Exceptional and derived environments in Assamese vowel harmony

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Assamese vowel harmony with exceptional triggers and exceptional undergoers follows in an account without direct reference to morphology in the phonology:

1. exceptional triggers = floating features

2. exceptional undergoers = a marked structure is avoided if it is derived but preserved if it is underlying: a gang effect in HG

(Legendre et al., 1990; Smolensky and Legendre, 2006)
Data
- all data and generalizations from Mahanta (2008) and Mahanta (2012)

(1) **Vocalic inventory (Mahanta, 2012, 1111)**

<table>
<thead>
<tr>
<th>Levels</th>
<th>-back</th>
<th>+back</th>
</tr>
</thead>
<tbody>
<tr>
<td>+high, -low</td>
<td>i</td>
<td>u</td>
</tr>
<tr>
<td></td>
<td>ʊ</td>
<td></td>
</tr>
<tr>
<td>-high, -low</td>
<td>e</td>
<td>o</td>
</tr>
<tr>
<td></td>
<td>ɛ</td>
<td>ɔ</td>
</tr>
<tr>
<td>-high, +low</td>
<td></td>
<td>α</td>
</tr>
</tbody>
</table>

(/e/ and /o/ are only derived, never underlying)
Regressive [+ATR]-harmony

\[(2) \quad \textbf{Suffix-triggered harmony (Mahanta, 2012, 1112+1113)}\]

\begin{align*}
\text{a.} & \quad \text{gu}l & \text{‘mix’} & -i & \quad \text{guli} & \text{‘to mix’} \\
& \text{pɛt} & \text{‘belly’} & -u & \quad \text{petu} & \text{‘pot bellied’} \\
\text{b.} & \quad \text{bosɔr} & \text{‘year’} & -i & \quad \text{bosori} & \text{‘yearly’} \\
& \text{ɡɛɾɛlɑ} & \text{‘fat’ (MASC)} & -i & \quad \text{gerel}i & \text{‘fat’ (FEM)} \\
& \text{bɔx} & \text{‘settle’} & -ɔ-ti & \quad \text{boxoti} & \text{‘settlement’} \\
& \text{mɔr} & \text{‘die’} & -ɔ-ti & \quad \text{moroti} & \text{‘cursed to die’} \\
\end{align*}
Regressive [+ATR]-harmony

(3) No [-ATR] harmony (Mahanta, 2012, 1113)

a. \(b^h\text{ut} \) ‘ghost’ \(-\varepsilon\) | \(b^h\text{ute} \) ‘ghost’ (Erg)
kin ‘buy’ \(-\varepsilon\) | kin\(\varepsilon\) ‘buy’ (Erg)
\(p^h\text{ur} \) ‘travel/roam’ \(-\upsilon\) | \(p^h\text{uru} \) ‘travel/roam’ (1.PRS)

b. \(g\text{orom} \) ‘hot’ \(-\omega t\) | \(g\text{orom}\omega t \) ‘heat’ (Acc)
\(p\text{oxek} \) ‘week’ \(-\omega t\) | \(p\text{oxek}\omega t \) ‘week’ (Loc)
Opaque /a/

- the **low vowel /a/ is opaque** and blocks any further harmony to its left
- this opaque /a/ can be in the stem (4-a) or the suffix (4-b)

(4) **Opaque low vowel /a/ (Mahanta, 2012, 1119)**

<table>
<thead>
<tr>
<th>Example</th>
<th>Stem Form</th>
<th>Suffix</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kɔpah</td>
<td>–i kɔpahi</td>
<td>‘made of cotton’</td>
<td></td>
</tr>
<tr>
<td>zʊkər</td>
<td>–i zʊkəri</td>
<td>‘shake’ (INF)</td>
<td></td>
</tr>
<tr>
<td>bəpar</td>
<td>–i bəpari</td>
<td>‘trader’</td>
<td></td>
</tr>
<tr>
<td>b. lɛkʰ</td>
<td>–aru lɛkʰaru</td>
<td>‘writer’</td>
<td></td>
</tr>
<tr>
<td>gɔz</td>
<td>–ali gɔzali</td>
<td>‘sprout’</td>
<td></td>
</tr>
<tr>
<td>zʊn</td>
<td>–ali zʊnali</td>
<td>‘silvery’</td>
<td></td>
</tr>
</tbody>
</table>
Exceptional triggering

A /a/ adjacent to the exceptional suffixes /-ija/ and /-uwa/ is unexpectedly raised to a mid vowel and undergoes harmony.

(5) Exceptional raising (Mahanta, 2012, 1121)

<table>
<thead>
<tr>
<th>Stem</th>
<th>English</th>
<th>Exceptional Suffix</th>
<th>Resulting Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>sal</td>
<td>‘roof’</td>
<td>-ija</td>
<td>solija ‘roof-ed’</td>
</tr>
<tr>
<td>dal</td>
<td>‘branch’</td>
<td>-ija</td>
<td>dolija ‘branch-ed’</td>
</tr>
<tr>
<td>mar</td>
<td>‘beat’ (Vb)</td>
<td>-ija</td>
<td>morija ‘beat’</td>
</tr>
<tr>
<td>misa</td>
<td>‘lie’</td>
<td>-ija</td>
<td>misolija ‘liar’</td>
</tr>
<tr>
<td>kʰitap</td>
<td>‘title’</td>
<td>-ija</td>
<td>kʰitopija ‘renowned/titled’</td>
</tr>
<tr>
<td>dʰar</td>
<td>‘debt’</td>
<td>-uwa</td>
<td>dʰoruwa ‘debtor’</td>
</tr>
</tbody>
</table>
the exceptional trigger suffixes only have an effect on an adjacent /a/

(6)  *Only adjacent /a/’s as exceptional undergoers (Mahanta, 2012, 1121)*

<table>
<thead>
<tr>
<th>Alf</th>
<th>‘light’</th>
<th>-ija</th>
<th>patoliija</th>
<th>‘lightly’</th>
</tr>
</thead>
<tbody>
<tr>
<td>abod</td>
<td>‘danger’</td>
<td>-ija</td>
<td>apodija</td>
<td>‘in danger’</td>
</tr>
<tr>
<td>abotor</td>
<td>‘bad time’</td>
<td>-ija</td>
<td>abotorija</td>
<td>‘bad-timed’</td>
</tr>
<tr>
<td>alax</td>
<td>‘luxury’</td>
<td>-uwa</td>
<td>aloxuwa</td>
<td>‘pampered’</td>
</tr>
<tr>
<td>adha</td>
<td>‘half’</td>
<td>-uwa</td>
<td>adhooruwa</td>
<td>‘halved’</td>
</tr>
</tbody>
</table>
Exceptional triggers: Regular triggers for [+ATR]-harmony

- in the absence of an adjacent /a/, the two suffixes trigger regular [+ATR] harmony

\[(7) \quad \text{Exceptional suffixes as regular triggers (Mahanta, 2012, 1120)}\]

- \(d^h\ul\) ‘drum’ –ija \(d^h\ulija\) ‘drummer’
- sɔr ‘slap’ –ija \(sorija\) ‘to slap’
- bojɔx ‘age’ –ija \(bojoxija\) ‘aged’
- gubɔr ‘dung’ –uwa \(guboruwa\) ‘kind of beetle found in dung’
- mɛr ‘wind’ –uwa \(meruwa\) ‘wind’ (CAUS)
Exceptional undergoers and fronting

- the vowels subject to exceptional raising agree in frontness with a preceding mid vowel

\[(8) \text{ Exceptional progressive frontness harmony (Mahanta, 2012, 1132)}\]

\begin{tabular}{llll}
\textbf{a.} & kəpəl & ‘destiny’ & -iə & kopolija & ‘destined’ \\
& bozər & ‘marketplace’ & -uwa & bozoruwa & ‘cheap’ \\
& pəlax & ‘fertiliser’ & -uwa & poloxuwa & ‘fertile’ \\
\textbf{b.} & dʰəməli & ‘play’ & -iə & dʰemelija & ‘playful’ \\
& ələh & ‘laziness’ & -uwa & elehuwa & ‘lazy’ \\
& kəsa & ‘raw’ & -uwa & keseluwa & ‘rawness’ \\
& dəka & ‘youth (male)’ & -uwa & dekeruwa & ‘youthfulness’ \\
\end{tabular}
Exceptional undergoers and fronting

- **fronting only for phonologically derived mid** vowels, never for underlyingly mid ones

(9) **No fronting for underlying mid vowels** (Mahanta, 2012, 1112+1134)

<table>
<thead>
<tr>
<th>Example</th>
<th>Meaning</th>
<th>Phonological Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>bʰut</code></td>
<td>‘ghost’</td>
<td><code>bʰutɛ</code> <code>ghost</code> Erg</td>
</tr>
<tr>
<td><code>kʰuʃ</code></td>
<td>‘steps’</td>
<td><code>ekʰuzija</code> ‘going slowly’</td>
</tr>
<tr>
<td><code>xɛh</code></td>
<td>‘last’</td>
<td><code>xehotija</code> ‘recent’</td>
</tr>
<tr>
<td><code>kɔt</code></td>
<td>‘inclining’</td>
<td><code>ekotija</code> ‘inclining to one side’</td>
</tr>
<tr>
<td><code>pɔxɛk</code></td>
<td>‘week’</td>
<td><code>pɔxɛkɔt</code> ‘week’ Loc</td>
</tr>
<tr>
<td><code>bɛtɔn</code></td>
<td>‘salary’</td>
<td></td>
</tr>
</tbody>
</table>
Summary: The empirical picture

(10) **Regular ATR-Harmony**

\[+\text{ATR}\]

\[
/\text{u}/ & - /i/ \\
[u] & [i]
\]

(11) **Opaque low vowel**

\[+\text{ATR}\]

\[
/\varepsilon/ & /\alpha/ & - /i/ \\
[\varepsilon] & [\alpha] & [i]
\]

(12) **Exceptional trigger**

\[+\text{ATR}\]

\[
/o/ & /\alpha/ & - /i/_{\text{ija}} \\
[o] & [o] & [i]
\]

(13) **Exceptional undergoer**

\[-\text{back}\]

\[+\text{ATR}\]

\[
/e/ & /\alpha/ & - /i/_{\text{ija}} \\
[e] & [e] & [i]
\]
Analysis
Background assumptions

- **Harmonic Grammar**
  ⇒ Weighted constraints (Smolensky and Legendre, 2006; Legendre et al., 1990)

- **Stratal OT**
  ⇒ Pre-optimization at the stem level ensures that all stems are (featurally) fully specified (cf. Trommer (2011))

- **Autosegmental feature representations**: $\text{Max}(F)$ and $\text{Dep}(F)$ preserve feature specifications in correspondence theory (McCarthy and Prince, 1995)

(14) a. $\text{Max}(\pm F)$
Assign a violation mark for every $[\pm F]$ input feature without an output correspondent.

b. $\text{Dep}(\pm F)$
Assign a violation mark for every $[\pm F]$ output feature without an input correspondent.
Harmony is the result of **feature spreading**.

Triggered by an **alignment constraint**, that aligns [+ATR]-features with the left edge of a prosodic word.

(Kirchner, 1993; Akinlabi, 1994; Archangeli and Pulleyblank, 2002)

It can only become active, when it **reduces markedness** by keeping the [-ATR]-features from being realized.
Constraints for regular harmony

(15)  a. ALIGN([+ATR],ω,L)
Assign a violation mark for every [+ATR] feature that is not associated with the leftmost vowel in a prosodic word.

b. *[−ATR]
Assign a violation mark for every [−ATR] feature in the output.
### Regressive harmony

<table>
<thead>
<tr>
<th>Input = a.</th>
<th>( W = )</th>
<th>( \text{Max}(\pm \text{ATR}) )</th>
<th>( *[\text{ATR}] )</th>
<th>( \text{Align} )</th>
<th>( \text{H} = )</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-\text{ATR} \quad +\text{ATR})</td>
<td></td>
<td>5</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td>-1</td>
<td>-1</td>
<td>-6</td>
</tr>
<tr>
<td>p \quad \varepsilon \quad t \quad + \quad u</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
<td>-1</td>
<td></td>
<td>-5</td>
</tr>
<tr>
<td>p \quad e \quad t \quad u</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
<td>-1</td>
<td>-1</td>
<td>-9</td>
</tr>
<tr>
<td>p \quad \varepsilon \quad t \quad \ddot{u}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The opacity of /a/ follows from a high ranked markedness constraint against [+ATR,+low] vowels.

(17) *[+ATR,+low]
    Assign a violation mark for every vowel that is associated to [+ATR] and [+low].
(18) \textbf{Opaque /a/}

\begin{tabular}{|c|c|c|c|c|}
\hline
 & W= & *[+ATR,+low] & MAX(±ATR) & *[-ATR] & ALIGN & H= \\
\hline
b & ε & p & α & r & + & \textbf{1} & 5 & 5 & 4 & 2 & 2 & 4 \\
\hline
\end{tabular}
Constraints for opaque $\alpha$

- Changing the [±low] feature would entail more violation, because either the [±back] or the [±round] value would have to be changed as well.

(19)  

a. $^*_{[+rd]}$
    Assign a violation for every [+round]-feature in the output.

b. $(\text{FAITH}(\pm rd) = \text{DEP}(\pm rd) + \text{MAX}(\pm rd))$
(20) \textbf{Opaque /\textalpha/}

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
\textbf{} & \textbf{MAX(bk)} & \textbf{MAX(low)} & \textbf{ALIGN} & \textbf{FAITH(rd)} & \textbf{H=} \\
\hline
\textbf{W=} & 5 & 2 & 2 & 1 & 1 \\
\hline
\textbf{a.} & & & -2 & & -4 \\
\hline
\textbf{b.} & & & -1 & -2 & -1 & -5 \\
\hline
\textbf{c.} & & & -1 & -1 & & -7 \\
\hline
\end{tabular}
\end{table}
Exceptional triggers: Floating features

- /ija/ and /uwa/ bear a **floating [-low]-feature** that strives to associate to a stem-final vowel.

- That **only an adjacent /a/** can be raised follows mainly from the inviolable **ban on the crossing association lines**.

- The raised vowel can now undergo regular ATR-harmony.

(21) a. **MaxFl**
Assign a violation mark for every floating input feature without an output correspondent.

b. ***Float**
Assign a violation for every floating feature in the output.

(cf. Wolf (2007))
### Exceptional raising

$$\text{W= }5 \quad \text{FLOAT} \quad 5 \quad \text{Max}(\text{low}) \quad 2 \quad \text{H=}$$

<table>
<thead>
<tr>
<th></th>
<th>MAXFl</th>
<th>*FLOAT</th>
<th>Max(low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>-1</td>
<td>-1</td>
<td>-7</td>
</tr>
<tr>
<td>b.</td>
<td>-1</td>
<td>-1</td>
<td>-5</td>
</tr>
<tr>
<td>c.</td>
<td>-1</td>
<td>-1</td>
<td>-2</td>
</tr>
</tbody>
</table>
Exceptional triggers: Default realization

- Although [+bk] is marked, the /a/ becomes /o/ in the default case since changing the [±back]-feature is too costly.

(23)  *[+bk]

Assign a violation for every [+back]-feature in the output.
### Exceptional raising: Back round vowel as default

<table>
<thead>
<tr>
<th></th>
<th>MAX(bk)</th>
<th>FAITH(rd)</th>
<th>[+rd]</th>
<th>[+bk]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(24)</strong></td>
<td>W= 5</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>H=</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of exceptional raising](image)

**M/a.sc/x.sc**

**F/a.sc/i.sc/t.sc/h.sc**

**F/a.sc/i.sc/t.sc/h.sc**

**W= 5 1 1 1 H=**

---

**Exceptional and derived environments**

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Exceptional undergoers

- Exceptional harmony in derived environments is triggered by a $\text{SHARE}^{[bk]}$ constraint that requires mid vowels to agree in backness.
  (=Parasitic vowel harmony; cf. Jurgec, 2011, 2013)

(25) $\text{SHARE}^{[-hi,-lo]}$

Assign a violation mark for every pair of [-high,-low] vowels in adjacent syllables that have a different [±back] value.

- In combination with the $\text{FAITH}(rd)$, $^*[-rd]$ and $^*[-bk]$ it gangs up against $\text{Max(bk)}$. 
### Exceptional harmony

<table>
<thead>
<tr>
<th>Exceptional undergoers</th>
<th>Exceptional harmony</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\varepsilon$ l α h + u w α</td>
<td>$\varepsilon$ l α h + u w α</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>MAX(bk)</th>
<th>SHARE</th>
<th>FAITH(rd)</th>
<th>[+rd]</th>
<th>[+bk]</th>
<th>H=</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (-bk) +bk +bk +bk +bk +bk</td>
<td>-1</td>
<td>-2</td>
<td>-2</td>
<td>-3</td>
<td>-9</td>
<td></td>
</tr>
<tr>
<td>b. (-bk) -rk -rk -rk +bk +bk +bk</td>
<td>-1</td>
<td>-1</td>
<td>-2</td>
<td>-8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Underlying /eCo/

- Underlying mid back vowels do not front after /e/, because changing \([±\text{back}]\) is too costly:

- It does not help to avoid a violation of \(\text{FAITH}(±\text{rd})\) – The faithful candidate has no \(\text{FAITH}(±\text{rd})\) violation.
(27) **Preservation of the backness specification for underlying mid vowels**

<table>
<thead>
<tr>
<th>W= 5</th>
<th>SHARE</th>
<th>FAITH(rd)</th>
<th><em>[+rd]</em></th>
<th><em>[+bk]</em></th>
<th>H=</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>-1</td>
<td>-1</td>
<td>-2</td>
<td>-5</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>ε</th>
<th>h</th>
<th>o</th>
<th>t</th>
<th>i</th>
<th>j</th>
<th>a</th>
</tr>
</thead>
<tbody>
<tr>
<td>-low</td>
<td>-rd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ATR</td>
<td>-low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-bk</td>
<td>+bk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Analysis**

**Exceptional undergoers**

Preservation of the backness specification for underlying mid vowels.
The gang effect

(28) **Underlying mid vowel**

\[
\begin{array}{ccc}
\text{e} & \rightarrow & o \\
\alpha & \rightarrow & \text{e} \\
\end{array}
\]

\text{Impossible! loosing [–bk] is too costly}

\text{The Goal:}
- unmarked
- parasitic VH

(29) **Derived mid vowel**

\[
\begin{array}{ccc}
\text{e} & \rightarrow & O \\
\alpha & \rightarrow & \text{e} \\
\end{array}
\]

\text{Possible! staying /o/ requires add. change of [rd]}

\text{The Goal:}
- unmarked
- parasitic VH
### All constraints with their weights

\[(30)\]

<table>
<thead>
<tr>
<th>Markedness constraints</th>
<th>W=</th>
</tr>
</thead>
<tbody>
<tr>
<td>*[+ATR,+low]</td>
<td>5</td>
</tr>
<tr>
<td>*[FLOAT]</td>
<td>5</td>
</tr>
<tr>
<td>*[+ATR]</td>
<td>4</td>
</tr>
<tr>
<td>\textbf{ALIGN([+ATR],ω,L)}</td>
<td>2</td>
</tr>
<tr>
<td>\textbf{SHARE}[^{bk}][-hi,-lo]</td>
<td>2</td>
</tr>
<tr>
<td>*[+bk]</td>
<td>1</td>
</tr>
<tr>
<td>*[+rd]</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faithfulness constraints</th>
<th>W=</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textbf{Max}(±bk)</td>
<td>5</td>
</tr>
<tr>
<td>\textbf{Max}(±ATR)</td>
<td>5</td>
</tr>
<tr>
<td>\textbf{MaxFLOAT}</td>
<td>5</td>
</tr>
<tr>
<td>\textbf{Max}(±low)</td>
<td>2</td>
</tr>
<tr>
<td>\textbf{Dep}(±rd)</td>
<td>1</td>
</tr>
<tr>
<td>\textbf{Max}(±rd)</td>
<td>1</td>
</tr>
</tbody>
</table>

(Constraint weights were calculated using OTHelp (Staubs et al., 2010))
Alternative: morpheme-specific constraints
The account in Mahanta (2012)

- directional ‘agree’ constraint $\*[-\text{ATR}][+\text{ATR}]$
- exceptional triggers: lexically indexed constraints
  $\*[-\text{ATR}][+\text{ATR}]_L \gg \text{ID}[\text{LO}] \gg \*[-\text{ATR}][+\text{ATR}]$
- exceptional fronting: markedness avoidance effect
  ($=\text{LICENSE}[-\text{HIGH},-\text{LOW},+\text{BACK}]$)

Potentially problematic:

→ **undergeneration**: the exceptional undergoers are not correctly predicted

→ **economy**: specific morphological information is accessible in the phonology
Conclusion
Exceptional undergoer ~ Phonologically Derived Environment Effect

- the gang effect responsible for the exceptional fronting is in fact the implementation of a **Phonologically Derived Environment Effect** (Kiparsky, 1973; Lubowicz, 2002; Burzio, 2011)

Possible extension to other instances of PDEE

- only a derived long vowel in Slovak undergoes diphtongization, an underlyingly long vowel is realized faithfully (31)

→ **HG:** a marked long vowel *and* addition of a $\mu$-association to a vowel is too much: diphtongization applies for mid vowels

(31) **PDEE in Slovak (Lubowicz, 2002)**

<table>
<thead>
<tr>
<th></th>
<th>/piv+μ/ ‘beer’ GEN.PL</th>
<th>/čel+μ/ ‘forehead’</th>
<th>/dceːr+a/ ‘daughter’</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Affix-triggered V-lengthening:</td>
<td>piːv</td>
<td>čeːl</td>
<td>–</td>
</tr>
<tr>
<td>2. Diphtongization for mid V:</td>
<td>–</td>
<td>čiel</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>[piːv]</td>
<td>[čiel]</td>
<td>[dceːra]</td>
</tr>
</tbody>
</table>
(32) *V: and DEP AL gang up against *DIPH

<table>
<thead>
<tr>
<th></th>
<th>W=</th>
<th>Max-μ</th>
<th>*DIPH</th>
<th>*V:</th>
<th>DEP AL(μ-V)</th>
<th>H=</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dceːr+a/</td>
<td></td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>a.  dceːra</td>
<td></td>
<td></td>
<td></td>
<td>-1</td>
<td></td>
<td>-3</td>
</tr>
<tr>
<td>b.  dciera</td>
<td></td>
<td></td>
<td></td>
<td>-1</td>
<td></td>
<td>-4</td>
</tr>
<tr>
<td>/čel+μ/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.  čel</td>
<td></td>
<td>-1</td>
<td></td>
<td></td>
<td></td>
<td>-8</td>
</tr>
<tr>
<td>b.  čeːl</td>
<td></td>
<td></td>
<td>-1</td>
<td>-1</td>
<td></td>
<td>-5</td>
</tr>
<tr>
<td>c.  čiel</td>
<td></td>
<td></td>
<td>-1</td>
<td></td>
<td></td>
<td>-4</td>
</tr>
</tbody>
</table>
The complex pattern of vowel harmony in Assamese involving two levels of exceptionality follows in an account relying on independently motivated mechanisms:

- strengthening and extending the claim for floating features made for especially non-concatenative morphology (Zoll, 1996; Wolf, 2007)

- a gang effect in HG: deriving a marked structure is avoided whereas the same marked structure is preserved if underlying (=PDEE)
References


Staubs, Robert, Michael Becker, Christopher Potts, Patrick Pratt, John J. McCarthy and Joe Pater (2010), ‘Ot-help 2.0. software package’.


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