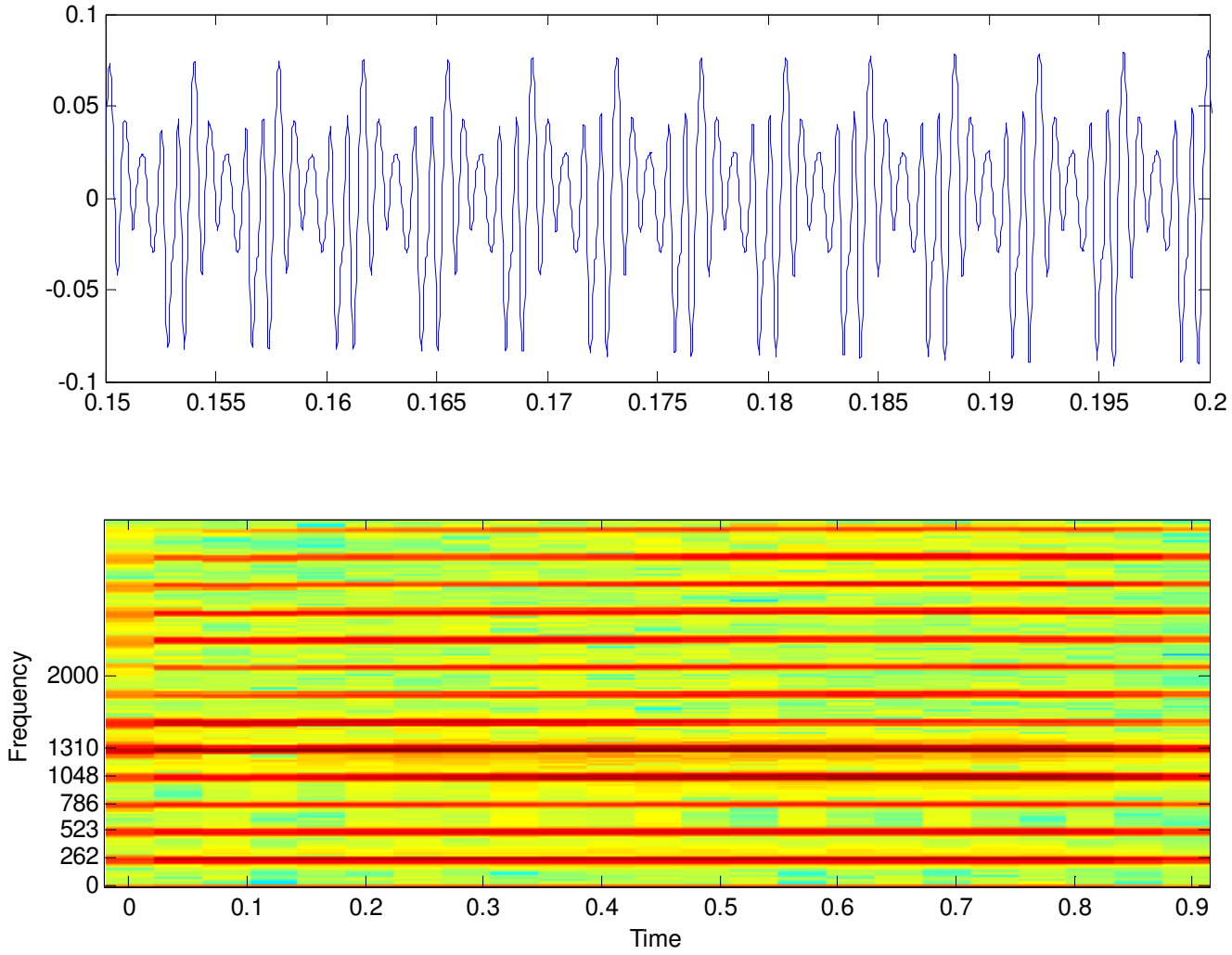

0.1
0.05
0
-0.05
-0.1
0.15
0.155
0.16
0.165
0.17
0.175
0.18
0.185
0.19
0.195
0.2
Frequency
2000
1310
1048
786
523
262
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Time

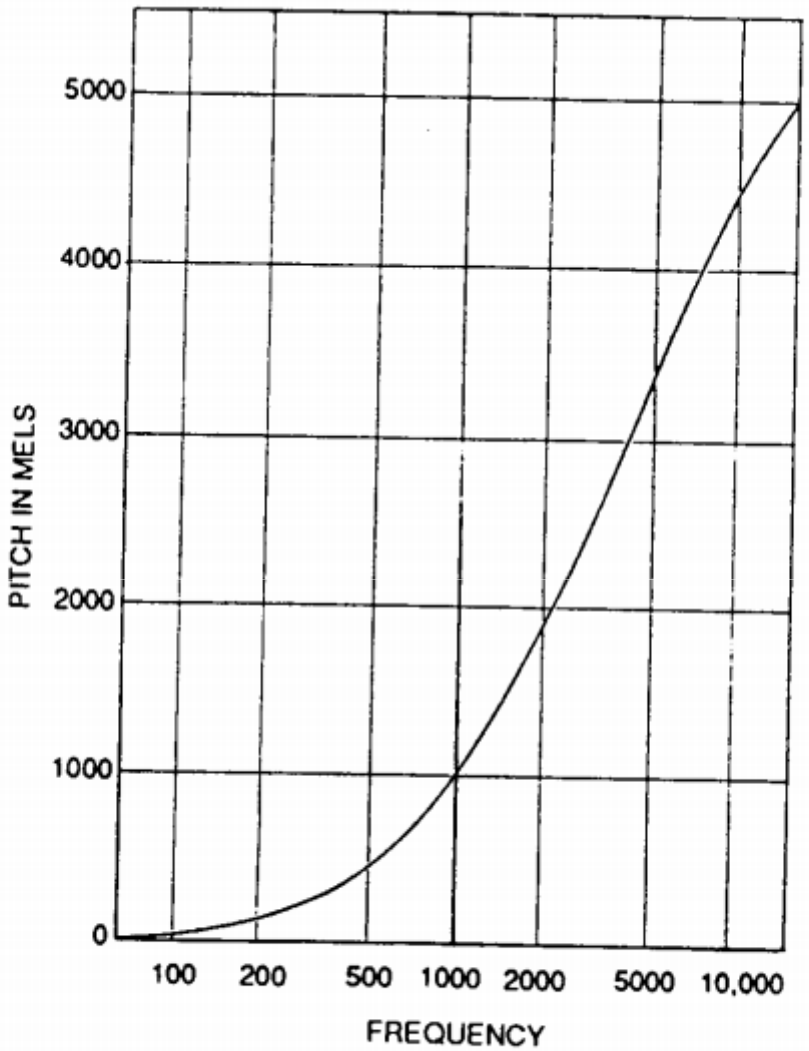
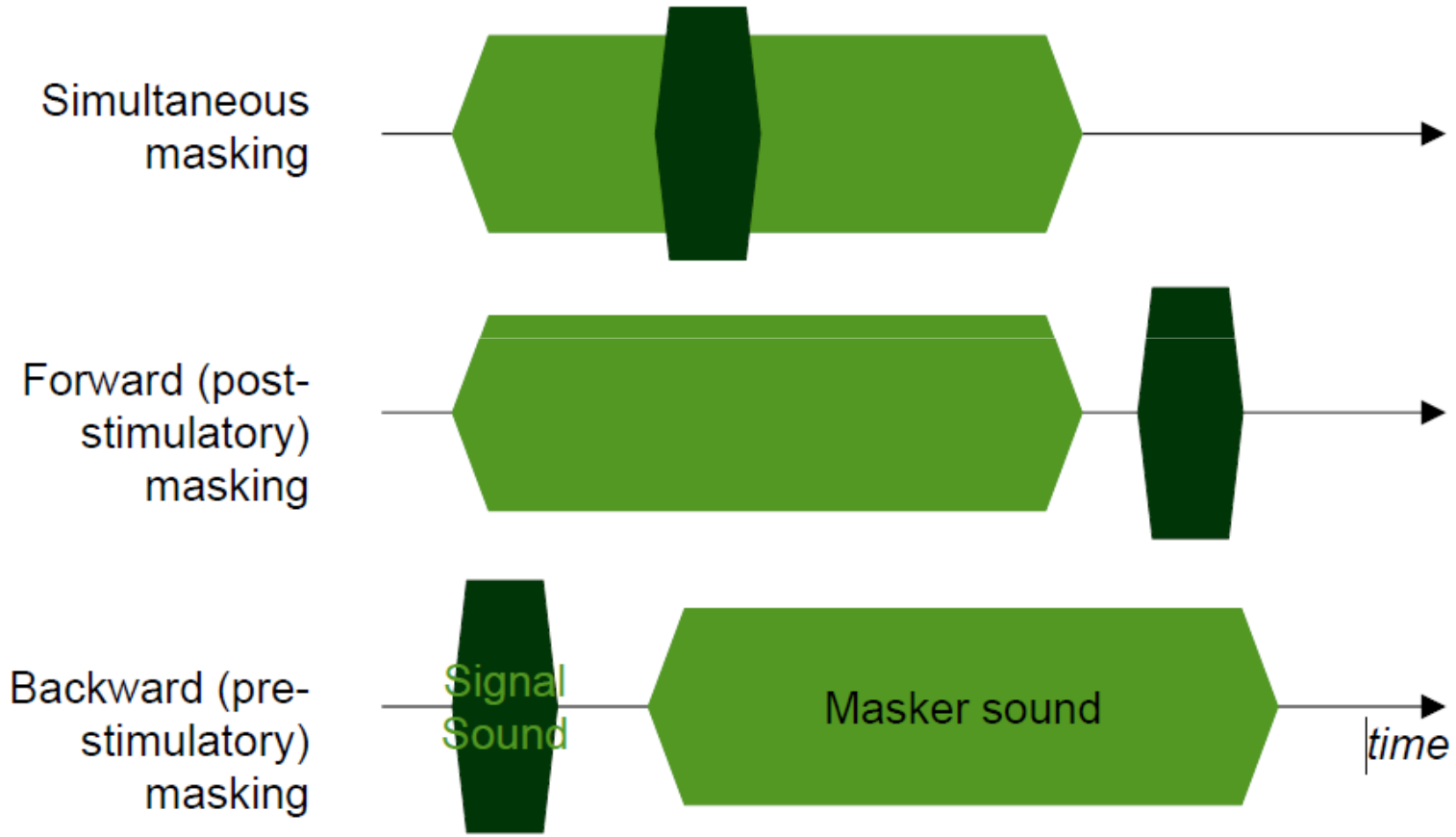
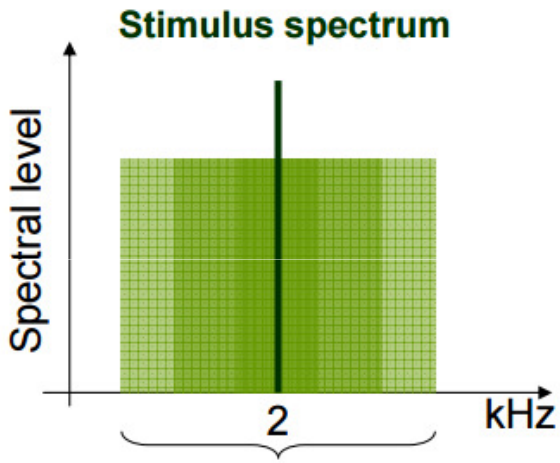


FIGURE 1 The relation of pitch (in mels) to the frequency of a pure tone. A 1000 Hz tone is arbitrarily assigned a value of 1000 mels. (From Stevens et al., 1937, reprinted with permission.)

Types

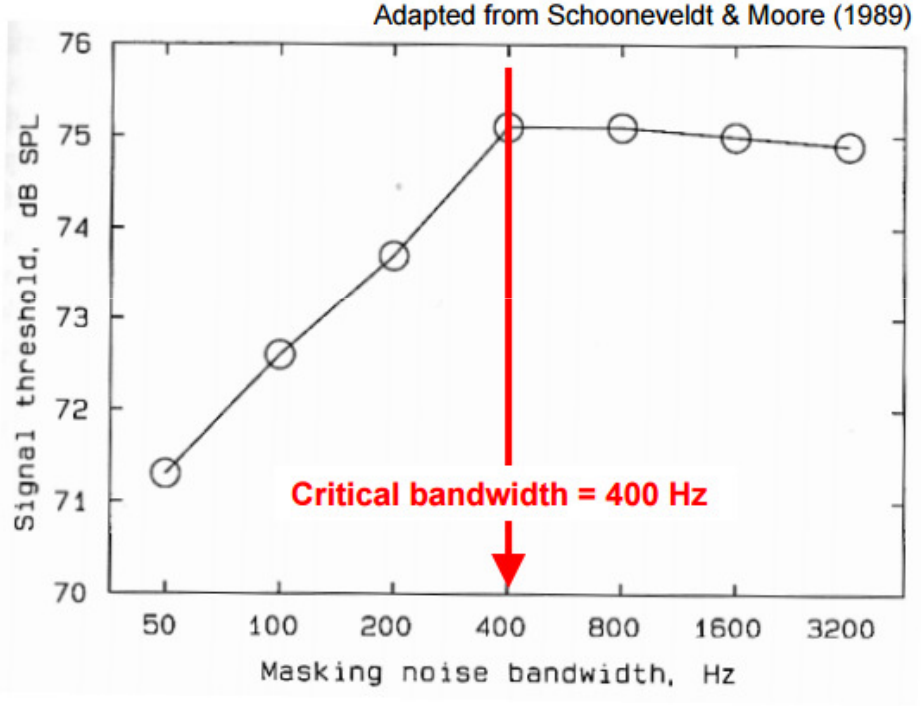

Simultaneous masking
Forward (post-stimulatory) masking
Backward (pre-stimulatory) masking
Signal Sound
Masker sound
time

The “critical band”



Signal detection threshold increases with increasing masking noise bandwidth up to a point after which signal threshold becomes independent of masker bandwidth.

Adapted from Schooneveldt & Moore (1989)



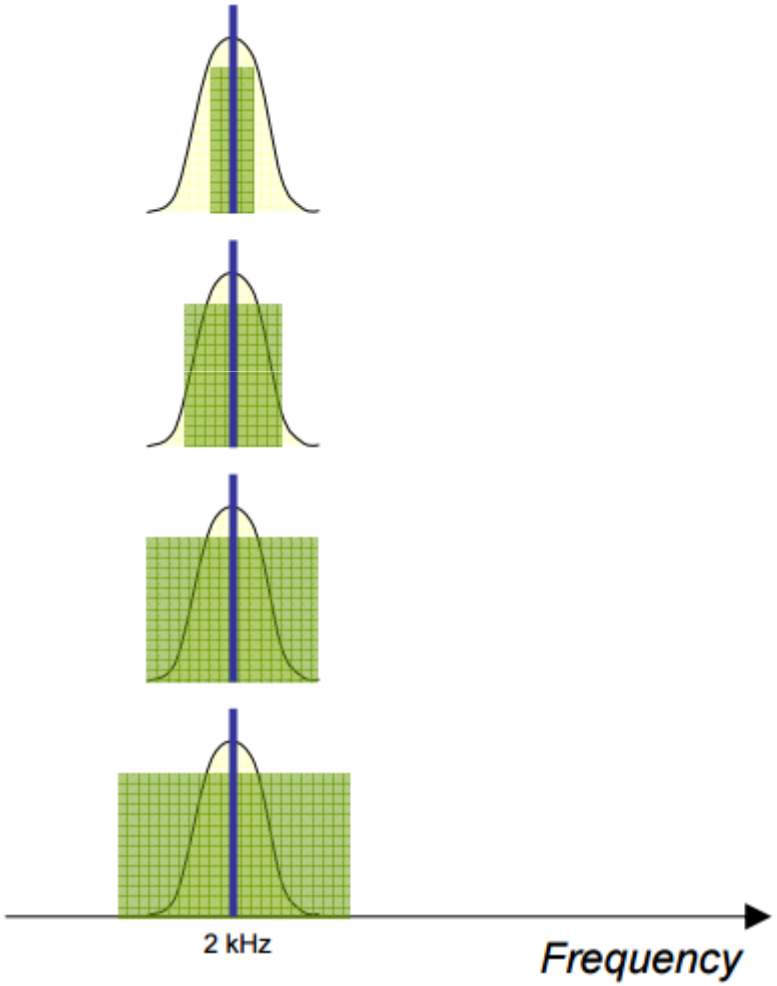
Schooneveldt GP, Moore BCJ. (1989). Comodulation masking release for various monaural and binaural combinations of the signal, on-frequency, and flanking bands. J Acoust Soc Am. 85(1):262-272.

An explanation of the critical band

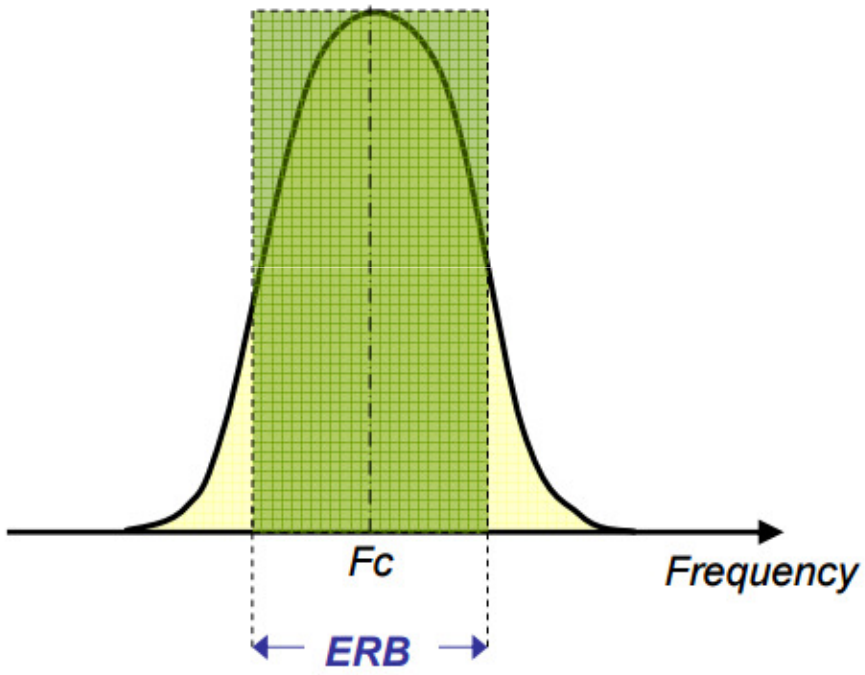
The amount of masking increases with increasing the noise (masker) energy that gets through the filter.

Up to a point…!

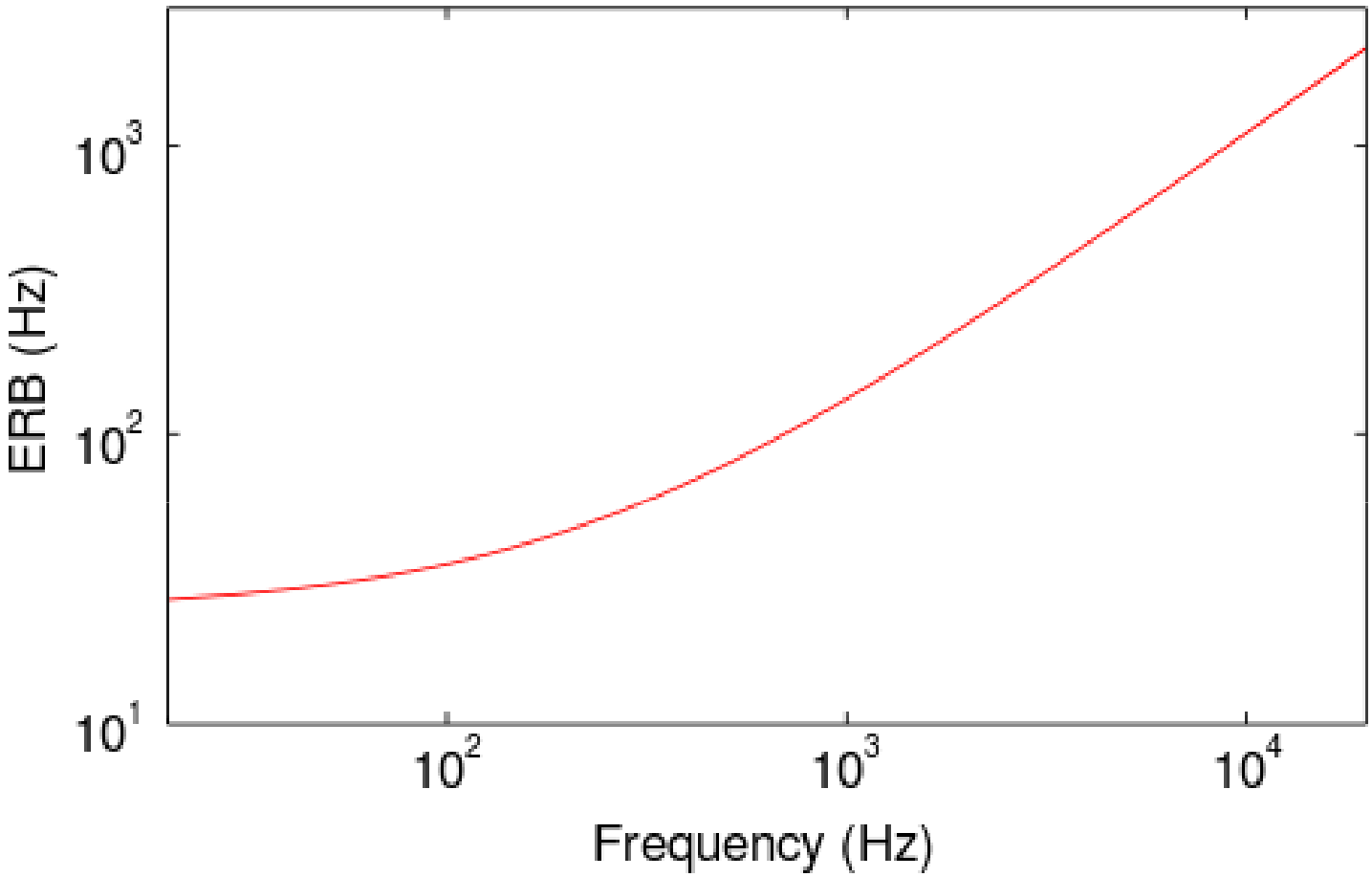
Further increases in noise bandwidth do not increase the masker energy through the filter.



Equivalent rectangular bandwidth (ERB)



An auditory filter (yellow area) and its ERB filter (green area). Both have different shapes but equal height and total area. That is, both let the same energy through.

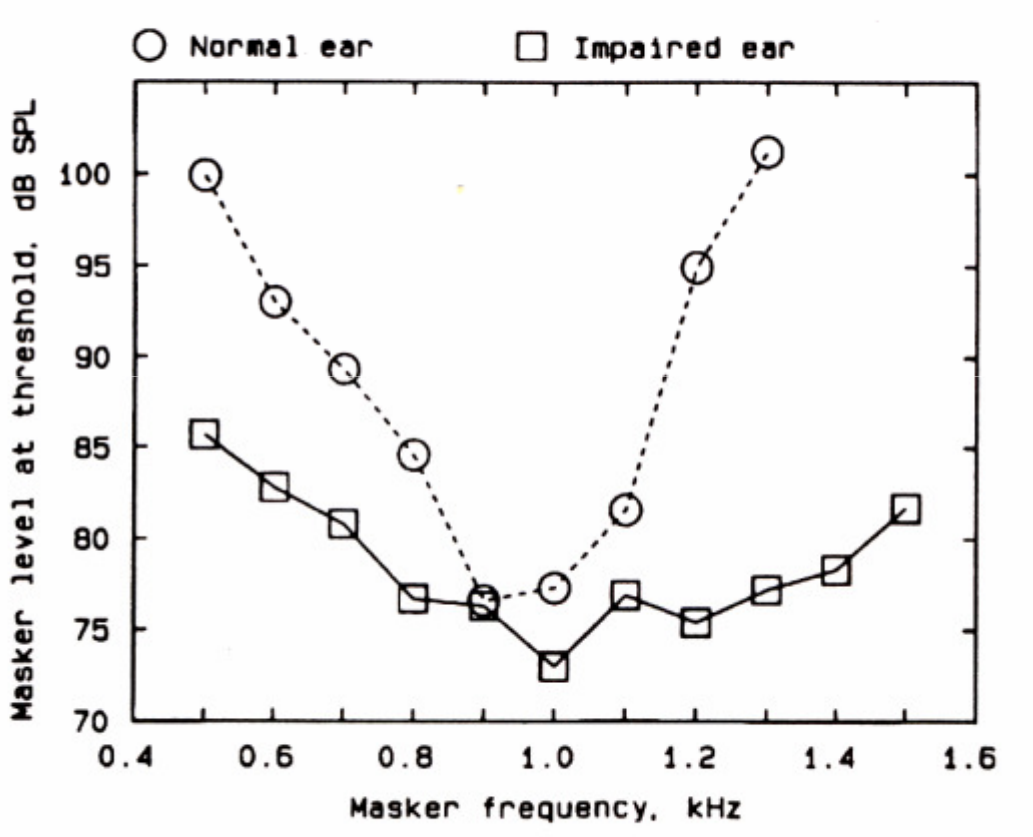


→ BARK scale

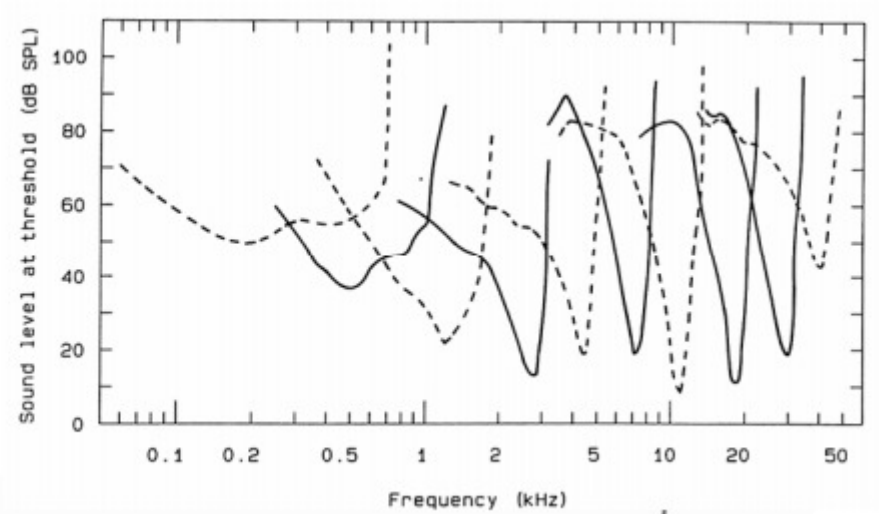
Psychoacoustical tuning curves

Method B produces **PSYCHOACOUSTICAL TUNING CURVES (PTCs)**.

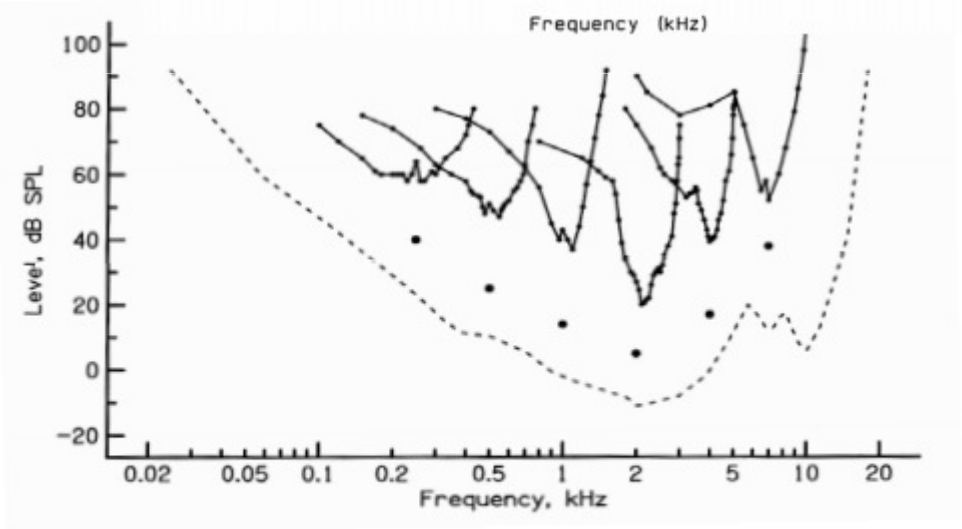
Psychoacoustical tuning curves for normal-hearing and hearing-impaired listeners. Signal was a 1-kHz pure tone at 10 dB SL. Masker was narrowband noise (Moore & Glasberg, 1986).



Moore BCJ, Glasberg, BR (1986). Comparisons of frequency selectivity in simultaneous and forward masking for subjects with unilateral cochlear impairments. J. Acoust. Soc. Am. 80, 93-107.



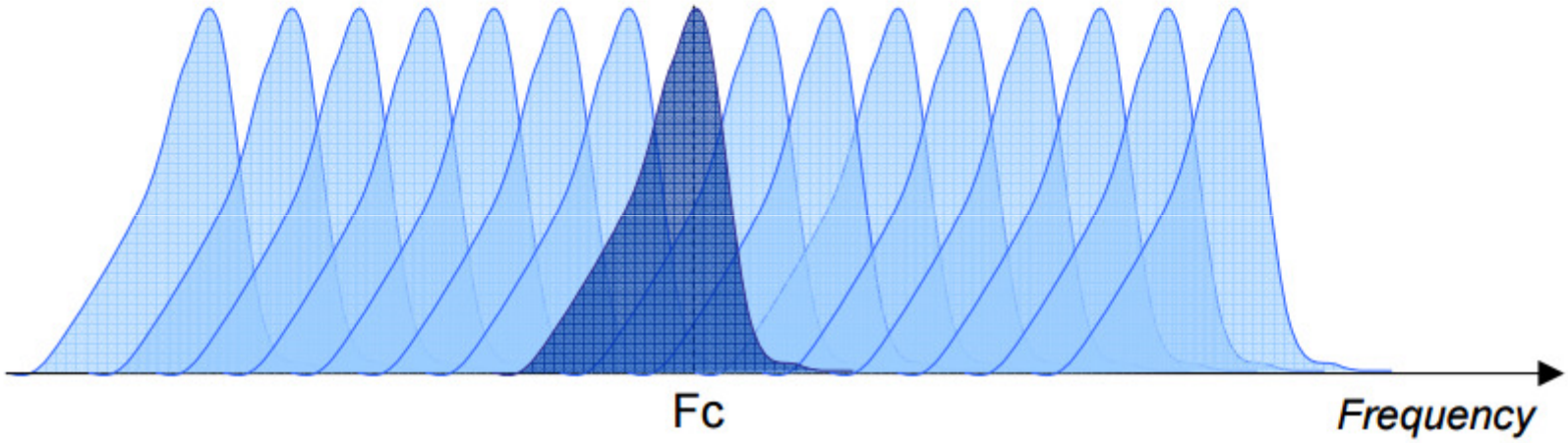
Auditory nerve fiber tuning curves (Palmer, 1987).



Psychoacoustical tuning curves (Vogten, 1974).

Palmer AR (1987). Physiology of the cochlear nerve and cochlear nucleus, in *Hearing*, edited by M.P. Haggard y E.F. Evans (Churchill Livingstone, Edinburgh).
Vogten, L.L.M. (1974). Pure-tone masking: A new result from a new method, in *Facts and Models in Hearing*, edited by E. Zwicker and E. Terhardt (Springer-Verlag, Berlin).

Auditory filters



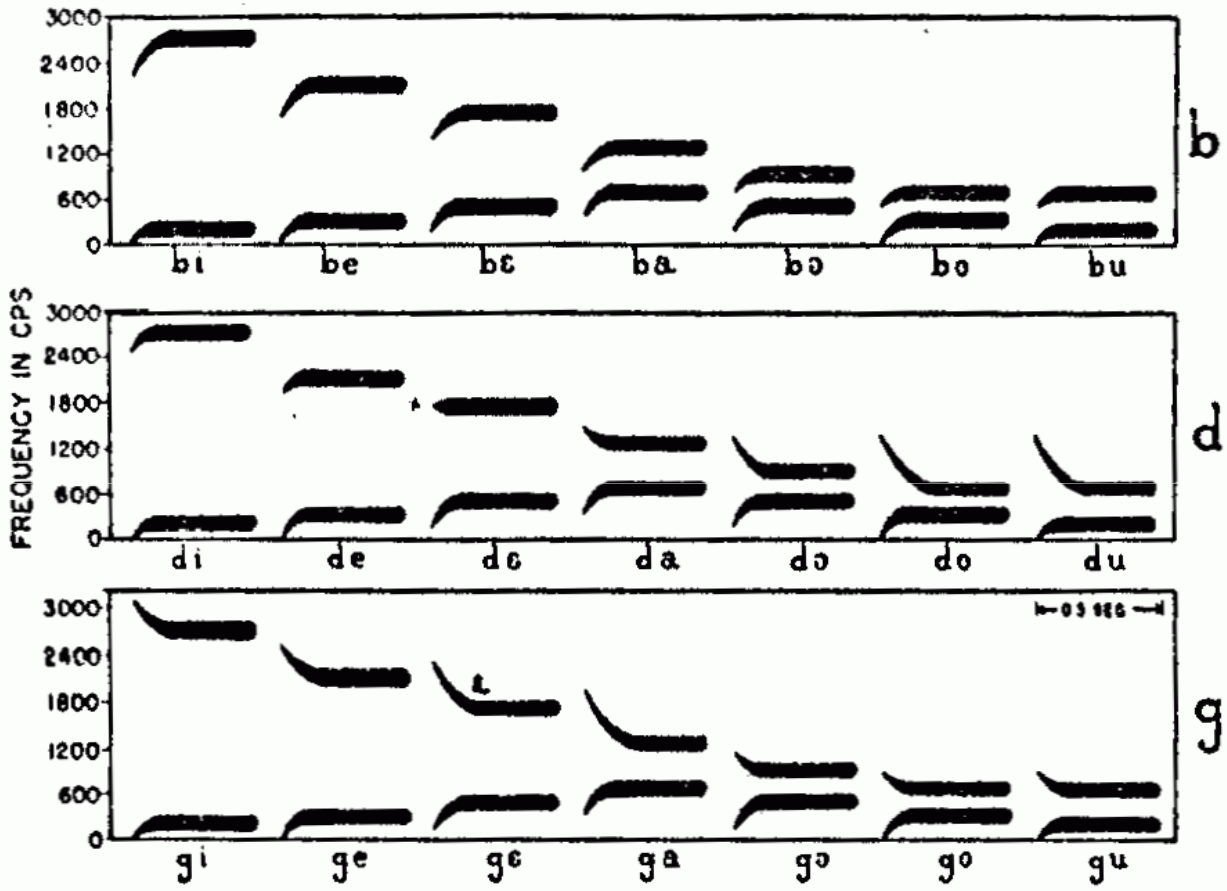
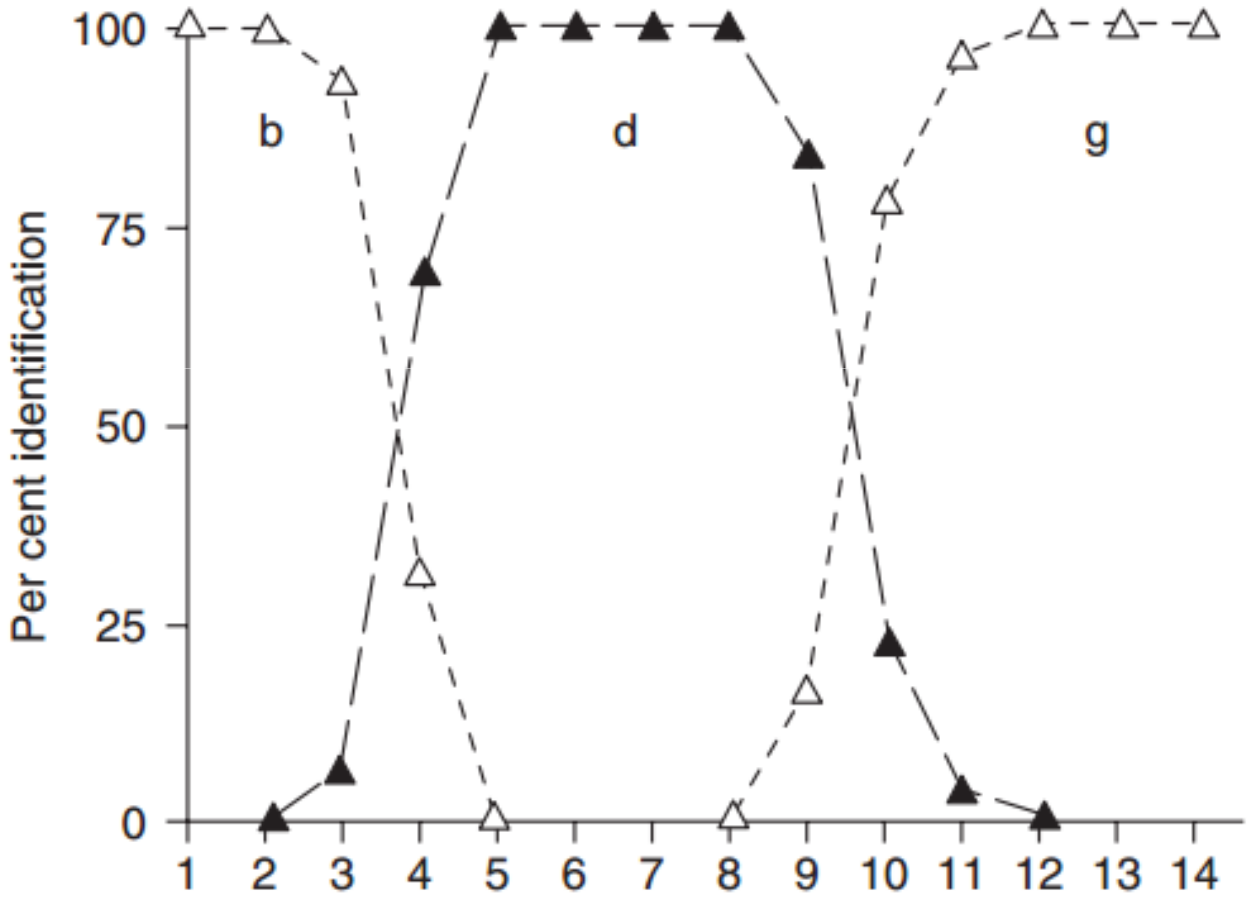


FIG. 1. Synthetic spectrograms showing second-formant transitions that produce the voiced stops before various vowels.


100
75
50
25
0
Per cent identification
b
d
g
1
2
3
4
5
6
7
8
9
10
11
12
13
14