

Sentence Processing

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In order to accomodate head movement, we have broken apart the phonological contribution of phrases into material to the left of the (complex) head, the (complex) head itself, and material to the right of the (complex) head. Thus each part manipulated by the syntactic operations now consists of these three components.

Because there are more ways of combining a pair of triples together than a pair of singletons, we have more combinatory operations than before.

op	strings
$\mathbf{s}((a, b, c), (d, e, f))$	$(defa, b, c)$
$\mathbf{c}((a, b, c), (d, e, f))$	$(a, b, cdef)$
\mathbf{t}	$(\epsilon, \epsilon, \epsilon)$
$\mathbf{c}_{pre}((a, b, c), (d, e, f))$	(a, be, cdf)
$\mathbf{c}_{suf}((a, b, c), (d, e, f))$	(a, eb, cdf)

We can interpret these operations on **spans** as well, which we exploit in parsing. Here, we continue to need one pair of numbers for each string (a string u is determined by its span—its beginning position i and its end position j). Thus a triple of strings is represented by a sextuple of integers: $(a, b, c) \rightsquigarrow (i, j, k, l, m, n)$.¹

op	spans
$\mathbf{s}(\langle i, j, k, l, m, n \rangle, \langle f, g, g, h, h, i \rangle)$	$\langle f, j, k, l, m, n \rangle$
$\mathbf{c}(\langle i, j, k, l, m, n \rangle, \langle n, o, o, p, p, q \rangle)$	$\langle i, j, k, l, m, q \rangle$
\mathbf{t}	$\langle i, i, j, j, k, k \rangle$ (for any i, j , and k)
$\mathbf{c}_{pre}(\langle i, j, k, l, m, n \rangle, \langle n, o, l, q, o, p \rangle)$	$\langle i, j, k, q, m, p \rangle$
$\mathbf{c}_{suf}(\langle i, j, k, l, m, n \rangle, \langle n, o, q, k, o, p \rangle)$	$\langle i, j, q, l, m, p \rangle$

¹I have here flattened the triple of pairs of integers $(\langle i, j \rangle, \langle k, l \rangle, \langle m, n \rangle)$ one would naively arrive at into a sextuple of integers.

It is simplest to indicate whether head-movement should occur on the feature itself (instead of on the pronounced component of the lexical item). This I will do by means of an overset arrow—so \overleftarrow{x} and \overrightarrow{x} are complement merge with head movement features, the former involving suffixation of the higher head, the latter prefixation (the arrow indicates the side the stem appears on). This means that the linguistic restrictions about the distribution of head movement (only from base generated complements) must be implemented in terms of constraints on lexical items (only the first feature of an LI may have an overset arrow, and then only if it is a complement selection feature).

1 MergeComp

$$\frac{(u, =x.\alpha), \Phi \quad (v, x), \Psi}{(c(u, v), \alpha), \Phi, \Psi} \qquad \frac{(u, =x.\alpha), \Phi \quad (v, x.\beta), \Psi}{(c(u, \tau), \alpha), \Phi, (v, \beta), \Psi}$$

1.1 with head movement

$$\frac{(u, \overleftarrow{x}.\alpha), \Phi \quad (v, x), \Psi}{(c_{suf}(u, v), \alpha), \Phi, \Psi} \qquad \frac{(u, \overrightarrow{x}.\alpha), \Phi \quad (v, x), \Psi}{(c_{pre}(u, v), \alpha), \Phi, \Psi}$$

2 MergeSpec

$$\frac{(u, x=. \alpha), \Phi \quad (v, x), \Psi}{(s(u, v), \alpha), \Phi, \Psi} \qquad \frac{(u, =x.\alpha), \Phi \quad (v, x.\beta), \Psi}{(s(u, \tau), \alpha), \Phi, (v, \beta), \Psi}$$

3 Move

$$\frac{(u, +x.\alpha), \Phi, (v, -x), \Psi}{(s(u, v), \alpha), \Phi, \Psi} \qquad \frac{(u, +x.\alpha), \Phi, (v, -x.\beta), \Psi}{(s(u, \tau), \alpha), \Phi, (v, \beta), \Psi}$$