BBN–ANG–243 Phonological Analysis #3
THE VOWEL INVENTORY OF BRITISH ENGLISH

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the traditions: short stressed vowels

lexical set	Sweet 1900	Jones 1918	Gimson 1962	Lindsey 2012
KIT	i	i	ɪ	ɪ
DRESS	e	e	e	ɛ
TRAP	æ	æ	æ	a
STRUT	ɐ	ʌ	ʌ	ə
LOT	o	ɔ	ɒ	ɔ
FOOT	u	u	ʊ	ʉ

the traditions: ‘long’ vowels and ‘diphthongs’, set 1

lexical set	Sweet 1900	Jones 1918	Gimson 1962	Lindsey 2012
NEAR	iə	iə	ɪə	ɪː
SQUARE	eə	ɛə	eə	ɛː
START/PALM/BATH	aa	ɑː	ɑː	ɑː
NURSE	əə	əː	ɜː	əː
FORCE	ɔə	ɔː	ɔː	oː
NORTH/THOUGHT	ɔ	ɔː	ɔː	oː
CURE	uə	uə	ʊə	ʉː

the traditions: ‘long’ vowels and ‘diphthongs’, set 2

lexical set	Sweet 1900	Jones 1918	Gimson 1962	Lindsey 2012
FLEECE	ij	iː	iː	ɪj
FACE	ei	ei	eɪ	ɛj
PRICE	ai	ai	aɪ	ɑj
MOUTH	au	au	aʊ	aw
CHOICE	oi	ɔi	ɔɪ	oj
GOAT	ou	ou	əʊ	əw
GOOSE	uw	uː	uː	ʉw

the widespread British tradition: Jones/Gimson/Wells

short/lax vowels

KIT ɪ, DRESS e, TRAP æ, STRUT ʌ, LOT/CLOTH ɒ, FOOT ʊ

long vowels

FLEECE iː, START/PALM/BATH ɑː, NURSE ɜː, FORCE/NORTH/THOUGHT ɔː, GOOSE uː

diphthongs

centring: NEAR ɪə, SQUARE eə, CURE ʊə; **closing:** FACE eɪ, PRICE aɪ, MOUTH aʊ, GOAT əʊ, CHOICE ɔɪ

unstressed

KIT ɪ, HAPPY i, COMMA/LETTER ə, FOOT ʊ, GOOSE uː, VOLUME u

the distribution of British English stressed vowels

vowels	_C	_#	_V	categories
KIT, STRUT, FOOT, DRESS, TRAP, LOT	✓	✗	✗	checked
NEAR, NURSE, CURE, SQUARE, START, FORCE	✓	✓	✗	R
FLEECE, GOAT, GOOSE, FACE, PRICE, MOUTH, CHOICE	✓	✓	✓	free

(we'll look at unstressed vowels next week)

the British traditions miscategorize the BE vowel system

(Jones 1917,) Gimson 1962, Wells 1990

1. checked vowels: ɪ e æ ʌ ɒ ʊ = short vowels
2. R vowels: ɪə eə ɑː ɜː ɔː ʊə = long vowels **and** centring diphthongs
3. free vowels: iː eɪ aɪ aʊ əʊ ɔɪ uː = long vowels **and** closing diphthongs

Windsor Lewis 1972, Giegerich 1992

1. checked vowels ɪ ɛ a ʌ ɒ ʊ = lax(?) vowels
2. R vowels: ɪə ɛə ɑ ɜ ɔ ʊə = lax(?) vowels and centring diphthongs
3. free vowels: i e aɪ aʊ o ɔɪ u = tense vowels and closing diphthongs

the vowel system of BE based on Lindsey 2012

category							_C	_#	_V
checked	ɪ	ə	ʉ	ɛ	a	ɔ	✓	✗	✗
long	ɪː	əː	ʉː	ɛː	ɑː	oː	✓	✓	✗
free/‘diphthongs’	ɪj	əw	ʉw	ɛj	ɑj aw	oj	✓	✓	✓

redundancy in Lindsey's symbols

checked	R	free	
a	ɑː	ɑj, aw	a vs ɑ
ɔ	oː	oj	ɔ vs o

simplification

checked	R	free
a	aː	aj, aw
o	oː	oj

the vowel inventory of BE (at this point)
with further symbol simplifications

category						
checked	KIT i	STRUT ə	FOOT u	DRESS e	TRAP a	LOT o
long	NEAR iː	NURSE əː	CURE uː	SQUARE eː	START aː	FORCE oː
j-final diphthongs	FLEECE ij			FACE ej	PRICE aj	CHOICE oj
w-final diphthongs		GOAT əw	GOOSE uw		MOUTH aw	

many vowel + glide combinations do not occur, standard conclusion:

a vowel + glide sequence is ‘one’ sound, a diphthong

new developments in English, episode 1: L-vocalization

an `l` that is not followed by a vowel (ie, dark L) turns more vowel-like (into a glide): `w`, eg,

pal `pal` > `paw`, *pulled* `puld` > `puwd`, *skull* `sgəl` > `sgəw`;

more importantly,

milk `milk` > `miwk`, *shelf* `ʃelf` > `ʃewf`, *salt* `solt` > `sowt` (creating new ‘diphthongs’)

the post-L-vocalization vowel inventory of BE

category						
checked	i	ə	u	e	a	o
long	iː	əː	uː	eː	aː	oː
j-final ‘diphthongs’	ij			ej	aj	oj
w-final ‘diphthongs’	iw	əw	uw	ew	aw	ow

new developments in English, episode 2: W-fronting

the back offglide, `w`, of some diphthongs turns into front `j`, eg,

goat `gəwt` > `gəjt`, *goose* `guws` > `gujs` (further ‘diphthongs’)

the post-W-fronting (and post-L-voc) vowel inventory of BE

category						
checked	i	ə	u	e	a	o
long	iː	əː	uː	eː	aː	oː
j-final ‘diphthongs’	ij	əj	uj	ej	aj	oj
w-final ‘diphthongs’	iw	əw	uw	ew	aw	ow

the distribution of vowel + glide sequences is no longer an argument for their diphthonghood

the distribution of plosives/vowels and approximants

	p	t	k		e	ə	a
j	pj	★	kj		ej	★	aj
w	★	tw	kw		★	əw	aw

is distribution in pre-L-vocalization and pre-W-fronting systems really an argument for ‘oneness’?

plosive, approximant, vowel; vowel, approximant, plosive

pour `poː`	*rap* `rap`		*cod* `kod`	*catch* `katʃ`		*kick* `kik`	*Mick* `mik`
your `joː`	*rye* `raj`		*wad* `wod`	*cow* `kaw`		*lick* `lik`	*mill* `mil`
pure `pjoː`	*ripe* `rajp`		*quad* `kwod`	*couch* `kawtʃ`		*click* `klik`	*milk* `milk`

why should the highlighted sequences be ‘one’, but none of the others?

how do we know if `jV` and `wV` begin with a V or C?

articles are sensitive to the vowel/consonant distinction at the beginning of a word:
a yacht `ə jot` (*`ən jot`), *the yacht* `ðə jot` (*`ðij jot`)
a wad `ə wod` (*`ən wod`), *the wad* `ðə wod` (*`ðij wod`)

that is, `j`V and `w`V begin with a consonant

how do we know if `Vj` and `Vw` end in a vowel or consonant?

we don’t: no suffix or enclitic is sensitive to the vowel/consonant distinction at the end of a word

gaps in the distribution of approximants

	l	r	j	w
#_V	*lay* lej	*ray* rej	*yea* jej	*way* wej
C_V	*clay* klej	*grey* grej	*cue* kjuw	*dwell* dwel
V_V́	*allay* əléj	*array* əréj	*vilayet* víləjét	*away* əwéj
V́_V	*ally* álaj	*arrow* árəw	★	★
V꞉_V	*scarlet* sgaːlət	*Zara* zaːrə	*sawyer* soːjə	*narwhal* naːwəl

why should j and w not occur after checked vowels?

an obvious explanation for the lack of checked vowel + glide

these sequences are traditionally all analysed as ‘diphthongs’

neon `níjon`, *crayon* `kréjon`, *lion* `lájən`, *royal* `rójəl`, *vowel* `váwəl`, *rowan* `rə́wən`, *fuel* `fjúwəl`

no gap in the distribution of approximants after all

	l	r	j	w
#_V	*lay* lej	*ray* rej	*yea* jej	*way* wej
C_V	*clay* klej	*grey* grej	*cue* kjuw	*dwell* dwel
V_V́	*allay* əléj	*array* əréj	*vilayet* víləjét	*away* əwéj
V́_V	*ally* álaj	*arrow* árəw	*lion* lájən	*hour* áwə
Vː_V	*scarlet* sgaːlət	*Zara* zaːrə	*sawyer* soːjə	*narwhal* naːwəl

repairing unwanted consonant clusters: insert schwa

(French) loans

metre mɛtr > mijtə(r), *simple* simpl > simpəl, *prism* prizm > prizəm

inflectional suffixes

matches matʃ + z > matʃəz; *fitted* fit + d > fitəd; *taken* tejk + n > tejkən, *given* giv + n > givən, *fallen* foːl + n > foːlən (cf *seen* sij + n > sijn, *known* nəw + n > nəwn)

Irish English sonorant clusters

elm eləm, *farm* farəm, *earn* ərən, *girl* gərəl

schwa insertion occurs after all ‘diphthongs’

before `l`

mile `majəl`, *veil* `vejəl`, *deal* `dijəl`, *boil* `bojəl` (also *owl* `%awəl`, *rule* `%ruwəl`, *known* `%nəwən`)

before `r` (which was later lost in BE)

sire `sajə(r)`, *fear* `fijə(r)`, *hour* `awə(r)`

no epenthesis before a vowel

metric `metrik`, *simplest* `simpləst`, *Miley Cyrus* `majlij sajrəs`

that is, ‘diphthongs’ (like `ej`) behave like vowel + consonant sequences (like `et` or `el`)

hiatus filling

BE does not tolerate hiatus (= adjacent vowels), hiatus is repaired by

1. vowel deletion: *extraordinary* `egsdr⟨ə⟩oːdinərij`
2. `r` insertion: *extra hours* `egsdrə r awəz`

hiatus filling occurs after

1. `ə` (see above)
2. all long vowels: *Shah of Persia* `ʃaː r əv pəːʃə`; *four hours* `foː r awəz`

hiatus filling does not occur after ‘diphthongs’ since there is no hiatus after `j` or `w`

no geminates within a morpheme

only across #: *unnerved* ən#nəːvd, *homemade* həwm#mejd, *blackcurrant* blak#kərənt, *dissatisfied* dis#satisfajd; also only *sukiyaki* suwkij#jaːkij, *noone* nəw#wən

jw: *Awacs* ejwaks, *Blawith* blejwiθ, *Chichewa* tʃitʃejwə, *Ewok* ijwok, *Iwo* ijwəw, *kiwi* kijwij, *pewit* pijwit, *Taiwan* tajwon, *Tewa* tejwə

wj: *alleluia* aləluwjə, *bouillon* buwjon, *cocoyam* kəwkəwjam, *Gruyere* gruwjeː, *Kikuyu* kikuwjuw, *thuya* θuwjə, *yoyo* jəwjəw

no j-final diphthong before j, no w-final diphthong before w because there are no geminates

the vowel inventory of BE without diphthongs

KIT i	STRUT ə	FOOT u	DRESS e	TRAP a	LOT o
NEAR iː	NURSE əː	CURE uː	SQUARE eː	START aː	FORCE oː

FLEECE = KIT + j, GOAT = STRUT + w, GOOSE = FOOT + w, etc

so why does the tradition suppose diphthongs?

history

most Present-day English diphthongs derive from Middle English long vowels, as a result, the spelling of many PdE diphthongs is a single vowel letter, cf the names of vowel letters:
A = `ej`, E = `ij`, I = `aj`, O = `əw`, U = `juw`

the generative tradition

generative phonology supposes that ‘surface’ sound strings are derived from abstract underlying sound strings that may be arbitrarily different, eg, *nation* `nejʃən` is underlyingly `naːsjən` (or even more removed: `naːtjən`; cf *national* `naʃənəl` supposedly from `natjənal`)

ME long vowel > PdE ‘diphthong’

word	Middle English	Present-day English
price	pri:s	prajs
fleece	fle:s	flijs
meat	mɛ:t	mijt
face	fa:s	fejs
goat	gɔ:t	gəwt
goose	go:s	guws
mouth	mu:θ	mawθ

lexical alternations

ME long–short alternations are PdE ‘diphthong’–short/checked alternations

word pair	ME	PdE
keep–kept	`keːp–kept`	`kijp–kept`
grave–gravity	`graːv–graviti`	`grejv–gravitij`
mime–mimic	`miːm–mimik`	`majm–mimik`
south–southern	`suːθ–suðərn`	`sawθ–səðən`
holy–holiday	`hɔːli–holidaj`	`həwlij–holidej`
fool–folly	`foːl–foli`	`fuwl–folij`

the sonority scale (in more and more detail)

<table>
<tr><td colspan="3">vowels</td><td colspan="4">consonants</td></tr>
<tr><td colspan="3">vowels</td><td colspan="3">sonorant Cs</td><td colspan="2">obstruents</td></tr>
<tr><td colspan="3">vowels</td><td>glides</td><td>liquids</td><td>nasals</td><td colspan="2">obstruents</td></tr>
<tr><td>low Vs</td><td>mid Vs</td><td colspan="2">high Vs/glides</td><td>liquids</td><td>nasals</td><td>fricatives</td><td>plosives</td></tr>
<tr><td>a</td><td>e o</td><td colspan="2">i/j u/w</td><td>r l</td><td>m n ŋ</td><td>f v s...</td><td>p b t...</td></tr>
<tr><td></td><td></td><td colspan="2"></td><td></td><td></td><td></td><td></td></tr>
</table>

flapping in New Zealand English (NZ)

	sound before t	General Am	NZ basilect	NZ acrolect
fatter	vowel	fɐɾə ✓	fɐɾə ✓	fɐɾə ✓
farter	rhotic/length	fɐrɾər ✓	fɐːɾə ✓	fɐːtə ✗
fighter	glide	fajɾə ✓	fajɾə ✓	fajtə ✗
Fanta	nasal	fanɾə ✓	fantə ✗	fantə ✗
factor	obstruent	fagtə ✗	fagtə ✗	fagtə ✗

if aj were a ‘diphthong’, the difference in *fighter* in NZ B and NZ A would not be accounted for;

if j is a consonant, flapping is switched off at different points in the sonority scale in NZ B & A

what is vowel length?

- most long vowels of BE derive from V + `r` sequences (eg, *start, nurse*)
- some long vowels derive from an earlier `aw` (eg, *law, haul*)
- some long vowels derive from lengthening (eg, *bath, example, last, dance*)
- vowel length does not behave like a V in NZ A (no flapping in *farter* `faːtə`): is it a C?

what sort of consonant could ˑ possibly be?

ˑ occurs before C and #, but not before V, ie, it is in complementary distribution with

- h (no, since this would lead to geminates in *yahoo* jaːhuw, *Tahiti* taːhijtij, etc)
- also r in nonrhotic BE (also geminates: *Sahara* səhaːrə, *Sarah* seːrə, *hero* hiːrəw)
- also l in L-vocalizing accents

most importantly, if ˑ were a consonant we would not expect hiatus filling after it…

conclusions

- ‘diphthongs’ are vowel + consonant sequences in English, since
  - checked vowel + glide sequences would be curiously missing (they are the ‘diphthongs’)
  - a ‘diphthong’ and a sonorant C is split up by epenthesis
  - there is no hiatus (filling) after ‘diphthongs’ (but there is after any (other) vowel)
  - there are no clusters of a `j`-final ‘diphthong’ and `j` or a `w`-final ‘diphthong’ and `w`
- long vowels could not be neatly analysed as vowel + consonant sequences

the vowel inventory of BE (last word — at least for today)

‘short’	front	central	back	‘long’	front	central	back
nonlow	i	ə	u	**nonlow**	iː	əː	uː
nonhigh	e	a	o	**nonhigh**	eː	aː	oː