English is a purely [spread glottis] language

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Aims:

to show that:

- the received view, that English has a phonological opposition between *voiceless* and *voiced* obstruents, is mistaken (spelling?? other (truly voice) languages??)

- the correct characterization of the opposition: *aspirated* ([spread glottis] – [sg] for short) vs. *unaspirated*

- using a *privative* [sg] feature

- not only for plosives, but fricatives, too
Aims:

to account for:

- the “lack” of aspiration in tautosyllabic s+C\[^{obs}\]

- the devoicing of the sonorant in both C\[^{sg}\]+C\[^{son}\] and s+C\[^{son}\]

- the "devoicing" of non-intersonorant lenis stops

- "bidirectional voice assimilation"

- the identical distribution of plosive aspiration and the segment /h/
### Laryngeal Systems

<table>
<thead>
<tr>
<th></th>
<th>/p ~ b/</th>
<th>/b/</th>
<th>/ph/</th>
<th>/p'/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaiian</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>K'ekchi</td>
<td>[</td>
<td></td>
<td></td>
<td>[cst gl]</td>
</tr>
<tr>
<td>Spanish</td>
<td>[voice]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>[spr gl]</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Note:**
- **One-way contrast**
- **Two-way contrast**
- **Three/four-way contrast...**
Two-way laryngeal contrast in obstruents:


\[ b \sim p \text{ vs. } \bigcirc b \sim p^h \text{ (lenis \sim fortis)} \]

in what follows: arguments that voice and aspiration ([sg]) are two totally different mechanisms defining the two types of system and incompatible within two-way systems

* cf. Iverson & Salmons 1995 (and subsequent publications), etc.
Two totally different mechanisms

- voice totally inactive in [sg] languages (English, German, etc.): no assimilation!
- instead: "bidirectional devoicing":

\[
\begin{align*}
\text{obtain} & \quad [\text{o\text{b}^{h}\text{t}^{h}\text{e}^{i}n}] \\
\text{cheesecake} & \quad [\text{t}^{i}z^{h}k^{h}\text{e}^{i}k] \\
\text{bigfoot} & \quad [\text{b}^{i}g^{f}^{u}t] \\
\text{egghead} & \quad [\text{e}^{g}^{h}^{e}^{d}] \\
\text{roadster} & \quad [\text{r}^{\text{au}d}^{\text{g}^{s}^{t}^{\text{e}}}^{(r)}]
\end{align*}
\]

\[
\begin{align*}
\text{matchbox} & \quad [\text{m}^{\text{a}^{e}t}^{\text{s}^{h}^{b}^{o}k}s] \\
\text{baseball} & \quad [\text{b}^{\text{e}^{i}^{s}^{h}^{o}^{r}^{l}}] \\
\text{cookbook} & \quad [\text{k}^{\text{h}^{u}^{k}^{b}^{u}k}] \\
\text{life gear} & \quad [\text{l}^{\text{a}^{i}^{f}^{g}^{i}^{e}^{r}}^{(r)}] \\
\text{Shoot back!} & \quad [\text{s}^{\text{u}^{j}^{t}}^{\text{t}}^{\text{b}^{e}^{e}^{k}}]
\end{align*}
\]

=> nothing happens!  UR->SR
Two totally different mechanisms

"initial and final de-voicing": nothing happens!

UR -> SR:

<table>
<thead>
<tr>
<th>Utterance-initial</th>
<th>Utterance-final</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>(b)</td>
</tr>
<tr>
<td><em>Bravo</em>! [braːvəʊ]</td>
<td><em>Mad</em>! [mæd]</td>
</tr>
<tr>
<td><em>Good</em>! [ɡʊd]</td>
<td><em>Go ahead</em>! [əˈhɛd]</td>
</tr>
<tr>
<td><em>Zany</em>! [ˈzæmɪ]</td>
<td><em>Think big</em>! [ˈbɪg]</td>
</tr>
<tr>
<td><em>Damn</em>! [ˈdæm]</td>
<td><em>Bob</em>! [ˈbɒb]</td>
</tr>
<tr>
<td><em>Very much</em>! [ˈvɜrɪ]</td>
<td><em>Leave</em>! [ˈliːv]</td>
</tr>
</tbody>
</table>
Two totally different mechanisms

• plus: intersonorant voicing of lenis:
  \textit{reading, reads it, Gardner, badly, bingo, big name, give it, Play Ball}

• \textcolor{red}{phonetics}: the influence of the spontaneous phonetic voicing of the flanking sonorants, surface string-adjacency is the only requirement, applies automatically irrespective of phon/morph/synt context/structure
Two totally different mechanisms

As opposed to

• [voice] languages: "Distinctive [voice] implies regressive voicing assimilation" (van Rooy & Wissing 2001)*

• Spanish, French, Slavic, Hungarian, etc.

Two totally different mechanisms

**Hungarian:**

<table>
<thead>
<tr>
<th>Hungarian</th>
<th>English</th>
<th>Glosses</th>
</tr>
</thead>
<tbody>
<tr>
<td>rabtól ['rɒptɔːl]</td>
<td><em>matchbox</em> ['mɛdʒboks]</td>
<td>'from prisoner'</td>
</tr>
<tr>
<td>rézkarc ['reːskɔrts]</td>
<td><em>baseball</em> ['beːzboːl]</td>
<td>'copper etching'</td>
</tr>
<tr>
<td>hangfal ['hɒŋkfɔl]</td>
<td><em>tökből</em> ['tɒgboːl]</td>
<td>'loudspeaker'</td>
</tr>
<tr>
<td>éghez ['eːkʰɛz]</td>
<td><em>afgán</em> ['ɒvgɑːn]</td>
<td>'to sky'</td>
</tr>
<tr>
<td>roadshow ['roːtsɔː]</td>
<td><em>kertből</em> ['kɛɾ$dboːl]</td>
<td>'ibid.'</td>
</tr>
</tbody>
</table>

(glosses: 'from prisoner'
  'copper etching'
  'loudspeaker'
  'to sky'
  'ibid.')
Two totally different mechanisms

As opposed to

• [voice] languages: "Distinctive [voice] implies regressive voicing assimilation" (van Rooy & Wissing 2001)

• true laryngeal activity!
Why Government Phonology?*

- to achieve a maximally constrained theory of subsegmental organization
- privativity
- the "One Mouth Principle"
- the Phonological epistemological principle (see above)
- forces driving suprasegmental organization: government and licensing

Classical GP's Element Theory

- L, H (e.g., Harris 1994)
- doesn't capture the fact that there are two different mechanisms! (see above)
Classical GP's Element Theory

• L, H

• two different mechanisms!

• L: the AUTONOMOUS INTERPRETATION HYPOTHESIS: primes of phonological representations should all enjoy ‘stand-alone phonetic interpretability’ (Harris & Lindsey 1995:34) (noted in Szigetvári (1996), de Carvalho (2002), Sóskuthy (2008))
 Classical GP's Element Theory

• L, H

• two different mechanisms!

• L: the AUTONOMOUS INTERPRETATION HYPOTHESIS

• /h/ -- the interpretation of [H] or [h]? – redundancy
Classical GP's Element Theory

- L, H
- two different mechanisms!
- L: the AUTONOMOUS INTERPRETATION HYPOTHESIS
- /h/ -- the interpretation of [H] or [h]? – redundancy
- let's throw away both! :-}
Voice

(detailed discussion beyond the scope of the present talk)

• ~ nasality

• e.g., GP's Revised Element Theory
  (Jonathan Kaye, p.c.): nasality=low tone > L
  is low tone, nasality and voicing

• here: Nasukawa (1997 and subsequent publications): [voice] and nasality
  expressed by {N}

• (may turn out to be merely notational variants)
Aspiration

= **fortisness**: English: all (?) fortis obstruents:

<table>
<thead>
<tr>
<th>pit</th>
<th>prim</th>
<th>spit</th>
<th>spray</th>
</tr>
</thead>
<tbody>
<tr>
<td>sit</td>
<td>slit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ship</td>
<td>shrink</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(fling? throb? -- no data; prediction: devoiced sonorant)

(NOT phonetic: *l slip* vs. *ice lip*)
Aspiration

plus: lenis obstruents take on passive voicing between sonorants: lenis ~ sonorant

=> fortis is more obstruent than lenis

==> aspiration is dominant obstruency ([h])
Theoretical framework

Activate α (Backley & Takahashi 1996, 1998)

- worked out for vocalic representation only (harmony processes specifically)
- it assumes all melodic elements (I, U, A) to be present in all positions
- it respects the strict Structure Preservation Principle
- it introduces ACTIVATION (and tier complement): it is a lexical instruction to activate an element lying dormant on its tier (or on the tier complement)
Theoretical framework

*Activate α* (Backley & Takahashi 1996, 1998)

\[
\overset{\text{melodic tier}}{\text{tier complement}} \rightarrow \quad [\text{comp}] \quad [\ ] \\
\quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad / \quad / \\
\quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad / \quad / \\
\overset{\text{aperture tier}}{\text{melodic tier}} \rightarrow \quad [I] \quad [I] \\
\quad \quad \quad \quad \quad \quad \quad | \quad | \\
\overset{\text{aperture tier}}{\text{melodic tier}} \rightarrow \quad [A] \quad [A] \\
\quad \quad \quad \quad \quad \quad \quad | \quad | \\
\quad \quad \quad \quad \quad \quad \quad [e] \quad [ɛ]
\]
Theoretical framework

*Leiden paper model* (Nasukawa & Backley 2005)

- elements are grouped into EDGE, SOURCE, RESONANCE and FUNDAMENTAL sets:
  
<table>
<thead>
<tr>
<th>EDGE</th>
<th>SOURCE</th>
<th>RESONANCE</th>
<th>FUNDAMENTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>{?, h}</td>
<td>{L, H}</td>
<td>{I, U}</td>
<td>{A}</td>
</tr>
</tbody>
</table>

- *all elements are present in all positions* -> “vowels” and “consonants” are composed of exactly the same elements…

- …in the reverse order of dominance:
Theoretical framework

Leiden paper model (Nasukawa & Backley 2005)

<table>
<thead>
<tr>
<th>Consonants</th>
<th>Vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDGE</td>
<td>FUNDAMENTAL</td>
</tr>
<tr>
<td></td>
<td>{h, ʔ} = X</td>
</tr>
<tr>
<td></td>
<td>{A} = X</td>
</tr>
<tr>
<td>SOURCE</td>
<td>RESONANCE</td>
</tr>
<tr>
<td></td>
<td>{N¹, H}</td>
</tr>
<tr>
<td></td>
<td>{I, U}</td>
</tr>
<tr>
<td>RESONANCE</td>
<td>SOURCE</td>
</tr>
<tr>
<td></td>
<td>{I, U}</td>
</tr>
<tr>
<td></td>
<td>{N, H}</td>
</tr>
<tr>
<td>FUNDAMENTAL</td>
<td>EDGE</td>
</tr>
<tr>
<td></td>
<td>{h, ʔ}</td>
</tr>
</tbody>
</table>

¹ This representation already has {N} for Nasukawa and Backley’s {L}.
Theoretical framework

Modifying the Leiden Model

we have proposed two important modifications (for details, see Huber & Balogné 2009 (MFM)) (mostly irrelevant to the present argument):

• the dependent group, SOURCE and FUNDAMENTAL, can maximally contain one single element

• \{N\} to replace \{L\} in all its functions
Analysis

• aspiration (in the form of a “dominant” \{h\} element): *part of the underlying representation* of fortis plosives (→ when it surfaces it is default rather than result of fortition process – cf. Vaux 2002)

\[ \text{tick} \ [t^h\text{k}] \]

• but: allowed to surface only when it is *licenced* to be realized (= in a strong phonological position)

• lenis obstruents: no source/voice element, no dominant \{h\} (→ phonologically inert); no obstruent devoicing or voice assimilation of any kind in the analysis!

\[ \text{matchbox} \ [\text{ˈmætʃˈbɒks}] \quad \text{bad} \ [\text{bæd}] \]
Analysis

the representation of consonants in a [sg] system:

\[ p^h \quad f^h \quad [p] = [\breve{b}] \quad [f] = [\breve{y}] \quad [m] \]

\[ [\mathcal{U}] \quad [\mathcal{U}] \quad [\mathcal{U}] \quad [\mathcal{U}] \quad [\mathcal{U}] \]

\[ [?] \quad [\ ] \quad [?] \quad [\ ] \quad [?] \]

\[ [h] \quad [h] \quad [h] \quad [h] \quad [\ ] \]

\[ [h] \quad [h] \quad [\ ] \quad [\ ] \quad [\ ] \]

recall: if there is no evidence for the presence of an element, it must not be assumed in the system – in this case, there is no \{N\} if there is no evidence of its being active
Analysis

- aspiration as agreement (~ harmony):
  - **Activate** \{h\} in licenced position
  - plus:
  - transmitted to the next (nonempty) C or V (~ Backley's (1998) PEx)

**Principle of Extension (PEx)**
Extend the domain of **Activate** \([\alpha]\) to enhance element interpretability.
Analysis

- aspiration as agreement (~ harmony):

<table>
<thead>
<tr>
<th></th>
<th>Pete</th>
<th>tea</th>
</tr>
</thead>
<tbody>
<tr>
<td>$p^h$</td>
<td>i ...</td>
<td>$t^h$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>RESONANCE</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[U]</td>
<td>[I]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>EDGE</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[?]</td>
<td></td>
<td>[?]</td>
</tr>
<tr>
<td></td>
<td>[h]</td>
<td>&gt;&gt;&gt;&gt;</td>
<td>[h]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>comp</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[h]</td>
<td>[I]</td>
<td>[h]</td>
</tr>
</tbody>
</table>
Analysis

- aspiration as agreement (~ harmony):

\[
\begin{array}{c}
\text{play} \\
p^h \\
\text{RESONANCE} [U] [ ] \\
\text{EDGE} [?] [?] \\
\text{comp} [h] [ ]
\end{array}
\]

\[
\begin{array}{c}
\text{} \\
\text{... }
\end{array}
\]
Analysis

• similarly: fortis fricatives have a dominant \{h\} element, too, which explains their ability to devoice sonorants analogously to aspiration*:

\[
\text{lay} [\text{leɪ}] \text{ versus } \text{play} [\text{pɬeɪ}] \text{ and } \text{slay} [\text{sɬeɪ}]
\]

Sonorant devoicing in English initial /pl/ cluster: *plod*

(Beckman & Ringen 2009: 2)
Sonorant devoicing in English initial /sl/ cluster:
sly

(Beckman & Ringen 2009: 2)
Analysis

• similarly: fortis fricatives have a dominant \{h\} element, too, which explains their ability to devoice sonorants analogously to aspiration:

  \textit{lay} [l\textipa{e\textipa{I}}] \textit{versus} \textit{play} [p\textipa{e\textipa{I}}] \textit{and} \textit{slay} [s\textipa{e\textipa{I}}]

• recall: aspiration is dominant obstruency: all obstruents are expected to follow the same pattern
Analysis

- similarly: fortis **fricatives** have a dominant \{h\} element, too:

<table>
<thead>
<tr>
<th></th>
<th>play</th>
<th></th>
<th>slay</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESONANCE</td>
<td>[U]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>EDGE</td>
<td>[ʔ ]</td>
<td>[ʔ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>comp</td>
<td>[h ]</td>
<td>&gt;&gt;&gt;&gt;</td>
<td>[h ]</td>
</tr>
<tr>
<td></td>
<td>[h ]</td>
<td>[ ]</td>
<td>[h ]</td>
</tr>
</tbody>
</table>
Analysis

• no aspiration in tautosyllabic $s+C_{[obs]}$:

$s^h$ $t$ ...

| RESONANCE | [ ] | [ ] |
| EDGE | [ ] | [?] |
| comp | [h ] | >>>> [h ] |

$[h ]$ $( [h ] )$

• /s/ vacuously activates [h] in /t/
• only /s/ is in strong position, /t/ is not licenced*

* NOT an OCP effect (contra Kim (1970), Iverson & Salmons (1995), etc.)
Conclusions

• in [sg] systems: \{h\} alone is active, SOURCE is "rejected/suppressed". This explains:
  • why there is no (true) laryngeal activity, no (true) voice assimilation
  • why the distribution of aspiration and the segment /h/ coincide (at least in English)
Conclusions

• VOICE and ASPIRATION: two totally different mechanisms!! which cannot combine in a language with a two-way contrast:
  
• if SOURCE present with its \{N\} $\rightarrow$ active $\rightarrow$ [voice] lang.
  
• if Activate \{h\} present $\rightarrow$ [sg] lang.
  
• if neither $\rightarrow$ one-way contrast: voiceless unasp.
  
• and: the inventory of elements utilized is reduced, which desirably constrains the generative power of the model
Conclusions

English is a purely [sg] language:
• "devoiced voiced" = unaspirated:
  
  ... sɡaɪ ... = ... sk家公司 ...

• no voice assimilation (as in [voice] languages):
  *zɡ
Questions remaining, e.g.:

• Do sibilant and non-sibilant fricatives behave in the same way?
• Difference between pre- and post-aspiration
• Representation of consonant clusters: cf. Tom/atom vs. prill/April
• Representation of consonant clusters: sC
• Languages with 3/4-way laryngeal contrast, [constr gl] systems...
References 1


References 2


References 3


