

this week's episode in *Linguistic Theory*,
an MA lecture course (S01E05)

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THE FORTIS FALLACY

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the aim of this talk

is to show why the sounds regularly transcribed in clusters as

p t tʃ k f θ s ʃ

are often better analysed (and therefore transcribed) as

b d dʒ g v ð z ʒ

respectively

(so *stops* [s**dp**z], *sphynx* [sviŋ**kz**], *aspect* [as**beg**t], *soft* [sof**d**])

grouping sounds

consonant vs vowel

p t tʃ k f θ s ʃ b d dʒ g v ð z ʒ m n ŋ w l r j h ✂ u i ə o e a

obstruent vs sonorant

p t tʃ k f θ s ʃ b d dʒ g v ð z ʒ ✂ m n ŋ w l r j h u i ə o e a

fortis vs lenis

p t tʃ k f θ s ʃ ✂ b d dʒ g v ð z ʒ m n ŋ w l r j h u i ə o e a

voicing (= vocal fold vibration)

spontaneous voicing

voicing occurs naturally in **sonorants**, which have relatively free airflow (eg *only* [əwnliɹ])

active voicing

voicing is also possible for **obstruents** (which have considerable obstruction in the airflow), but requires a deliberate effort (eg both [b]'s in Hu *bab* 'bean', cf En *bob*, in which neither [b] is voiced)

passive voicing

obstruents may be voiced by neighbouring sounds that are spontaneously and/or passively voiced (eg *ABBA* [abə], *fabric* [fabrik], *amber* [ambə], *gambler* [gamblə], *absolve* [əbzolv], *Thisbe* [θizbij], *Hasbro* [hazbrəw, *Rigsby* [rigzbij]); passive voicing is not available next to a fortis sound

voicing and aspirating languages

- French, Hungarian, or Polish are voicing languages: they have **actively voiced** obstruents (the [b] in *banque* or *bank* is voiced)
- English, Welsh, or Mandarin are aspirating languages: they do not have actively voiced obstruents (the [b] in *bank*, *banc*, or *Hubei* is not voiced, cf the Hu spelling *Hupei*)
 - so what's the difference between *bay* and *pay* or *dry* and *try*?
aspiration (not voicing)
 - and what's the difference between *Abe* and *ape* or *pens* [penz] and *pence* [pens]?
the **length** of the vowel(+consonant sequence) before the plosive (not voicing)
 - and between *rabid* and *rapid* or *anger* [aŋgə] and *anchor* [aŋkə]?
passive voicing ([b] or [g] is passively voiced between sonorants, [p] or [k] is not)
 - that is, in an aspirating language lenis obstruents are **not necessarily voiced**, they may as well be voiceless, if so we know they are lenis because they are (i) not aspirated, (ii) do not shorten the preceding sonorant sequence

assimilation

- Hungarian has voice assimilation: adjacent obstruents agree in voicing, all obstruents share the voicing of the last one (note [b] or [d] is **actively** voiced in Hu)
 - [ne:p]+[dal] → [ne:**b**dal] ‘folk song’
 - [la:b]+[tarto:] → [la:**p**tarto:] ‘footrest’
 - [list]+[bøl] → [liz**d**bøl] ‘from flour’
- there is no assimilation before a sonorant (sonorants are **not actively** voiced)
 - [ne:p]+[e:nek] → [ne:**p**e:nek] ‘religious folk song’
 - [ne:p]+[meʃe] → [ne:**p**meʃe] ‘folk tale’
- English has no voice assimilation: English (an aspirating language) has no **actively voiced** obstruents (more on the plural & past suffixes below)
 - [əp]+[dejt] → [ə**p**dejt] *update*
 - [səb]+[tajp] → [sə**b**tajp] *subtype*
 - [dəst]+[bin] → [də**st**bin] *dustbin*

fortis/lenis obstruent ratios in English

singleton obstruents

	initial	medial	final	total
plos.	1.3	1.5	1.2	1.4
fric.	6.8	2.1	0.4	1.5
all	1.9	1.6	0.7	1.4

fortis/lenis obstruent ratios in English

obstruent clusters

	initial	medial	final	total
plos.+plos.	—	6.3	3.2	4.9
plos.+fric.	(2.6)	5.8	3.1	3.7
fric.+plos.	—	23.8	4.4	15.3
fric.+fric.	—	11.2	0.8	1.9
all	(837)	10.5	3.1	6.2

question: why do we find overwhelmingly fortis obstruents in clusters (but not in singletons)

assimilating suffixes and enclitics in English?

the D-morphemes

past tense, past participle, *had, would*

quizzed [kwiz]+D → [kwiz**d**]; *missed* [mis]+D → [mist**t**?] (*kidded* [kid]+D → [kidə**d**])

the Z-morphemes

plural, genitive, 3sg present, *has, is*

dogs [dog]+Z → [dog**z**]; *cats* [kat]+Z → [kats**s**?] (*bosses* [bos]+Z → [bosə**z**])

questions

- if lenis obstruents may be voiceless, how do we know if its [mist**t**] or [mis**d**], [kats**s**] or [katz**z**]?
- if there is no assimilation within a morph in *absolute, Aztec, Leipzig, Webster*, why across?
- why assume a change if it is unnecessary?

an old problem: why is [p] not aspirated in *spin*?

syllable-based explanation

- fortis plosives are aspirated only syllable initially
- but if the [t] is aspirated in *winter*, why is it not in *after*? (is it syllabified *a.fter*?)

a better explanation

- the plosives after fortis fricatives are always lenis: *spin* [s**b**in], *after* [af**d**ə]
- a fortis (= aspirated) plosive only occurs after a fortis fricative across a morpheme boundary: *kiss Kate* [kis#kejt], *mistime* [mis#tajm] (vs *mistake* [misdɛjk]), *rooftop* [ruwf#top]
- a fortis plosive may also occur after a lenis fricative: *Aztec* [aztek], *cosplay* [kozplej], *lieutenant* [levtenənt]
- a lenis obstruent is voiceless next to a fortis obstruent (recall, passive voicing is not available next to fortis)

types of fricative+plosive clusters

- lenis+lenis: *husband* [həzbənd], *wisdom* [wɪzdəm], *Glasgow* [glazgəw]
- lenis+fortis: *gazpacho* [gazpatʃəw], *Aztec* [aztek], *lieutenant* [levtenənt]
- fortis+lenis: *aspen* [aspən], *after* [afdə], *Afghan* [afgan], *Oscar* [osgə]
- **fortis+fortis does not exist within a morpheme!**

but why?

a general assumption: no fortis+fortis clusters in En

the **fortis+fortis* constraint holds of **all obstruent clusters**

plosive+plosive

- lenis+lenis: *abdomen* [abdəmən], *Magda* [magdə], *object* [ɒdʒekt], *Rigby* [rigbij]
- lenis+fortis: *captain* [kaptən], *rupture* [rəptʃə], *active* [æktiv], *lecture* [lektʃə]
- fortis+lenis: *anecdote* [ænikdəwt], *Updike* [əpdajk], *Rutgers* [rətgəz], *Macbeth* [mækbeθ]

no fortis+fortis clusters in En

plosive+fricative

- lenis+lenis: *observe* [ə**b**zə:v], *exam* [i**g**zɑm], *luxurious* [lə**g**ʒu:rijəs]
- lenis+fortis: *absent* [ə**b**sənt], *Bergson* [bə:**g**sən], *action* [ə**g**fən], *Agfa* [ə**g**fə]
- fortis+lenis: *cats* [kə**t**z], *Leipzig* [lə**j**pzɪg], *wipes* [wə**j**pz]

no fortis+fortis clusters in En

fricative+fricative

- lenis+lenis: *evzone* [evzəwn], *transvestite* [tranzvesdajt]
- lenis+fortis: *Rumsfeld* [rəmzfeld], *twelfth* [twelvθ]
- fortis+lenis: *sphere* [svi:], *surfs* [sə:fz], *maths* [maθz]

advantages

- fortis+fortis clusters do not overwhelm others
- we understand why plosives are not aspirated after [s] (and [f])
- Z- and D-suffixes have only two allomorphs: [z]~[əz] and [d]~[əd]
- some other fortis/lenis alternations also disappear: *lose* [luwz]~*lost* [lozt], *leave* [lijv]~*left* [levt], *twelve* [twelv]~*twelfth* [twelvθ]

phonetic evidence

- phonetic measurements by G Kiss & Szigetvári (2020) show that the [a] is longer and the [t] is more aspirated in *acting* than in *packed in*
 - this fact is consistent with the analyses presented here: [a**g**tɪŋ] vs [pa**k**dɪn]
 - but it is **not** consistent with standard transcriptions/assumptions: [a**k**tɪŋ] and [pa**k**tɪŋ])
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- phonetic measurements by Wutka (forthc.) show that the obstruent clusters in *absolute* and *rhapsody* are very similar to each other and both are rather different from the cluster in *knapsack* (which we know is [p]#[s], ie two fortes)
- yet the two words are spelled and therefore(?) transcribed differently ([á**bs**əlɯwt] vs [rá**ps**ədɪj])
- the measurements suggest that both words contain [bs]

so why do we transcribe lenis obstruents as fortis?

- English is an aspirating language: there is no active voicing, obstruents are only passively voiced by adjacent sonorants
- Hungarian (and many other languages, speakers of which are users of English dictionaries) is a voicing language: there are actively voiced obstruents
- accordingly, English [b d dʒ g v ð z ʒ] stand for consonants that are not **necessarily** voiced, while Hungarian [b d ɟ g z ʒ] stand for actively voiced consonants
- so if *stops* were transcribed as [sdopz], many learners of English would be tempted to pronounce it [zdobz] (many learners of English pronounce *stopped* as [stobd], because of the influence of the **spelling**, but at least the transcription is [stopt])

conclusions

- English obstruent clusters within a morpheme never consist of two fortis members
- this is why we find no aspiration after [s] (or [f])
- there is no ‘voicing’ assimilation in English (not even in plural and past forms), since there is no active voicing
- the Z and the D morphemes have two allomorphs each: [z]~[əz] and [d]~[əd]
- there is no imbalance of fortis+fortis clusters: there **are** no fortis+fortis clusters

references

G Kiss, Zoltán and Péter Szigetvári. 2020. Telling fortis and lenis apart in English obstruent clusters. *The Even Yearbook* 14: 135–157. <http://seas.elte.hu/w/!even/20gs>

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