmania discovered and Cook the Cook islands
'... that Tasman discovered Tasmania and Cook the Cook Islands.'

b. ... dat Tasman probeerde [$_{CP}$ Tasmanië te ontdekken ] en
that Tasman tried Tasmania to discover and

Cook ~~probeerde~~ [$_{CP}$ de Cook-eilanden ~~te ontdekken~~ ]
Cook the Cook islands

'... that Tasman tried to discover Tasmania and Cook the Cook Islands.'

## 4. Gapping at the interfaces

(48) *Gapping without gaps*
[ [ John saw Mary ] & [ Bill Sue ] ]

(49) *Gapping (descriptive)*
Coordination of a clause A and a string of phrases B, such that
B presents the alternatives to the focused elements in A.

### 4.1 Results and problems

(50) *Immediate results*
a. no gap-remnant interactions (no gap)
b. differences with deletion (no deletion)
(i) no subordination: second conjunct is not a clause
(ii) no embedding: second conjunct is not a clause
(iii) no additional material: additional material presents no focus alternatives
(iv) no voice mismatches: no deleted verb
c. Carrera's generalization (no conjunction for clause + NP > no gapping)

(51) *Problems*
a. unlike category coordination
b. locality effects

### 4.2 Coordination & layered derivations

(52) *Inevitable*
The first conjunct is the output of a separate derivation

(53) N = { the, man, and, the, woman } > 〈 the { man, and, the, woman } 〉
*
(not a constituent)

N = { [the man], and, the, woman } > 〈 [the man], { and, the, woman } 〉

(54) *Strong version*
Conjuncts are outputs of separate derivations (Zwart 2005)
Coordinations are outputs of separate derivations (id., Johnson 2009)

(55) *If so*
Coordinate Structure Constraint reduces to Generalized Integrity (17)

(56) *Hence*
Conjuncts pass through the interfaces before being conjoined

(57) $\text{Derivation}_1$ N = { the, man } > 〈 the, man 〉 > Interfaces
$\text{Derivation}_2$ N = { the, woman } > 〈 the, woman 〉 > Interfaces
$\text{Derivation}_3$ N = { [the man], and, [the woman] } > / the man and the woman /

### 4.3 Gapping at the interfaces

(58) *Possible interface effect (= (22))*
At the meaning interface, the output of a derivation can be reduced to its focused elements

(59) 〈 $\text{John}_{\text{FOCUS}}$, 〈 saw, $\text{Mary}_{\text{FOCUS}}$ 〉〉 > sound interface / JOHN saw MARY /
meaning interface { John, Mary } = focus set

(60) *Unlike category coordination is OK up to semantic parallelism*
John is $[\text{happy}]_{\text{AP}}$ and $[\text{in love}]_{\text{PP}}$

(61) *Proposal*
A clause that is reduced to its set of focused elements at the semantics interface may be conjoined with a set of focus alternatives = Gapping

(62) { [JOHN saw MARY], and, [BILL SUE] } > JOHN saw MARY and BILL SUE (=(25))

(63) *Solves immediately*
unlike category coordination problem

## 5. Deriving locality effects

(64) *General idea*
Focus is a syntactic feature, assigned to *x* upon merger of *x*.

(65) *Hence*
Given a derivation D built on a numeration N, focus can be assigned in D only to members of N (not to members of members of N)

(66) *It follows that*
Elements contained in the output of a previous derivation (cannot be focused and hence) cannot be antecedents in for gapping in the current derivation

(67) *Corollaries*
a. the antecedent cannot be contained in a coordinate structure (**CSC effect** (30a))
> [ Alphonse cooked **[** the rice and **the beans ]** ] and [ Harry **the potatoes** ]

b. the antecedent cannot be contained in a sentential subject (**SSC effect** (30b))
   > [ **[** That **Alphonse** ate **the rice ]** is fantastic ] ] and [ **Harry the beans** ]

c. the antecedent cannot be contained in a left branch constituent (**Left Branch effect** (30d))
   > [ **[** People from **New York ]** love the beach ] ] and [ **LA** the theater ]

d. the antecedent cannot be contained in an adjunct (**Adjunct Island effect** (30f))
   > [ John saw Mary **[** after he fixed **the car ]** ] and [ Bill **the bike** ]

(68) *More generally: an element that cannot be moved in D cannot be marked as an antecedent for gapping in D*

a. the antecedent cannot be contained in a complex NP (**CNPC effect** (30c))
   > [ Alphonse discussed **[** the question of **which rice** we would eat **]** ] and [ Harry **which beans** ]
b. the antecedent cannot be contained in a wh-island (**Wh-Island effect** (30e))
   > [ John wondered **[** when I had fixed **the car ]** ] and [ Bill **the bike** ]

(69) *If we are to have a single account for all constraints on gapping, it follows that* Complex NPs and Wh-islands are outputs of separate derivations

## 6. Problems

### 6.1 A uniform locality principle?

(70) *Discrepancies between movement and gapping*
*(Neijt 1979 Vanden Wyngaerd 1993,Johnson 1994)*
a. Island effects may be relaxed for movement, but not for gapping.
b. Movement across a finite clause boundary is easy, gapping is not.
c. Movement out of *for*-infinitivals OK, gapping not.

(71) *Island effects*
a. What did John wonder when to cook ?
b. *John wondered what to cook today and Bill tomorrow.

(72) *Finite complement clauses*
a. What did Max say that you should buy ?
b. *Max said that you should buy bread and Peter wine

(73) For-*infinitivals*
a. Which video did Vivek want for Nishi to buy ?
b. *Vivek wanted for Nishi to buy the video and Carrie the ice cream.

(74) *Suggestions*
a. Wh-island violations involve a repair strategy (island effect is real)
b. Finite complement clause effect not absolute, possibly involves construction of focus set
c. *For*-infinitival effect: unclear.

(75) JAN zei dat TASMAN Tasmanië ontdekt had en PIET COOK
John said that Tasman Tasmania discovered had and Pete Cook
'John said Tasman discovered Tasmania and Pete (said that) Cook (discovered it).'

## 6.2 Gapping and Conjunction Reduction

(76) *Conjunction reduction ('Right node raising')*
Tasman heeft Tasmanië — en Cook heeft de Cook eilanden ontdekt
Tasman has Tasmania and Cook has the Cook Islands discovered
'Tasman discovered Tasmania and Cook discovered the Cook Islands.'

(77) *Gapping*
Tasman heeft Tasmanië ontdekt en Cook — de Cook eilanden
Tasman has Tasmania discovered and Cook the Cook Islands
'Tasman discovered Tasmania and Cook discovered the Cook Islands.'

(78) *Combined conjunction reduction and gapping*
Tasman heeft Tasmanië — en Cook — de Cook eilanden ontdekt
Tasman has Tasmania and Cook the Cook Islands discovered
'Tasman discovered Tasmania and Cook discovered the Cook Islands.'

(79) *Gapping properties now disappear*
... dat Tasman Tasmanië en **dat** Cook de Cook eilanden ontdekte
that Tasman Tasmania and that Cook the Cook islands discovered
> possibly does not involve gapping after all.

## 7. Conclusion

(80) a. Gapping involves neither ellipsis nor movement
b. Locality effects can be explained as effects of derivation layering (Generalized Integrity)
c. Locality should not be narrowly construed as a condition on movement
d. Locality effects are not indicative of movement

## References

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