LOT Summer School July 2012
Introduction to Distributed Morphology
Rolf Noyer, University of Pennsylvania
11:15 am-1:15 pm
building 10 Blauw Gedicht I

Session 3: Impoverishment
Morphosyntactic Features and the systems they compose

• Are there operations on morphosyntactic features before phonological realization takes place? If so, what are these like and how are they constrained?

• How can we define the notion ‘morphological category’?

• What corresponds to the descriptive notion of ‘postion-class’?
I. Categories

If morphosyntactic features provided by UG combine freely in syntax to create, e.g. AGR or TENSE morphemes, then how can we explain why some languages have ‘many’ such categories and others have few or none?

• Example 1.
  1st person inclusive & exclusive vs. generalized 1st person plural
  *[+1 +2]

• Example 2.
  dual number (sometimes restricted to certain persons)
  *[-sg –pl]
  * [+1 –sg –pl]
Hypothesis I:
‘Categories’ are epiphenomena resulting from the lexical resources available.

Examples.
• English/Dutch/German/French have no 1st inclusive since there is no ‘word’ for it. (we, wij, wir, nous)

• Russian/German do not distinguish gender in the plural because there are no ‘words/morphemes’ for it. (sie, oní) whereas Czech and French do because there are (oni/ony, ils/elles)
Hypothesis II:
‘Categories’ result from generalized restrictions on the combinability of features.

• English (etc.) has no 1st inclusive since *[+1 +2]
• German has no gender in the plural since *[gender +pl]

• How can these two hypotheses be tested?

What is required is a language in which the ‘uncombinable’ features have separate morphemes.
Example: Nunngubuyu  (Australia, Heath 1984)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Pronunciation</th>
<th>Restricted (-)</th>
<th>Non-restricted (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1m</td>
<td>ηa</td>
<td>ni:-ni</td>
<td>1+.m</td>
<td></td>
</tr>
<tr>
<td>1f</td>
<td>ηi</td>
<td>ni:-ŋi</td>
<td>1+.f</td>
<td></td>
</tr>
<tr>
<td>1P</td>
<td>ηu[:]-ru</td>
<td>1+.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12m</td>
<td>na</td>
<td>ηi:-ni</td>
<td>12+.m</td>
<td></td>
</tr>
<tr>
<td>12f</td>
<td>ηi</td>
<td>ηi:-ŋi</td>
<td>12+.f</td>
<td></td>
</tr>
<tr>
<td>12P</td>
<td>ηu[:]-ru</td>
<td>12+.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2m</td>
<td>nun-ɴ-ba</td>
<td>2-</td>
<td>ni-V-ni</td>
<td>2.+.m</td>
</tr>
<tr>
<td>2f</td>
<td>ηi</td>
<td>ni-V-ŋi</td>
<td>2.+.f</td>
<td></td>
</tr>
<tr>
<td>2P</td>
<td>ηi</td>
<td>ni-[V]-ri</td>
<td>2.+.P</td>
<td></td>
</tr>
<tr>
<td>3m</td>
<td>ni</td>
<td>wi-ni</td>
<td>‘+.m’</td>
<td></td>
</tr>
<tr>
<td>3f</td>
<td>ηi</td>
<td>wi-ŋi</td>
<td>‘+.f’</td>
<td></td>
</tr>
<tr>
<td>3P</td>
<td>ηi</td>
<td>wu-ru</td>
<td>‘+.P’</td>
<td></td>
</tr>
<tr>
<td>3A</td>
<td>wu</td>
<td>‘A’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3M</td>
<td>ma</td>
<td>‘M’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• A, M are neuter genders; P is a gender, which, when used with 1st or 2nd person arguments, denotes plurality.

• ŋi denotes ‘fem’ in the unrestricted (nonsg) forms and the 3rd person.
  ni denoted ‘masc’ in the same set of contexts

• What accounts for the ill-formedness of?
  *ŋa-ŋi ‘I (masc)’
  *ŋa-ŋi ‘I (fem)’
  *na-ŋi ‘You (sg) and I (masc)’
  *na-ŋi ‘You (sg) and I (fem)’
  *nun-ŋi ‘You (sg, masc)’
  *nun-ŋi ‘You (sg, fem)’

• It can’t be selectional restrictions on ni and ŋi since these do attach to 1st and 2nd person (in the nonsg); moreover, they need not attach to any person clitic at all, since they can occur in isolation.
Two ways of enforcing a generalized restriction.

Output filter: *[ + participant + restricted GENDER ]

Feature-Erasing Rule:

GENDER → Ø / [ + participant ]
   [ + restricted ]
The South Arabian languages (including Mehri: Johnstone 1987) are the only modern Semitic languages with a 1st person dual. In all other Semitic languages, the 1st dual = 1st plural.
Mehri simply lost the filter \(*[+1 {-sg} {-pl}]\) and innovated dual forms from pre-existing affixes.

Filter \(*[+1 {-sg} {-pl}]\)

Rule: \([-pl] \rightarrow \emptyset / [+1]\)

- If \(ə-\ldots-ô\) in the 1 dual were merely a reanalysis of affixes, allowing a distinct 1st person dual to appear, we cannot explain the simultaneous innovation of a distinct 1 dual form in other conjugations:

<table>
<thead>
<tr>
<th></th>
<th>1 sg</th>
<th>1 dual</th>
<th>1pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mehri prefixing conjugation</td>
<td>ə-</td>
<td>ə- -ô</td>
<td>nə-</td>
</tr>
<tr>
<td>Mehri suffixing conjugation</td>
<td>-k</td>
<td>-k-î</td>
<td>-ən</td>
</tr>
</tbody>
</table>

- Conclusion: certain systematic neutralizations result from generalized conditions on the combinability of morphosyntactic properties.
Impoverishment

• Impoverishment is a theory of morphological neutralization. Morphosyntactic properties such as number, gender or case are altered before phonological realization, giving rise to generalized syncretisms. (Bonet 1991, Noyer 1992)

• By deleting certain features prior to phonological realization Impoverishment causes a ‘retreat to the general case’ (Halle & Marantz 1993)

• Impoverishment rules do not account just for what are the inflectional categories of a language.
Halle & Marantz 1993 (following Bonet 1991) proposed that Impoverishment rules are context-sensitive, that is, they can apply for neutralizations where a retreat to the general case occurs only the context of certain other morphemes.
Spurious se (Harris 1993).

<table>
<thead>
<tr>
<th></th>
<th>3 pers</th>
<th>2 pers</th>
<th>1 pers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m</td>
<td>f</td>
<td>m</td>
</tr>
<tr>
<td>ACC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sg</td>
<td>l-o</td>
<td>l-a</td>
<td>t-e</td>
</tr>
<tr>
<td>pl</td>
<td>l-o-s</td>
<td>l-a-s</td>
<td>o-s</td>
</tr>
<tr>
<td>DAT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sg</td>
<td>l-e</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl</td>
<td>l-e-s</td>
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<tr>
<td>REF</td>
<td></td>
<td></td>
<td>s-e</td>
</tr>
<tr>
<td>sg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Clitic Stems

n ←→ 1 pl
dat
Ø ←→ 2 pl
Ø
m ←→ 1
elsewhere
a ←→ II
t ←→ 2
refl
l ←→ acc/dat
s ←→ elsewhere
plural

Class Markers

e ←→ III
Ø ←→ 2 pl
elsewhere
a ←→ II
o ←→ elsewhere
Number

• Redundancy Rules for Class Assignment

  a. \[
      \begin{bmatrix}
        1/2 \\
        \text{dat} \\
        \text{refl}
      \end{bmatrix}
      \rightarrow \text{III}
  \]

  b. feminine \rightarrow \text{II}

  c. elsewhere \rightarrow \text{I}
• ‘… syntactically dative [expected: le or les]… are realized as se when clustered with a third person accusative clitic … ’ (Harris 1993)

• ¿ A ustedes, las peras?  Se las daré ahora.
  *Les las daré ahora.  
    to you (pl), the pears   I will give them to them now.

• Spurious se Impoverishment Rule:  \text{dat} \rightarrow \emptyset / _____ \text{acc}
• The [dat] value necessary for insertion of stem l- is deleted, leaving only default stem s-
• In no sense is dative being ‘replaced’ by reflexive.
• s- is not ‘reflexive’, it is the elsewhere clitic stem.
• This is a ‘retreat to the general case.’
Nunggubuyu Clitic Combinations (Heath 1984, Noyer 1992)

<table>
<thead>
<tr>
<th>'...her'</th>
<th>'...him'</th>
<th>'...them'</th>
</tr>
</thead>
<tbody>
<tr>
<td>'she...'</td>
<td>ŋu</td>
<td>ŋu-nu</td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>f.m</td>
</tr>
<tr>
<td>'he...'</td>
<td></td>
<td>nu</td>
</tr>
<tr>
<td></td>
<td></td>
<td>m</td>
</tr>
<tr>
<td>'they (fem dual)...'</td>
<td>wu-ŋu-nu</td>
<td>wa-V-ŋi</td>
</tr>
<tr>
<td></td>
<td>+.f.m</td>
<td>+.+.f</td>
</tr>
<tr>
<td>'they (masc dual)...'</td>
<td>wu-nu</td>
<td>wa-V-ni</td>
</tr>
<tr>
<td></td>
<td>+.m</td>
<td>+.+.m</td>
</tr>
<tr>
<td>'they (pl)'</td>
<td>wi-ri-ŋa</td>
<td>wa-[V]-ra</td>
</tr>
<tr>
<td></td>
<td>+.pl.f</td>
<td>+.+.pl</td>
</tr>
</tbody>
</table>

nV  ←→  masc  (w)V  ←→  nonsg
ŋV  ←→  fem  rV  ←→  plural

Subject Gender Impoverishment A (SGIa)

15
[α fem, β pl] → Ø / _____ [α fem, β pl]

‘she … her’  (*ŋu) ŋu  fem → Ø

‘he … him’  (*nu) nu  masc → Ø

Default Rule:  [-sg] → [+]pl

‘they (fem dual) … her’  wu (*ŋu) ŋu
fem → Ø → plur  → wi ri ŋa
Subject Gender Impoverishment B (SGIb)

\[ [+\text{masc}] \rightarrow \emptyset / \underline{\text{____}} \ [+\text{fem}] \]

‘he … her’ \quad (*nu) \ ηu \quad \text{masc} \rightarrow \emptyset

Subject Gender Impoverishment C (SGIc)

\[ [+\text{pl}] \rightarrow \emptyset / \underline{\text{____}} \ [+\text{masc}] \]

‘they (masc dual) … him’ \quad wu (*nu) \ nu \quad \text{masc} \rightarrow \emptyset
Summary

Impoverishments may be:

(a) context-free, defining available ‘categories’
(b) context-sensitive, entailing loss of contrastiveness between categories in certain morphological contexts.
Rules of Referral  (Zwicky 1985, Stump 1993)

• Rules of Referral, like Rules of Impoverishment, are instructions that direct phonological realization away from the expected forms and ‘into’ different forms.

• Since Rules of Referral (effectively) are feature-changing operations, they can move an exception into a more marked locus.

• Impoverishment does not permit this possibility.

• Impoverishments must be a ‘retreat’ to the elsewhere.
Macedonian past tense **padn-** ‘to fall’ (Stump 1993)

<table>
<thead>
<tr>
<th>1 sg</th>
<th>2 sg</th>
<th>3 sg</th>
<th>1 pl</th>
<th>2 pl</th>
<th>3 pl</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>padn-am</strong></td>
<td><strong>padn-e-š</strong></td>
<td><strong>padn-e</strong></td>
<td><strong>padn-e-me</strong></td>
<td><strong>padn-e-te</strong></td>
<td><strong>padn- at</strong></td>
</tr>
<tr>
<td><strong>padn-e-v</strong></td>
<td><strong>padn-e-še</strong></td>
<td><strong>padn-e-še</strong></td>
<td><strong>padn-e-v-me</strong></td>
<td><strong>padn-e-v-te</strong></td>
<td><strong>padn-e-a</strong></td>
</tr>
<tr>
<td><strong>padn-a-v</strong></td>
<td><strong>padn-a</strong></td>
<td><strong>padn-a</strong></td>
<td><strong>padn-a-v-me</strong></td>
<td><strong>padn-a-v-te</strong></td>
<td><strong>padn-a-a</strong></td>
</tr>
</tbody>
</table>
‘In the past tenses the second person singular has the same form as the third
person singular.’ Stump 1993: 452.


Rules of referral are formally identical to feature-changing operations.

“For instance, the syncretism of padnešē ‘you (sg.) fell’ and padnešē ‘s/he fell’
in Macedonian arises as the consequence of a rule of referral applying to the
specification ‘second person singular imperfect’ to yield the specification ‘third
person singular imperfect.” (Stump 1993:457)


Feature-changing operations are (obviously) completely unrestricted in expres-
sive power. Does natural language morphology require this powerful a device?
Feature-erasing neutralization

Macedonian 2nd person Impoverishment: \([+2 \text{ +partic}] \rightarrow \emptyset / [+\text{past} +\text{sg}]\)

Tense (Stump’s Slot II): \(v \leftarrow \rightarrow [+\text{partic} +\text{past}]\)

• Impoverishment bleeds the insertion of \(v\)

AGR (partial) (= Stump’s Slot III)

\begin{align*}
\text{me} & \leftarrow \rightarrow [+1 +\text{plur}] \\
\text{te} & \leftarrow \rightarrow [+2 +\text{plur}] \\
\text{a} & \leftarrow \rightarrow [-\text{partic} +\text{pl}] \\
\emptyset & \leftarrow \rightarrow [+1 \text{ sg}] / [\text{imperfect}] * _____ \\
\text{še} & \leftarrow \rightarrow \emptyset / [\text{imperfect}] * _____
\end{align*}

• The ‘referral’ of 2nd person into 3rd person is a retreat to the general case, where 3rd person forms are the default realizations.

• Are feature-changing rules of referral really necessary?

• Or does natural language use only feature-erasing rules (Impoverishment)?
# Varieties of Impoverishment

<table>
<thead>
<tr>
<th>underlying</th>
<th>outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[F]</td>
<td>1  2  3  4  5  6  7</td>
</tr>
<tr>
<td>m</td>
<td>u  m  u  m  Ø  Ø  u</td>
</tr>
<tr>
<td>u</td>
<td>u  m  m  Ø  Ø  u  Ø</td>
</tr>
</tbody>
</table>

- Rules required to effect these changes.

1. \([\text{mF}] \rightarrow [\text{uF}]\)  
2. \([\text{uF}] \rightarrow [\text{mF}]\)  
3. \([\text{αF}] \rightarrow [\text{–αF}]\)  
4. \([\text{uF}] \rightarrow Ø\)  
5. \([\text{αF}] \rightarrow Ø\)  
6. \([\text{mF}] \rightarrow Ø\)  
7. \([\text{uF}] \rightarrow Ø, \ [\text{mF}] \rightarrow [\text{uF}]\)
Varieties of Impoverishment: Changes permitted by various theories

<table>
<thead>
<tr>
<th>underlying</th>
<th>outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[±F]</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>m</td>
<td>u m u m Ø Ø u</td>
</tr>
<tr>
<td>u</td>
<td>u m m Ø Ø u Ø</td>
</tr>
</tbody>
</table>

- Markedness Impoverishment: m → Ø entails u → Ø
### Nimboran (New Guinea): Inkelas 1992; Anceaux 1965

I. Outline of Verbal Morphology using descriptive position classes

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>root</td>
<td>PLSUBJ</td>
<td>DUSUBJ</td>
<td>MOBJ</td>
<td>INCDSUBJ</td>
<td>LOC</td>
<td>ITER</td>
<td>TENSE</td>
<td>SUBJPERS</td>
</tr>
<tr>
<td>PL OBJ</td>
<td>DUR</td>
<td>PART</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>5</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>kéin</td>
<td>i</td>
<td>táim</td>
<td>sa</td>
<td>t</td>
<td>e</td>
</tr>
</tbody>
</table>

follow.PL | PLSUBJ | PLOBJ.PART | 8LOC | PRES | 2 |

‘You (nonsg) follow them from here to below’ (I:578 < A:146)
• Verbs show allomorphy, correlating with number of the subject.

• Certain affixes (underlined here), induce rightward morphophonological ablaut.

• The PlSubj affix (denoted here: \( i \)) is an autosegmental entity inducing palatalization and other local changes.

• Certain verb roots can select obligatorily for a ‘particle’ in slot 3.

• Affix List (partial) Tense:

  \( i \) \( \leftarrow \rightarrow \) PlSubj \( d, r \) \( \leftarrow \rightarrow \) Future

  \( k \) \( \leftarrow \rightarrow \) DuSubj \( t, \emptyset, ná \) \( \leftarrow \rightarrow \) Present

  \( dár \) \( \leftarrow \rightarrow \) PlObj \( p, \emptyset, ná \) \( \leftarrow \rightarrow \) Recent Past

  \( rár \) \( \leftarrow \rightarrow \) MObj \( k \) \( \leftarrow \rightarrow \) Past

  \( tam \) \( \leftarrow \rightarrow \) Durative

  \( ŋkat \) \( \leftarrow \rightarrow \) Iterative
Inkelas assumes that there are two types of ‘blocking’:

- featural/semantic (where two affixes have clashing values)
- positional (two affixes have same position or level)
A Blocking Paradox

a. Dur pre-empts MObj
   a. \textit{príb-(*rár)-tam-be-t-u}
      \textit{throw-(*MOBJ)-D\textit{UR}-6L\textit{OC}-PRES-1}
      ‘I am throwing (him, Ø) from here to above’

b. Dur pre-empts DuSubj
   i. \textit{ŋgedóu-*k-tam-t-u}
      \textit{draw-NONSG-DUR-PRES-1}
      ‘We (dual) are drawing (here)’

   Instead, PlSubj \textit{i} must be used:
   ii. \textit{ŋgedói-i-tam-t-u}
      \textit{draw.PL-PL-DUR-PRES-1}
      ‘We (dual or plural, exclusive) are drawing (here).’
c. But MObj *can* co-occur with DuSubj (NONsg):

*ŋgedóu-k-rár-k-u*

draw-NONsg-DUR-PAST-1

‘We two drew him here’

- Problem: There is a paradox. If all cases of arbitrary disjunction are to be handled by position classes, then Dur tam seems to occupy both slots 2 and 3.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
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<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>DuSubj</td>
<td>MOBJ</td>
</tr>
<tr>
<td>PL OBJ</td>
<td>DUR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DUR</td>
<td>PART</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- This incorrectly predicts that DUR should block DuSubj. But it does not.
Lexicalist Solution (Inkelas)

- Nimboran INFL constitutes ‘positions’ 2-8, which form a single prosodic domain (for stress-assignment, for example).

Lexically, there exist 7 levels of word-formation (A-G)

<table>
<thead>
<tr>
<th>DuSubj</th>
<th>MObj</th>
<th>InclDuSubj</th>
<th>LOC</th>
<th>Iter</th>
<th>Tense</th>
<th>SubjPers</th>
</tr>
</thead>
<tbody>
<tr>
<td>k</td>
<td>rár</td>
<td>man</td>
<td>varies</td>
<td>ŋkat</td>
<td>varies</td>
<td>varies</td>
</tr>
</tbody>
</table>
a. The Durative affix attaches to constituents of level B but itself forms a constituent of level D, by skipping a level.

\[ \text{DUR}: \quad [\text{tam} [ \quad ]_B ]_D \]

b. MOBJ: \[ [\text{rar} [ \quad ]_B ]_C \] The MOBJ affix attaches at level B.

c. DuSUBJ: \[ [\text{k} [ \quad ]_C ]_D \] The DuSUBJ affix attaches at level C.

- MOBJ and DUR cannot co-occur since both attach at level B.
- DuSUBJ and DUR cannot co-occur since DUR ‘skips’ level C, where DuSUBJ attaches.
Some Assumptions of the Lexicalist Analysis

a. Position is an arbitrary property of every affix. Aside from its phonetic form and morphosyntactic features one must also learn
   (i) its level of attachment
   (ii) its ‘output’ level
b. Affix disjunctions must be captured by level-ordering and selectional frames
c. There is no syntactic affixation or other non-lexical means of constructing composite verbs
d. Words are formed by free combination of morphemes in the lexicon, subject only to selectional restrictions of their parts.
IV. Distributed Morphology Analysis (Noyer 1992, Halle & Marantz 1993)

• Word-formation is syntactic. Morphemes combine by Head-Movement.

• Consequence: Position classes will normally consist of affixes of similar type

\[
\begin{array}{cccccccc}
0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
\text{ROOT} & \text{SUBJ-NUMBER} & \text{OBJ} & \text{DUR} & \text{ADV} & \text{ASPECT} & \text{TENSE} & \text{SUBJ-PERS} \\
\text{PART} & & & & & & & \\
\end{array}
\]

• Syntax manipulates only abstract entities. Each morpheme consists only of values which are relevant to syntactic principles.

• After syntax, phonological pieces (vocabulary items) are inserted into syntactic terminals.
Example

\[
V + \left[ \text{[INFL SUBJ-NUM OBJ ADV TENSE]} \right. \\
\text{follow} \quad \left[ + \text{pl} \text{–sg} \right] \quad \left[ + \text{pl} \right] \quad ?? \quad \left[ + \text{pres} \right] \\
\left[ \text{–1 +2} \right] \\
\text{কেইন} \quad \text{তাইম} \quad \text{সাটি} \quad \text{ে} \\
\]

‘You (nonsg) follow them from here to below’ (Inkelas:578 < Anceaux:146)
Three Arguments against the Lexicalist Approach

1. **Paucity of Marked Values**
   Affixes must supply all marked features of a word. Sometimes words with marked features require affixes with unmarked ‘elsewhere’ distribution.

2. **Directionality**
   Standard Lexicalist theories define the class of well-formed words for a language. They do not, however, explain which word is preferred in the event that two words are equally compatible with a given syntactic context.

3. **Arbitrariness**
   No interesting relations between syntax and morphology are predicted. Selectional restrictions (entailing disjunctions and position-class) are not correlated with content.
Directionality

1. Dur tam is disjunctive with DuSubj k
   a. ŋgedóu-*k-tam-t-u
draw-nonsg-dur-pres-1
      ‘We (dual) are drawing (here)’

   • Selectional frames ensure that both cannot occur in the same word.
   • This does not explain why the property [durative] is expressed, and
     [-sg –pl] (dual) subject is sacrificed and replaced by [+pl]:
   b. ŋgedói-i-tam-t-u
draw.pl-pl-dur-pres-1
      ‘We (dual or plural, exclusive) are drawing (here).’

   • Standard Lexicalist Theory does not explain why the property ‘dual’ is not
     preserved at the expense of ‘durative.’
2. Dur tam is disjunctive with MObj rár.

a. príb-(*rár)-tam-be-t-u

   throw-(*MObj)-Dur-6Loc-pres-1

   ‘I am throwing (him, Ø) from here to above’

• Why does Dur tam ‘win’ and MObj rár ‘lose’?

• Distributed Morphology provides an explanation for the directionality of neutralizations of this sort through the theory of Impoverishment.
Context-sensitive Impoverishment

Halle & Marantz 1993 (following Bonet 1991) proposed that Impoverishment rules are context-sensitive, that is, they can apply for neutralizations where a retreat to the general case occurs only the context of certain other morphemes.

- Context-sensitive Impoverishment rules can account for affix disjunctions without using position-classes.
1. Dur *tam* is disjunctive with MObj *rár*.

\[ \text{príb-(*rár)-tam-be-t-u} \]
\[ \text{throw-(*MObj)-Dur-6Loc-pres-1} \]

‘I am throwing (him, Ø) from here to above’

- Inkelas achieves this by having Dur *tam* skip a level, the level at which MObj *rár* would attach.

2. But Dur *tam* is also disjunctive with PlObj *dár*.

\[ \text{príb-(*dár)-tam-be-t-u} \]
\[ \text{throw-(*MObj)-Dur-6Loc-pres-1} \]

‘I am throwing (them, him, Ø) from here to above’

- Inkelas accomplishes this disjunction by using arbitrary position-class.
Yet clearly, Dur is disjunctive with any object:

Durative-Object Impoverishment: \( \text{Obj} \rightarrow \emptyset / \ldots \text{Durative} \)

- Impoverishment captures both:
  (i)  Disjunctivity
  (ii) Directionality
  (iii) Makes arbitrary position classes unnecessary: affixes can be arranged by content.

- Durative-Object Impoverishment expresses the fact that distinctions in object number are neutralized when the verb has durative aspect.

- Distributed Morphology takes this to be a generalized property of the language. The standard lexicalist theory treats this fact as an accident of the selectional properties of affixes.
Further Evidence for Impoverishment

Subject Agreement Affixes of Nimboran

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<td>... u</td>
<td>k ... u</td>
<td>i ... u</td>
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<td>k ... ám</td>
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<td>... e</td>
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<td>3fem</td>
<td>... um</td>
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<td>3 inan</td>
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<tr>
<td>Gender features</td>
<td>± masc</td>
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<td>neuter</td>
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Vocabulary

• masculine ←→ am
  feminine, neuter ←→ um

• Subject-Person
  [ +1  +2] ←→ ám
  [ +1] ←→ u
  [ +2] ←→ e
  [ +3 –masc] ←→ um
  elsewhere ←→ am

• Gender Impoverishment
  [± masc] → Ø / [+pl –sg]
• Gender is neutralized in the plural.
• Why not um $\leftrightarrow$ [+3 -masc +pl]?   Explanation to follow.

• Subject-Number
  maN $\leftrightarrow$ [+ sg] / [+1 +2]
  i $\leftrightarrow$ [+ pl]
  k $\leftrightarrow$ [–sg]

• i [ + pl]  does not occur in the 2nd person plural.

• Number Impoverishment
  [+ pl] $\rightarrow$ Ø / [+2 –sg]
• Why not \( i \leftrightarrow [ + \text{pl} -2] \)? Explanation to follow.

• Number

\[
\begin{align*}
& i \quad \leftrightarrow \quad [ + \text{pl}] \quad \text{Inkelas’ gloss} \\
& i \quad \leftrightarrow \quad [ -\text{sg}] \quad \text{[Subj = Du] or [Subj = –Sg.2pers]}
\end{align*}
\]
Paucity of Marked Values in Root Allomorphy

• In standard lexicalist theories, it is difficult to express the notion of ‘default’ or ‘elsewhere’ affix. Default affixes carry few or no features, so words with default affixes can’t generally bear marked feature values. This leads to severe difficulty.
Nimboran Verb roots show a complex pattern of allomorphy.

<table>
<thead>
<tr>
<th>root</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<tbody>
<tr>
<td>‘draw’</td>
<td>ηgedóu-</td>
<td>ηgedúo-</td>
<td>ηgedói-</td>
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<tr>
<td>‘pull out’</td>
<td>betáo-</td>
<td>betuá-</td>
<td>betaóí-</td>
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<tr>
<td>‘water’</td>
<td>sáoŋ-</td>
<td>suáŋ-</td>
<td>saóiŋ-</td>
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<tr>
<td>‘flee’</td>
<td>krí-</td>
<td>krí-</td>
<td>krí-</td>
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<td>‘say to’</td>
<td>u-</td>
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<td>i-</td>
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<tr>
<th>subject number</th>
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<th>special context</th>
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<tr>
<td>singular</td>
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<td>plural</td>
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- The special case arises whenever k ‘DuSubj’ is blocked from attaching to the stem. This arises in the context of Dur tam and certain other particles.
Normal Context

a. ŋgedúo-d-u
   draw[A]-fut-1  ‘I will draw (here)’

b. ŋgedóu-k-d-u
   draw[B]-nonsg-fut-1  ‘We (excl, dual) will draw (here)’

c. ŋgedóí-i-d-uŋ
   draw [C]-pl-fut-1  ‘We (excl, plur) will draw (here)’
Special Context (e.g. with durative verbs)

a. ŋgedóu-tam-t-u
draw[B]-durative-pres-1 ‘I am drawing’
b. *ŋgedúo-tam-t-u
draw [A]-durative-pres-1 * ‘I am drawing’
c. ŋgedóí-i- tam-t-u
draw[C]-pl-durative-pres-1 ‘We (excl, dual/plur) are drawing’
d. *ŋgedóu-k -tam-t-u
draw[B]-nonsg-dur-pres-1 * ‘We (excl, dual) are drawing’
Inkelas’ analysis

A = [Sg]
C = [–Sg]
B = [Du] or [Ø] or [2 –Sg]

Stem-Modifier Agreement

The shift in distribution of root allomorphs arises because the root and INFL must agree in Subject Features.
Since \( k \) [Du] or \( k \) [2 –Sg] cannot attach, the only way to express nonsingulars is by attacing \( i \) [–Sg]. This means that both Duals and Plurals will have C roots

(a) Root INFL
   
   \[
   \begin{array}{c|c|c|
   \hline
   C & i & [–Sg] \\
   \hline
   [–Sg] \\
   \hline
   \end{array}
   \]

\( \text{ŋgedói- i - tam-t-u} \)

\text{draw[C]-pl-durative-pres-1}

‘We (excl, dual/plur) are drawing’
Because singulars have B roots in the same circumstance, there must be a [Sg] Ø affix at the same level as k. It will be blocked whenever k is blocked. If the B root is unmarked for number, it will be used when Ø [Sg] cannot attach in INFL.

(b) Root  INFL
    A  Ø  [Sg]
    [Sg]

ηgedúo-Ø-d-u

draw[A]-sg-fut-1  ‘I will draw (here)’
(c) Root INFL
   B no number affix
   [Ø]

ηgedóu-tam-t-u
draw[B]-durative-pres-1 ‘I am drawing’
Objections

- The B root must be treated as having three accidental homophones. It must be unmarked, so it can occur in the ‘special’ singular situation. It must be [Du], so it can occur in the ‘regular’ dual situation. It must also be [2 –Sg], so that it occurs in the 2nd person plural instead of C.

- Although Inkelas calls the B root the ‘elsewhere’ root (p. 606), her analysis cannot express this fact, since Stem-Modifier Agreement requires that the stem bear features to ensure agreement with INFL.
Impoverishment Analysis

Root Allomorphy Rules

a. Root → metathesized / ____ [+sg]
b. Root → ablauted / ____ [+pl]

• Special Number Impoverishment

a. [–pl] → Ø / ‘special case’
   [–sg] → [+pl] (Redundancy Rule)

b. [± sg] → Ø / ‘special case’
The Effects of Special Number Impoverishment

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Further Effects of the loss of [-sg] in the ‘special environment’

• k [-sg] cannot be inserted.
  \[\eta\text{ged\^{\acute{\text{o}}}u-}^{\text{k}}\text{-tam-t-u}\]
  draw[B]-nonsg-dur-pres-1
  * ‘We (excl, dual) are drawing’

• Instead, i [+pl] is inserted.
  \[\eta\text{ged\^{\acute{\text{o}}}i-}^{\text{i}}\text{-tam-t-u}\]
  draw[C]-pl-durative-pres-1
  ‘We (excl, dual or plural) are drawing’

• i [+pl] is inserted, even in the 2nd person, where it normally does not occur.
  \[\eta\text{ged\^{\acute{\text{o}}}i-}^{\text{i}}\text{-tam-t-e}\]
  draw [C]-plur-durative-pres-2
  ‘You (dual, plural) are drawing’
• This shows that \( i \) cannot be \([-2 + pl]\), hence there must be Impoverishment to restrict its distribution in normal plurals.

Second-Person Number Impoverishment: \([+ pl] \rightarrow \emptyset / [+2 -sg]\)
This rule cannot apply since \([-sg]\) has been erased

• \textit{um} \([-\text{masc}]\) is inserted, even in the plural, where it normally does not occur.

\textit{ŋgedōi- i-tam-t-um}
draw[C]-pl-durative-pres-3.nonmasc
‘They (dual or pl, fem or inan) are drawing’

• This is the only circumstance where \( i \) \([+ pl]\) co-occurs with \textit{um} \([-\text{masc}]\).
Gender Impoverishment: $[\pm \text{masc}] \rightarrow \emptyset / [+\text{pl} - \text{sg}]$

- Normally all gender is neutralized in the plural.

\[
\eta\text{ged}^i\text{t}-\text{am}
\]
draw[C]-pl-tense-3
‘They (masc/fem/neut) draw’

- Inkelas does not take note of this fact, nor is it clear how the lexicalist analysis could handle this case.

- \textit{um} $[-\text{masc}]$ can occur only in the plural where dual is blocked ??

- The Impoverishment analysis captures this directly. Since $[-\text{sg}]$ has been deleted, Gender Impoverishment cannot apply, and \textit{um} is freely inserted for masculine subjects.
Summary

The Lexicalist account of Nimboran verb morphology (Inkelas 1992) has several serious defects.

a. **Directionality:** which affix wins when two are disjunctive?
b. **Paucity of Marked Values:** words with marked properties do not necessarily have affixes with marked properties.
c. **Arbitrariness:** the position and selectional restrictions of affixes are completely arbitrary
d. **Spurious accidental homophonies.**
DM answers these objections as follows:

a. Insertion of phonologically specified ‘vocabulary’ does not take place until Phonological Form (after syntax creates some word structure)

b. Because affixes do not have to supply all marked values in syntax, as in the standard lexicalist model, vocabulary items can be significantly underspecified, avoiding the problem of accidental homophony.

c. Impoverishment deletes morphosyntactic properties prior to insertion, accounting for:
   i. available categories (paradigmatic impoverishment)
   ii. disjunctions among affixes of unlike type (syntagmatic impoverishment)
   iii. directionality of neutralization

d. The existence of context-sensitive Impoverishment entails that affixes which do not co-occur need not be in the same ‘position’ structurally, as in classical template models. This entails that affixes align according to content, as predicted by the theory of syntactic affixation.