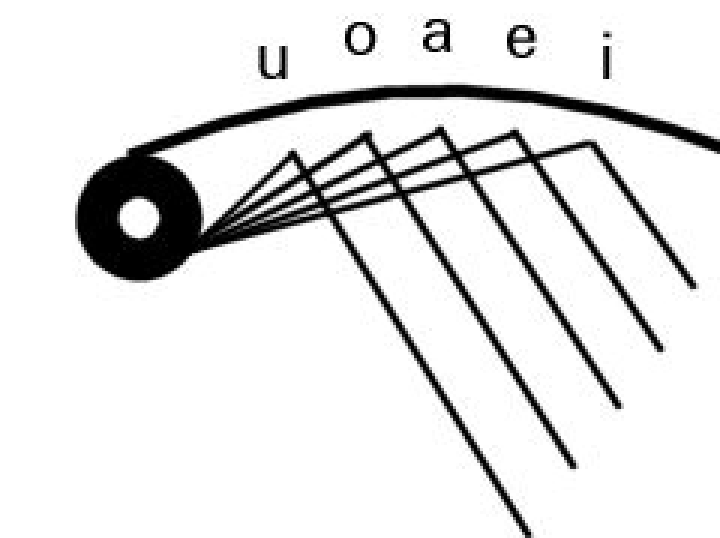


On the structure of vowel space: A genealogy of general phonetic concepts

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University of Pretoria, South Africa



Robinson (1617) [2]

i e a o u

Olearius (1630)

y i e a o u w

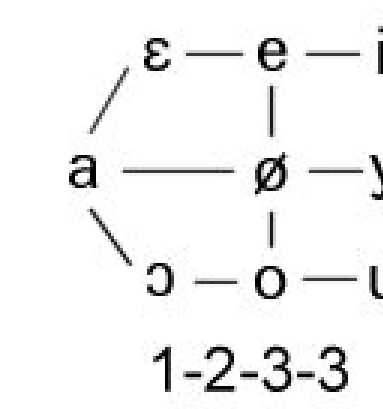
Newton (1665) [2]

a	ε	?
æ	e	i
ɔ	o	u

3-3-3

Wallis (1653)

WB: Brightland (1711) [2]

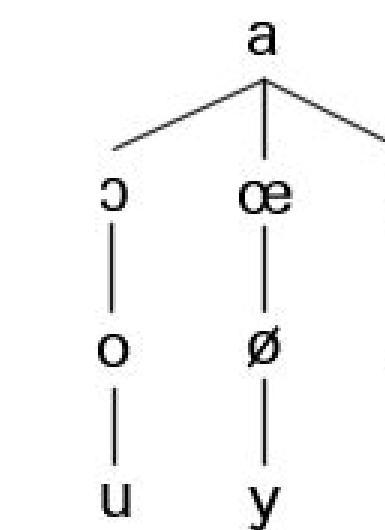


He: Hellwag (1780) [5]

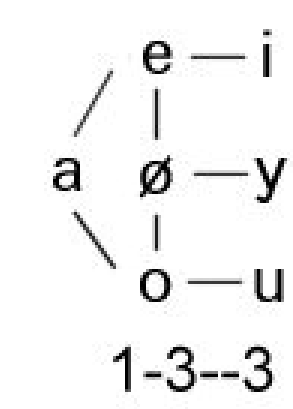
u y i
o ø e
ɔ ε
a

1-2-3-3

He: Hellwag (1781) [5]



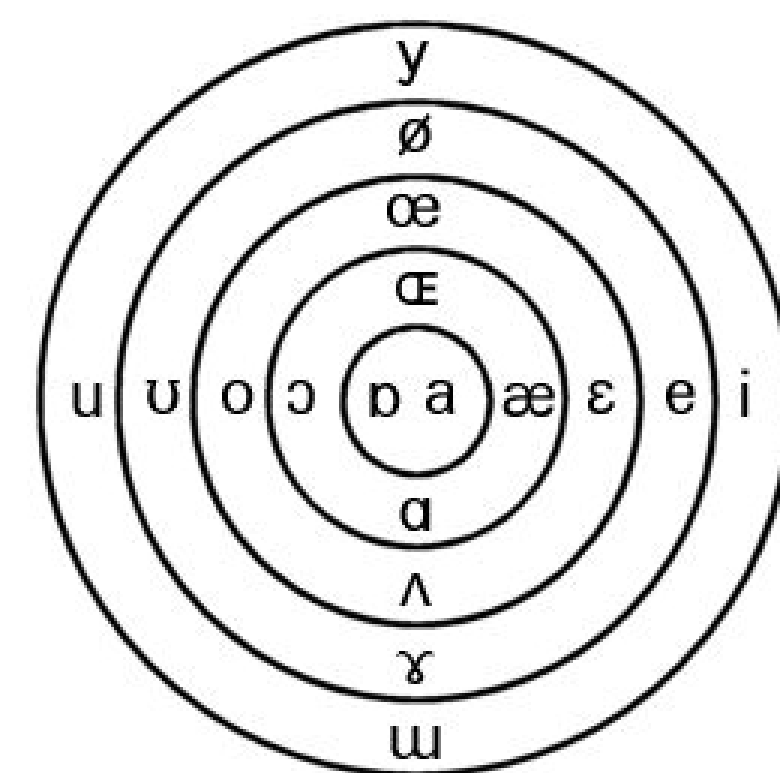
Ch: Chladni (1809) [5]



D-R: Du Bois-Reymond (1812)



Br: Brücke (1856) [5]

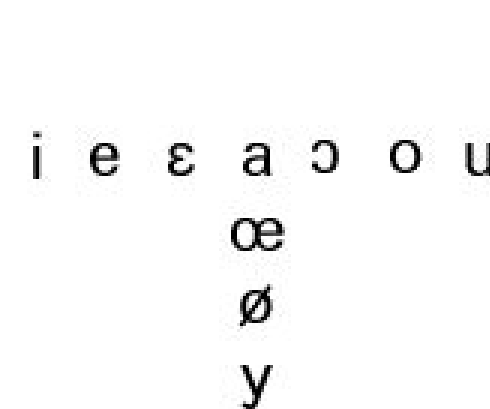


W-S: Winteler Sievers (1876)

ɯ	ɨ	i			ɪ
ʌ	ə	e	ɤ	ə	
a	ɜ	ε	ɑ	ɐ	æ
u	ʉ	y	ʊ		ʏ
o	ɵ	ø			
ɔ	ɐ	œ	ɒ		œ

4 x (3-3-3)

B: Bell (1867) [6]



Tra: Trautmann (1877) [5]

i
e y
ε
a œ ø
ɔ
o
u

1-3-3-4

Te: Techmer (1880) [5]



Trb: Trautmann (1884) [5]

y
ø
œ
u o ɔ ɒ a ε e i
ʌ
ɤ
ɯ

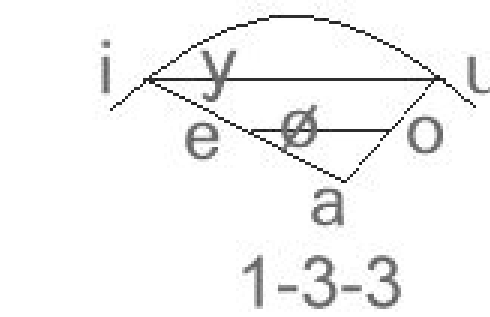
2-4-4-4

Trb: Trautmann (1884) [5]

ɒ a
ɔ ʌ œ ε
o ɤ ø e
u ɯ y i

2-4-4-4

Trb: Trautmann (1884) [5]



Vi: Viëtor (1884-1914) [5]

u
o
ɔ
ɑ a
2-2-2-2
i
e
ɤ
ʌ
œ
y

PA: Passy (1890 a) [7]

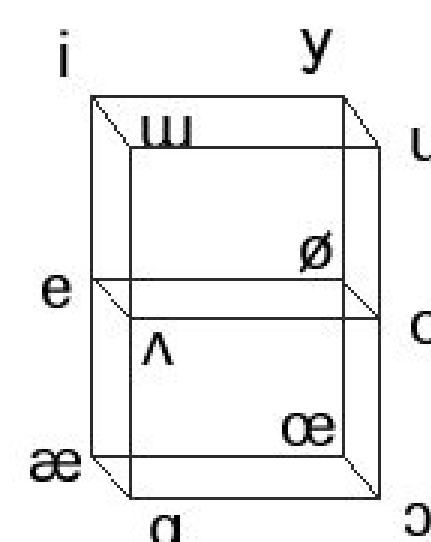
u ɯ ʉ ɨ y i
o ɤ ɵ ɐ ø e
ɔ ʌ ɜ œ ε
ɑ a

2-5-6-6

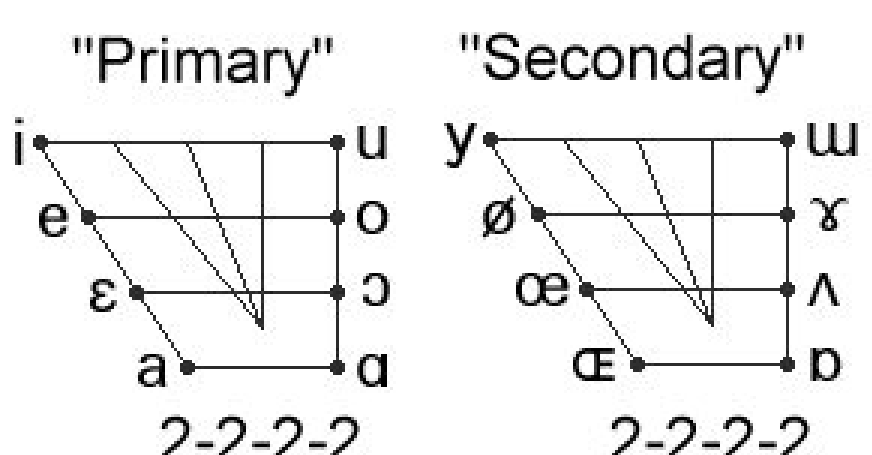
Pb: Passy (1890 b) [7]

8 x (3-3-3)

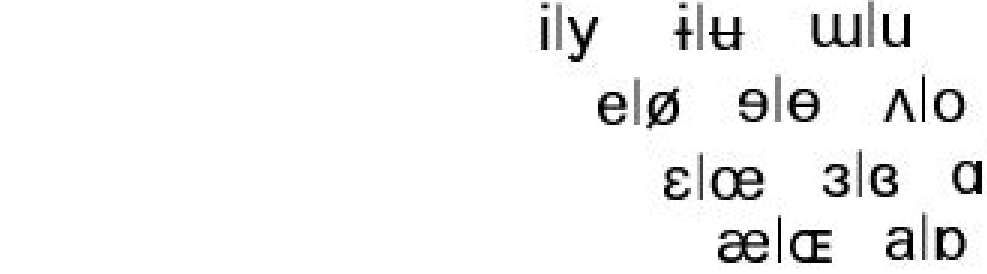
Sweet (1906) (6)



F: Forchhammer (1924)



J: Jones (1918) Cardinal Vowels [8]

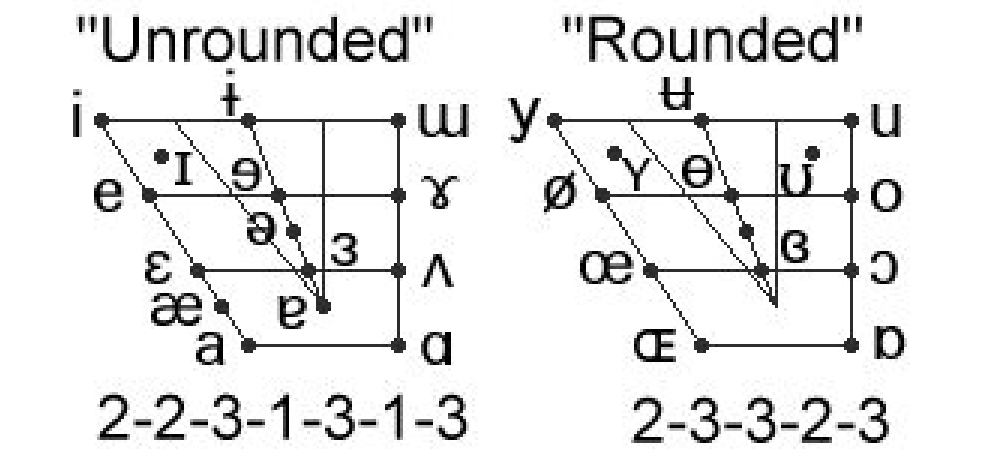


2 x (2-3-3-3)
Bob: Boshoff (1998 b) [15]

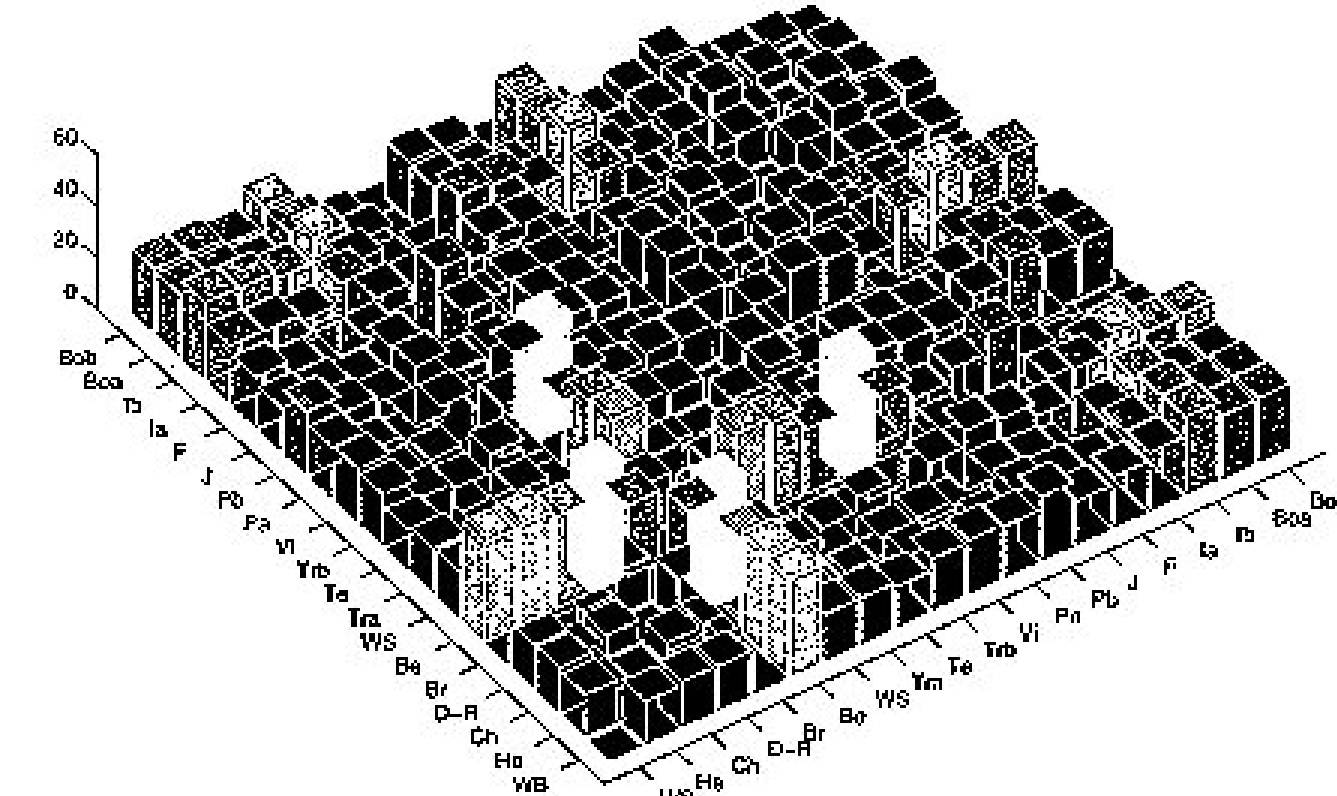
i
e ɨ
ε ɵ ɯ
æ ɜ ʌ
a ɑ
y
ø ʉ
œ ɵ u
ɛ ɐ
a ɒ ɔ

2 x (2-3-3-2-1)

Boa: Boshoff (1998 a) [15]



la & lb: IPA (1993)

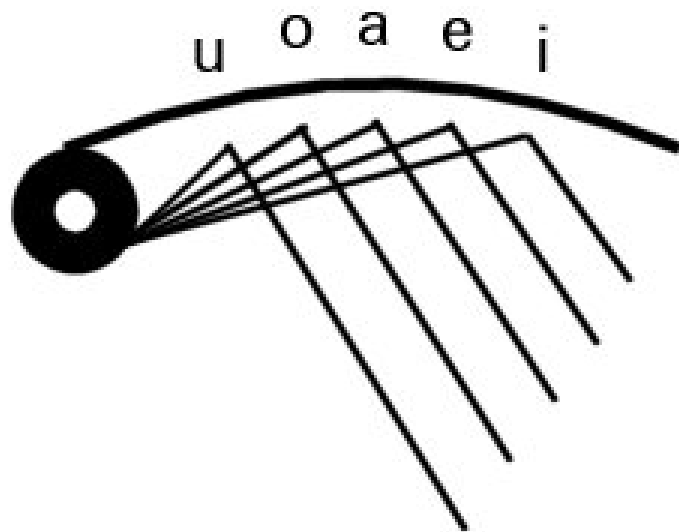


3-D barplot of the Distance Matrix between the vowel schemes, calculated using the measure defined in the paper.

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Newton (1665) [2]

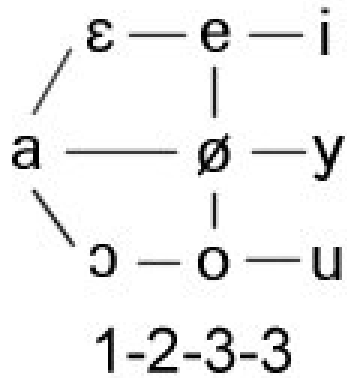
Wallis (1653)



WB: Brightland (1711) [2]

a	ɛ	?
æ	e	i
ɔ	o	u

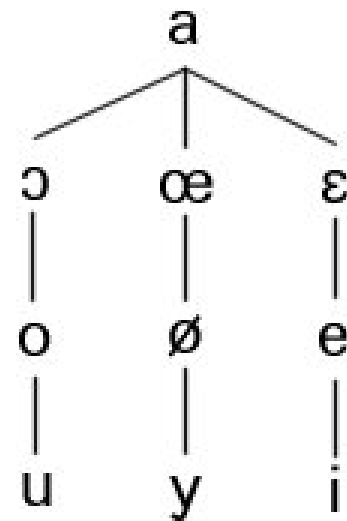
3-3-3



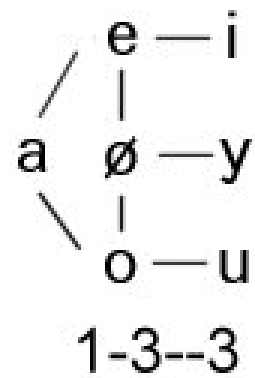
He: Hellwag (1780) [5]

u y i
o ø e
ɔ ɛ
a
1-2-3-3

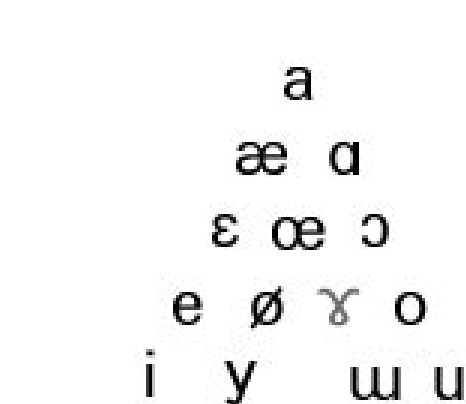
He: Hellwag (1781) [5]



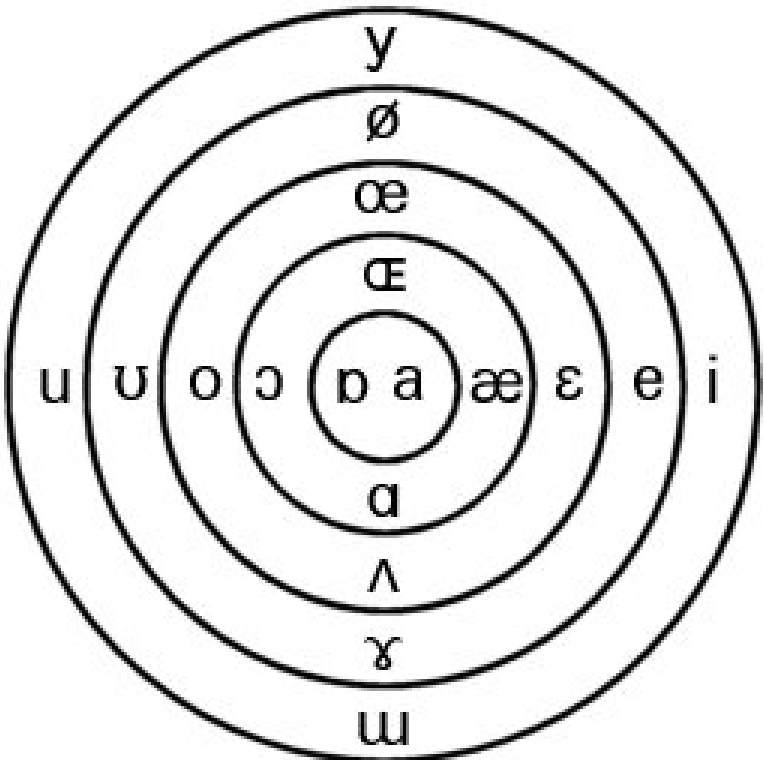
Ch: Chladni (1809) [5]



D-R: Du Bois-Reymond (1812)



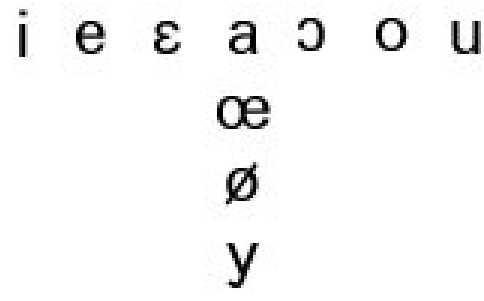
Br: Brücke (1856) [5]



W-S: Winteler Sievers (1876)

ɯ	ɨ	i			ɪ
ʌ	ə	e	ɣ	ə	
a	ɜ	ɛ	ɑ	e	æ
u	ɥ	y	ʊ		ʏ
o	ə	ø			
ɔ	ɐ	œ	ɒ		œ

4 x (3-3-3)
B: Bell (1867) [6]



Tra: Trautmann (1877) [5]

i
e y
ε
a œ ø
ɔ
o
u
1-3-3-4

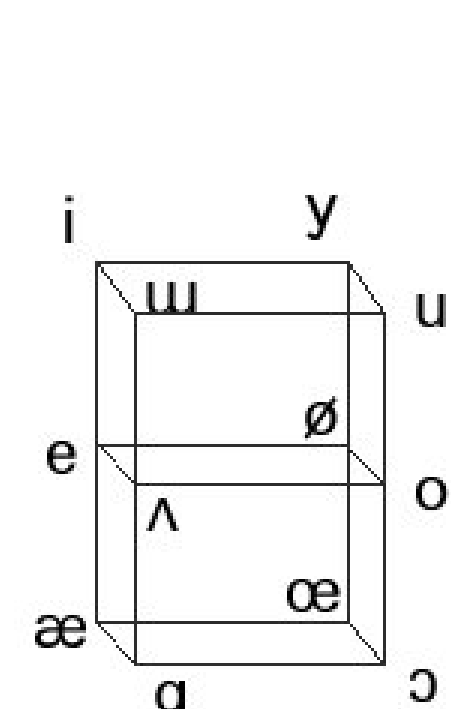
Te: Techmer (1880) [5]

y
ø
œ
u o ɔ ɒ a ε e i
ʌ
ɣ
ɯ
2-4-4-4

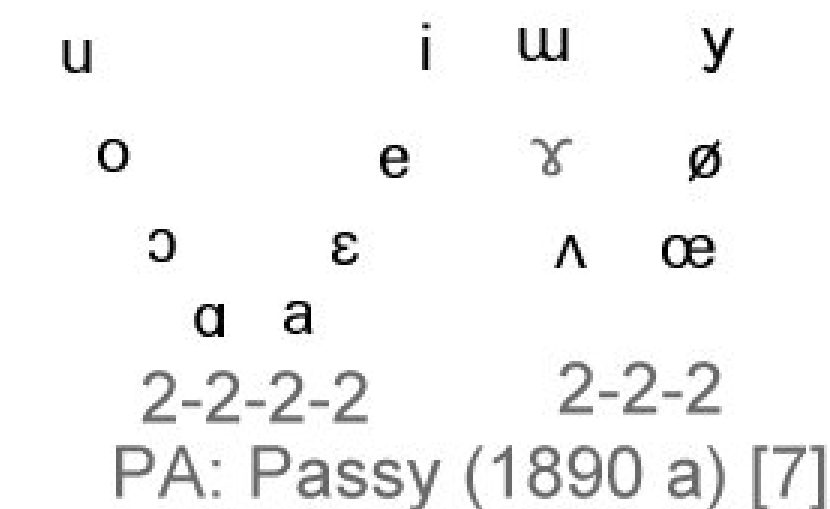
Trb: Trautmann (1884) [5]

ɒ a
ɔ ʌ œ ε
o ɣ ø e
u ɯ y i
2-4-4-4

Trb: Trautmann (1884) [5]



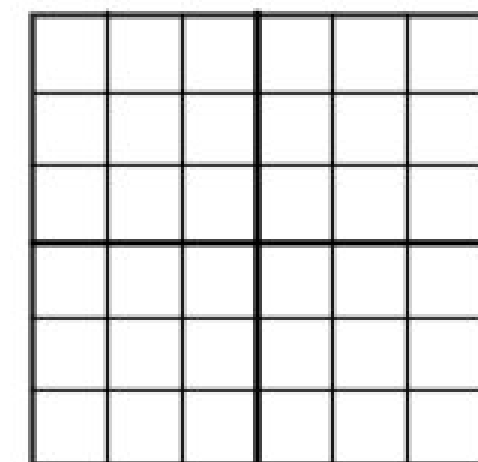
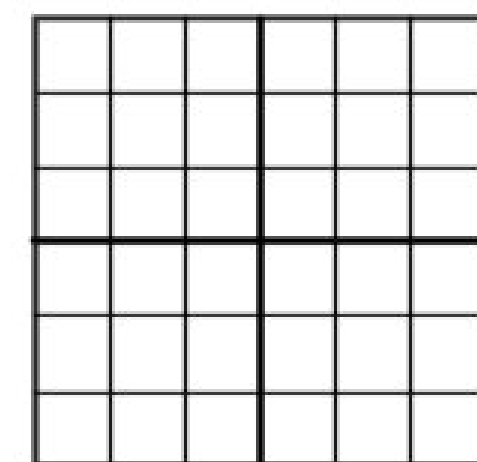
Vi: Viëtor (1884-1914) [5]



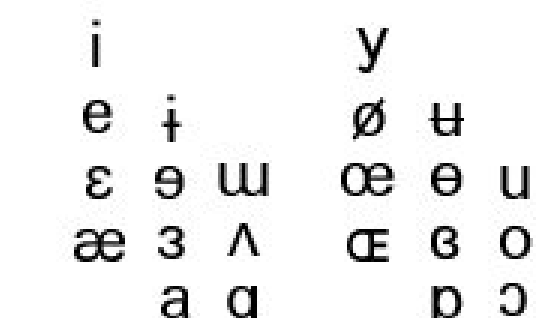
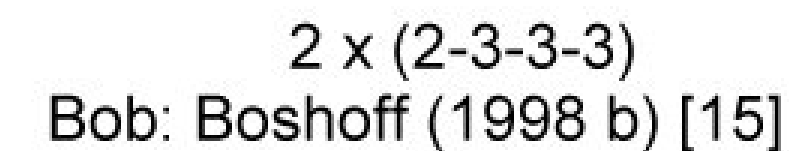
Trb: Trautmann (1884) [5]



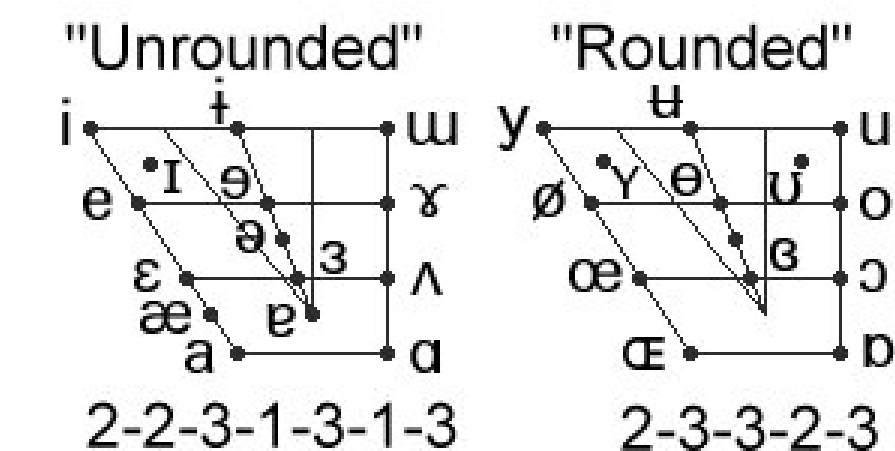
Trb: Trautmann (1884) [5]



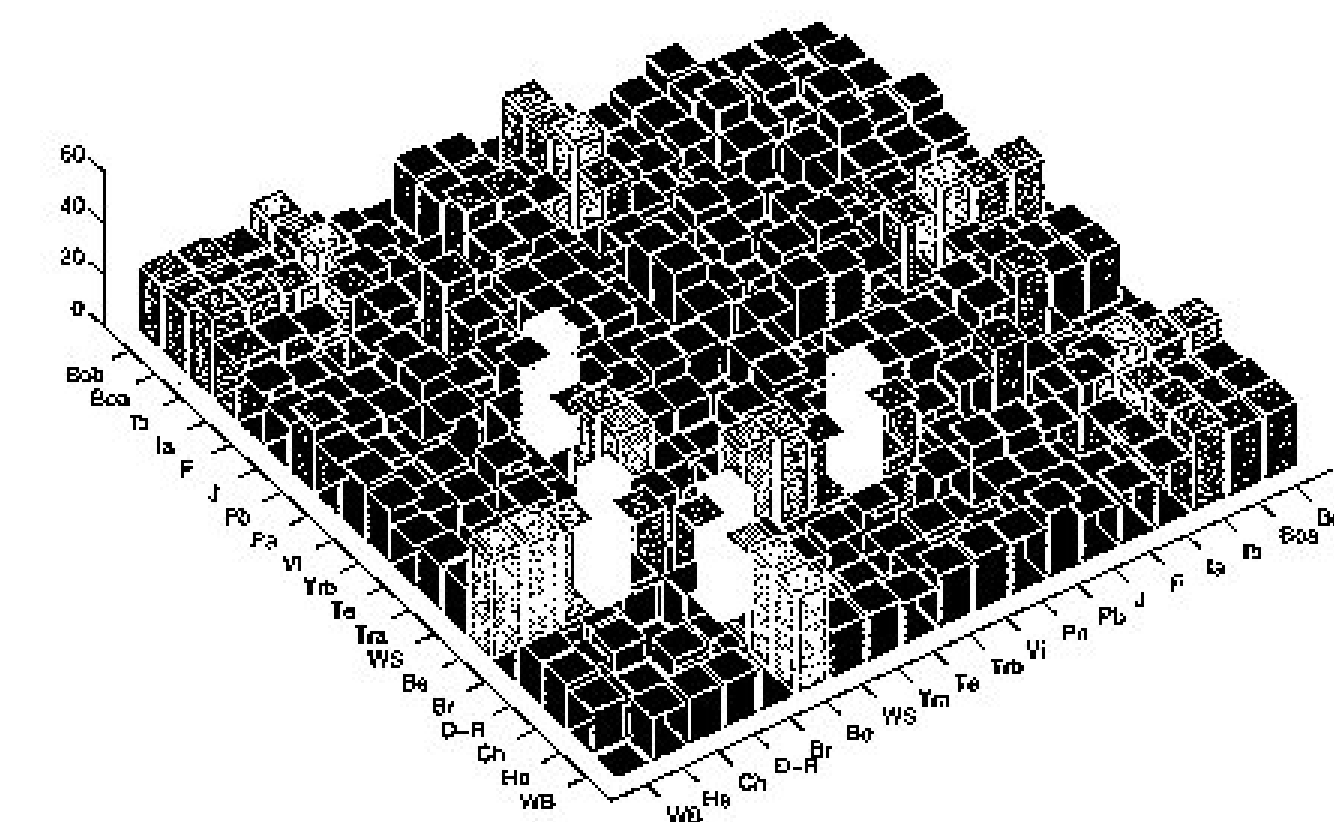
8 x (3-3-3)
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Boa: Boshoff (1998 a) [15]



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