Main ideas

**STRUCTURE**: Paradigms have internal structure: e.g. a noun paradigm consists of a singular and a plural subparadigm.

**CONTRAST**: Conditions of Paradigmatic Contrast (Kenstowicz 2002) require distinct subparadigms to have phonologically distinct stems.

**UNIFORMITY**: Conditions of Paradigmatic Uniformity operate within and across subparadigms.

**STEPWISE GENERATION**: Subparadigms can stand in a Base Derivative relation (cf. Albright 2002, 2005 on bases in inflectional paradigms): e.g., in Ukrainian nouns, the Sg is the base of the Pl.

---

Basic features of Ukrainian stress

- One and only one stress per word
- No fixed position for stress in language as a whole
- Diversity of stress mobility patterns within a paradigm
- In some stress types, accentually non-uniform paradigms

---

Outline of the stress patterns in Ukrainian

Main four stress types of Ukrainian nouns:

<table>
<thead>
<tr>
<th>Stem</th>
<th>Nom Sg</th>
<th>Nom Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>'nadij-a'</td>
<td>'nadiji-i'</td>
</tr>
<tr>
<td>b</td>
<td>'xan'3-a'</td>
<td>'xan'3-i'</td>
</tr>
<tr>
<td>c</td>
<td>'bolot-o'</td>
<td>'bolot-a'</td>
</tr>
<tr>
<td>d</td>
<td>'pelen-a'</td>
<td>'pelen-y'</td>
</tr>
</tbody>
</table>

- and • represent stem syllables; ○ and • ending syllables.
- • and ○ stressed; □ and ○ stressless.

Glosses:
- 'nadij-a' 'hope', 'xan'3-a' 'bigot', 'bolot-o' 'swamp', 'pelen-a' 'shroud'; 'podea'.
Main ideas

Outline of the stress patterns in Ukrainian

<table>
<thead>
<tr>
<th>Sg ≠ Pl</th>
<th>Ranked low</th>
<th>Ranked high</th>
</tr>
</thead>
<tbody>
<tr>
<td>+stress stem</td>
<td>Nom Sg na’dij-a</td>
<td>Nom Sg bo’lot-o</td>
</tr>
<tr>
<td>Nom P1 na’dij-i</td>
<td>Nom P1 bo’lot-a</td>
<td></td>
</tr>
<tr>
<td>−stress stem</td>
<td>Nom Sg xan’Z-a</td>
<td>Nom Sg pele’n-a</td>
</tr>
<tr>
<td>Nom P1 xan’Z-i</td>
<td>Nom P1 ’pelen-y</td>
<td></td>
</tr>
</tbody>
</table>

In types a and c, when the stress is on the stem, it is unpredictable.
Type a: 'vyvyx-' vs. 'Ryroj-'.
Type c: 'kuzov-a_{GenSg} vs 'ne’boz-a_{GenSg}.

In b and d, when there are stress stems, it is predictable.
In type b, when the ending is null, the last stem σ is stressed: kob’zar-∅.
In type d, a more complex distribution — to be discussed in detail.

Igor Yanovich and Donca Steriade (MIT)
Stress in Ukrainian nominal paradigms
December 4, 2010

Uniform stress patterns

Type a: Id ±Str Stem IO >> Id ±Str Endg IO

- Stress is underlying in type a:
  'perepel-o ‘collar-bone’, vy’dovyS :-e ‘spectacle’, koZu’Syn-a ‘sheepskin coat’,
  'vyvyx-∅ ‘displacement’, bry’had-∅ ‘team’, etc.

- Analysis:
  Stem has at least one +stress syllable
  Ident ±Stress Stem IO >> Ident ±Stress Ending IO
  (cf. Alderete 1999); Culminativity is not dominated

<table>
<thead>
<tr>
<th>/na’dij-/</th>
<th>Ident ±Stress Stem IO</th>
<th>Ident ±Stress Ending IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. n’di-j-a</td>
<td>+!</td>
<td>+</td>
</tr>
<tr>
<td>b. ’nadij-a</td>
<td>+!</td>
<td>+</td>
</tr>
<tr>
<td>c. nadi’j-a</td>
<td>+!</td>
<td>+</td>
</tr>
</tbody>
</table>

⇒ underlying stem stress surfaces
⇒ underlying ending stress never plays a role

In types a and b, the singular and the plural have uniform stress.

In mobile types c and d, the singular and the plural must have different placement of stress.

Sg ≠ Pl. (Paradigmatic Contrast): assigns a violation for each pair of stems with identical stress grids whose morphological feature matrices differ in [singular/plural]. (cf. Kenstowicz 2002)

Igor Yanovich and Donca Steriade (MIT)
Stress in Ukrainian nominal paradigms
December 4, 2010

Underlying representation for type b

- Type b: stress is always on the ending, unless it is null:

<table>
<thead>
<tr>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>Gen</td>
</tr>
<tr>
<td>xan’Z-a</td>
<td>xan’Z-i</td>
</tr>
<tr>
<td>xan’Z-i</td>
<td>xan’Z-i</td>
</tr>
</tbody>
</table>

- When the ending is null (kob’zar-∅), the stress always falls onto the last stem syllable (i.e., no /’mobzar-∅, /mobza’-a, /mobza’-ev/.)

Igor Yanovich and Donca Steriade (MIT)
Stress in Ukrainian nominal paradigms
December 4, 2010
Type b: ID ± Str Stem IO >> ID ± Str Endg IO

- Type b stems are −stress.
- ID ± Str Stem >> ID ± Str Endg forces stress onto the ending.
- In stressed disyllabic endings, the first syllable is stressed, so ending stress is always predictable. It may be derived by Stress Left, or some other favorite of yours.

<table>
<thead>
<tr>
<th>/xanỳ-a/</th>
<th>IDENT ± Stress Stem IO</th>
<th>IDENT ± Stress Ending IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 'xanỳ-a</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>b. 'xanỳ-a</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

⇒ the absence of underlying stem stress shifts stress to the ending
⇒ as in a, underlying ending stress never plays a role

Mobile stress patterns: Stepwise generation

Mobile stress patterns

Sg ≠ Pl (Paradigmatic Contrast): assigns a violation for each pair of stems with identical stress patterns (=stress grids of the stem) whose morphological feature matrices differ in [singular/plural].

A hypothetical example:

<table>
<thead>
<tr>
<th>/'ab-oSg, 'ab-uPl/</th>
<th>IDENT ± Str Stem IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. a'b-oSg, a'b-uPl</td>
<td>*!</td>
</tr>
<tr>
<td>b. a'b-oSg, a'b-uPl</td>
<td>*</td>
</tr>
<tr>
<td>c. 'ab-oSg, a'b-uPl</td>
<td>*</td>
</tr>
<tr>
<td>d. 'ab-oSg, a'b-uPl</td>
<td>*</td>
</tr>
</tbody>
</table>

⇒ What is the driving force behind accentual mobility?
⇒ a contrast constraint pushing the Sg and the Pl apart.

⇒ With an F constraint at the top, all forms are accentually uniform.
Mobile stress patterns: Stepwise generation

**Singular≠Plural**

- SG≠Pl (Paradigmatic Contrast): assigns a violation for each pair of **stems** with identical stress patterns (=stress grids of the stem) whose morphological feature matrices differ in [singular/plural].

A hypothetical example:

<table>
<thead>
<tr>
<th>/ab-oSg, 'ab-uP</th>
<th>SG≠Pl</th>
<th>ID ± Str</th>
<th>STEM</th>
<th>IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 'ab-oSg, 'ab-uP</td>
<td>+1</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. a'b-oSg, a'b-uP</td>
<td>+1</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. ?? 'ab-oSg, 'ab-uP</td>
<td>+1</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. ?? a'b-oSg, a'b-uP</td>
<td>+1</td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- With SG≠Pl on top, one subparadigm has to violate Faithfulness (as in this artificial example) and/or Markedness.

⇒ SG≠Pl itself does not determine the choice between the (c) and (d) candidates. Some other factor has to.

The Sg is more faithful: type c, one stem stress in UR

- Mobile stress types: SG≠Pl forces the Sg and the Pl to be distinct
- Our finding: the singular is more harmonic (either by faithfulness or markedness) than the plural in the mobile types

We derive the singular priority effect of Ukrainian as follows:

- Two subparadigms are generated in sequence.
- The Sg is always generated first.

**Singular≠Plural + stepwise generation**

- What happens if one subparadigm is generated before the other?

- Suppose the singular is generated first, and stored.
  It will obey Faithfulness:

<table>
<thead>
<tr>
<th>/ab-oSg/</th>
<th>SG≠Pl</th>
<th>ID ± Str</th>
<th>STEM</th>
<th>IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>e. ?? 'ab-oSg</td>
<td>+1</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. a'b-oSg</td>
<td>+1</td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The plural is generated next, and has to violate F IO to satisfy SG≠Pl:

<table>
<thead>
<tr>
<th>/ab-oSg/, /ab-uP/</th>
<th>SG≠Pl</th>
<th>ID ± Str</th>
<th>STEM</th>
<th>IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>g. ?? 'ab-uP</td>
<td>+1</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. ?? a'b-uP</td>
<td>+1</td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

⇒ The subparadigm generated first is more harmonic.

The Sg is more faithful: type c, one stem stress in UR

- Singular: **unpredictable** stem stress (=Sg of type a, e.g. na’dij-a) 'dil-o, 'kuzov-u, ostrofi-u, etc.

- Plural: **predictable** ending stress (=Pl of type b, e.g. xan‘ʒ-a) di‘l-a, kuzo‘v-a, ostrofi‘y, etc.
Mobile stress patterns: Stepwise generation

The Sg is more faithful: type c, one stem stress in UR

- Analysis for type c:
  - The stem’s UR contains a +stress syllable
  - The singular is computed first, so it can be more faithful and satisfy IDENT ±STRESS STEM IO
  - The plural wants to be faithful too, but must be distinct from the singular. Hence overapplication, violating ID ±STR STEM IO

<table>
<thead>
<tr>
<th>Evaluation of the singular (= na’dija-a of type a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ kuzov-∅NomSg /, ... / kuzov-∅LocSg /</td>
</tr>
<tr>
<td>a. ewise kuzov-∅NomSg, ... kuzov-∅LocSg</td>
</tr>
<tr>
<td>b. ewise kuzov-∅NomSg, ...</td>
</tr>
</tbody>
</table>

The plural is evaluated with the Sg “frozen” (= xan’ja-a of type b)

| / kuzov-∅NomSg /, ... / kuzov-∅NomPl /, ...    | Sg≠Pl | Id ±STR STEM IO |
|-----------------------------------------------|
| a. ewise kuzov-∅NomPl, ...                   |     |                |
| b. ewise kuzov-∅NomPl, ...                   |     |                |

The Sg is less marked: koleso, two stem stresses in UR

- The koleso type is exhibited by 6 disyllabic stems.
  - Singular: constant stress on the 1st stem syllable (=Sg of type a, e.g. ‘vyvyx⁻³⁻)
  - Plural: constant stress on the 2nd stem syllable (=Pl (of a different word) of type a, e.g. ‘re’roj⁻³⁻)

<table>
<thead>
<tr>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Nom</td>
</tr>
<tr>
<td>Gen</td>
</tr>
<tr>
<td>Dat</td>
</tr>
<tr>
<td>Acc</td>
</tr>
<tr>
<td>Inst</td>
</tr>
<tr>
<td>Loc</td>
</tr>
<tr>
<td>Voc</td>
</tr>
</tbody>
</table>

The singular is more faithful: type d

- Sg: stress on the first ending syllable (=Sg of type b, e.g. xan’ja-a)
  - Pl: stress on the stem, and predictable
    (not like in any other stem-stress type!)

<table>
<thead>
<tr>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Nom</td>
</tr>
<tr>
<td>Gen</td>
</tr>
<tr>
<td>Dat</td>
</tr>
<tr>
<td>Acc</td>
</tr>
<tr>
<td>Inst</td>
</tr>
<tr>
<td>Loc</td>
</tr>
<tr>
<td>Voc</td>
</tr>
</tbody>
</table>
The singular is more faithful: type \( d \)

- **Sg**: stress on the first ending syllable (\( = \) Sg of type \( b \), \( \text{xan}'-z-a \))
- **Pl**: stress on the stem, and predictable (\( \neq \) any other type)

**Analysis for type \( d \):**

- The stem is stressless
- Just as in type \( c \), the Sg is more faithful than the Pl:

\[
\begin{array}{c|c|c}
\text{NomSg} & \text{Sg} & \text{Pl} \\
\hline
\text{Sg} & \text{vyn-o} & \text{Ident} \pm \text{Str Stem IO} \\
\hline
\text{Pl} & & \\
\end{array}
\]

For type \( d \):

\[
\begin{array}{c|c|c}
\text{NomSg} & \text{Sg} & \text{Pl} \\
\hline
\text{Sg} & \text{vyn-o} & \text{Ident} \pm \text{Str Stem IO} \\
\hline
\text{Pl} & & \\
\end{array}
\]

**Base Priority within paradigms**

- The singulars of types \( c \) and \( d \) are more faithful to the UR than the plurals: the Sg forms preserve the UR stem stress, the Pl violate \( \text{Id} \pm \text{Str Stem IO} \)

- The singulars of type \( koleso \) are less marked than the plurals: the Sg forms obey \( \text{Stress 1st} \), the Pl forms do not

\[ \Rightarrow \text{canonical Base Priority effects} \]

### Polysyllabic \( d \) nouns: Stepwise generation - Uniformity

**Polysyllabic \( d \) nouns without Uniformity effects**

- **Type \( d \)**: ending stress in the Sg, stem stress in the Pl
- **In polysyllabic \( d \)**, stem stress is non-underlying, but that is not immediately evident from the surface forms.

\[
\begin{array}{c|c|c}
\text{Nom} & \text{Sg} & \text{Pl} \\
\hline
\text{Nom} & \text{pele''n-a} & \text{pele''n-}\hat{\text{y}} \\
\text{Dat} & \text{pele''n-i} & \text{pele''n-}\overline{\text{y}} \\
\text{Acc} & \text{pele''n-u} & \text{Nom \text{Pl}} \\
\text{Inst} & \text{pele''n-ju} & \text{pele''n-amy} \\
\text{Loc} & \text{pele''n-}\hat{\text{i}} & \text{pele''n-ax} \\
\end{array}
\]

\[
\begin{array}{c|c|c}
\text{Nom} & \text{bula''v-a} & \text{bula''v-}\hat{\text{y}} \\
\text{Dat} & \text{bula''v-i} & \text{bula''v-}\overline{\text{y}} \\
\text{Acc} & \text{bula''v-u} & \text{Nom \text{Pl}} \\
\text{Inst} & \text{bula''v-ju} & \text{bula''v-amy} \\
\text{Loc} & \text{bula''v-}\hat{\text{i}} & \text{bula''v-ax} \\
\end{array}
\]

**Stress STEM Right**: stress the stem-final syllable if word-final (recall \( \text{kob'zar-0} \), type \( b \) with a null ending)

**Stress 1st** (recall the \( koleso \) type)

\[
\begin{array}{c|c|c}
\text{Nom} & \text{syro't-a} & \text{syro't-y} \\
\text{Dat} & \text{syro't-i} & \text{syro't-am} \\
\text{Acc} & \text{syro't-u} & \text{Gm \text{Pl}} \\
\text{Inst} & \text{syro't-ju} & \text{syro't-amy} \\
\text{Loc} & \text{syro't-}\hat{\text{i}} & \text{syro't-ax} \\
\end{array}
\]

- **The ranking for type \( syro't-a \):**

\( \text{Sg} \neq \text{Pl}, \text{Stress STEM Right} \gg \text{Stress 1st} \)
**syro\'t-a: Stress Stem Right >> Stress 1st**

- The Sg is generated first, so it is maximally faithful (= type b, xan\'z-a)

\[
\begin{array}{|c|c|c|c|}
\hline
\text{syro\'t-a}_{\text{NomSg}} & \text{Sg} \neq \text{Pl} & \text{Str Stem R} & \text{Stress 1st} \\
\hline
\text{a}. & \text{syro\'t-a}, & & + \checkmark \\
\text{b}. & \text{syro\'t-a}, & & + \checkmark \\
\text{c}. & \text{syro\'t-a}, & & + \checkmark \\
\hline
\end{array}
\]

- The Pl is generated with reference to the Sg:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{syro\'t-a}_{\text{NomSg}}, \ldots / \text{syro\'t-y, syro\'t-}, & \text{Sg} \neq \text{Pl} & \text{Str Stem R} & \text{Stress 1st} \\
\hline
\text{a}. & \text{syro\'t-y, syro\'t-}, & & + \checkmark \\
\text{b}. & \text{syro\'t-y, syro\'t-}, & & + \checkmark \\
\text{c}. & \text{syro\'t-y, syro\'t-}, & & + \checkmark \\
\text{d}. & \text{syro\'t-y, syro\'t-}, & & + \checkmark \\
\hline
\end{array}
\]

As Stress Stem R targets only the form with a null ending, the Pl subparadigm is non-uniform.

**pele\'n-a: Stress 1st >> Stress Stem Right**

- The pele\'n-a type with uniform stem-initial stress in the Pl is derived by the opposite ranking:

\[
\begin{array}{|c|c|c|c|}
\hline
\text{pele\'n-a}_{\text{NomSg}}, \ldots / \text{pele\'n-y, pele\'n-}, & \text{Sg} \neq \text{Pl} & \text{Str Stem R} & \text{Stress 1st} \\
\hline
\text{a}. & \text{pele\'n-y, pele\'n-}, & & + \checkmark \\
\text{b}. & \text{pele\'n-y, pele\'n-}, & & + \checkmark \\
\text{c}. & \text{pele\'n-y, pele\'n-}, & & + \checkmark \\
\text{d}. & \text{pele\'n-y, pele\'n-}, & & + \checkmark \\
\hline
\end{array}
\]

**bula\'v-a: Stress Stem Right + Uniformity**

- The bula\'v-a type cannot be explained by markedness alone: there are no markedness constraints in Ukrainian favoring stem-final stress, unless the ending is null.

\[
\begin{array}{|c|c|}
\hline
\text{polysyllabic d, stem-final stress} & \\
\hline
\text{Sg} & \text{Pl} \\
\hline
\text{Nom} & \text{bula\'v-a} \quad \text{bula\'v-y} \\
\text{Gen} & \text{bula\'v-y} \quad \text{bula\'v-l} \\
\text{Dat} & \text{bula\'v-i} \quad \text{bula\'v-am} \\
\text{Acc} & \text{bula\'v-u} \quad \text{Nom Pl} \\
\text{Inst} & \text{bula\'v-oju} \quad \text{bula\'v-am} \\
\text{Loc} & \text{bula\'v-i} \quad \text{bula\'v-ax} \\
\hline
\end{array}
\]

- Stress Stem Right >> Stress 1st
  - ⇒ Gen Pl has to have stem-final stress.
- Uniformity >> Stress 1st
  - ⇒ The other Pl forms have to be uniform with Gen Pl.

**Uniformity: Assign a * for each new accentual pattern (= new stress grid of the stem) in the subparadigm under evaluation (that is, for each pattern which has not been present in the fixed subparadigms generated earlier.)**

- Uniformity works locally in each subparadigm, but favors greater global uniformity.

⇒ Our formulation is different from McCarthy’s Optimal Paradigms (OP), but in the bula\'v-a case, the two derive the same result. The alternative formulation becomes essential for Vocative Singular forms. Those forms can only be derived by Uniformity without majority-rules effects.
**bula’v-a: Stress Stem Right + Uniformity**

- The singular (same as syro’t-a):

<table>
<thead>
<tr>
<th>/bulav-aNomSg,.../</th>
<th>Sg≠Pl</th>
<th>Str Stem R</th>
<th>Id ≠Str Stem</th>
<th>Stress 1st</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. bulav-a,...</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>b. bulav-a,...</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>c. ✹ bulav-a,...</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

- The plural (compare with syro’t-a, where candidate b wins in the absence of highly ranked Uniformity):

<table>
<thead>
<tr>
<th>[bulav-yNomSg,... /bulav-y, bulav-∅,...]</th>
<th>Sg≠Pl</th>
<th>Uniformity</th>
<th>Str Stem R</th>
<th>Id ≠Str Stem</th>
<th>Str 1st</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. bulav-y, bulav∅,...</td>
<td>✹</td>
<td>✗</td>
<td>✹</td>
<td>✹</td>
<td>✹</td>
</tr>
<tr>
<td>b. bulav-y, bulav∅,...</td>
<td>✹</td>
<td>✗</td>
<td>✹</td>
<td>✹</td>
<td>✹</td>
</tr>
<tr>
<td>c. ✹ bulav-y, bulav∅,...</td>
<td>✹</td>
<td>✗</td>
<td>✹</td>
<td>✹</td>
<td>✹</td>
</tr>
<tr>
<td>d. bulav-y, bulav∅,...</td>
<td>✹</td>
<td>✗</td>
<td>✹</td>
<td>✹</td>
<td>✹</td>
</tr>
</tbody>
</table>

**Conclusions**

- Traditionally, there are two types of OO faithfulness acknowledged:
  - asymmetric Base-Derivative OO F, at work in derivational morphology
  - symmetric Optimal Paradigms OO F, at work within inflectional paradigms

- Ukrainian is one of the known cases where there are both symmetry and asymmetry within an inflectional paradigm, e.g. Albright 2002, Steriade 2007.

- What is interesting about the Ukrainian case:
  - The base is not any single form, it is collective
  - The relation between base and derivative enforces contrast, not uniformity

**New open questions**

- We have shown that in Ukrainian, there is fine structure within the nominal inflectional paradigm
  ⇒ Can we predict which subdivisions exist in a given language, and if there should be any such at all?

- In Ukrainian, the order of stepwise generation is (Sg) → (Pl)
  But it does not seem to be a universal law!
  Romanian: (Nom-Acc Sg) → (Plural) → (Gen-Dat Sg)
  And in Albright’s cases, the base is determined by a different principle altogether (maximal informativeness)
  ⇒ Can we predict what the order will be in a given language?