Comparative root suppletion: DM vs Nanosyntax

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Outline

1. The Containment Hypothesis
2. Czech comparative morphology
3. The internal structure of the comparative
4. Suppletion I: Nanosyntax
5. Suppletion II: Distributed Morphology
6. Conclusions
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Containment Hypothesis

`The representation of the superlative properly contains that of the comparative' (?: 4)
Comparative root suppletion: DM vs Nanosyntax
### Morphological evidence

<table>
<thead>
<tr>
<th></th>
<th>Pos</th>
<th>Cmpr</th>
<th>Sprl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persian</td>
<td>kam</td>
<td>kam-tar</td>
<td>kam-tar-in</td>
</tr>
<tr>
<td>Cimbrian</td>
<td>šüa</td>
<td>šüan-ar</td>
<td>šüan-ar-ste</td>
</tr>
<tr>
<td>Czech</td>
<td>mlad-ý</td>
<td>mlad-ší</td>
<td>nej-mlad-ší</td>
</tr>
<tr>
<td>Hungarian</td>
<td>nagy</td>
<td>nagy-obb</td>
<td>leg-nagy-obb</td>
</tr>
<tr>
<td>Latvian</td>
<td>zil-ais</td>
<td>zil-âk-ais</td>
<td>vis-zil-âk-ais</td>
</tr>
<tr>
<td>Ubykh</td>
<td>nüs(^w)(_{ə})</td>
<td>ç'a-nüs(^w)(_{ə})</td>
<td>a-ç'a-nüs(^w)(_{ə})</td>
</tr>
</tbody>
</table>
Comparative-Superlative Generalisation

When the comparative has a suppletive form, the superlative will also be suppletive, and vice versa (?: 29-30).
Comparative-Superlative Generalisation

When the comparative has a suppletive form, the superlative will also be suppletive, and vice versa (?: 29-30).

(3) ABB  good  better  best
    *ABA  good  better  goodest
    *AAB  good  gooder  best
\[ \text{Cmpr} = C1 + C2 \]

**Our claim**

- the Cmpr head is to be split up into two distinct heads, C1 and C2 (see also ?)

(4)

```plaintext
(4)  C2P
     /   \
    C2   C1P
       /   \
      C1    A
```
Evidence comes from Czech

- regular degree morphology
- root suppletion in degree morphology
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Regular comparative degree morphology

-ějš-

<table>
<thead>
<tr>
<th>Pos</th>
<th>Cmpr</th>
<th>Sprl</th>
</tr>
</thead>
<tbody>
<tr>
<td>červen-ý</td>
<td>červen-ějš-í</td>
<td>nej-červen-ějš-í `red'</td>
</tr>
<tr>
<td>hloup-ý</td>
<td>hloup-ějš-í</td>
<td>nej-hloup-ějš-í `stupid'</td>
</tr>
<tr>
<td>moudr-ý</td>
<td>moudř-ejš-í</td>
<td>nej-moudř-ejš-í `wise'</td>
</tr>
</tbody>
</table>
Regular comparative degree morphology

-ějš-

(6) | Pos   | Cmpr | Sprl   |
    | červen-ý | červen-ějš-í | nej-červen-ějš-í | `red' |
    | hloup-ý  | hloup-ějš-í  | nej-hloup-ějš-í  | `stupid' |
    | moudr-ý | moudř-ejš-í  | nej-moudř-ejš-í  | `wise' |

í/ý = adjectival agreement: Case, number, gender
\[ \tilde{e}j\tilde{s} = \tilde{e}j + \tilde{s} \]

5 pieces of evidence showing that \(-\tilde{e}j\tilde{s}\) consists of two parts (\(\tilde{e}j + \tilde{s}\))

1. \(-\tilde{e}j\) disappears with suppletive roots
2. \(-\tilde{e}j\) disappears in cases where the root shortens
3. \(-\tilde{e}j\) can disappear non-predictably
4. \(-\tilde{e}j\) disappears with de-adjectival verbs
5. \(-\tilde{s}\) disappears with comparative adverbs
-ěj- disappears with suppletive roots

(7)

<table>
<thead>
<tr>
<th>Pos</th>
<th>CMPR</th>
<th>SPRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>dobr-ý</td>
<td>lep-š-í</td>
<td>nej-lep-š-í</td>
</tr>
<tr>
<td>špatn-ý</td>
<td>hor-š-í</td>
<td>nej-hor-š-í</td>
</tr>
<tr>
<td>mal-ý</td>
<td>men-š-í</td>
<td>nej-men-š-í</td>
</tr>
<tr>
<td>velk-ý</td>
<td>vět-š-í</td>
<td>nej-vět-š-í</td>
</tr>
</tbody>
</table>
-ěj- disappears in cases where the root shortens

<table>
<thead>
<tr>
<th>Pos</th>
<th>Cmpr</th>
</tr>
</thead>
<tbody>
<tr>
<td>dlouh-ý</td>
<td>del-š-í ‘long’</td>
</tr>
<tr>
<td>blízk-ý</td>
<td>bliž-š-í ‘close’</td>
</tr>
<tr>
<td>vys-ok-ý</td>
<td>vyš-š-í ‘tall’</td>
</tr>
</tbody>
</table>
-řěj- can disappear non-predictably

<table>
<thead>
<tr>
<th>Pos</th>
<th>CompR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>star-ý</td>
<td>star-š-í</td>
<td>`old'</td>
</tr>
<tr>
<td>such-ý</td>
<td>suš-š-í</td>
<td>`dry'</td>
</tr>
<tr>
<td>drah-ý</td>
<td>draž-š-í</td>
<td>`expensive'</td>
</tr>
<tr>
<td>tvrd-ý</td>
<td>tvrd-š-í</td>
<td>`hard'</td>
</tr>
<tr>
<td>tich-ý</td>
<td>tiš-š-í</td>
<td>`silent'</td>
</tr>
</tbody>
</table>

16/58
-ěj- disappears with de-adjectival verbs

<table>
<thead>
<tr>
<th>Pos</th>
<th>COMP</th>
<th>VERB</th>
</tr>
</thead>
<tbody>
<tr>
<td>such-ý</td>
<td>suš-š-í</td>
<td>(u-)suš-i-t `dry'</td>
</tr>
<tr>
<td>mokr-ý</td>
<td>mokř-ejš-í</td>
<td>(za-)mokř-i-t `wet'</td>
</tr>
<tr>
<td>drah-ý</td>
<td>draž-š-í</td>
<td>z-draž-i-t `expensive'</td>
</tr>
<tr>
<td>dlouh-ý</td>
<td>del-š-í</td>
<td>z-dlouž-i-t `long'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>z-del-š-i-t</td>
</tr>
</tbody>
</table>
-š- disappears with comparative adverbs

(11) | CMPR ADJ   | CMPR ADV   |
----|------------|------------|
červen-ěj-š-í | červen-ěj-i | `redder' |
hloup-ěj-š-í | hloup-ěj-i | `more stupid' |
moudř-ej-š-í | moudř-ej-i | `wiser' |
rychl-ej-š-í | rychl-ej-i | `faster' |
Preliminary Conclusion

The regular comparative suffix consists of two parts: \( ěj+š \)
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Nanosyntax

- One Feature, One Head (OFOH)
- Postsyntactic Lexicon
- Phrasal Spellout
- Superset Principle: A lexical entry may spell out a syntactic node iff the lexical tree contains the syntactic node.
- Elsewhere Principle: If there is more than one candidate for spellout, the closest match wins.
- Language variation can be reduced to the size of lexically stored trees (?).
The Czech regular comparative

(12) C2P ⇒ -š-

C2

C1P ⇒ -ěj-

C1

QP ⇒ moudr-

Q

aP

a

√P
The Czech regular comparative

\[(12)\quad C2P \Rightarrow -š-\]

\[
\begin{array}{c}
C2 \\
C1P \Rightarrow -ěj-
\end{array}
\]

\[
\begin{array}{c}
C1 \\
QP \Rightarrow \text{moudr-}
\end{array}
\]

\[
\begin{array}{c}
Q \\
aP
\end{array}
\]

\[
\begin{array}{c}
a \\
\sqrt{P}
\end{array}
\]

\(Q = \text{gradability}\)
The lexicon

(13)  a.  $<$ /moudr-/, [QP $Q$ [a$P$ a [\$P \checkmark ]]], WISE $>$

b.  $<$ /-ěj-/, [C$_{1P}$ C$_1$ ] $>$

c.  $<$ /-š-/, [C$_{2P}$ C$_2$ ] $>$
The derivation-1

\[ \text{(14)} \quad (14) \]

\[
\begin{array}{c}
\text{C1P} \\
\text{C1} & \text{QP} \Rightarrow \text{moudr-} \\
\text{Q} & \text{aP} \\
\text{a} & \sqrt{P}
\end{array}
\]

\[ < /\text{moudr-}/, [\text{QP} \ Q \ [\text{aP} \ a \ [\sqrt{P} \ \sqrt{]}]], \ WISE > \]

\[ < /-ěj-/, [\text{C1P} \ C1 ] > \]
The derivation-2 (spellout-driven movement)

(15)

\[
\text{moudr-} \leftrightarrow \begin{array}{c}
\text{QP} \\
\text{aP}
\end{array}
\]

\[
\text{QP} \quad \text{aP}
\]

\[
\text{a} \quad \sqrt{\text{P}}
\]

\[
\text{C1P} \Rightarrow -\text{ěj-}
\]

\[
< /-\text{ěj-}/, [\text{C1P} \text{ C1}] >
\]
The derivation-3

(16)

< /-š-/ , [C₂P C₂ ] >
The derivation-4

(17)

< /-š-/, [C2P C2 ] >
The derivation-5

(18)

\[ \text{nej-} \leftrightarrow \text{SprlP} \]
\[ \text{moudr-} \leftrightarrow \text{QP} \]

\[ < -\text{nej-}, [\text{SprlP Sprl}] > \]
Language variation

(19) | POS  | CMPR  | SPRL   |
    | wise | wis-er | wis-est |
    | moudr-ý | moudř-ej-š-í | nej-moudř-ej-š-í |

- the difference between Czech and English is entirely located in the size of the lexically stored trees
English

(20) C2P ⇒ -er

C2

C1P ⇒ wise

C1

QP

Q

aP

a

√

(21) a. < /wise/, [C1P C1 [QP Q [aP a [√P √ ]]]] >
b. < /-er/, [C2P C2 ] >
(22) $\text{SprlP} \Rightarrow -\text{est}$

$\text{Sprl} \quad \text{C2P} \Rightarrow -\text{er}$

$\text{C2} \quad \text{C1P} \Rightarrow \text{wise}$

$\text{C1} \quad \text{QP}$

$\text{Q} \quad \text{aP}$

(23) $< /-\text{est}/, \left[ \text{SprlP Sprl} \left[ \text{C2P C2} \right] \right> >$
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Suppletion

Two types:

- Portmanteau suppletion (24a)
- Root suppletion (24b)

(24) | Pos | Cmpr |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>bad</td>
<td>worse</td>
</tr>
<tr>
<td>b.</td>
<td>good</td>
<td>bett-er</td>
</tr>
</tbody>
</table>
Portmanteau suppletion $=$ pointers

(25)  

a. $<_{WORSE} /worse/, [_{C2P} BAD ER ] >$

b. $<_{BAD} /bad/, [_{C1P} [QP Q [aP a $\sqrt{]} ] ] ] >$

c. $<_{-ER} /-er/, [_{C2P} C2 ] >$
Portmanteau suppletion = pointers

(25)  
a. \(<_{\text{WORSE}} /\text{worse}/, [C_{2P} \text{ BAD } \text{ ER }] >\)  
b. \(<_{\text{BAD}} /\text{bad}/, [C_{1P} [QP \text{ Q } [aP \text{ a } \checkmark ]] >\)  
c. \(<_{-\text{ER}} /-\text{er}/, [C_{2P} \text{ C2 }] >\)

(26)  
\[ \begin{array}{c} 
\text{bad} \leftrightarrow C_{1P} \\
\text{C2P} \Rightarrow \text{worse} \\
\text{C2P}_{\text{ER}} \Rightarrow -\text{er} \\
\text{C2} \\
\text{QP}_{\text{BAD}} \\
\text{Q} \quad \text{aP} \\
\text{a} \quad \checkmark \\
\end{array} \]
Root suppletion = pointers (but differently)

- the contrast between *good* and *bett-* is one of internal makeup:
  - *good* spells out QP
  - *bett-* spells out C1P
- *bett-* contains a pointer to GOOD
better

(27) C2P ⇒ -er

C2

C1P ⇒ bett-

C1

QP ⇒ good

Q

aP

a \sqrt{P}

(28) a. \langle_{\text{GOOD}} /\text{good}/, [QP Q [aP a [\sqrt{P} \checkmark ]]] \rangle >

b. \langle_{\text{BETT}} /\text{bett-}/, [C1P C1 \text{GOOD}] \rangle >
This analysis explains 1

5 pieces of evidence showing that -ějš- consists of two parts (ěj+š)

1. -ěj- disappears with suppletive roots
2. -ěj- disappears in cases where the root shortens
3. -ěj- can disappear non-predictably
4. -ěj- disappears with de-adjectival verbs
5. -š- disappears with comparative adverbs
This analysis explains 1

1. -ěj- disappears with suppletive roots
   - -ěj- spells out the C1 feature
   - the suppletive root lep- also spells out C1
   - therefore, suppletive roots are predicted to be incompatible with -ěj- in principle
lep- eats up -ěj-

(29) \[ C2P \Rightarrow -\ensuremath{\text{s}} - \]

```
C2
   C1P \Rightarrow lep-
     |   
     QP \Rightarrow dobr-
       |   
       Q
       |   
       aP
       |   
       a
     \sqrt{P}
```

(30)

a. \(<_{\text{DOBR}} /dobr-/ , [QP Q [aP a [\sqrt{P} \sqrt{P}]]) >

b. \(<_{\text{LEP}} /lep-/ , [C1P C1 DOBR ] >

c. \(< /-ěj-/ , [C1P C1 ] >

d. \(<_{\text{s}} /-\ensuremath{\text{s}}-/ , [C2P C2 ] >

Comparative root suppletion: DM vs Nanosyntax

bit.ly/2jFQOUm
The analysis explains 2

5 pieces of evidence showing that -ějš- consists of two parts (ěj+š)

1. -ěj- disappears with suppletive roots
2. -ěj- disappears in cases where the root shortens
3. -ěj- can disappear non-predictably
4. -ěj- disappears with de-adjectival verbs
5. -š- disappears with comparative adverbs

⇒ shortened roots (like suppletive roots) spell out C1P
(8) \[
\begin{array}{l|c|c}
\text{Pos} & \text{Cmpr} & \text{CMPR} \\
\hline
dlouh-ý & del-š-í & ‘long’ \\
blízk-ý & bliž-š-í & ‘close’ \\
vys-ok-ý & vyš-š-í & ‘tall’ \\
\end{array}
\]

(31) a. \(<_{\text{DLOUH}} /dlouh-/, [QP \; Q \; [\alpha_P \; \alpha \; [\sqrt{P} \; \sqrt{P} ]] >
\]
b. \(<_{\text{DEL}} /del-/, [C_1P \; C_1 \; DLOUH ] >
\]
The analysis explains 3

5 pieces of evidence showing that -ějš- consists of two parts (ěj+š)

1. -ěj- disappears with suppletive roots
2. -ěj- disappears in cases where the root shortens
3. -ěj- can disappear non-predictably
4. -ěj- disappears with de-adjectival verbs
5. -š- disappears with comparative adverbs

⇒ the relevant lexical items spell out C1P
(9) | Pos | Cmpr |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>star-ý</td>
<td>star-š-í</td>
</tr>
<tr>
<td>such-ý</td>
<td>suš-š-í</td>
</tr>
<tr>
<td>drah-ý</td>
<td>draž-š-í</td>
</tr>
</tbody>
</table>

(32) `< /star-/, [C1P C1 [QP Q [aP a [√P √ ]]]]` >

- *star-* can spell out C1P, causing -ěj- to disappear in the comparative
- *star-* does not contain a pointer
- the difference between these adjectives and the ones that do take -ěj-š- is a matter of lexical idiosyncrasy
5 pieces of evidence showing that -ějš- consists of two parts (ěj+š)

1. -ěj- disappears with suppletive roots
2. -ěj- disappears in cases where the root shortens
3. -ěj- can disappear non-predictably
4. -ěj- disappears with de-adjectival verbs
5. -š- disappears with comparative adverbs
5 pieces of evidence showing that -ějš- consists of two parts (ěj+š)

1. -ěj- disappears with suppletive roots
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4. -ěj- disappears with de-adjectival verbs
5. -š- disappears with comparative adverbs

We skip 4 and 5 here
... and move on to ...
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DM account of suppletion

- root suppletion: contextual allomorphy
- portmanteau suppletion: contextual allomorphy + fusion
Root Suppletion = contextual allomorphy

(33) A
    \sqrt{\text{GOOD}}

(34) \text{CmprP}
    \quad \text{A}
    \quad \text{Cmpr}
        \sqrt{\text{GOOD}}

(35) a. $\sqrt{\text{GOOD}} \rightarrow \text{be(tt)-} / \underline{\quad} ] \text{Cmpr} ]$

b. $\sqrt{\text{GOOD}} \rightarrow \text{good}$
Root suppletion in Czech

(36) \[ \sqrt{\text{GOOD}} \]

\[ A \]

\[ \sqrt{\text{GOOD}} \]

\[ C1 \]

\[ C2 \]

\[ C1P \]

\[ C2P \]
Root suppletion in Czech

(36)  
```
      C2P
     /   \
C1P    C2
```

(37)  
```
A   C1
\sqrt{GOOD}
```

(37)  
```
   a. \sqrt{GOOD} \rightarrow dobr-
   b. \sqrt{GOOD} \rightarrow lep- / ___ ] C1 ]
```

(38)  
```
a. C1 \rightarrow \check{e}j
b. C1 \rightarrow \emptyset / lep ] ___
c. C2 \rightarrow \check{s}
```
Root suppletion in Czech

(38)  a. $C_1 \rightarrow \text{ěj}$
     b. $C_1 \rightarrow \emptyset / \text{lep}$ ] _____
     c. $C_2 \rightarrow \text{š}$

- a rule like (38b) must be duplicated for each suppletive root
- nothing in principle prevents the existence of suppletive roots with -ěj-: Czech could have (37), and at the same time lack (38b)
- there is no principled explanation for the systematic absence of -ěj- with suppletive (and shortened) roots
Portmanteau suppletion = Fusion + contextual allomorphy

(39)

\[
\text{CmprP} \quad \Rightarrow \quad \text{AC}
\]

\[
A \quad \text{Cmpr} \quad \sqrt{\text{BAD}} \quad \sqrt{\text{BAD} \oplus \text{Cmpr}}
\]

(40)  

a. \( \sqrt{\text{BAD}}, \text{Cmpr} \rightarrow \text{worse} \)  

b. \( \sqrt{\text{BAD}} \rightarrow \text{bad} \)
Alternative for Czech: *lep* is portmanteau suppletion

(41)

```
  C2P
  /  \
C1P  C2   ⇒
 /    /
A  C1
```

(42)  

a. $\sqrt{DOBR}$, $C1 \rightarrow lep$

b. $\sqrt{DOBR} \rightarrow dobr$

c. $C1 \rightarrow ěj$

d. $C2 \rightarrow š$
The Good

- *lep* lexically contains C1, therefore no spellout for C1 as -ěj- is needed/allowed (like in the nanosyntactic approach).
The Good

- *lep* lexically contains C1, therefore no spellout for C1 as -ěj- is needed/allowed (like in the nanosyntactic approach).

The Bad

- to derive the principled incompatibility of -ěj- with suppletive roots, the Fusion derivation *must* be chosen over the contextual allomorphy derivation.
The Good

- *lep* lexically contains C1, therefore no spellout for C1 as -ěj- is needed/allowed (like in the nanosyntactic approach).

The Bad

- to derive the principled incompatibility of -ěj- with suppletive roots, the Fusion derivation *must* be chosen over the contextual allomorphy derivation.

The Ugly

- a timing paradox arises (?).
The Paradox

- Fusion $<$ Lexical insertion
- Fusion must apply in all and only those cases where a portmanteau morpheme is available:
  - $lep$- `good'
  - $del$- `long'
  - $star$- `old'
- the rules manipulating the structure (like Fusion) must know what the lexicon contains, in advance of lexical insertion
The Paradox

- Fusion $< <$Lexical insertion
- Fusion must apply in all and only those cases where a portmanteau morpheme is available:
  - `lep- `good'
  - `del- `long'
  - `star- `old'
- the rules manipulating the structure (like Fusion) must know what the lexicon contains, in advance of lexical insertion

The Solution

- Give up the assumption that lexical insertion can only take place at terminals (?).
(43)  a. \( \sqrt{\text{DOBR}}, \ C_1 \rightarrow \text{lep} \)
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Conclusions

- Bobaljik's Cmpr needs to be split up into two distinct heads/features, C1 and C2.
- Czech morphology provides evidence for two distinct exponents corresponding to these two features: ěj+š.
- We developed a nanosyntactic analysis of root suppletion that accounts for the systematic absence of ěj with suppletive and shortened roots in Czech comparatives.
- We showed that the DM account leads to a timing paradox, which supports the idea of phrasal spellout.
Thank you!

Pavel Caha