

# Phonology doesn't always add up: final and non-final schwa in non- rhotic English

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The 'additive assumption':

The PF of a morphologically complex item is the sum of the PFs of its constituents – 'proper containment'

*surf* + *board* = *surfboard*  
*/sɜ:f/* + */bɔ:d/* = */sɜ:fbɔ:d/*

*bag* + *PLURAL* = *bags*  
*/bag/* + */z/* = */bagz/*

2 aims in phonology that have been given high importance:

- 1) redundancy-free representations
  - 2) single underlying PF per morpheme
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### 1) redundancy-free

Phenomena predictable from context are excluded, e.g. –

aspiration of voiceless stops in English /p/ → [p<sup>h</sup>] / #\_\_ V

### 2) single underlying PF per morpheme

Morphemes are stored in ML in a single PF despite surface variation

e.g.–

/d/ as the underlier for English *PAST*

Note that predictability is an important criterion in setting up underlying forms (Hyman, 1975; Kenstowicz, 1994; Odden, 2005)

# SCHWA

All syllables with schwa are unaccented and bound in RP English – schwa cannot be the only vowel in any single-word complete utterance – a motivation for exclusion from PFs.

## FINAL SCHWA:

*bitter, quota, fear, layer, tyre, sour, employer, lower*

Shown to be distinctive by:

*bit, quote, fee, lay, tie, sow, employ, low*

*letter-comma* merger and R-sandhi justify treating final [ə] as vocalised allophone of /r/:

<i>letter</i>			<i>comma</i>	
#	V		#	V
ɹ	ɹ	17 <sup>th</sup> C	ə	ə
ə	ɹ	↓	ə	ɹ
		20 <sup>th</sup> C		

Intrusive & linking R same distribution

**Not low-level liaison phenomena:**

Hiatus-breaking [j] and [w] different to lexical /j/ and /w/ (Cruttenden, 2001) – cf. *the axe – the yaks, no itches – no witches*

Developmentally different – linking R acquired later (Newton & Wells, 2002)

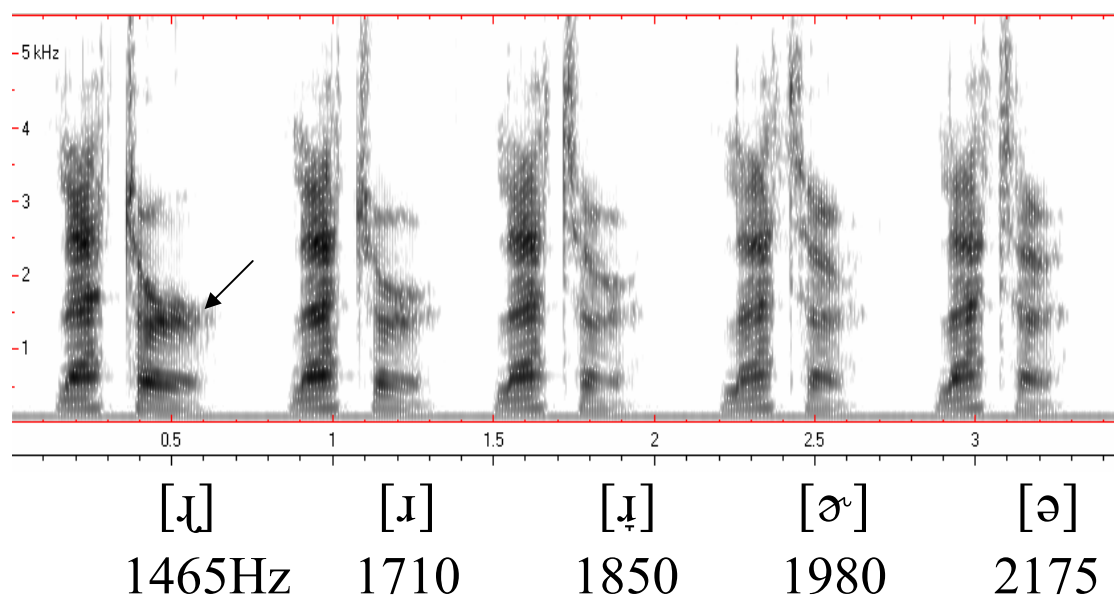
Speakers use lexical /r/ realisations for R-sandhi even if ‘deviant’ – [ɹ, ʊ, l, ... ] (Heselwood, 2006)

/r/ more likely than [j, w] to be replaced by [ʔ] in contact-induced change (Britain & Fox, in prep)

Higher probability of constrictive [r] in faster speech does not have to mean R-sandhi is an insertion process – cf. voicing~devoicing of final obstruents with higher probability of voicing in faster speech

Complementary distribution of [ə]-[ɪ]  
(Giegerich, 1999)

Phonetic similarity of [ə] and [ɪ]:



PF of *muster* hypothesised as /mʌstr/

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## NON-FINAL (POST-TONIC) SCHWAS:

1) predictable/non-distinctive –  
between:

- obstruents with opposite voicing,  
e.g. *abbot, mustard*
- coronal – non-coronal, e.g.  
*haddock, atom*
- /r/ and C, e.g. *syrup, harass*
- identical Cs, e.g. *cannon, standard*

## 2) unpredictable/distinctive, elsewhere:

schwa	no schwa
<i>wizard</i>	<i>whizzed</i>
<i>lion</i>	<i>line</i>
<i>beard</i>	<i>bid</i>
<i>lotus</i>	<i>oats</i>

Are these schwas also vocalised realisations of /r/?

If 'yes', then we get PFs like:

*abbot*      *mustard*      *haddock*      *atom*  
 /abrt/      /mʌstrd/      /hadrk/      /atrm/

*lion*      *wizard*      *beard*      *lotus*  
 /laɪrn/      /wɪzrd/      /bɪrd/      /ləʊtrs/

Can avoid setting up /r/:

a) Unpredictable schwas accounted for by phonotactics:

	O	N	C1	C2	C3
<i>line</i>	l	aɪ	n		
<i>lion</i>	l	aɪ	.	n	
<i>whizzed</i>	w	ɪ	z	d	
<i>wizard</i>	w	ɪ	z	.	d
<i>bid</i>	b	ɪ	d		
<i>beard</i>	b	ɪ	.	d	
<i>oats</i>		əʊ	t	s	
<i>lotus</i>		əʊ	t	.	s

b) Predictable schwas do not need accounting for in PFs:

<i>abbot</i>		a	b	t	
<i>mustard</i>	m	ʌ	s	t	d
<i>haddock</i>	h	a	d	k	
<i>atom</i>		a	t	m	
<i>syrup</i>	s	ɪ	r	p	
<i>harass</i>	h	a	r	s	
<i>cannon</i>	k	a	n	n	
<i>standard</i>	st	a	n	d	d

But – what happens when a final schwa becomes non-final due to suffixation? Does it remain an allophone of /r/?

*muster* + *PAST*

/mʌstr/ + /d/

Realised [mʌstəd]

Is it more important to  
make this operation work  
additively?

Or to account for this  
phonetic form non-  
redundantly?

Taking *mustard* and *mustered* as  
homophones – [mʌstəd], the [ə] is  
equally predictable so should it  
appear in the PF? :

*mustard* }  
*mustered* } /mʌstd/

But then the phonology does not ‘add  
up’ – no proper containment:

*muster* + *PAST* = *mustered*

/mʌstr/ + /d/ ≠ /mʌstd/

/t/ not final, so doesn't trigger the /ɪd/  
alternant of *PAST*

But once the /d/ has been added, the [ə] is predictable in the resulting pronunciation.

Giegerich's (1999) 'free-ride derivation' argument – that e.g. *weird* must have /r/ if *weir* has – only applies if we think that the PF of *weird* is the same as *weir* + /d/.

Uffmann (2003) objects that if all non-high final vowels, e.g. *car*, *door*, are said to have final /r/ because of R-sandhi, then they must have non-final /r/ in *cars*, *doors*, and [r] in fact becomes predictable. The objection doesn't stand if there is no /r/ set up in *cars*, *doors*, etc. – i.e. if we don't make the additive assumption.

The additive assumption can be saved by...

## EITHER

...a rule that changes the stem:

$/r/ \# \rightarrow \emptyset / [\alpha \text{ voice}] \_ \# [\beta \text{ voice}]$

Far too arbitrary, especially as [ə] is still there!

## OR

...setting up /r/ in *mustard*, *abbot*, etc.

$/m\Lambda strd/$ ,  $/abrt/$

Highly counter-intuitive in *abbot*, etc.

## OR

...phonemicising a redundant item in the PF of *mustered* to distinguish it from *mustard*  $/m\Lambda strd/ - /m\Lambda std/$

undermines a central aim of phonology to have redundancy-free PFs

What are the data phonology tries to account for –

## EITHER

**Speakers' mental representations of morphemes?**

morphemes mentally represented as PFs – phonology as a kind of spelling system to facilitate storage/search/recognition/retrieval.

Logically, PFs could exist without speech. Speech dependant on PFs.

Not imperative to have redundancy-free PFs.

OR

## Observed phonetic 'facts'?

morphemes not necessarily represented as PFs – episodic models of the lexicon allow for indefinitely rich phonetic representations.

Phonology accounts for how speech patterns work semiotically. PFs therefore cannot exist without speech, although morphemes/ can.

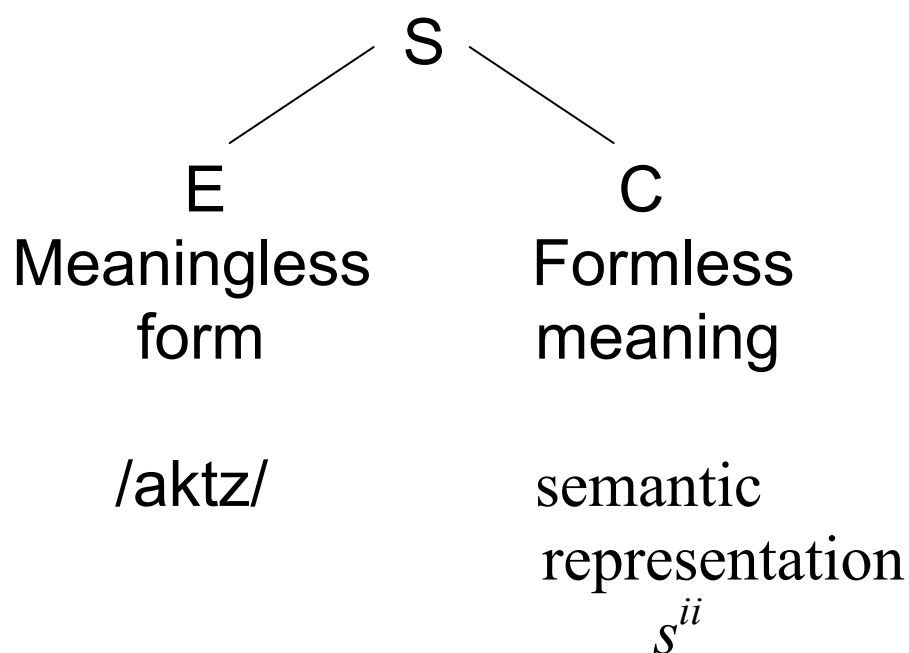
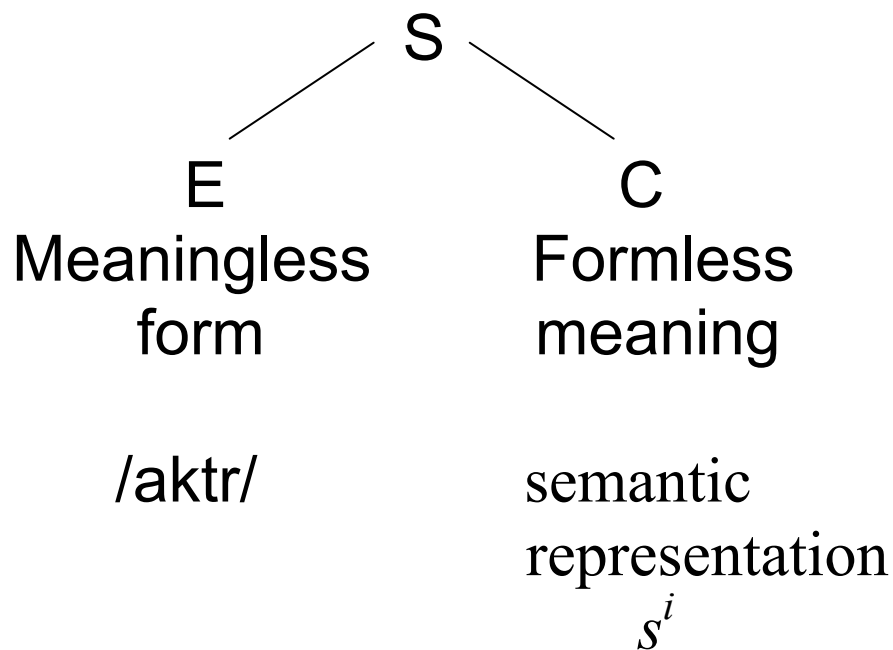
Redundancy-free PFs are at a premium – no semiotic value in predictable items.

Already accept that sometimes we cannot identify morphs in PFs – e.g. French

*au*                      /o/  
to the MASC.

Is it ever *necessary* to do so to be a competent language-user?

## The Saussurean sign –



No need to worry if phonology doesn't always add up – the morphology always does! (Or does it ...?)