English obstruents and laryngeal markedness

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Eötvös Loránd University

OCP15, London, 2018-01-14
# Type Frequency of Singleton Obstruents in CUBE*

<table>
<thead>
<tr>
<th></th>
<th>fortis</th>
<th>lenis</th>
<th>f/l ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>initial</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>plosive</td>
<td>23,730</td>
<td>17,694</td>
<td>1.34</td>
</tr>
<tr>
<td>fricative</td>
<td>14,546</td>
<td>2,154</td>
<td>6.75</td>
</tr>
<tr>
<td>all</td>
<td>38,276</td>
<td>19,848</td>
<td>1.93</td>
</tr>
<tr>
<td><strong>medial</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>plosive</td>
<td>41,488</td>
<td>28,601</td>
<td>1.45</td>
</tr>
<tr>
<td>fricative</td>
<td>23,552</td>
<td>11,218</td>
<td>2.10</td>
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<tr>
<td>all</td>
<td>65,040</td>
<td>39,819</td>
<td>1.63</td>
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<tr>
<td><strong>final</strong></td>
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</tr>
<tr>
<td>plosive</td>
<td>10,953</td>
<td>9,321</td>
<td>1.18</td>
</tr>
<tr>
<td>fricative</td>
<td>6,885</td>
<td>16,617</td>
<td>0.41</td>
</tr>
<tr>
<td>all</td>
<td>17,838</td>
<td>25,938</td>
<td>0.69</td>
</tr>
</tbody>
</table>

* a 103k-entry online pronunciation dictionary at cube.elte.hu, figures as of November 2017
## Type Frequency of Obstruent Clusters: As Per Transcription

<table>
<thead>
<tr>
<th></th>
<th>Fortis</th>
<th>Lenis</th>
<th>F/L Ratio</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>plos+plos</td>
<td>0</td>
<td>0</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>plos+fric</td>
<td>13</td>
<td>5</td>
<td>2.60</td>
<td><em>tsetse, Dvorak</em></td>
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<tr>
<td>fric+plos</td>
<td>4,143</td>
<td>0</td>
<td>—</td>
<td><em>spot</em></td>
</tr>
<tr>
<td>fric+fric</td>
<td>29</td>
<td>0</td>
<td>—</td>
<td><em>sphere</em></td>
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<tr>
<td>All</td>
<td>4,185</td>
<td>5</td>
<td>837.00</td>
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<td><strong>Medial</strong></td>
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<tr>
<td>plos+plos</td>
<td>2,360</td>
<td>376</td>
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<td><em>Atkins, Edgar</em></td>
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<tr>
<td>plos+fric</td>
<td>2,787</td>
<td>479</td>
<td>5.82</td>
<td><em>apsis, absorb</em></td>
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<tr>
<td>fric+plos</td>
<td>6,758</td>
<td>284</td>
<td>23.80</td>
<td><em>system, wisdom</em></td>
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<tr>
<td>fric+fric</td>
<td>424</td>
<td>38</td>
<td>11.16</td>
<td><em>asphalt, evzone</em></td>
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<tr>
<td>All</td>
<td>12,329</td>
<td>1,177</td>
<td>10.47</td>
<td></td>
</tr>
<tr>
<td><strong>Final</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>plos+plos</td>
<td>954</td>
<td>301</td>
<td>3.17</td>
<td><em>act, bagged</em></td>
</tr>
<tr>
<td>plos+fric</td>
<td>4,990</td>
<td>1,616</td>
<td>3.09</td>
<td><em>Ritz, adze</em></td>
</tr>
<tr>
<td>fric+plos</td>
<td>2,606</td>
<td>596</td>
<td>4.37</td>
<td><em>boost, used</em></td>
</tr>
<tr>
<td>fric+fric</td>
<td>313</td>
<td>370</td>
<td>0.85</td>
<td><em>luffs, loves</em></td>
</tr>
<tr>
<td>All</td>
<td>8,863</td>
<td>2,883</td>
<td>3.07</td>
<td></td>
</tr>
</tbody>
</table>

Fortis+Lenis: 631 (eg *Afghan, anecdote*); Lenis+Fortis: 886 (eg *Aztek, subtract*)
1. fortis is marked, yet in clusters fortis+fortis the overwhelming majority (even finally); unmarked lenis is rare
issues

1. fortis is marked, yet in clusters fortis+fortis the overwhelming majority (even finally); unmarked lenis is rare
2. fortis+lenis and lenis+fortis clusters very rarely occur (only before a stressed vowel), although there is no assimilation rule
3sg, plur, gen: hits, hit’s, hits’ \([\text{hit}]+[z] \rightarrow \text{hits}\)

is, has: it’s \([\text{it}]+[z] \rightarrow \text{its}\)

past, part: hissed \([\text{his}]+[d] \rightarrow \text{hist}\)
1. fortis is marked, yet in clusters fortis+fortis the overwhelming majority (even finally); unmarked lenis is rare
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3. certain suffixes, even clitics(!) show a unique assimilatory pattern: obligatory laryngeal assimilation across #
a well-known pattern

batik [bəθíjk] ∼ Nadine [nədíjn]
cartoon [kaːθúwn] ∼ sardine [saːdíjn]
boutique [buwθíjk] ∼ modiste [məwdíjst]
Maltese [molθíjz] ∼ Chaldee [kaldíj]
antique [anthíjk] ∼ Dundee [dəndíj]
Aztek [ázthek] ∼ Nasdaq [názdak]
fructose [frǽkθəwz] ∼ anecdote [ánəkdəwt]

vs

mistique [mist*híjk]
issues

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3. certain suffixes, even clitics(!) show a unique assimilatory pattern: obligatory laryngeal assimilation across #
4. prevocalic fortis plosives are aspirated, but not after fortis fricative
interpreting fortis vs lenis

all obstruents are phonologically voiceless
interpreting fortis vs lenis

all obstruents are phonologically voiceless

fortis = excessive voicelessness/consonantality

- a fortis obstruent may spread its Cness on adjacent sounds (Cness protrudes on the adjacent sonorant, making its voiced phase, Vness, shorter)
- a fortis obstruent resists the Vness (voicing) of its environment (pace flapping)
interpreting fortis vs lenis

all obstruents are phonologically voiceless

**fortis = excessive voicelessness/consonantalness**

- a fortis obstruent may spread its Cness on adjacent sounds  
  (Cness protrudes on the adjacent sonorant, making its voiced 
  phase, Vness, shorter)
- a fortis obstruent resists the Vness (voicing) of its 
  environment (pace flapping)

**lenis = absence of excessive voicelessness/consonantalness**

a lenis obstruent may accommodate (some of) the Vness 
(spontaneous voicing) of adjacent sounds (sonorants)
explanations
explanations

1. C must be “syllable”-initial
   - why must it be syllable initial?, nb the [t] of [wintə], [letə] is aspirated, but not that of [astə], [aːftə]
explanations

1. C must be “syllable”-initial
   - why must it be syllable initial?, nb the [t] of [wintə], [letə] is aspirated, but not that of [astə], [aːftə]

2. The [spread glottis] of [s] “expires” by the time we reach the following sonorant: hence [phaj] pie vs [spaj] spy (Iverson & Salmons 1995)
   - so in spy the [p] is not itself [spread glottis], ie it is lenis?
explanations

1. C must be “syllable”-initial
   ▶ why must it be syllable initial?, nb the [t] of [wintə], [leta] is aspirated, but not that of [astə], [aːftə]

2. the [spread glottis] of [s] “expires” by the time we reach the following sonorant: hence [phaj] pie vs [spaj] spy (Iverson & Salmons 1995)
   ▶ so in spy the [p] is not itself [spread glottis], ie it is lenis?

3. fortis fricatives are not followed by a fortis plosive: *mistique* is not [mistǐːk], but [misdǐːk] (eg Twaddell 1935, Davidsen-Nielsen 1969, Kaye & Pöchtrager 2017)
   ▶ so [p t k] are not aspirated after [s f], because only [b d g] may occur there within a morpheme
accessible types of monomorphemic fricative+plosive clusters

fortis+lenis ✓

star [sdaː], spar [sbaː], scar [sgaː], stew [sdʒuː], Afghan [afgan]
accessible types of monomorphemic fricative+plosive clusters

fortis+lenis ✓
star [sdaː], spar [sbaː], scar [sgaː], stew [sdʒuː], Afghan [afɡan]

lenis+fortis ✓
Aztec [aztek], lieutenant [levtenənt], gazpatcho [gazpatʃəʊ] (or [gasbatʃəʊ])
accessible types of monomorphemic fricative+plosive clusters

fortis+lenis ✓
star [sdaː], spar [sbaː], scar [sgaː], stew [sdʒuː], Afghan [afɡan]

lenis+fortis ✓
Aztec [aztek], lieutenant [levtɛnənt], gazpatcho [ɡazpatʃɔw] (or [ɡasbatʃɔw])

lenis+lenis ✓
wisdom [wɪzdəm], husband [həzbənd], Glasgow [ɡlɑzɡəw]
accessible types of monomorphemic fricative+plosive clusters

fortis+lenis ✓
star [sdaː], spar [sbaː], scar [sgaː], stew [sdʒuː], Afghan [afgan]

lenis+fortis ✓
Aztec [aztek], lieutenant [levtenənt], gazpatcho [gazpatʃəw] (or [gasbatʃəw])

lenis+lenis ✓
wisdom [wizdəm], husband [həzbənd], Glasgow [glazgəw]

fortis+fortis X
only across a word boundary: mis#time, kiss#Pam, brief#case
let’s assume that...

*fortis+fortis extends to all clusters
fortis + lenis vs lenis + fortis

obstruent + plosive + sonorant
fortis+lenis vs lenis+fortis

obstruent+plosive+sonorant

▶ no aspiration: anecdote [\textipa{anəkdəwt}], Macbeth [\textipa{məkbeθ}]
fortis+lenis vs lenis+fortis

obstruent+plosive+sonorant

- no aspiration: anecdote [anəkdəwt], Macbeth [mækbeθ]
- aspiration: September [sebtembə], October [ogtəwbə], electron [ilegtron]
fortis+lenis vs lenis+fortis

obstruent+plosive+sonorant

- no aspiration: anecdote [anəkdəwt], Macbeth [məkbeθ]
- aspiration: September [sebtembə], October [ɔgtəwbə], electron [ilegtron]

source of misanalysis

the assumption that any voiceless obstruent that does not contrast with a fortis is itself fortis
fortis+lenis vs lenis+fortis

obstruent+plosive+sonorant

- no aspiration: anecdote [anəkdəwt], Macbeth [mækbeθ]
- aspiration: September [sebtembə], October [ogtəwbə], electron [ilegtron]

source of misanalysis
the assumption that any voiceless obstruent that does not contrast with a fortis is itself fortis

lenis obstruents
are voiceless except between two nonfortis segments: [g] is voiced in dagger, alga, anger, singular, language, angry, English, Magda, Pisgah, exam; but voiceless in god, dog, actor [agtə], action [agʃən], Agfa, Afghan
apparently

word finally the fortis+lenis vs lenis+fortis contrast is neutralized: *tract* [tragt] (cf *tractate* [tragtejt])

vs

*tracked* [trakd] (cf *track* [trak])

ie [tragt] and [trakd] are homonyms
apparently

word finally the fortis+lenis vs lenis+fortis contrast is neutralized:

*tract* [tragt] (cf *tractate* [tragtejt])

vs

*tracked* [trakd] (cf *track* [trak])

ie [tragt] and [trakd] are homonyms

note

in both [trakd] and [tragt] the vowel is shorter than in *rag* or *Brad*
because it is followed by a fortis, like in *rant*, *scalp*, or *ramp*
the issues...

1. fortis is marked, yet in clusters fortis+fortis is the overwhelming majority (even finally); unmarked lenis is rare

2. fortis+lenis and lenis+fortis clusters very rarely occur, although there is no assimilation rule

3. certain suffixes, even clitics(!) show a unique assimilatory pattern: obligatory laryngeal assimilation across #

4. prevocalic fortis plosives are aspirated, but not after fortis fricative
the issues... 

1. fortis is marked, yet in clusters fortis\+-fortis is the overwhelming majority (even finally); unmarked lenis is rare
   ▶ fortis\+-fortis doesn’t even occur

2. fortis\+-lenis and lenis\+-fortis clusters very rarely occur, although there is no assimilation rule

3. certain suffixes, even clitics(!) show a unique assimilatory pattern: obligatory laryngeal assimilation across \#

4. prevocalic fortis plosives are aspirated, but not after fortis fricative
the issues are... 

1. fortis is marked, yet in clusters fortis+fortis is the overwhelming majority (even finally); unmarked lenis is rare  
   ▶ fortis+fortis doesn’t even occur

2. fortis+lenis and lenis+fortis clusters very rarely occur, although there is no assimilation rule
   ▶ most obstruent clusters are either fortis+lenis or lenis+fortis

3. certain suffixes, even clitics(!) show a unique assimilatory pattern: obligatory laryngeal assimilation across #

4. prevocalic fortis plosives are aspirated, but not after fortis fricative
the issues are all . . .

1. fortis is marked, yet in clusters fortis+fortis is the overwhelming majority (even finally); unmarked lenis is rare
   ▶ fortis+fortis doesn’t even occur
2. fortis+lenis and lenis+fortis clusters very rarely occur, although there is no assimilation rule
   ▶ most obstruent clusters are either fortis+lenis or lenis+fortis
3. certain suffixes, even clitics(!) show a unique assimilatory pattern: obligatory laryngeal assimilation across #
   ▶ these suffixes do not undergo assimilation at all
   *banned* [band], *bagged* [bagd], *backed* [bakd]
   *bans* [banz], *bags* [bagz], *backs* [bakz], *it’s* [itz]
   ([s] and [t] occur irregularly: *pence* [pens], *burnt* [bəːnt])
4. prevocalic fortis plosives are aspirated, but not after fortis fricative
the issues are all gone

1. fortis is marked, yet in clusters fortis+fortis is the overwhelming majority (even finally); unmarked lenis is rare
   ▶ fortis+fortis doesn’t even occur
2. fortis+lenis and lenis+fortis clusters very rarely occur, although there is no assimilation rule
   ▶ most obstruent clusters are either fortis+lenis or lenis+fortis
3. certain suffixes, even clitics(!) show a unique assimilatory pattern: obligatory laryngeal assimilation across #
   ▶ these suffixes do not undergo assimilation at all
   - banned [band], bagged [bagd], backed [bakk]
   - bans [banz], bags [bagz], backs [bakz], it’s [itz]
   (\([s]\) and \([t]\) occur irregularly: pence [pens], burnt [bənt])
4. prevocalic fortis plosives are aspirated, but not after fortis fricative
   ▶ because fortis plosives cannot occur after a fortis fricative
so why do we transcribe fortis+lenis as fortis+fortis?

imagine we didn’t…

*sport* [sboːt], *Asperger’s* [æsəɡəz], *kissed* [kɪsd], *licks* [likz], etc would be fine for German or Chinese learners
so why do we transcribe fortis+lenis as fortis+fortis?

imagine we didn’t...  

*sport* [sboːt], *Asperger’s* [asəˈɡəz], *kissed* [kisd], *licks* [likz], etc would be fine for German or Chinese learners

but many others would notoriously mispronounce

[zboːt], [azbəˈɡəz], [kizd], [ligz]
thanks to

- you & the organizers
- NKFI #119863
I am grateful to George Soros.