Peeling the onion

On domains and semantic hierarchies in Icelandic compounds

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1. Introduction

Compounds have generally been assumed to be recursive structures where, e.g. N is added to another N, yielding large and complex structures such as the following

(1) a. child camel jockey slavery (Jackendoff 2009)
   b. $$\begin{array}{ll}
   & N \\
   & \downarrow \\
   & N \\
   & \downarrow \\
   & N \\
   & \downarrow \\
   & N \\
   & N \\
   & N \\
   & N
   \end{array}$$

General intuition regarding non-head elements has been that are somehow deficient.
   - non-referential
   - cannot be inflected
     - Pervasive myth (see e.g. Bloomfield 1933; Allen 1978; Wiltschko 2008)

Various languages allow inflection on non-head elements in compounds, e.g. Finnish, Estonian, Yimas, Tamashek, Warlpiri and Icelandic (see e.g. Bauer 2009: 346-347 and references cited therein; Rögnvaldsson 1990).

(2) lækni-s#tösk-ur
    doctor-GEN.SG#bag-NOM.PL
    doctor’s bags

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1 I would like to thank the following people (in chronological order) for valuable discussions and comments on various parts of this analysis at different stages of this project: Jonathan Bobaljik, Alec Marantz, Anton Karl Ingason, Hlíf Árnadóttir, Einar Freyr Sigurðsson, Susi Wurmbrand, Jim Wood, Beata Moskal, Peter Smith, Magdalena Kaufmann, Andrea Calabrese, William Snyder as well as the audience at the NYU Syntax/Semantics Brown Bag Series, the 9th Workshop on Syntax and Semantics in Siena and the 2013 LSA annual meeting where different stages of this analysis were presented.
Differences in distribution of inflected and uninflected modifiers have been noted but not expanded on (e.g. Rögnvaldsson 1990):

- Inflected modifiers appear to be peripheral to stem modifiers in a right branching structure.

**Proposal:**

I. There are separate domains in which inflected and uninflected modifiers are merged.

   → Compounding is subject to a Matching Condition, which states that compounding only merges elements of the same type/size.

II. The types of relations between the head and its modifiers are subject to a semantic hierarchy.

   → This hierarchy is repeated at each level of modification, but does not hold between them.

**Roadmap:**

Section 2: Constituency within compounds

Section 3: Word structure and compounds

Section 4: Semantic hierarchies
2. Constituency within compounds

Any linear order and combination of modifiers is possible:

STEM – STEM – HEAD; GEN – STEM – HEAD; STEM – GEN – HEAD; GEN – GEN – HEAD

Interpretation reveals limitations to the internal structure.

If both modifiers are of the same type, either left branching structure or a right branching structure will be available.

(3)  a. karl#hest#vagn
    man#horse#wagon

    b. MAN
       |  or
       HORSE   WAGON
       ‘a horse carriage for men’
    

(4)  a. karl-a#hest-a#vagn
    men-GEN#horses-GEN#wagon

    b. MAN
       |  or
       HORSE   WAGON
       ‘a horse carriage for men’
    

If compounds are ‘mixed’, they are no longer ambiguous wrt. left- or right branching structures.

In case of GEN – STEM – HEAD, only right branching structure will be available (see e.g. Rögnvaldsson 1990).

(5)  a. karl-a#hest#vagn
    men-GEN#horse#wagon

    b. MAN
       | *
       HORSE   WAGON
       ‘a horse carriage for men’
    

    MAN   HORSE   WAGON
    ‘carriage drawn by male horses’
In case of the order STEM – GEN – HEAD, only left branching structure will be available.

(6) a. karl#hest-a#vagn
   man#horses-GEN#wagon

   b. *
      \[\text{MAN} \quad | \quad \text{HORSE} \quad \text{WAGON} \quad \text{MAN} \quad \text{HORSE} \quad \text{WAGON}\]
   ‘a horse carriage for men’  ‘carriage drawn by male horses’

(7) **Generalization**
    Inflected modifiers are merged ‘higher’ than stem modifiers.

3. **Word structure and compounds**

Setting aside the question of whether N consists of a root and a category creating node, $c^o$ as argued by e.g. Marantz (1997; 2001; 2007), the assumed structure of a noun is given below.

(8) a. mann-i
    man-DAT.SG

    b. \[\varphi \quad N \quad \varphi \quad \text{MAN} \quad \varphi \quad \text{DAT.SG}\]

- $\varphi$ is a (potentially empty) structure, necessary for realizing inflection.
- Inflected modifiers, consisting of stem N and $\varphi$, can only attach to $\varphi$.
- Stem modifiers, being N, cannot attach to anything larger than N.
- Both stem and inflected modifiers can be modified by elements of the same size or smaller.
(9) a. karl-a #hest #vagn  (cf. 5 above)
    men-GEN#horse#wagon

b. 
   \[ \varphi_1 \]
   \[ \varphi_3 \]
   \[ \varphi_3 \]
   \[ N_3 \]
   \[ \text{MAN} \]
   \[ \text{GEN} \]
   \[ N_1 \]
   \[ \varphi_1 \]
   \[ \text{NOM} \]
   \[ N_2 \]
   \[ \text{HORSE} \]
   \[ N_1 \]
   \[ \text{WAGON} \]

c. 
   \[ \varphi_1 \]
   \[ N_1 \]
   \[ \varphi_1 \]
   \[ N_2 \]
   \[ \text{WAGON} \]
   \[ \varphi_2 \]
   \[ \text{HORSE} \]
   \[ \varphi_3 \]
   \[ N_3 \]
   \[ \text{MAN} \]
   \[ \text{GEN} \]

(10) a. karl#hest-a#vagn  (cf. 6 above)
    man#horse-GEN#wagon

b. 
   \[ \varphi_1 \]
   \[ \varphi_2 \]
   \[ \varphi_1 \]
   \[ N_2 \]
   \[ \text{HORSE} \]
   \[ \varphi_2 \]
   \[ \text{GEN} \]
   \[ N_3 \]
   \[ \text{MAN} \]
   \[ N_2 \]
   \[ \text{HORSE} \]
   \[ N_1 \]
   \[ \text{WAGON} \]
   \[ \text{NOM} \]

c. * 
   \[ \varphi_1 \]
   \[ N_3 \]
   \[ \text{MAN} \]
   \[ \varphi_2 \]
   \[ \text{HORSE} \]
   \[ \varphi_2 \]
   \[ \text{GEN} \]
   \[ N_1 \]
   \[ \text{WAGON} \]
   \[ \text{NOM} \]
(11) a. karl#hest#vagn       (cf. 3 above)
man#horse#wagon

b.  
\[
\begin{array}{c}
\varphi_1 \\
N_1 \\
N_2 \\
N_3 \\
\end{array}
\begin{array}{c}
\varphi_1 \\
NOM \\
WAGON \\
MAN \\
\end{array}
\begin{array}{c}
N_2 \\
N_1 \\
\end{array}
\begin{array}{c}
N_1 \\
HORSE \\
\end{array}
\]

c.  
\[
\begin{array}{c}
\varphi \\
N_1 \\
N_3 \\
\end{array}
\begin{array}{c}
\varphi \\
N_1 \\
\end{array}
\begin{array}{c}
N_2 \\
N_1 \\
\end{array}
\begin{array}{c}
man \\
horse \\
wagon \\
\end{array}
\]

(12) a. karl-a#hest-a#vagn     (cf. 4 above)
men-GEN#horse-GEN#wagon

b.  
\[
\begin{array}{c}
\varphi_1 \\
\varphi_2 \\
\varphi_3 \\
N_3 \\
\end{array}
\begin{array}{c}
\varphi_2 \\
\varphi_1 \\
N_2 \\
\end{array}
\begin{array}{c}
\varphi_1 \\
N_1 \\
\end{array}
\begin{array}{c}
WAGON \\
NOM \\
\end{array}
\begin{array}{c}
MAN \\
GEN \\
HORSE \\
GEN \\
\end{array}
\]

c.  
\[
\begin{array}{c}
\varphi_1 \\
\varphi_3 \\
\varphi_2 \\
\varphi_1 \\
N_3 \\
\end{array}
\begin{array}{c}
\varphi_3 \\
\varphi_2 \\
N_2 \\
\end{array}
\begin{array}{c}
\varphi_1 \\
N_1 \\
\end{array}
\begin{array}{c}
MAN \\
GEN \\
HORSE \\
\end{array}
\begin{array}{c}
GEN \\
WAGON \\
NOM \\
\end{array}
\]
(13) *The Matching condition.*
Compounding merges elements of the same syntactic type.

A potential counterexample to the analysis above.

(14) vör-u#bíl#stjór-i
    merchendise-GEN#car#stearer-nom
    truck driver

(15) a. vör-u#bíl-l
    merchendise-GEN#car-nom
    truck

b. bíl#stjór-i
    car#stearer-nom
    driver

(16) a. [rút-u#[bíl#stjóri]]
    bus-GEN#car#stearer
    bus driver

b. [trukk-a#[bíl#stjóri]]
    truck-GEN#car#stearer
    truck driver

b. [trukk-a#[bíl#stjóri]]
    truck-GEN#car#stearer
    truck driver

c. [eink-a#[bil#stjóri]]
    private-GEN#car#stearer
    chauffeur

d. [strætis#vagna#[bíl#stjóri]]
    street-GEN#wagon-GEN#car#stearer
    bus driver


(17) a. transformational grammarian (Spencer 1988)

b. ummyndanamálfraðingur (Bjarnadóttir 1994)
4. Semantic hierarchies

Adopting Bisetto and Scalise’s (2005; 2009) classification of compounds.

(18) Compounds

<table>
<thead>
<tr>
<th>Coordinate</th>
<th>Attributive</th>
<th>Subordinate</th>
</tr>
</thead>
</table>

Relations of each type are possible at either domain of modification.

(19) a. sür#sætur  
sour#sweet  
sweet and sour

b. eld#fjall  
fire#mountain

c. vél#maður  
machine#man  
(heavy) machinery operator

(20) a. bakara#lögga  
baker-GEN#cop

b. myglu#ostur  
mold-GEN#cheese

c. félags#fæði  
company-GEN#study

These relations appear to be hierarchically ordered.

The following compound is ambiguous, vél- could be in either subordinate or coordinate (or attributive) relationship with the head.

(21) vél#maður  
machine#man  
(heavy) machinery operator / android

Ambiguity lost with the addition of an attributive stem modifier, i.e. only coordinate interpretation is possible.

(22) góð#vél#maður  
good#machine#man

a good android

If the attributive modifier is inflected, both subordinate and coordinate readings are available for vél-.

(23) gæð-a#vél#maður  
good(N)-GEN#machine#man

a good quality heavy machinery operator / android

Same holds at the higher domain, φ.
Drawing on the works of e.g. Cinque (2010), Scott (2002) and Bobaljik (1999), I propose that the availability of relations is subject to a semantic hierarchy.

(32) **Semantic hierarchy of modifier-head relations**

SUBORDINATE > ATTRIBUTIVE > COORDINATE

In principle, any modifier can be in any type of relation with the head. Availability of different relations is restricted by the modifier’s position relative to other modifiers and what relation they bear with the head.

The hierarchy in (32) is repeated at each level of modification, but does not hold between levels.

5.1. Restrictions on right branching structures.

Asymmetric complexities of right and left branching structures well known (e.g. Warren 1978), where the majority of compounds consisting of 3 or more elements have a left branching structure. Same holds for Icelandic (Kvaran 2005:154-155).


(26) a. [[nú#tíma#máls][athugunar]texti] now#time#language#checking#text modern language research text

b. [[al#þjóða#heil#brigðís#mála]stofnun] all#nation#whole#change#issue#institution World Health Organization (adapted from Snædal 1992)

(27) [[Donau#dampf#schiff#fahrt -s#gesellschaft -s#kapitän-s]mütze] Danube#steam #ship #journey-L#journeyman-SUFF-L#captain-L#cap cap of the captain of the Danube steam ship company (Neef 2009)
It appears that there are limits to how many modifier can bear a particular relation at either level of modification, i.e. one.

Attributive
(28) a. *góð#rauð#vín  
good#red#wine  
a good quality red wine
b. gænd#rauð#vin   
good(N)-GEN#red#wine

Subordinative
(29) a. *sagn#mál#fræði  
verb#language#study  
linguistics of verbs
b. sagna#mál#fræði

Coordinative
(30) a. *bjarn#vél#menni  
bear#machine#man  
a robot bear
b. bjarna#vél#menni

The same appears to hold at the inflectional level of modification.

Coordinative
(31) a. *bakara#kennara#lögga  
baker-GEN#teacher-GEN#cop  
policemen/baker/teacher
b. *bjarna#vélar#menni  
bear-GEN#machine-GEN#man  
bear robot

Subordinative
(32) a. *sölu#véla#maður  
sale-GEN#machine-GEN#man  
a salesman and a (heavy) machinery operator
b. *sagna#mála#fræði  
verb-GEN#language-GEN#study  
linguistics of verbs

Attributive
(33) a. *atvinnu#konu#leikari  
work-GEN#woman-GEN#actor  
professional female actor
b. *dýra#barns#grátur  
animal-GEN#child-GEN#cry  
an animal-like and child-like cry
If only one modifier can be in a particular type of relation with the head at any given level of modification, right branching structures will be severely restricted.

Still allows up to 6 modifiers in a right branching structure.

References

Appendix: Distinguishing words from phrases

I. Stress. Primary stress falls on the first syllable; secondary stress falls on every other subsequent syllable (Árnason 1985; 1987; 2011).

(1) a. ’prófessˌor  
b. ’drottningˌar  
   professor  
   queen

In compounds, the first syllable of the leftmost stem will receive primary stress and the first syllable of every subsequent stem will receive secondary stress. If clash arises, stress will be shifted (2a) or dropped, (2b-d).

(2) a. ’fisk#verˌkandi  
b. ’prófessor#ˌbindi  
fish#worker  
a professor tie  
c. ’plat#fisk#ˌverkandi  
d. ’drottningar#ˌmaður  
fake#fish#worker  
the queen#man  
fake fish processor  
the queen’s husband

II. Syntax. Phrasal genitives in Icelandic are always postnominal, (3a), unless contrastive, (3b). Word-internal genitives cannot have the suffixed definite article, (3c-d).

(3) a. ’bill ˈstrákanˌna  
b. ’strákanna ˈbill  
c. *’strákanna ˈbill  
d. *’stráka ˈbill  
car  boysŋenˌtheŋen  
the boys’ car  
boysŋenˌtheŋen  
the boys’ car  
boysŋenˌtheŋen  
the boys’ car  
boysŋenˌtheŋen  
the boys’ car  
boysŋenˌtheŋen  
the boys’ car  
boysŋenˌtheŋen  
the boys’ car

Word-internal genitives (læknis-) don’t survive N’ deletion, (4b) and (4e), where phrasal genitives do, (4f), (Jónasar).

(4) Mig langar í...  
IACC wants in  
I want...

a. ...þrjár gular læknis#töskur  
b. *...þrjár gular læknis  
c. *...þrjár gular _  
d. ...þessa gulu læknis#tösku  
e. *...þessa gulu læknis  
f. *...þessa gulu _  
threeACC  
threeACC  
threeACC  
threeACC  
threeACC  
yellowACC  
three yellowACC  
three yellowACC  
doctorGEN#bags  
doctorGEN#bagACC  
three yellow doctor’s bags  
that yellow doctor’s bag of Jonas’  
three yellow doctors ones  
that yellow doctor’s one of Jonas’  
three ACC  
three ACC  
three ACC

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