Cyclic Feature Deletion

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Main Claim: In this talk we argue for a concept of cyclic deletion of morphological features within Distributed Morphology theory (Halle and Marantz, 1993). We present data from different Kiranti languages which show blocking phenomena that are strong evidence for a concept of impoverishment rules that can only take already realized features as their context. The implementation of this derives instances of category- and marker-sensitive blocking.

Background In many Kiranti languages, an interesting distribution of agreement markers in the transitive verbal paradigms can be found. In principle, transitive verbs show agreement with subject and object for number and person features as can be seen in the example (2a) for Hayu. In (2b), however, we see that only agreement with the object is possible and the expected number markers *-tshe* (dual), *-ne* (2pl) and *-me* (3pl) for the subject are blocked. A closer look at the verbal agreement paradigms in different Kiranti languages reveals a simple generalization: whenever a non-singular (dual or plural) marker realizes features of argument α, agreement with the other argument β is impossible. Since agreement in Kiranti follows a person hierarchy $1 \gg 2 \gg 3$, only the highest argument's features are realized in those blocking contexts. The paradigm (3) which gives the agreement affixes for Hayu illustrates this.

Analysis In DM, such blocking of expected markers are the result of impoverishment rules which delete morpho-syntactic features of the input: certain expected vocabulary items (VI) are not inserted since their features are deleted. We propose a modification of this system where impoverishment rules only take features that are already realized by inserted markers as their context (Noyer, 1992; Frampton, 2003, are other examples where reference to realized features is crucial). Impoverishment therefore applies cyclically after every insertion step (cf. the insertion algorithm (4)). After a VI is inserted, the available impoverishment rules are checked if one or more can be applied. If this is the case, the respective features are deleted and the insertion process proceeds until no VIs are available that match the feature specification of the context. Such a system implements the Kiranti facts with a single impoverishment rule that deletes an agreement head α in the context of a *–sg* feature that is realized on the other agreement head β. The impoverishment rule (1) does not apply until a VI with the feature *–sg* is inserted (features in angle brackets symbolize <*realized*> features).

(1) *Impoverishment in Hayu*
$[\dots]_\alpha \rightarrow \emptyset$ / <–sg>$_\beta$ __

Discussion Impoverishment rules in DM standardly apply before the insertion process starts. Our approach differs in combining insertion and deletion into one step. Otherwise, a couple of unrelated impoverishment rules would be necessary to account for the blocking in the Kiranti patterns since such a solution is incapable of capturing an important hierarchy-effect: the highest argument's features are realized first and if this contains a non-singular agreement marker, further agreement is impossible. The proposed solution implements the hierarchy into the specificity concept that decides competition for insertion between markers (e.g. Müller, 2006). So a marker realizing features of the highest argument is always inserted first. Only if this marker realizes *–sg*, the impoverishment rule in (1) applies. This is why it's always agreement with the argument highest on the language-specific hierarchy that is realized and agreement with the lower argument is omitted in the blocking contexts. Agreement with the latter can only surface if the agreement marker inserted for the highest argument is a singular marker. Standard impoverishment rules can never capture this point and need different rules: for example, in $2\rightarrow1$ contexts, agreement with the agent is blocked (rule (5a)) and in $1\rightarrow2$, agreement with the patient (5b). With these multiple rules, it is merely a coincidence that first person is higher-ranked than second person and that the lower argument's features remain unrealized.

(2) *Agreement in Hayu (Michailovsky, 1974, 2003)*

a.

	1s
2s	-ŋo
2d	-ŋo-tshe
2p	-ŋo-ne
3s	-ŋo
3d	-ŋo-tshe
3p	-ŋo-me

b.

	1de	1pe
2s	-tshok	-kok
2d	-tshok***-tshe**	-kok***-tshe**
2p	-tshok***-ne**	-kok***-ne**
3s	-tshok	-kok
3d	-tshok***-tshe**	-kok***-tshe**
3p	-tshok***-me**	-kok***-me**

(3) *The non-past agreement paradigms for Hayu (affixes only)*

A\P	1s	1de	1pe	1di	1pi	2s	2d	2p	3s	3d	3p	INTR	
1s						-no	-no-tshe	-no-ne	-ŋ	-ŋ-tshe	-ŋ-me	-ŋo	1s
1de						-tshok	-tshok	-tshok	-tshok	-tshok	-tshok	-tshok	1de
1pe						-kok	-kok	-kok	-kok	-kok	-kok	-kok	1pe
1di									-tshik	-tshik	-tshik	-tshik	1di
1pi									-ke	-ke	-ke	-ke	1pi
2s	-ŋo	-tshok	-kok								-me		2s
2d	-ŋo-tshe	-tshok	-kok						-tshik	-tshik	-tshik	-tshik	2d
2p	-ŋo-ne	-tshok	-kok						-ne	-ne	-ne	-ne	2p
3s	-ŋo	-tshok	-kok	-tshik	-ke		-tshik	-ne		-tshik	-me		3s
3d	-ŋo-tshe	-tshok	-kok	-tshik	-ke		-tshik	-ne	-tshik	-tshik	-me	-tshik	3d
3p	-ŋo-me	-tshok	-kok	-tshik	-ke	-me	-tshik	-ne	-me	-me	-me	-me	3p

(4) *Insertion: subset principle, specificity and cyclic features discharge*
(Halle and Marantz, 1993, 1994; Halle, 1997; Noyer, 1998; Harley and Noyer, 1999)

For the insertion of vocabulary items into a morpheme M with the morpho-syntactic features α :

while:

there are any vocabulary items VI_α whose morpho-syntactic features are a subset of α :

1. choose among VI_α the most specific vocabulary item VI_α ' with features β ,
2. add VI'_α to the output O and replace α with $(\alpha - \beta)$ so that: $\alpha = \alpha - \beta$

   while:

   i. choose among I_O the most specific impoverishment rule I'_O specified for deleting γ

   ii. replace α with $(\alpha - \gamma)$ so that: $\alpha = \alpha - \gamma$

(5) *The alternative: 'standard' impoverishment rules for Hayu*

a. $[-sg] \rightarrow \emptyset$ / __ [A,–3,–sg]
b. $[-sg] \rightarrow \emptyset$ / [A,–1,__] [–3,–sg]
c. $[-sg] \rightarrow \emptyset$ / [+3,–pl,__] [+3,+pl]

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