

Less (Structure) is More (Economical)

What does the Interaction of Across-the-Board Wh-Movement and Left Branch Extraction Tell Us about the Economy of Deletion (or Structure Building)?

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1. Puzzle

• Across-the-Board Wh-Movement:

1) WH_i [XP ..._{t_i} ...] and [XP ... t_i ...]?

• Left Branch Extraction:

2) WH_i [[DP t_i ...]]

• Across-the-Board Left Branch Extraction:

3) WH_i [XP ... [DP t_i ...]] and [XP ... [DP t_i ...]]?

4) * Which did John recommend t_i book and Mary read t_i book?

5) a. * Which_i did John read [DP t_i book]?

b. * Whose_i did John read [DP t_i book]?

c. * This_i John has read [DP t_i book].

d. * Interesting_i John has read [DP t_i books].

• Exceptions to the Left Branch Condition:

6) a. Którą Jan przeczytał książkę? Polish
 which Jan read book
 ‘Which book did Jan read?’

b. Čju ty čitaeš knigu? Russian
 whose you read book
 ‘Whose book are you reading?’

c. Jakou čte Petr knihu? Czech
 which reads Peter book
 ‘Which book is Peter reading?’

d. Kiro je Janez prebral knjigo? Slovenian
 which is Jan read book
 ‘Which book has John read?’

• Across-the-board wh-questions:

7) a. Którą książkę Maria poleciła a Jan przeczytał? Po
 which book Maria recommended and Jan read
 ‘Which book did Maria recommend and Jan read?’

b. Kakuju knigu Džon porekomendiroval a Meri pročitala? Ru
 which book John recommend and Mary read
 ‘Which book did John recommend and Mary read?’

c. Kterou knihu Jan doporučil a Marie přečetla? Cze
 which book Jan recommended and Marie read
 ‘Which book did John recommend and Mary read?’

d. Kiro knjigo je Janez priporocu in Marija prebrala? Sl
 which book John recommend and Mary read
 ‘Which book did John recommend and Mary read?’

• Across-the-Board Left Branch Extraction:

8) a. * Którą_i Maria poleciła [DP_{t_i} książkę] i Jan przeczytał [DP t_i książkę]? Po
 which Maria recommend book and Jan read book
 ‘Which book did Mary recommend and John read?’

b. * Kakuju Džon porekomendiroval knigu a Meri pročitala knigu? Ru
 which John recommended book and Mary read book
 ‘Which book did John recommend and Mary read?’

c. * Kterou Jan doporučil knihu a Maruška si přečetla knihu? Cze
 which Jan recommend book and Mary REFL read book
 ‘Which book did John recommend and Mary read?’

d. * Kiro je Janez priporocu knjigo in Marija prebrala knjigo? Sl
 which has Jan recommend book and Maria read book
 ‘Which book did John recommend and Mary read?’

• ATB LBE improves if the verb in the second conjunct is gapped (‘salvation by deletion’ of Ross 1969, Merchant 2001, Lasnik and Fox 2003).

9) a. Jaką Maria zamówiła kawę a Jan herbatę? Po
 what-kind-of Maria ordered coffee and Jan tea
 ‘What kind of coffee did Mary order and what kind of tea did Jan order?’

- b. Kakuju Džon pročitao knihu a Meri gazetu? Ru
 which John read book and Mary newspaper
 ‘What kind of book did John read and what kind of newspaper did Mary read?’
- c. Kterou Jan přečetl knihu a Maruška báseň? Cze
 which Jan read book and Mary poem
 ‘Which book did John read and which poem did Mary read?’
- d. Cigavo je Janez prebral pesem a Marija knjigo? Sl
 whose has Jan read poem and Mary book
 ‘Whose poem did John read and whose book did Mary read?’

• If the verb inside the second conjunct is *not* gapped, it has to be distinct from the verb inside the first conjunct:

- 10) Ile Maria zjadła pierogów a Janek wypił drinków?
 how-many Mary ate pierogis and John drank drinks
 ‘How many pierogis did Maria eat and how many drinks did John have?’

• The nominals inside the two conjuncts also have to be distinct:

- 11) a. *Ile Jan kupił kawy a Maria kupiła kawę?
 how-much Jan bought coffee and Maria bought coffee
- b. Ile Jan kupił kawy a Maria kupiła herbatę?
 how-much Jan bought coffee and Maria bought tea

• More generally, the remnants in the second conjunct have to be distinct from their correlates in the first conjunct.

Q1: Why do the remnants in ATB LBE constructions have to be distinct?

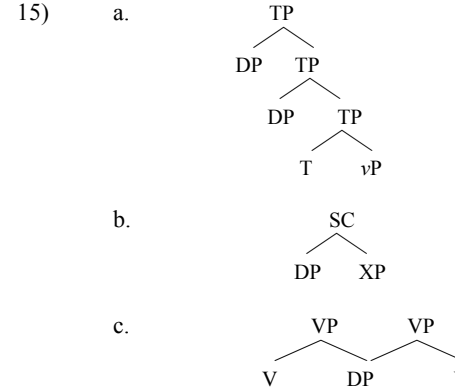
- 12) Jan kupił kawę i Maria kupiła kawę.
 Jan bought coffee and Maria bought coffee
 ‘John bought coffee and Mary bought coffee.’

• In this respect, ATB movement parallels gapping (Ross 1970, Jackendoff 1971, Kuno 1974, Hankamer 1971, Rooth 1992).

- 13) a. Robin likes movies, and Leslie ~~likes~~ plays.
 b. * Robin likes movies, and Leslie likes plays.
 c. * Robin likes movies, and Leslie ~~likes~~ movies.

- 14) a. ?? What movie did Mary see and John see?
 b. ?? Where did Mary go and John go?

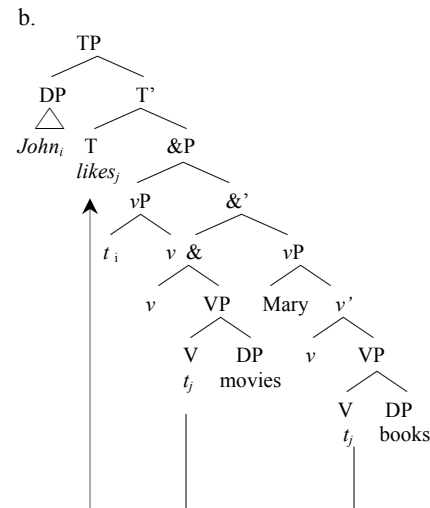
• A ban against linearizing symmetric structures (Kayne 1994, Moro 2000, Citko 2005)



• Economy of Deletion (*Maximize Deletion Under Identity, Minimize Structure Under Ellipsis*)

• Gapping involves ATB (verb)-movement (Johnson 2000, 2003, Lin 2000):

- 16) a. John likes movies and Mary books.



• In Slavic, gapped sentences require a different conjunction than their non-gapped counterparts:

- 17) a. Maria napisała książkę *i* Jan napisał książkę.
 Maria wrote book and Jan wrote book
 ‘Maria wrote a book and Jan wrote a book.’ Po
- b. * Maria napisała książkę *i* Jan recenzje.
 Maria wrote book and Jan review
 ‘Maria wrote a book and Jan a review.’
- c. Maria napisała książkę *a* Jan recenzje.
 Maria wrote book and_C Jan review
 ‘Maria wrote a book and Jan a review.’
- 18) a. * Vasja podaril Maše knigu *i* Kolja kompakt-disk Ru
 Vasja presented Masha book and Kolja CD
 ‘Vasja presented Masha a book, and Kolja a CD.’
- b. Vasja podaril Maše knigu *a* Kolja kompakt-disk
 Vasja presented Masha book and_C Kolja CD
 Vasja presented Masha a book, and Kolja a CD. (Kazenin 2001:7)
- 19) a. * Jaka Maria napisała książkę *i* Jan recenzje?
 what Maria wrote book and Jan review
 ‘What book did Maria write and what review did Jan write?’
- b. Jaka Maria napisała książkę *a* Jan recenzje?
 What Maria wrote book and_C Jan review
 ‘What book did Maria write and what review did Jan write?’
- 20) a. Ile Maria napisała książek *a* Jan przeczytał recenzji?
 how-many Maria wrote books and_C Jan read reviews
 ‘How many books did Maria write and how many reviews did Jan read?’
- b. * Ile Maria napisała książek *i* Jan przeczytał recenzji?
 how-many Maria wrote books and Jan read reviews
 ‘How many books did Mary write and how many reviews did Jan read?’

Q2: Can we learn something about ATB wh-movement and LBE the way they interact with each other?

A2: ATB wh-movement involves a multi-dominant structure.

	<i>Op movement</i>	<i>Sideward movement</i>	<i>multi-dominance</i>
<i>‘No DP’</i>	☹	☹	☺
<i>remnant movement</i>	☹	☹	☺
<i>scattered deletion</i>	☹	☹	☺

2. Some Background on Left Branch Extraction

2.1. *‘No DP’ Approach* (Corver 1992, Gij 1987, Kennedy and Merchant 2000, Zlatic 1997, Uriagereka 1988, Bošković 2005)

• LBE correlates with the lack of overt articles:

- 21) a. * *Kakva* prodade Petko *t* kola? Bulgarian
 what-kind sold Petko car
 I ‘What kind of a car did Petko sell?’
- b. * *Kakva_i* prodade Petko *t* kola? Macedonian
 what-kind-of sold Petko car
- 22) a. [CP which_i [C_i did [IP John read [DP *t_i* book]]]]
 └──────────────────────────────────┘
- b. [CP which_i [C_i [IP Jan read [NP *t_i* book]]]]
 └──────────────────────────────────┘

• Other D-like elements have to be reanalyzed as adjectives:

- 23) a. ten pan Po
 this man
- b. každy pan
 every man

• Head raising within noun phrases has to target some other projection:

- 24) a. język polski
 language polish
 ‘Polish language’
- b. kraj ojczysty
 country paternal
 ‘motherland’

• The assumption that there is no DP layer does not (by itself) account for what looks like movement of non-constituents:

- 25) *Z którymi* rozmawiałś *studentami*?
 with which you-talked students
 ‘Which students did you talk to?’

2.2 *Remnant Movement Approach* (Borsley and Jaworska 1988, Franks and Progovac 1994)

- 26) a. Którą Jan przeczytał książkę?
 which Jan read book
 ‘Which book did Jan read?’

- b. Jan read *book_i* [_{DP} which *t_i*]
- c. [_{DP} which *t_i*]_j Jan read *book_i* *t_j*

27) a. *Z którymi* rozmawiałaś *studentami*?
with which you-talked students
'Which students did you talk to?'

- b. You talked *students_i* [_{PP} to which *t_i*]
- c. [_{PP} to which *t_i*]_j you talked *students_i* *t_j*

2.3 Scattered Deletion Approach (Fanselow and Cavar 2002, Fanselow 2005)

• PP are islands:

- 28) a. **Jakie drzewo* Jan wszedł [_{PP} na *t*]?
what-kind-of tree Jan climbed on
'What kind of tree did Jan climb?'
- b. **Co* Jan wszedł [_{PP} na duże *t*]?
what Jan climbed on big
'What big thing did Jan climb?'
- c. **Drzewo* Jan wszedł [_{PP} na duże *t*]
tree Jan climbed on big
'Jan climbed a big tree.'

• LBE is a consequence of a *Copy* and *Merge* approach to movement coupled with the assumption that copy deletion can take place in a discontinuous manner:

- 29) a. Którą Jan przeczytał książkę?
which Jan read book
- b. which book Jan read which book? (Copy)
- c. which ~~book~~ Jan read ~~which~~ book? (Delete)

• How to constrain it? (Discourse considerations)

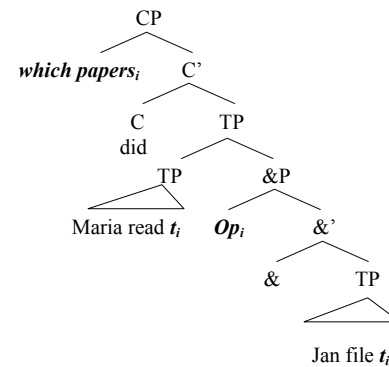
• Why do some *Copy* and *Delete* operations obey islands, and others don't?

3. Some Background on ATB Movement

3.1 Empty Operator Movement Analysis (Franks 1993, 1995, Munn 1993,2001)

- 30) a. Which papers did Mary read and John file?
- b. Which paper did Mary file without reading?

31)

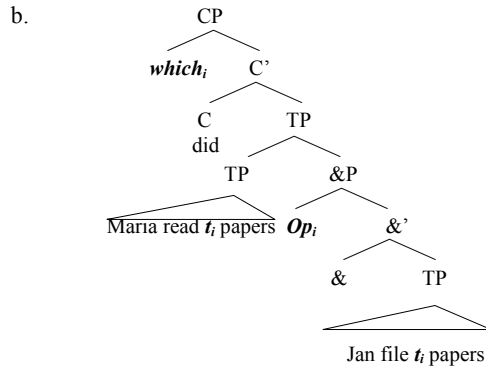


• Case matching and case syncretism effects in ATB questions and parasitic gap constructions (Franks 1993, 1995):

- 32) *Kogo-ACC* Jan polubił *t-ACC* a *Maria* pokochała *t-ACC*? *Po*
who Jan liked and_C Maria loved
'Who did Jan begin to like and Maria begin to love?'
- 33) **Komu-DAT/kogo-ACC* Maria dawała pieniądze *t-DAT* a Jan unikał *t-GEN*?
whom Maria gave money and_C Jan avoid
'Whom did Maria give money and John avoid?'
- 34) *Kogo-ACC* Jan polubił *t-ACC* a *Maria* zaczęła unikać *t-GEN*?
who Jan liked and Maria started avoid
'Who did Jan begin to like and Maria begin to avoid?'
- 35) * *malčik, ktoromu/kotorogo* Maša dawała den'gi *t-DAT* do togo, kak (ona) *Ru*
boy who-DAT/who-GEN Masha gave money until she
stala izbegat' PG-GEN
started to-avoid
'the boy who Masha gave money to until she started to avoid'
(Franks 1995:79)
- 36) *devuška, ktoroj* Ivan dawała den'gi *t-DAT* do togo, kak (on)
girl who-DAT/GEN Ivan gave money until he
stal izbegat' PG-GEN
started to-avoid
'the girl who Ivan gave money to until he started to avoid'
(Franks 1995:78)

• What rules out empty operator movement out of the left branch?

- 37) a. * *Jakie_i Maria przeczytała* [_{DP*t_i*} artykuły] i Jan odłożył [_{DP *t_i*} artykuły]?
 what Maria read papers and Jan filed papers



• Comparative subdeletion (Kennedy and Merchant 2000, Kennedy 2002)

- 38) a. * Pico wrote a more interesting novel [_{CP *Op_i*} than Brio wrote *t_i* a play]
 b. * Erik drives a more expensive car [_{CP *Op_i*} than Polly drives a *t_i* motorcycle]

- 39) a. Pico wrote a more interesting novel than Brio did.
 b. Erik drives a more expensive car than Polly does.

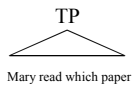
- 40) a. Jan napisał dłuższy list niż Paweł napisał sztukę. *Po*
 Jan wrote longer letter than Paweł wrote play
 'Jan wrote a longer letter than Paweł did a play.'

- b. Jan kupił droższy samochód niż Paweł kupił motocykl.
 Jan bought more-expensive car than Paweł bought motorcycle
 (Kennedy and Merchant 2000:105)

3.2 *Sideward Movement (Nunes 1995, Nunes 2001, Nunes and Hornstein 2002, Adbayani and Zoerner 2004)*

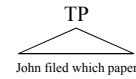
- 41) a. Which paper did Mary read and John file?
 b. N = {*which paper*, Mary, John, file, read, *v₂*, T₂, &, C}

- 42) a. Build TP₁ *Mary read which paper*
 b. Copy *which paper*

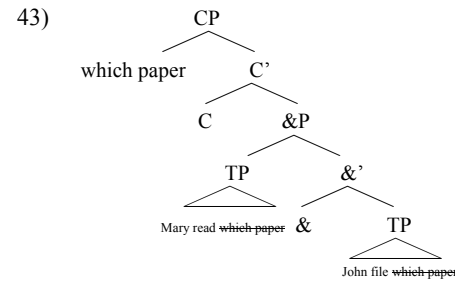


which paper

- c. Merge *which paper* with *file*
 d. Build TP₂ *John filed which paper*



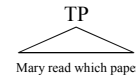
- e. Merge TP₁ with &
 f. Merge TP₂ with &P
 g. Merge &P with C
 h. Copy and Merge *which paper* with C



• What rules out sideward movement out of the left branch?

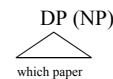
• N = {*which*, *paper*₂, Mary, John, file, read, *v₂*, T₂, &, C}

- 44) a. Build TP₁ *Mary read which paper*
 b. Copy *which*

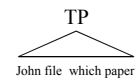


which

- c. Merge *which* with *paper*

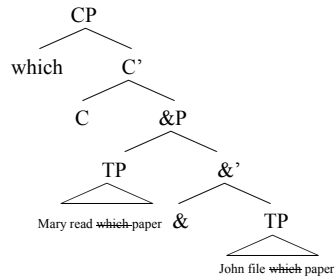


- d. Build TP *John file which paper*



- e. Merge TP1 with &
- f. Merge TP2 with &P
- g. Merge &P with C
- h. Copy and Merge *which*

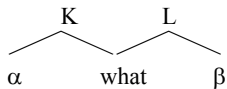
45)



3.3 *Multi-Dominance Approaches* (Williams 1977, Goodall 1983, 1987, Muadz 1991, Moltmann 1992, Wilder 1998, Citko 2005).

- ATB wh-questions involve a multi-dominance structure, in which the wh-pronoun is shared between the two conjuncts

46) *Parallel Merge*



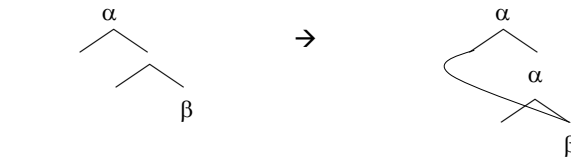
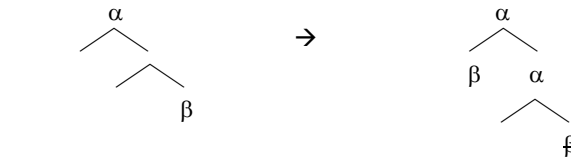
- How are *Parallel Merge* structures created? In one step (violating binarity of Merge) or in two steps (violating cyclicity) (Citko 2005)?
- How are *Parallel Merge* structures linearized?
- The existence of *Parallel Merge* structures is a natural consequence of a system that has *Internal Merge* and *External Merge* (Chomsky 2001).

• External Merge:



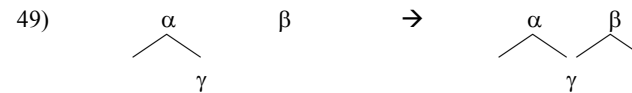
• Internal Merge (Chomsky 2001, see also Gärtner 1999, Starke 2001, Zhang 2001):

- 48) a. 'Copy and Paste' Theory of Movement



- The existence of *External Merge* and *Internal Merge* predicts the existence of a third type of *Merge* combining the properties of both. It is like *External Merge* in that it takes two distinct rooted objects but is like *Internal Merge* in that it combines them by taking a subpart of one of them.

• *Parallel Merge* (compare to Chomsky's 2001 *Pair Merge*):



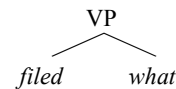
- Chomsky 2001:16: 'There is an operation SIMPL that converts $\langle \alpha, \beta \rangle$ to $\{\alpha, \beta\}$... it is part of the operation TRANSFER which transfers the NS derivation to both Φ and Σ .'

- Only phonetically overt elements need to be linearized (Chomsky 1995, Moro's 2000 Dynamic Antisymmetry)

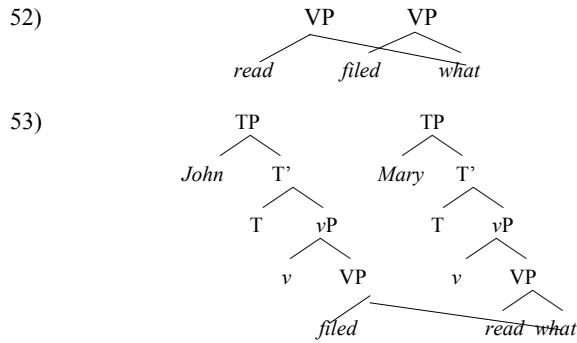
- *Parallel Merge* structures are linearizable as long as the shared element is a trace (more generally, an unpronounced element).

50) I wonder what *Mary read and John filed*.

51) a. Merge *filed* and *what*

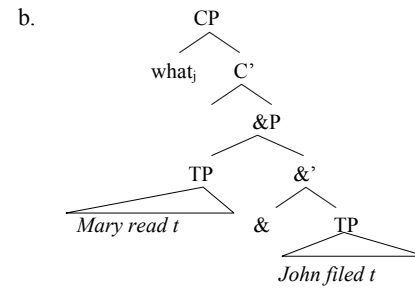
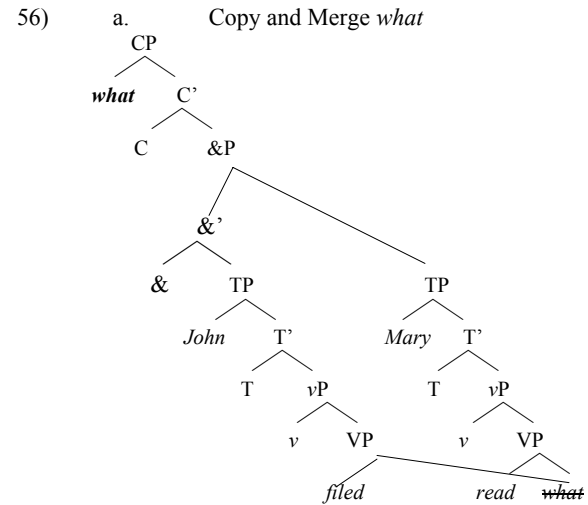
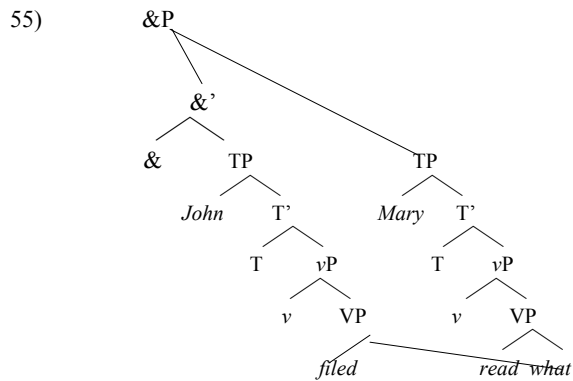
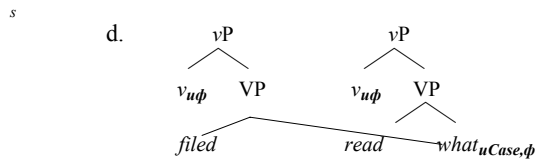


b. *Parallel Merge* *read* with *what*

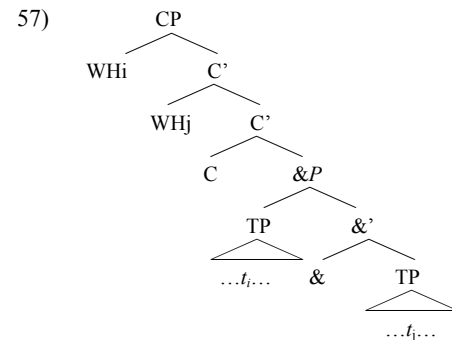


• Case valuation in Parallel Merge structures

- 54) a. $Probe_{u\phi} \quad Goal_{uCase,\phi}$ *Agree* (Chomsky 2001)
 b. $Probe_{u\phi} \quad Goal_{uCase,\phi} \quad Goal_{uCase,\phi}$ *Multiple Agree* (Hiraiwa 2005)
 c. $Probe_{u\phi} \quad Probe_{u\phi} \quad Goal_{uCase,\phi}$ *Parallel Agree*



• The quintessential property of ATB movement follows the *Parallel Merge* analysis:



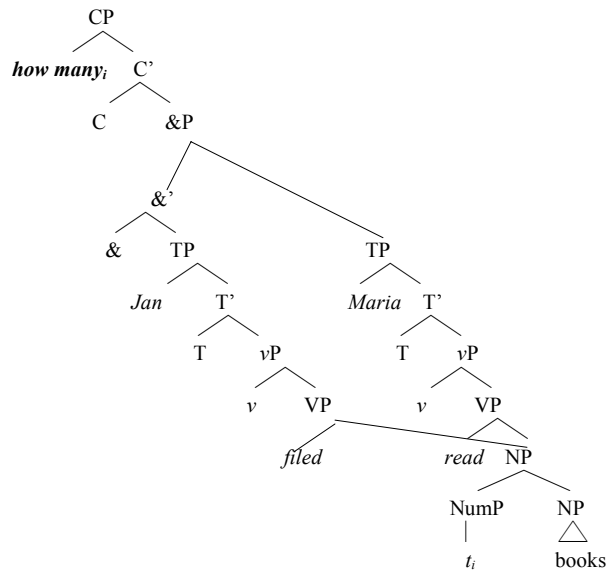
- 58) a. $Co_i \quad co_j$ Maria przeczytała t_i a Jan odłożył t_j ?
 what what Maria read and_C Jan filed
 'What did Maria read and John file?'

- b. * *Kogo_i komu_j Jan lubi t_i a Maria się przygląda t_i?*
 who-ACC who-DAT Jan likes and_C Maria REFL looks-at
 'Whom does Jan like and Maria is looking at?'
- c. * *Komu_j kogo_i Jan lubi t_i a Maria się przygląda t_i?*
 who-DAT who-ACC Jan likes and_C Maria REFL looks-at
 'Who does Jan like and Maria looks at?'
- d. *Co_i komu_j Jan wczoraj dał t_j t_i a Maria dzisiaj oddała t_j t_i?*
 what whom Jan yesterday gave and_C Maria today returned
 'What did Jan give to whom yesterday and Maria return to whom today?'

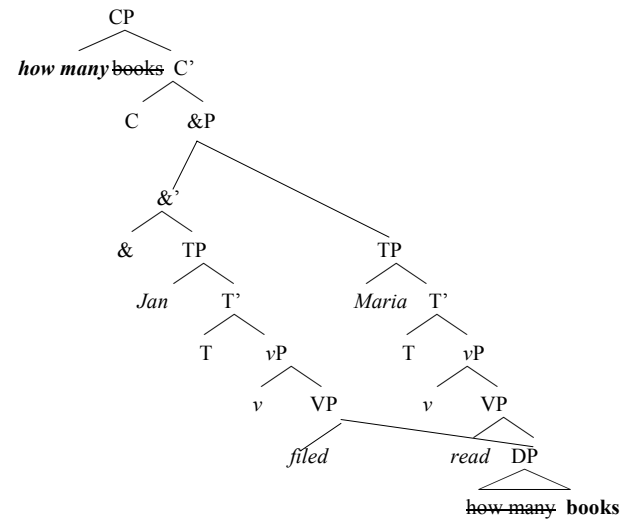
4. Constraints on LBE

- 59) * *Ile_i Maria przeczytała t_i książek a Jan odłożył t_i książek?*
 how many Maria read books and_C Jan filed books
 'How many books did Maria read and how many books did Jan file?'

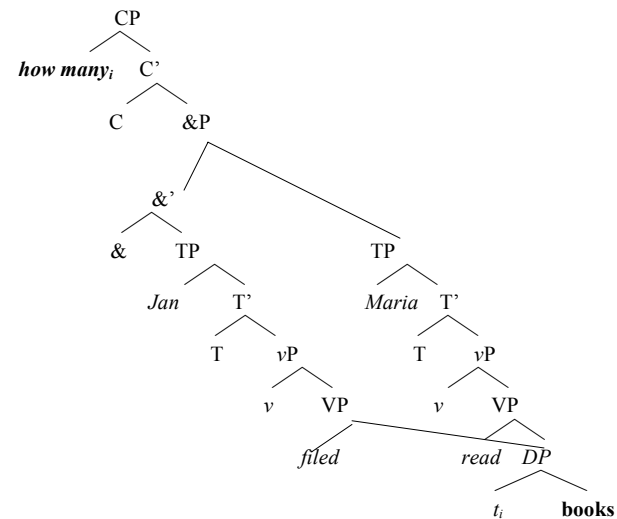
- 60) a. No DP Approach:



- b. Scattered Deletion Approach:

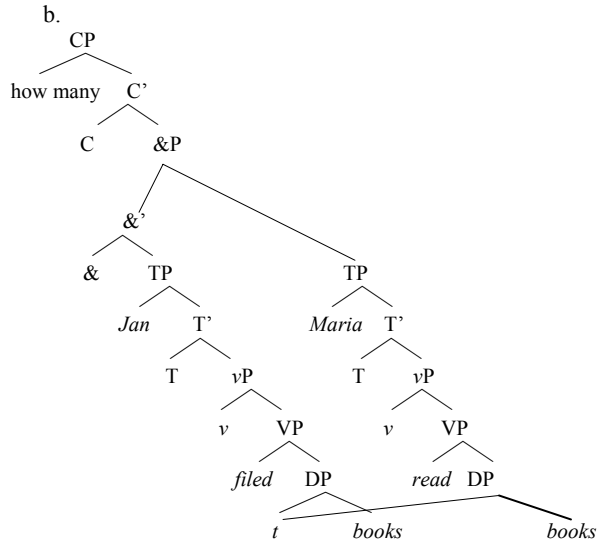


- c. Remnant Movement Approach:



• What rules out the following derivation?

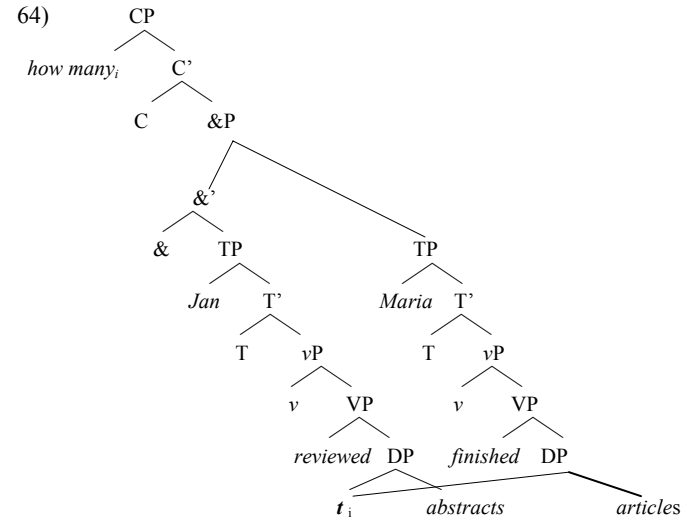
61) a. **Ile_i* Maria przeczytała *t_i* książek a Jan odłożył *t_i* książek?
 how-many Maria read books and_C Jan filed books



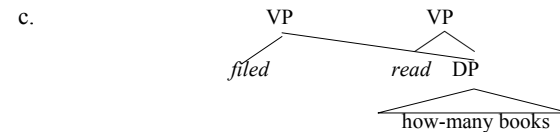
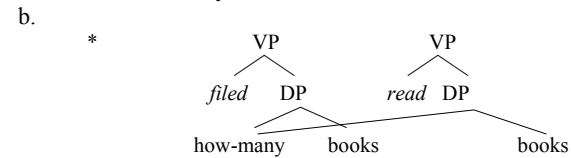
• Shared determiners are possible as long as their complement nominals are distinct.

62) *Ile_i* Maria skończyła *artykułów* a Jan zrecenzjonował *abstraktów*?
 how-many Maria finished articles-GEN and_C Jan reviewed abstract-GEN
 'How many articles did Maria finish and how many abstracts did Jan review?'

63) **Który_i* Maria skończyła *t_i* artykuł a Jan zaczął *t_i* książkę?
 which-SG.MASC Maria finished article-SG.MASC and_C Jan started book-SG.FEM
 'Which article did Mary finish and which book did Jan start?'



65) a. **Ile* Maria przeczytała książek a Jan odłożył książek?
 how-many Maria read books and_C Jan filed books
 'How many books did Maria read and Jan file?'



• Economy of Deletion

66) Maximize Deletion (Delete as much as is recoverable)

• Economy of Representation (Minimal Structure in Ellipsis)

67) In ellipsis constructions, only as much structure as is required to satisfy the interface conditions is posited in the ellipsis site. (Kennedy 2001:17)

• Economy of Numeration

- 68) a. $N_1 = \{Jan, Maria, read, recommended, book_1, and, T_2, v_2, C\}$
 b. $N_2 = \{Jan, Maria, read, recommended, what, book_2, and, T_2, v_2, C\}$

Chomsky 1995:227: 'in evaluating derivations for economy, we consider only alternatives with the *same numeration*.'

Fox 2000:111: 'Reference set is restricted to linguistic objects that have *identical semantic interpretations*.'

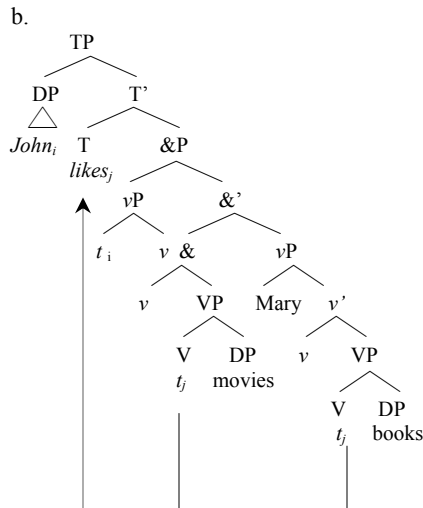
- 69) Reference-Set Economy (Reinhart 1995, 2004)

The reference-set consists of pairs $\langle d, i \rangle$ of derivation and interpretation, and it is motivated by interface needs: A given $\langle d, i \rangle$ pair is blocked if the same interface effect could be obtained more economically (i.e. there is a more economical $\langle d, i \rangle$ competitor in the reference-set).

- 70) Mary read this *book* and John read that *book*.

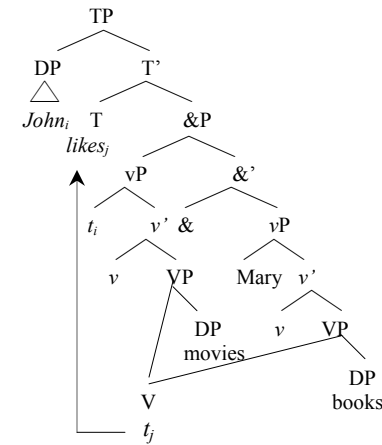
- Johnson 1996/2003: (verb) gapping involves across-the-board movement *not* deletion

- 71) a. John likes movies and Mary books.



- Across-the-board movement involves *Parallel Merge*
- Gapping thus also has to involve *Parallel Merge*

72)



- The presence of the same constraints in gapping and ATB wh-movement follows from the same structure (and the same economy considerations).

- 'Complex gaps' involve ATB movement of bigger units (predicate shift of Johnson 2003)

- 73) a. Some ate nattoo and others ate rice.
 b. Some ate the nattoo hungrily and others ate the nattoo timidly.
 c. Some talk about problems openly and others talk about problems cautiously.

Conclusions and Implications

- ATB movement involves *Parallel Merge*.
- All *Parallel Merge* structures are subject to a *distinctness requirement*, which follows from a structural economy condition.

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Disanaphora requirement arises only in the context of coordinate ellipsis

How many did you buy t of these books, and give (of them) to Mary?
How many did you buy of these books, and sell t of those books*

Appendix: Further Consequences of a Parallel Merge Approach to ATB Wh-Questions (Citko in press)

• Case matching and case syncretism effects in ATB questions:

- 74) *Kogo-ACC* Jan polubił *e-ACC* a Maria pokochała *e-ACC*? *Po*
 who Jan liked and Maria loved
 ‘Who did Jan begin to like and Maria begin to love?’
- 75) * *Komu-DAT/kogo-ACC* Maria dawała pieniądze *e-DAT* a Jan unikał *e-ACC*?
 whom Maria gave money and Jan avoid
 ‘Whom did Maria give money and John avoid?’
- 76) *Kogo-ACC* Jan polubił *e-ACC* a Maria zaczęła unikać *e-GEN*? *Po*
 who Jan liked and Maria started avoid
 ‘Who did Jan begin to like and Maria begin to avoid?’

• Lack of covert ATB movement (Cho and Zhou 1999, Wu 1999 and Citko and Grohmann 2000, Bošković and Franks 2000):

Chinese:

- 77) Zhangsan xihuan *shenme ren* Lisi taoyan *shenme ren*?
 Zhangsan like which person Lisi hate which person
 ‘Which person does Zhangsan like and which person does Lisi hate?’

Korean:

- 78) John-i enu *salam-ul* cohaka-ko Maryka-ka enu *salam-ul* miweha-ni?
 John which person like-and Mary which person hate-Q
 ‘Which person does John like and which person does Mary hate?’

Japanese:

- 79) John-ga *dono hito-o* aisitei-te Mary-ga dono hito-o nikundeiru-no?
 John which person love-and Mary which person hate-Q
 ‘Which person does John love and which person does Mary hate?’

- 80) a. * which person x, Zhangsan/John likes x and Lisi/Mary hates x
 b. which person x, Zhangsan/John likes x and which person y, Lisi/Mary hates y

- 81) a. *Shenmo ren* Zhangsan xihuan Lisi taoyan?
 which person Zhangsan like Lisi hate
 ‘Which person does Zhangsan like and Lisi hate?’

- b. *Enu salam-ul* John-icohaka-ko Maryka-ka miweha-ni?
 which person John like-and Mary hate-Q
 ‘Which person does John like and Mary hate?’

- c. *Dono hito-o* John-ga aisitei-te Mary-ga nikundeiru-no?
 which person John love-and Mary hate-Q
 ‘Which person does John love and Mary hate?’

- 82) a. Some delegate represented *every candidate* and nominated *every candidate*. (* $\forall y \exists x$)
 b. Some boy hugged *every girl* and hugged *every girl*. (* $\forall y \exists x$)
 (Bošković and Franks 2000:114)