

# Distinctive Features – Vowels

Traditionally /ɪ/ = close front unrounded short monophthong.  
Can these be represented in terms of binary features?

## Open/Close

IPA has four values: close, close-mid, open-mid, open.  
For English, three values work best: **close, mid, open**.  
Carr (1993:61) uses [high] and [low].

## Back/Front

IPA has three values: **back, central, front**.

## Rounded/Unrounded

Already binary  
Phonetically /ɜ:/ is neutral. But not a problem for classification

## Length

/bi:t/ is actually shorter than /bɪd/.  
Therefore we generally prefer tense/lax to long/short. /i:/ is tense, /ɪ/ is lax  
Carr (1993:64) uses ATR = Advanced Tongue Root. Tense are [+ATR]; lax are [-ATR].

## Monophthong/Diphthong

monophthong/diphthong. What about triphthongs? Do they exist? How many? Roach (2000:24) lists 5 possible triphthongs.

## American English

For American English, there are no centring diphthongs. /ɪə, ʊə, eə/ are /ɪr, ʊr, er/.  
For British English, the centring diphthongs cannot be analysed in this way.

Make sure you can classify the monophthongs:

	i:	ɪ	e	æ	ʌ	ɑ:	ɒ	ɔ:	ʊ	u:	ɜ:	ə
openness (c,m,o)												
backness (f,c,b)												
round/unround												
tense/lax												

## Binary Features

We have two ternary features. Can they be represented in binary terms?

## Close/Open

For front vowels we have /i, e, æ/: open, mid, close.

If [open] and [close] are separate binary features, we have:

	i	e	æ
close			
open			

Is this a fudge? If these features are genuine, they should work for all languages. But French has four front vowels: [i, e, ε, a]. It is hard to capture these in binary terms.

## Front/Back

For /æ, ʌ, ɑ:/: we have three values: front, central, back.

We can handle these in the same way as close/open.

	æ	ʌ	ɑ:
front			
back			

## Full binary classification

	i:	i	e	æ	ʌ	ɑ:	ɒ	ɔ:	ʊ	u:	ɜ:	ə
syll	+	+	+	+	+	+	+	+	+	+	+	+
close	+	+	-	-	-	-	-	-	+	+	-	-
open	-	-	-	+	+	+	+	-	-	-	-	-
front	+	+	+	+	-	-	-	-	-	-	-	-
back	-	-	-	-	-	+	+	+	+	+	-	-
round	-	-	-	-	-	-	+	+	+	+	-	-
tense	+	-	-	-	-	+	-	+	-	+	+	-

Binary classification works well for consonants: they are **discrete**.

It works less well for vowels: they are **continuous**.

Note:

- /ə/ is [-] for everything! Maybe this is right.
- [+close] are always [-open]; [+open] are always [-close]. This confirms that there is some redundancy here.
- similarly for [+front] and [+back]

Questions:

1. How are the mid vowels represented?
2. How are the central vowels represented?
3. What are the [+open -long] vowels?
4. What are the [+back +long] vowels?

## References

Carr, P (1993) *Phonology*, London: Macmillan.

Roach, P (2000) *English Phonetics and Phonology (3rd Edition)*, Cambridge: Cambridge University Press.