Physiology Lessons
for use with the
Biopac Student Lab

PC under Windows® 98SE, Me, 2000 Pro
or Macintosh® OS 8.6-9.1

Manual Revision
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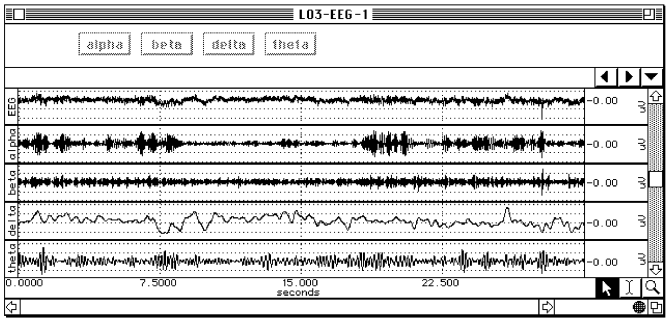
Lesson 3 Data Report

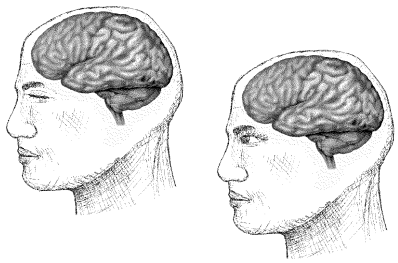
ELECTROENCEPHALOGRAPHY I

EEG I

Relaxation and Brain Rhythms

Alpha, beta, delta, and theta rhythms





Lesson 3

ELECTROENCEPHALOGRAPHY I

EEG I

DATA REPORT

Student's Name: 劉維凱 解正平 張景程

Lab Section: 3

Date: 3/23

I. Data and Calculations

Subject Profile

Name 解正平 Height 173

Age 21 Weight 66

Gender: Male or Female

A. EEG Amplitude Measurements

Complete Table 3.2 with Standard Deviation measurements:

Table 3.2 Standard Deviation [stddev]

Rhythm	Channel	Eyes Closed	Eyes Open	Eyes Re-closed
Alpha	CH 2	2.278586uV	1.293577	2.081121
Beta	CH 3	2.372860uV	1.264416	1.496023
Delta	CH 4	5.843241	6.523869	6.383193
Theta	CH 5	1.597178	1.568636	1.262293

B. EEG Frequency Measurements

Complete Table 3.3 with the frequencies for each rhythm and calculate the mean frequency:

Table 3.3 Frequency (Hz)

Rhythm	Channel	Cycle 1	Cycle 2	Cycle 3	Mean
Alpha	CH 2	10.8	11.2	11.5	11.2
Beta	CH 3	22.9	21.8	19.8	21.5
Delta	CH 4	0.35	0.23	0.25	0.28
Theta	CH 5	5.8	5.2	5.5	5.5

II. Questions

C. List and define two characteristics of regular, periodic waveforms.

1.週期是波行經介質時，介質上一個質點完成一次振動的時間

2.峰對峰值是波的最大值和最小值的差距

D. Compare and contrast synchrony and alpha block.

synchrony occurs when wave patterns & electrical activity occur at the same time.

Alpha block occurs when Beta waves dominate and mask alpha waves causing them to be desynchronized

E. Examine the alpha and beta waveforms for change between the "eyes closed" state and the "eyes open" state.

i. Does **desynchronization** of the alpha rhythm occur when the eyes are open?

Yes,because our brains will receive more inference and stimulation.

ii. Does the beta rhythm become more pronounced in the "eyes open" state?

No,it does not become more pronounced but decline in the eyes open state

F. The amplitude measurements (stddev) are indicative of how much alpha activity is occurring in the subject. But, the amplitude values for beta do not truly reflect the amount of mental activity occurring with the eyes open. Explain.

Because beta is concerned with anxiety, activity, and concentration, it will not truly reflect whether eyes open or not

G. Examine the delta and theta rhythm. Is there an increase in delta and theta activity when the eyes are open? Explain your observation.

delta波在深度睡眠時較明顯，theta波則是在成人情緒受到壓力時出現，從波形中也看不出來在眼睛睜開時有什麼特別的現象產生，我們認為delta和theta rhythm的變化可能在不同人的狀況下差異也會比較大

H. Define the following terms:

i. Alpha rhythm

brainwave with a frequency range of between 8and 13Hz with a pattern in normal persons at rest with closed eyes

ii. Beta rhythm

brainwave with a frequency range of between 13 and 30 Hz. Beta waves can be split into three sections : Low Beta Waves; Beta Waves ; and High Beta Waves

iii. Delta rhythm

brainwave with a frequency of oscillation between 0.5–4 Hz.

iv. Theta rhythm

brainwave with a frequency of oscillation between 4-8 Hz.It is associated with drowsiness, childhood, adolescence and young adulthood

End of Lesson 3 Data Report