Roll-up Movement and Complement-Head orders

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Abstract

- Cross-linguistic word-order variation supports the idea of roll-up movement.
- An analysis of the data in Dryer (2005) shows that complement-head orders in most languages are derived by full, partial or zero roll-up movement.
- Complement-head order within words gives evidence to complement movement to the local spec.
- Roll-up movement derives compound-like constituents with complement-head order only if the derived constituent has an unmarked word-stress.

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Loadmap

1. **Complement movement to Spec**
   FOFC, snowballs, junctural asymmetry, derivation of CH orders, non-existent orders
2. **Typology of snowballs**
   heads and complements, data of word orders, sizes of snowballs, CH/HC typology, movement domains, deriving Greenberg's universals
3. **On Anti-locality**
   derivation of CH orders, implausible functional categories
4. **Stress and snowballing movement**
   selection checking, overt/covert movement, stress location and CH orders, other correlations
5. **Conclusion**

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1. Complement movement to Spec

1.1 The Final-Over-Final Constraint (FOFC)

- The absence of certain word orders (e.g. $[_{IP}\ [_{VP}$ V O] Aux], $[_{CP}\ [_{VP}$ V O] .. C]) in languages is explained with FOFC (Biberauer et al. 2008)

(1) *$[_{ZP}\ [_{XP}$ X YP] Z] where XP is the complement of Z and YP is the complement of X.

- FOFC prohibits a complement phrase with head-complement order (XP) from moving into the spec of the head (Z), namely ...
- Roll-up movement cannot skip cycles.

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1.2 Roll up complements to make snowballs

- Roll-up movement has the effect of phonological/ morphological compounding.
- The constituent derived by roll-up movement, which moves (potentially) branching complement to the spec of X^0, has left-branching structure, which has short juncture between its constituents.
- For the difference of juncture (pause) mapped from left-branching and right-branching structure, see the next slide.

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1.3 Junctual asymmetry: $[_{XP}$ X YP]/$[_{X}$ YP-X]

- Sequential Voicing in Japanese (Tokizaki 2008)
  [*nise* [*t*anuki *jiru*]] vs. [[*nise danuki*] *jiru*]
  mock badger-soup mock-badger soup
- Similar blocking in Korean *n*-Insertion (Han 1994)
- Interfixation in Dutch three-word compounds (Krott et al. 2004)
- Suffixes attach to stems more closely than prefixes (Hyman 2008)
- Phrasing in German VP: (V)(O)/(OV) (Wagner 2005)
- Quasi-Incorporation in Dutch OV (Booij 2009)
- OV languages tend to be agglutinative (Lehmann 1973, Plank 1998, cf. Kayne 1994)

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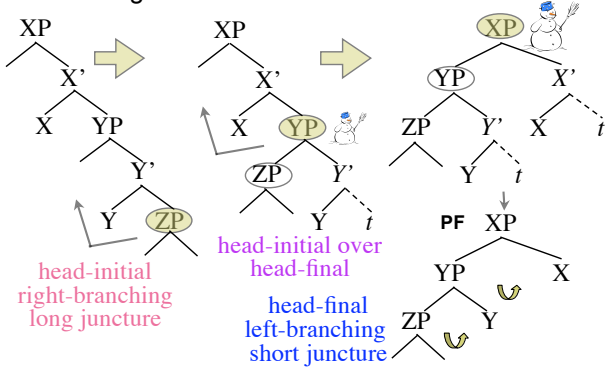
1.4 Deriving head-final structure to make snowballs



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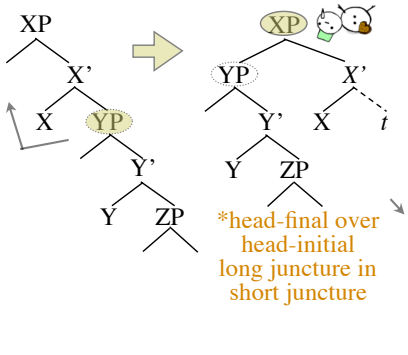
1.5 Non-existent orders and FOFC



Holmberg's (2000) Final-Over-Final Constraint (FOFC)
*[βP [αP α γP] β]
Biberauer et al. (2007) EPP < EPP

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2. Typology of snowballs

2.1 Heads and Complements

- Heads: non-branching constituents (cf. Dryer 1992)
- Complements: (potentially) branching constituents

	Head-Compl	->	Compl-Head
a.	Prefix-Stem		Stem-Suffix
	m-wia (Swa)		*debt-or*
b.	Noun-Genitive		Genitive-Noun
	nímò ma-Kùkkú (Krongo)		*Kukku's-mother*
c.	Prepostion-DP		DP-Postposition
	into room		*huoneese-en* (Fin)
d.	Verb-Object		Object-Verb
	read books		*Bücher lesen* (Ger)
e.	AdvSubordinator-Cl		Cl-AdvSubordinator
	before you go		*anata-ga iku maeni* (Jap)

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2.2 Analyzing the data of word orders

- Roll-up movement makes snowballs (complement-head) of different sizes.
- Some of them can be checked with Dryer (2005)
  - Stem-Suffix
    Prefixing vs. suffixing in inflectional morphology (#26)
  - Genitive-Noun
    Order of genitive and noun (#86)
  - DP-Postposition
    Order of adposition and noun phrases (#85)
  - Object-Verb
    Order of object and verb (#83)
  - Clause-Adverbial Subordinator
    Order of adverbial subordinator and clause (#93)

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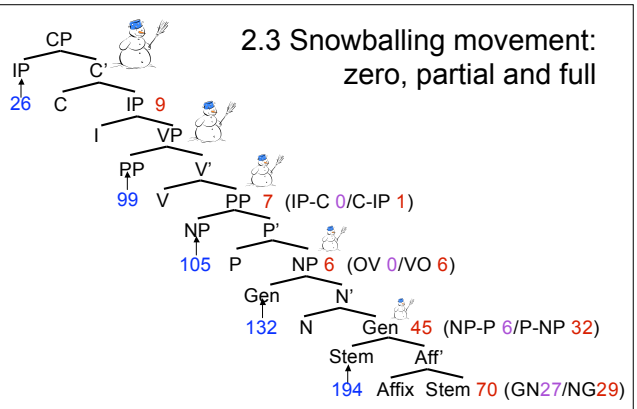
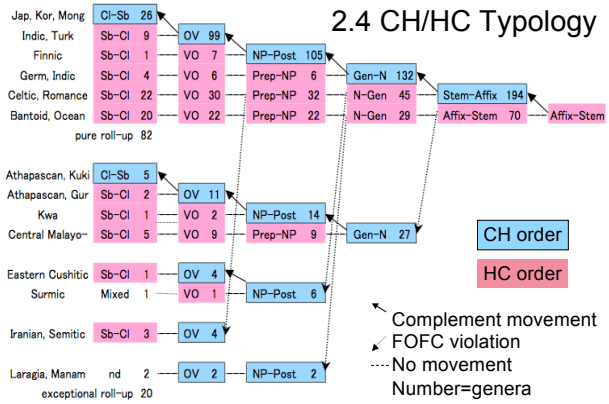
2.3 Snowballing movement: zero, partial and full



2.4 CH/HC Typology



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2.5 Domains of roll-up movement 1

- Word: Affix-Stem
  - No Stem-movement results in Prefix-Stem (prefixing: 70 genera) (No roll-up, strictly head-initial, Bantu)
  - Complement movement applies to Prefix-Stem to make Stem-suffix (suffixing: 194 genera)
- NP: Noun-Genitive
  - No Genitive-movement results in N-Gen (45 genera) (Partial roll-up, Celtic, Romance)
  - Genitive-movement applies to N-Gen to make Gen-N (132 genera)
- PP: Adposition-DP
  - No DP-movement results in P-DP (6 genera, Partial roll-up, Germanic, Indic)
  - DP-movement applies to P-DP to make DP-P (105 genera)

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2.6 Domains of roll-up movement 2

- VP: Verb-Object
  - No Object-movement results in VO (7 genera, Partial roll-up, Finnic)
  - Object-movement applies to P-DP to make DP-P (99 genera)
- Subordinate clause: Adverbial subordinator-Clause
  - No Clause-movement results in AdvSub-Cl (9 genera, Partial roll-up, Indic, Turkic)
  - Clause-movement applies to P-DP to make DP-P (26 genera, Full roll-up, harmonic head-final, Japanese, Korean)

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2.7 Deriving Greenberg's universals

- The number of the genera with pure roll-up movement (82) is more than four times as much as the number of the genera with exceptional roll-up movement including FOFC violation (20).
- Moreover, even in exceptional cases, there is no double FOFC violation.
- We can derive Greenberg's (1963) implicational universals #2, 3, 4, 5, 7, 9, 16, 17, 18, 21 and 27 from the theory of roll-up movement.
- These facts support the idea of roll-up movement.

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2.8 Greenberg's implicational universals

#2: P-NP -> N-Gen; NP-P -> Gen-N
#3: VSO -> P-NP
#4: SOV -> NP-P
#7: SOV (or OSV) -> Adv-V
#9: QPrt-IP -> P-NP; IP-QPrt -> NP-P
#15: VP-I -> OV
#16: VSO -> I-VP; SVO -> VP-I
#17: VSO -> N-Adj
#18: Adj-N -> Dem/Num-N
#21: Adj-Adv -> N-Adj, VO
#27: Prefix-Stem -> P-NP; Stem-Suffix -> NP-P

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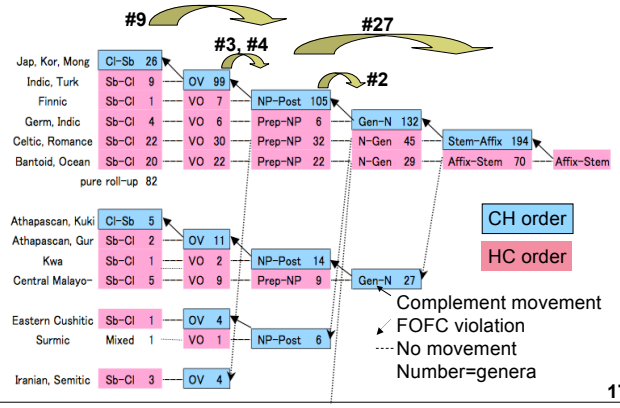
2.9 Greenberg's universals predicted



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3. On Anti-locality

3.1 Derivations of Complement-Head orders

- Complement movement into the local Spec: Anti-locality violation
  $[_{XP}$ YP $[_{X'}$ X YP]]
- Complement movement into the Spec of functional head (F): Anti-locality observed (Kayne 1994)
  $[_{FP}$ YP $[_{F'}$ F $[_{XP}$ X YP]]]
- We could choose either of these as long as the functional category has no phonetic features.
- But the problem is whether it is plausible to assume any functional category in the constituent.
- Is there any evidence for functional categories?

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3.2 Implausible functional categories

- It is implausible that there is any functional category within a word (cf. Di Sciullo 2005).
  a. $[_{AffixP}$ Stem $[_{Affix'}$ Affix Stem$]]$
  b. $[_{FP}$ Stem $[_{F'}$ F $[_{AffixP}$ Affix Stem$]]]$ (FP=word)
- Stem moves to the spec of Affix as in (a), and not to the spec of a higher functional head than Affix as in (b).
- Complement can move to the local spec at least in word domain.
- $[_{FP}$ Genitive $[_{F'}$ F $[_{NP}$ N Genitive$]]]$ (FP=NP)
- $[_{FP}$ DP $[_{F'}$ F $[_{PP}$ P DP$]]]$ (FP=PP)
- $[_{FP}$ DP $[_{F'}$ F $[_{VP}$ V DP$]]]$ (FP=VP)
- $[_{FP}$ IP $[_{F'}$ F $[_{CP}$ C IP$]]]$ (FP=CP)

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4. Stress and snowballing movement

4.1 Questions and short answers

- What is the trigger for roll-up movement?
- Why are there no, partial and full roll-up movement?
  - Complement must be in the Spec position of Head to be checked for selection at LF.
  - A phonological compound made by overt roll-up movement must have the unmarked word-stress in the language.

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4.2 Roll-up movement for selection checking

- The selectional relation needs to be checked in some way (cf. Holmberg 2000).
  a. Pure f(eature)-movement (Chomsky 1995)
  b. Head movement
  c. XP-movement
  - Complement or its feature moves to the Spec of its head in order to be licensed at LF.
  - Constituents with head-complement order are not interpretable at LF.
  - Spec-Head is a local relation but Head-Complement is not.

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4.3 Why is the movement overt in HF languages?

- Compact PF:
  PF representation should have compounds rather than phrases.
- Complements overtly move to the spec in order to make compounds.
  $[_{VP}$ $[_{V'}$ *taberu* $[_{NP}$ *buryusselu waffulu(-o)*$]]]$ -->
  eat Brussels waffle(-Acc)
  $[_{VP}$ $[_{NP}$ *buryusselu waffulu(-o)*$]$ $[_{V'}$ *taberu* $[_{NP}$ *t*$]]]$
- Stress Constraint:
  The resulting constituent, which is like a compound because it is left-branching, observes the unmarked stress location of the language.

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4.4 Why is the movement covert in HI lgs?

- Compact PF:
  PF representation should have compounds rather than phrases.
- Complements overtly move to the spec in order to make compounds.
  $[_{VP}$ $[_{V'}$ eat $[_{NP}$ Brussels waffles$]]]$ -->
  *$[_{VP}$ $[_{NP}$ Brússels waffles$]$ $[_{V'}$ eat $[_{NP}$ *t*$]]]$
- However, the resulting constituent, which is like a compound because it is left-branching, does not observe the unmarked stress location of the language (e.g. English: right-oriented stress).
- Cf. German: right-oriented but a bit more leftward
  $[_{VP}$ $[_{NP}$ *Brússels waffeln*$]$ $[_{V'}$ *essen* $[_{NP}$ *t*$]]]$

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4.5 Stress position and Coml-Head orders

- The main stress falls on the most deeply embedded element (cf. Cinque 1993).
  =the leftmost element in a left-branching structure
- As Complement and Head become longer, the stress moves to the left in the resulting compound:

$[_{HP}$ $[_{H}$ σ$][_{C}$ σ$]]$	-1 ult	Pref-St	Bantu	pen
$[[_{C}$ σ$][_{H}$ σ$]]$	-2 pen	St-Suf	Romance	R-edge
$[[_{C}$ σσ$][_{H}$ σ$]]$	-3 ant	Gen-N	German	R-orient
$[[_{C}$ σσσ$][_{H}$ σ$]]$	-4	DP-P	Finnic	initial
$[[_{C}$ σσσ$][_{H}$ σσ$]]$	-5	DP-V	Ind, Turk	R-orient?
$[[_{C}$ σσσσ$][_{H}$ σσ$]]$	-6	IP-C	Jap, Kor	No

- Roll-up movement is possible if the main stress location in the derived quasi-compound matches the unmarked word-stress location in the language.

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4.6 Stress locations: Fixed and Weight-sensitive

- Fixed: σ σ σ .. σ σ σ
  initial, second, third .. antepenult, penult, ultimate
- Weight-sensitive:
- Left-edge (37): first or second σ σ σ ... σ σ σ
  ˈkutira, paʈˈʈaaɭak,kaaran (Malayalam)
- Left-oriented (2): first, second or third σ σ σ ... σ σ σ
  (Kashaya, Hokan; Laragia, Australian)
- Right-edge (65): penult or ultimate σ σ σ ... σ σ σ
  ˈwarra, waˈraa (Epena Pedee, Choco)
- Right-oriented (27): antepen, pen or ult σ σ σ ... σ σ σ
  doˈmesticus, reˈfeːcit (Classical Latin)
- Unbounded (54): anywhere in the word σ σ σ ... σ σ σ
  ˈnosogid, kɛmiŋˈgaːr (Dongolese Nubian)
- Combined (8): Right-edge and unbounded

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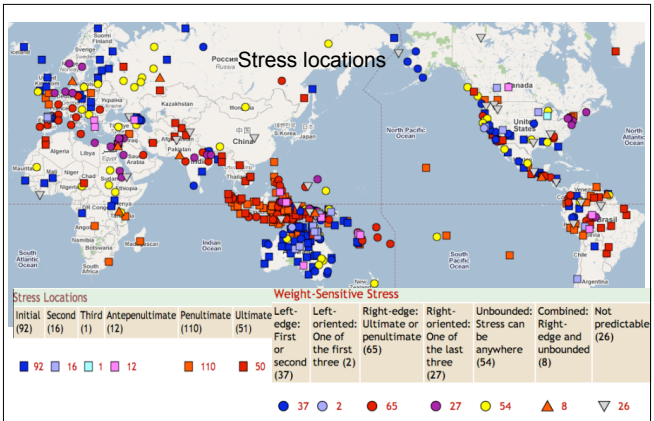

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Lang	JpKr	Altai	Supyr	Finn	Germ	Rom	Bant	Lang
Stress	no	unbd	init	init	R-ori	R-ed	pen	Stress
St-Af	+	+	+	+	+	+	–	Af-St
G-N	+	+	+	+	+	–	–	N-G
DP-P	+	+	+	+	–	–	–	P-DP
O-V	+	+	+	–	–	–	–	V-O
Cl-Sb	+	+	–	–	–	–	–	Sb-Cl

- As the unmarked stress position moves leftward, C-H order increases from the smallest constituent (Stem-Affix) to the largest (Clause-Subordinator).
- Complement moves to the specifier position to make a C-H 'compound' if it observes the word-stress in the language: $[_{HP}[_{H}\ \sigma][_{C}\ ..\ \underline{\sigma}\ \sigma]] \rightarrow [_{H}[_{C}\ ..\ \underline{\sigma}\ \sigma][_{H}\ \sigma]]$

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Percentages of genera with H-C/C-H order (*WALS*)

	L-ed	Initial	Unbnd	R-ed	R-ori	Ultimate	Penult
Aff-Stem	0.0	20.7	21.1	16.7	25.0	23.5	35.5
N-Gen	28.0	20.6	100.0	30.4	100.0	51.7	48.4
P-NP	10.0	38.9	38.1	47.4	45.5	53.8	62.1
VO	40.5	40.5	45.5	44.4	45.5	50.0	60.0
Sub-Cl	20.0	83.3	63.2	85.7	85.7	64.7	76.9
H-C Ave	19.6	40.8	41.9	44.9	45.5	48.8	56.6
Stem-Aff	100	79.3	78.9	83.3	75.0	76.5	64.5
Gen-N	72.0	79.4	0.0	69.6	0.0	48.3	51.6
NP-P	90.0	61.1	61.9	52.6	54.5	46.2	37.9
OV	59.5	59.5	54.5	55.6	54.5	50.0	40.0
Cl-Sub	80.0	16.7	36.8	14.3	14.3	35.3	23.1
C-H Ave	80.4	59.2	58.1	55.1	54.5	51.2	43.4

Combinations of less than 10 genera are not colored.

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4.7 Other universal correlations

- CH order -> simple syllable strcture to avoid consonant cluster
  *$[[_{C}$ ...VCC$][_{H}$ CCC...$]]$ -> $[[_{C}$ ...V$][_{H}$ C...$]]$
  HC order -> simple or complex syllable structure
- Compounding parameter +:
  compounds (esp. recursive compounds)
  preposition stranding (V-P)
  ...
- Clitic-V in Bantu and Romance
- Historical changes of stress location and word orders

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5. Conclusion

- To sum up, complement-head orders in languages support the idea of roll-up movement, which also explains language universals in morpho-syntax and its interface with phonology.

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