

## Feature-changing rules

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### 1 Noyer (1998)

(1) *Subject agreement in Nimboran:*

	singular [+sg, -pl]	dual [-sg, -pl]	plural [-sg, +pl]
1 EXCL	... <i>u</i>	<i>k</i> ... <i>u</i>	<sup><i>i</i></sup> ... <i>u</i>
1 INCL	<i>maN</i> ... <i>ám</i>	<i>k</i> ... <i>ám</i>	<i>k</i> ... <i>ám</i>
2	... <i>e</i>	<i>k</i> ... <i>e</i>	<i>k</i> ... <i>e</i>
3 MASC	... <i>am</i>	<i>k</i> ... <i>am</i>	<sup><i>i</i></sup> ... <i>am</i>
3 FEM/INAN	... <i>um</i>	<i>k</i> ... <i>um</i>	<sup><i>i</i></sup> ... <i>am</i>

How should we analyze the distribution of exponents?

What are impoverishment vs. ‘representational’ options for number (*k*/<sup>*i*</sup>) and gender (-*am*/*-um*)?

- (2) a.  $\eta$ gedúo-d-u  
draw.A-FUT-1  
‘I will draw (here).’
- b.  $\eta$ gedóu-k-d-u  
draw.B-NON.SG-FUT-1  
‘We (excl,dual) will draw (here).’
- c.  $\eta$ gedói<sup>*i*</sup>-d-u  
draw.C-PL-FUT-1  
‘We (excl, pl) will draw (here).’
- (3) a. [+sg] ↔ A (metathesis rule)  
b. [+pl] ↔ C (ablaut rule)  
c. Elsewhere ↔ B
- (4) *Durative forms:*
- a.  $\eta$ gedóu-**tam**-t-u  
draw.B-DUR-PRES-1  
‘I am drawing.’

- b.  $\eta$ gedói<sup>*i*</sup>-**tam**-t-u  
draw.C-PL-DUR-PRES-1  
‘We (excl, dual/pl) are drawing.’

What is striking about the forms we find in the ‘special environment’ (durative)?

(5) *Stem forms in Nimboran:*

subject number	normal	special
singular	A	B
dual	B	C
plural	C	C

(6) *Subject agreement in Nimboran (special environment):*

	singular [+sg, -pl]	dual [-sg, -pl]	plural [-sg, +pl]
1 EXCL	... <i>u</i>	<sup><i>i</i></sup> ... <i>u</i>	<sup><i>i</i></sup> ... <i>u</i>
1 INCL	<i>maN</i> ... <i>ám</i>	<sup><i>i</i></sup> ... <i>ám</i>	<sup><i>i</i></sup> ... <i>ám</i>
2	... <i>e</i>	<sup><i>i</i></sup> ... <i>e</i>	<sup><i>i</i></sup> ... <i>e</i>
3 MASC	... <i>am</i>	<sup><i>i</i></sup> ... <i>am</i>	<sup><i>i</i></sup> ... <i>am</i>
3 FEM/INAM	... <i>um</i>	<sup><i>i</i></sup> ... <i>um</i>	<sup><i>i</i></sup> ... <i>um</i>

How could we describe the distribution of *-k* vs <sup>*i*</sup> across both cases?

Noyer’s analysis:

- (7) *Impoverishment rule I:*  
[-pl] → ∅ / [+dur]
- (8) *Impoverishment rule II:*  
[αsg] → ∅ / [+dur]
- (9) *Redundancy rule:*  
∅ → [+pl] / [-sg]

How do these rules work together to derive the durative paradigm? Does the order of rules matter?

How do these data justify the impoverishment approach to plural (<sup>-i</sup>) and gender markers (-um/am) over a 'representational' (purely underspecification-based) one?

- (10)  $\eta$ gedó<sup>-i</sup>-tam-t-e  
draw.C-PL-DUR-PRES-2  
'You (dual, plural) are drawing.'
- (11)  $\eta$ gedoi<sup>-i</sup>-tam-t-um  
draw.C-PL-DUR-PRES.3.NONMASC  
'They (dual or pl, fem or inan) are drawing.'

How many effects does [ $\pm$ sg]-impoverishment have?

What about Noyer's use of redundancy rules? Is it really a redundancy rule?

- (12) *English vowels:*  
a. Front: {i, e, æ, ε}  
b. Back: {o, u, ʌ, ɑ}
- (13) [+syll, -cons, -back] → [-round]

## 2 Keine (2013)

- (14) *Standard view:*  
For any given input, knowing the morpho-syntactic specification of each exponent is sufficient to deduce the exponence produced for this input by vocabulary insertion.
- (15) *Keine's view:*  
The exponent chosen at a step  $n$  affects the set of exponents competing for insertion at step  $n+1$ .

Definitions:

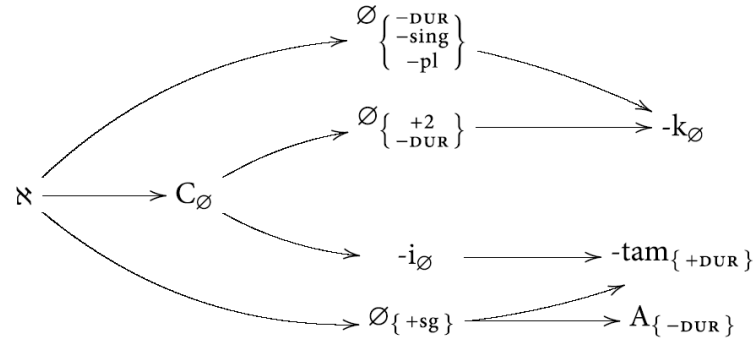
- (16) *Morphological inventory:*  
Morphological inventories are ordered pairs  $\langle \Gamma, \Delta \rangle$  with  $\Gamma$  a set of exponents and  $\Delta$  an accessibility relation defined over  $\Gamma$ .
- (17) *Exponent:*  
An exponent  $A$  is an ordered pair  $\langle \sigma, \pi \rangle$ , where  $\sigma$  is a set of morphosyntactic features and  $\pi$  is a phonological string.
- (18) *Accessibility relation:*  
The accessibility relation is a set of ordered pairs of exponents. If  $\langle A, B \rangle \in \Delta$ , then  $A, B \in \Gamma$ .  $\langle A, B \rangle \in \Delta$  will be notated as ' $A \rightarrow B$ ' for convenience.

- (19) *State:*  
A state is an ordered triple  $\langle A, \Sigma, \Pi \rangle$  such that  $A$  is an exponent,  $\Sigma$  is a set of morphosyntactic features, and  $\Pi$  is a phonological string.
- (20) *Insertion:*  
Given a morphological inventory,  $\langle \Gamma, \Delta \rangle$ ,
- initial state:*  
 $\langle N, \Sigma, \Pi \rangle$  with  $\Sigma$  being some syntactically well-formed set of morpho-syntactic features and  $\Pi$  being some lexically determined phonological string:
  - transition '⇒':*  
given some state  $\langle A, \Sigma, \Pi \rangle$  and an exponent  $B = \langle \sigma, \pi \rangle$ , a well-formed transition into  $B$  subtracts  $\pi$  from  $\Sigma$  and adds  $\pi$  to  $\Pi$ :  
 $\langle A, \Sigma, \Pi \rangle \Rightarrow B = \langle B, \Sigma \setminus \sigma, \Pi \oplus \pi \rangle$ .
- (21) *Wellformedness Restriction on Transitions:*  
Given a state  $\Omega = \langle B, \Sigma, \Pi \rangle$ , transition into an exponent  $A = \langle \sigma, \pi \rangle$  is well-formed if
- $A$  is accessible from  $B$ :  
 $B \rightarrow A$ .
  - the morphosyntactic features of  $A$  are a subset of the morpho-syntactic features of  $\Sigma$ :  
 $\sigma \subseteq \Sigma$ .
  - for all exponents  $C = \langle \sigma', \pi' \rangle$ , such that  $B \rightarrow C$  and  $\sigma' \subseteq \Sigma$ ,  $A$  is more specific than  $C$ .
- (22) Insertion terminates if and only if a final state is reached.
- (23) *Final state:*  
Given a morphological inventory  $\langle \Gamma, \Delta \rangle$ , a state  $\langle A, \Sigma, \Pi \rangle$  is final if for all exponents  $B \in \Gamma$  with  $B = \langle \sigma, \pi \rangle$ , either  $A \not\rightarrow B$  or  $\sigma \not\subseteq \Sigma$  or both.

Let's consider a toy example first:

- (24)
- |        | -pl | +pl |
|--------|-----|-----|
| +a, -b | x   | x   |
| +a, +b | y   | x   |
| -a, +b | y   | w   |

(25) Keine's analysis of Nimboran:



- What is the Morphological Inventory for Nimboran?
- How does the solve the underspecification problem for the number markers *-k* and *-i*?
- How can we augment Keine's system to account for the gender markers *-um/-am*?

## References

- Keine, Stefan (2013). Syntagmatic Constraints on Insertion. *Morphology* 23(2). 201–226.
- Noyer, Rolf (1998). Impoverishment Theory and Morphosyntactic Markedness. In S. Lapointe, D. Brentari and P. Farrell (eds). *Morphology and Its Relation to Phonology and Syntax*. CSLI: Palo Alto. 264–285.