Persistence vs. improvement in prosodic opacity

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OCP7

1 Typology of stress-epenthesis interactions

(1) Language | Ordering | Translucency
--- | --- | ---
Swahili | Epenthesis before stress | Transparent
Dakota | Stress before epenthesis | Opaque
Yimas | Stress – epenthesis – stress | 
Mohawk | Epenthesis – stress – epenthesis | 

Hagstrom (1997); Bye (2001)

In addition, a number of languages show opaque stress-epenthesis interaction patterns with additional complications conditioned by factors other than ordering, e.g. syllable weight, foot size, syllable well-formedness (Alderete, 1995, 1999; Broselow, 2008; Elfner, 2009; Strycharczuk, 2009).

2 Persistent stress assignment and opacity in Yimas

(2) Canonical stress in Yimas (Foley, 1991; Alderete, 1999)

wáŋkaŋ | ‘bird’
kúlanaŋ | ‘walk’
wúratàkay | ‘turtle’
mámantàkarman | ‘land crab’

(3) Opaque stress in Yimas (Foley, 1991; Alderete, 1999)

*Thanks to Patrik Bye, Ricardo Bermúdez-Otero and Yumi Kim for comments and discussion.
Initial epenthetic vowels can receive stress when they are immediately followed by another epenthetic vowel.

3 **Persistent rules**

- From the serial point of view, stress in Yimas applies both before and after epenthesis
- Proposal: stress is not ordered, but persistent: it applies whenever there is unparsed prosodic material
  - Deletion is stress driven, so stress feeds syncope
  - Deletion also affects foot structure (it can cause stress shift), so it feeds stress rules.
- Similar proposals in other domains:
  - Diachronic phonology (Chafe, 1968)
  - Syllabification (McCarthy, 1982)
  - Systematic gaps (Myers, 1991)
4 Persistent footing and epenthesis in Yimas

(5) UR /nmp anm ara / /tmpn awkwan/

\[
\begin{array}{c|c|c}
\text{Footing} & \text{nmp anm ara} & \text{tmpn awkwan} \\
\hline
\text{Epenthesis} & \text{n i m p an m ara} & \text{t i m p i n a w k w a n} \\
\hline
\text{Footing} & \text{b l o c k e d} & \text{t i m p i n a w k w a n} \\
\hline
\text{Stress} & \text{n i m p an m ara} & \text{t i m p i n a w k w a n} \\
\hline
\text{Output} & \text{n i m p á n m a r a} & \text{t i m p i n a w k w a n} \\
\end{array}
\]

5 Harmonic Serialism

- Like in classic OT, HS computes the optimal candidate according to a given constraint ranking.
- Instead of an infinite set of candidates, only candidates minimally different from the input are generated (restriction on GEN).
- At every stage of the derivation, the most optimal candidate wins.
- The chains improve steadily under a given constraint ranking.
- Ordering can be, to an extent, implemented via ranking.

6 Epenthesis before stress: Swahili

(6) Penultimate stress in Swahili (Ashton, 1944; Polomé, 1967; Broselow, 1982; Alderete, 1995)

jíkó \(\text{‘kitchen’}\)
jíkóni \(\text{‘in the kitchen’}\)
nílimpíña \(\text{‘I hit him’}\)
nítkúpíña \(\text{‘I shall hit him’}\)

(7) Penultimate stress in loans containing epenthetic vowels

tíkét \sim ti kétj \text{‘ticket’}
rátli \sim rátli \text{‘pound’}

(8) \langle \text{tiket, ti.ke.ti, ti.ké.ti} \rangle
Step 1

<table>
<thead>
<tr>
<th>/tiket/</th>
<th>NoCoda</th>
<th>ALIGN-R</th>
<th>PARSE-σ</th>
<th>DEP-V</th>
<th>IDENT(stress)</th>
</tr>
</thead>
<tbody>
<tr>
<td>→ a.ti.ke.ti</td>
<td>***</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.ti.ket</td>
<td>*!</td>
<td>**</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.(ti.ket)</td>
<td>*!</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Step 2

<table>
<thead>
<tr>
<th>/ti.ke.ti/</th>
<th>NoCoda</th>
<th>ALIGN-R</th>
<th>PARSE-σ</th>
<th>DEP-V</th>
<th>IDENT(stress)</th>
</tr>
</thead>
<tbody>
<tr>
<td>→ a.ti.(ké.ti)</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b.ti.ke.ti</td>
<td><em>!</em>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.(ti.ke.)ti</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

7 Stress before epenthesis in HS – blocking

\[
\times \times \times \langle \times \times \rangle \times \times \langle \times \times \rangle \times
\]

(9) \(<\text{nmpanmara, nmpanmara, nimpanmara}>\)

Step 1

<table>
<thead>
<tr>
<th>\times \times \times \text{/nmpanmara/}</th>
<th>PARSE-σ</th>
<th>SON</th>
<th>ALIGN-L</th>
<th>DEP-V</th>
<th>IDENT(stress)</th>
</tr>
</thead>
<tbody>
<tr>
<td>→ \langle \times \times \rangle \times \text{a. nmpanmara}</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>× \langle \times \times \rangle \text{b. nmpanmara}</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>× × × \times \text{c. nmpanmara}</td>
<td><em>!</em>**</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Step 2

<table>
<thead>
<tr>
<th>\langle \times \times \rangle \times \text{/nmpanmara/}</th>
<th>PARSE-σ</th>
<th>SON</th>
<th>ALIGN-L</th>
<th>DEP-V</th>
<th>IDENT(stress)</th>
</tr>
</thead>
<tbody>
<tr>
<td>→ \langle \times \times \rangle \times \text{a. nmpanmara}</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>→ \langle \times \times \rangle \text{b. nmpanmara}</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8 OT-CC

- Serial OT developed initially as an alternative theory of GEN (Harmonic Serialism), has been amended to constitute a theory of opacity
- Candidate-Chain theory [OT-CC, McCarthy (2007)] embraces the notion of extrinsic ordering implemented through PRECEDENCE constraints.
• Prec constraints require that a Faithfulness violation A is not incurred before a Faithfulness violation B.

9 Extrinsic ordering in Yimas with Prec constraints

(10)  \( \text{Prec(Ident(Stress),Dep-V) \gg Son \gg Parse-\sigma} \)

\[
\times \times \times (\times \times) \times (\times \times) \\
<\text{nimpanmara, nimpanmara, nimpanmara}> 
\]

Step 1

<table>
<thead>
<tr>
<th>(\times \times \times)</th>
<th>(\text{Prec(Ident(Stress),Dep-V)})</th>
<th>(\text{Son})</th>
<th>(\text{Parse-\sigma})</th>
<th>(\text{Dep-V \cdot IDENT(stress)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{nimpanmara})</td>
<td>(\times \times \times)</td>
<td>#</td>
<td>#</td>
<td>(\ast)</td>
</tr>
<tr>
<td>(\text{nimpanmara})</td>
<td>(\times \times \times)</td>
<td>#</td>
<td><strong>#</strong></td>
<td>(\ast)</td>
</tr>
<tr>
<td>(\text{nimpanmara})</td>
<td>(\times \times \times)</td>
<td>#</td>
<td><strong>#</strong></td>
<td>(\ast)</td>
</tr>
</tbody>
</table>

Step 2

<table>
<thead>
<tr>
<th>(\times \times \times)</th>
<th>(\text{Prec(Ident(Stress),Dep-V)})</th>
<th>(\text{Son})</th>
<th>(\text{Parse-\sigma})</th>
<th>(\text{Dep-V \cdot IDENT(stress)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{nimpanmara})</td>
<td>(\times \times \times)</td>
<td>(\ast)</td>
<td>(\ast)</td>
<td>(\ast)</td>
</tr>
<tr>
<td>(\text{nimpanmara})</td>
<td>(\times \times \times)</td>
<td>(\ast)</td>
<td>(\ast)</td>
<td>(\ast)</td>
</tr>
</tbody>
</table>

10 Second round of stress assignment in OT-CC – blocking

\[
\times \times \times (\times \times) \times (\times \times) \\
<\text{tmpnawkw an, tmpnawkw an, timpnawkw an, timpnawkw an, timpnawkw an, timpnawkw an, timpnawkw an, timpnawkw an, timpnawkw an, timpnawkw an}> 
\]

5
11 Interim summary

- Harmonic Serialism can model intrinsic ordering which produces transparent interactions (epenthesis before stress)

- OT-CC with Prec constraints can model the opaque counterfeeding case (stress before epenthesis), but it blocks the second round of stress application which conditions the initial stress assignment on an epenthetic vowel in words like timpi awkwan, ‘sago palm’

12 Complex opacity cases

- Rule sandwiching (Bye, 2001):
  Rule $\mathcal{P}$
  Rule $\mathcal{Q}$
  Rule $\mathcal{R}$
  $\mathcal{P}$ and $\mathcal{R}$ introduce the same structural change

  A $\to$ B $\to$ A
  An underlying representation A is mapped onto the identical output representation A, via a distinct representation B

- Serial OT blocks the derivation of a bad structure

- Proposed solution: analyse the interaction as transparent (McCarthy, 2007)

13 Transparent alternative

(12) HEAD-Dep-analysis Alderete (1999)
Constraints
HEAD-Dep
Every segment in a prosodic head must have an underlying correspondent. ALIGN-L
Align the left edge of the word with a foot.

<table>
<thead>
<tr>
<th>/nimpanmarra/</th>
<th>HEAD-Dep</th>
<th>ALIGN-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\rightarrow$ a. nim.(pan.ma).ra</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. (nim.pan.)(ma.ra)</td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>
(13) Optimisation of non-parsing

<table>
<thead>
<tr>
<th></th>
<th>/tmpnawkwan/</th>
<th>HEAD-DEP</th>
<th>ALIGN-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>(t 많 .p.bar) (naw.kwan)</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>t 많 .(p.bar.naw.)kwan</td>
<td>*</td>
<td>*!</td>
</tr>
<tr>
<td>c.</td>
<td>t 많 .p.bar(naw.kwan)</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

(14) Parse-Syll-2

In adjacent syllables, avoid more than one unfooted syllable.

<table>
<thead>
<tr>
<th></th>
<th>/tmpnawkwan/</th>
<th>PARSE-Syll-2</th>
<th>HEAD-DEP</th>
<th>ALIGN-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>→  a.</td>
<td>(t 많 .p.bar) (naw.kwan)</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>t 많 .(p.bar.naw.)kwan</td>
<td>*</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>t 많 .p.bar(naw.kwan)</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

14 Problems

While the HEAD-DEP analysis is transparent, and thus it can be translated into Serial OT, there are the following concerns:

- Serial OT set out to eliminate the typological problems of local conjunction through serial ordering.
  The constraint Parse-Syll-2 penalises violations of Parse-σ over a specific local domain (two adjacent syllables), and is thus equivalent to self-conjunction [Parse-σ&Parse-σ]_AdjSyll (Smolensky, 1995; Alderete, 1997; Itô and Mester, 1998; Lubowicz, 2002)

- In a theory of serial derivations, the unstressability of epenthetic vowels follows straightforwardly from ordering (stress before epenthesis). HEAD-DEP duplicates the explanation of why epenthetic vowels are not stressed by re-stating it as an axiom.

- Serial OT is independently equipped with tools to model some opaque interactions of stress and epenthesis. Incorporating HEAD-DEP, serial OT must either assume that stress and epenthesis cannot interact opaque, or that they can interact opaque insofar stress precedes epenthesis, but when stress seems to both precede and follow epenthesis, the interaction is transparent

15 Conclusion

- Serial OT, due its architectural assumptions, rules out certain complex types of serial ordering, e.g. persistent rules, rule sandwiching.

- The current data present a case where exactly this type of ordering is needed in a serial analysis.

- The quick-fix of analysing the data as transparent results in major theoretical shortcomings.
• Despite its major concession to extrinsic ordering in the form of PREC constraints, serial OT does not present a ready solution to the attested range of opaque phonological interactions.

References


