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2005/04/18

2005/08/14

EEG :

()

(R.612)

:

()

EEG :

:

...

The relationship between the Visual Arrest Reaction of the occipital electroencephalogram and the level of scholar rentability measured as collegian's accumulative mean

«Experimental study on a sample of psychology students, Faculty of
Education, King Saud University, Riyadh»

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ABSTRACT

There have been many attempts to find a relationship between the electroencephalogram waves and intelligence by using a variety of different measures. Although many studies have neglected such correlation, others found a statistically significant positive relationship between the alpha waves and intelligence.

The objective of this study was to investigate, and for the first time, the relationship between latencies of attenuation or suppression of the alpha rhythm of the occipital EEG visual arrest reaction for a group of university students and the levels of their scholar rentability measured as collegian's accumulative means.

Recording of the occipital EEG by using of Polygraph BECKMANN (R.612) revealed a variation of these latencies and significant increasing inclination with the decreasing levels of the scholar rentability measured as collegian's accumulative means. We consequently highlight the presence of a strong negative correlation between these latencies and the accumulative means: latency means increase when accumulative means decrease.

Our study confirms that the cortical electrical waves (EEG) reflect in a manner the nervous system dynamic and elasticity: the longer is the latency of the attenuation or suppression of the alpha rhythm of the occipital EEG visual arrest reaction, the more is the reactive inertia, the lesser is the performance, and hence the rentability measured as accumulative mean, and the opposite is true.

Key Words: Visual Arrest Reaction, Occipital EEG, Alpha Rhythm, Scholar Rentability, Accumulative Mean, Intelligence.

[3]

EEG :

(V IV)

dendrites

[11] EEG :

polarization

Calvet (PSP_s) post-synaptic potentials

[11]

generators

Sherrer

EEG :

.[11] EEG

:

"synchronized" "

.[11] EEG :

autorhythmicity

EEG :

.[11]

"desynchronization" "

() vigilance

()

.[11]

(

rhythmes

waves

)

.(delta - theta - beta - alpha

-50 Mv

6-13 Hz

30

(8 HERMANN)

(15 PASCUAL - MARQUI)

(relaxed wakefulness)
)

.(

arrest reaction

.[7]

[3 11]

.[9]

EEG :

emotional tension

.[1]

alertness

(100-700 ms)

(1000 ms)

.[7]

.[3 7 11]

sensory

.psycho sensory

()

-800 ms)

()

.(100

()

(5)

: 1

(35)

()

()

(7 - 1)

(4 -1)

:(1)

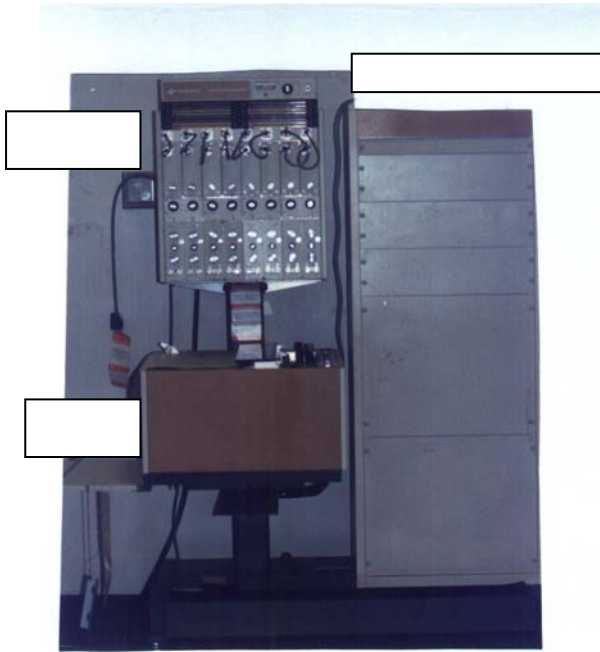
() (1)

	5	(100-90)	5	1	5	1
+	4.5	(89-85)	5	2	10	2
	4	(84-80)	5	3		
+	3.5	(79-75)	5	4	10	3
	3	(74-70)	5	5		
+	2.5	(69-65)	5	6	10	4
	2	(64-60)	5	7		

: -2

(R.612)

.(1)



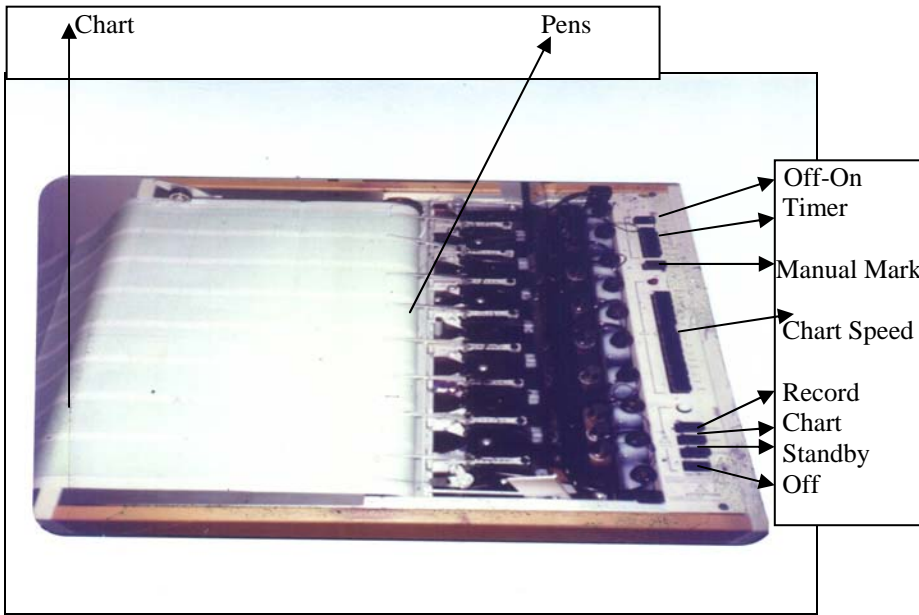
« » () (1)

:

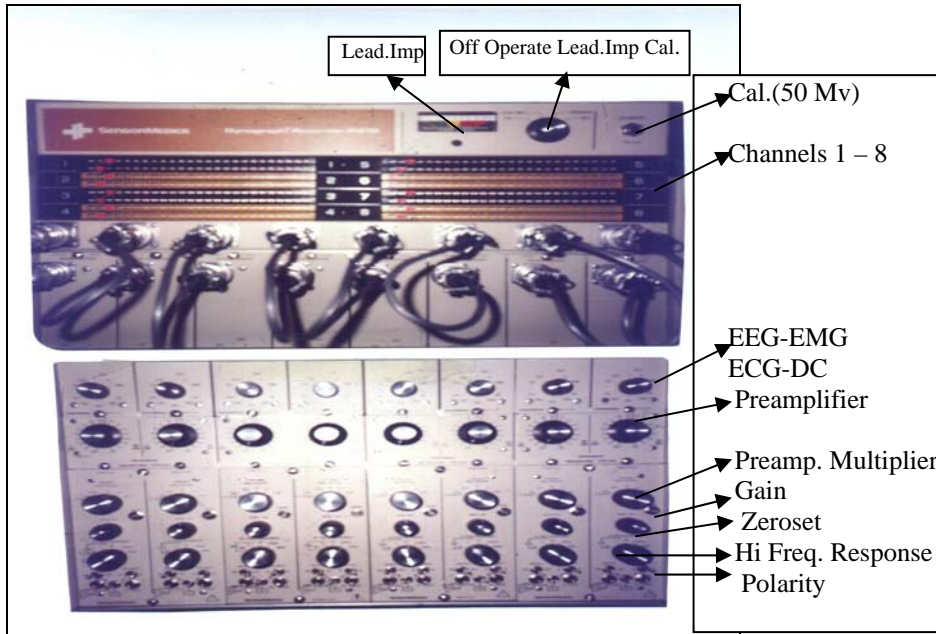
.(2)

-
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.(3)



(2)



(3)

-3

(5 -15)

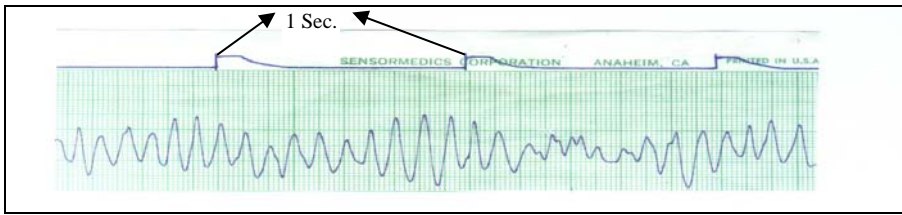
manual mark

()
: -4

ANOVA

...
(6-13 Hz)

(4)



(6-13 Hz :)

(4)

()

(5)

)

(

171ms :

. 4 3 2 1 :

600ms 400ms 257ms

(2)

(35 1) 35 :

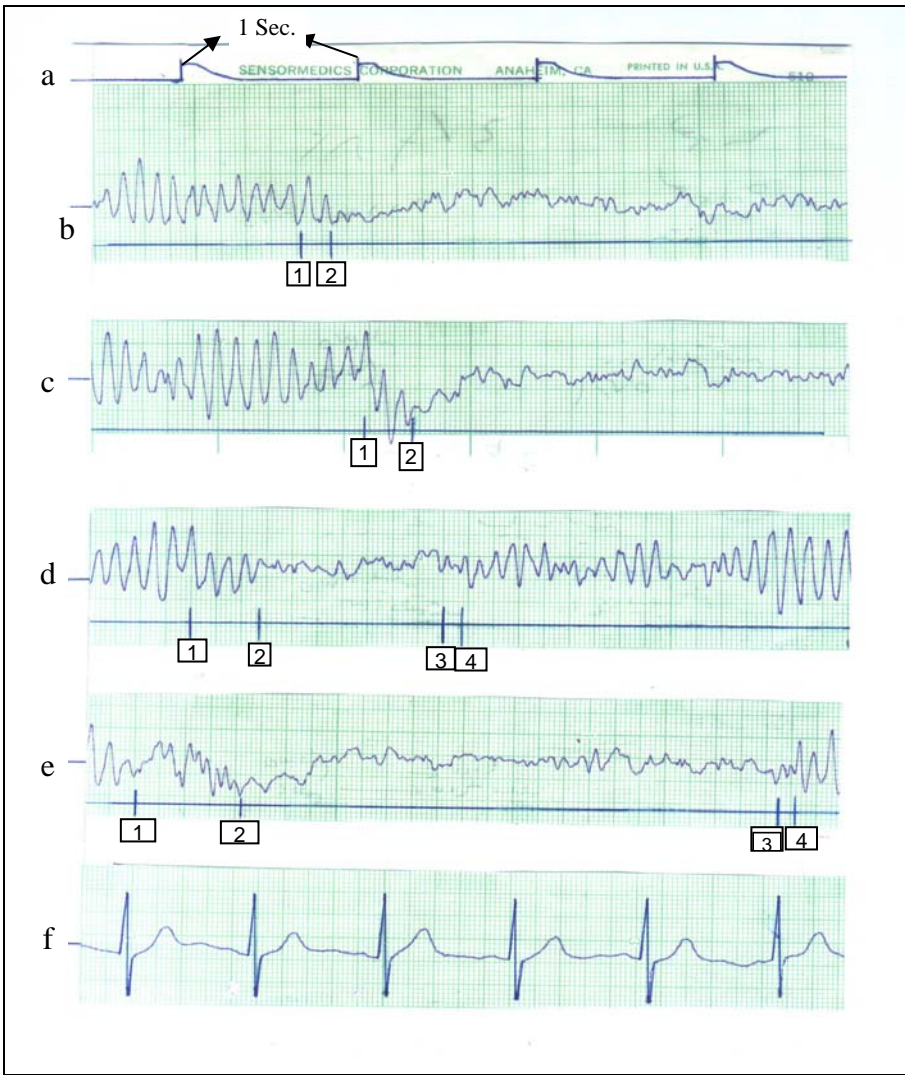
(

(2 5)

) 7 1

) 4 1 (5

3 + 2 = 2 1 = 1
(7 + 6 = 4 5 + 4 = 3



() EEG (5)

()
 :2 7) c (171 ms :1 5) :
 34) e (400 ms :3 17) d (275 ms
 .(600 ms :4
 . ECG : f .(1 Sec.) : a
 :4 . :3 . :2 . :1

(2)

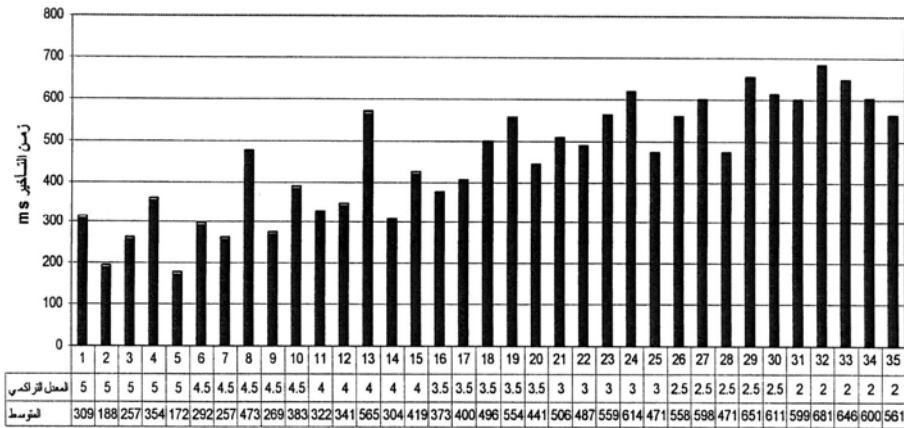
(4 1) (35 1) (7 1) ()

(2 5) (60 100) ()

ms	ms	ms	(5) ms ()			
= 1 = 1 255.9 ± 77.6	= 1 255.9 ± 77.6	309.2 ± 74.1	265-317-272-435-257	1	= 1 5 (100-90)	
		187.8 ± 36.7	247-147-185-187-173	2		
		257 ± 46.9	207-263-283-214-318	3		
		353.6 ± 48.6	331-407-283-386-361	4		
		171.8 ± 42.8	133-243-145-167-171	5		
= 2 = 2 362.6 ± 39	= 2 335 ± 91.6	292 ± 56.8	297-331-357-213-262	6	= 2 4.5 + (89-85)	
		257.4 ± 20.8	254-237-292-247-257	7		
		473 ± 49.8	392-524-497-485-467	8		
		269.4 ± 26.3	283-257-306-237-264	9		
		383.2 ± 36.8	383-372-446-354-361	10		
	= 3 = 3 390.1 ± 106.9	= 3 390.1 ± 106.9	322.4 ± 32.6	362-283-297-344-326	11	= 3 4 (84-80)
			341.2 ± 27.1	358-350-296-338-364	12	
			564.5 ± 53.7	490-548-638-566-582	13	
			303.6 ± 25.2	237-325-333-300-287	14	
			418.8 ± 106.2	334-562-387-495-316	15	
= 4 = 4 490.2 ± 52.8	= 4 452.9 ± 73	373.4 ± 49.8	400-420-375-382-290	16	= 4 3.5 + (79-75)	
		400 ± 29.4	358-387-400-430-425	17		
		496.2 ± 47.8	416-540-508-522-495	18		
		553.8 ± 76.7	541-492-674-576-486	19		
		441 ± 54.9	387-436-474-516-392	20		
	= 5 = 5 527.5 ± 58.8	= 5 527.5 ± 58.8	506 ± 89	450-560-567-376-577	21	= 5 3 (74-70)
			486.6 ± 82.4	512-532-387-585-417	22	
			559.4 ± 52.4	623-585-530-487-572	23	
			614.2 ± 65	647-514-687-627-596	24	
			471.4 ± 52.4	437-510-500-396-514	25	
= 6 = 6 597.7 ± 27.9	= 6 578 ± 68.2	558.4 ± 74.4	634-582-600-442-534	26	= 6 2.5 + (69-65)	
		598.2 ± 107.3	674-436-574-714-593	27		
		471.2 ± 80.6	474-374-432-593-483	28		
		651 ± 60.3	687-654-694-547-675	29		
		611 ± 107.4	667-458-704-687-539	30		
	= 7 = 7 617.4 ± 46.7	= 7 617.4 ± 46.7	598.6 ± 91.5	473-562-681-582-695	31	= 7 2 (64-60)
			681.2 ± 55.8	597-712-747-673-677	32	
			646.2 ± 52.9	634-674-720-581-622	33	
			600 ± 86.7	569-638-479-714-600	34	
			561 ± 78.2	687-574-484-513-547	35	

35 :

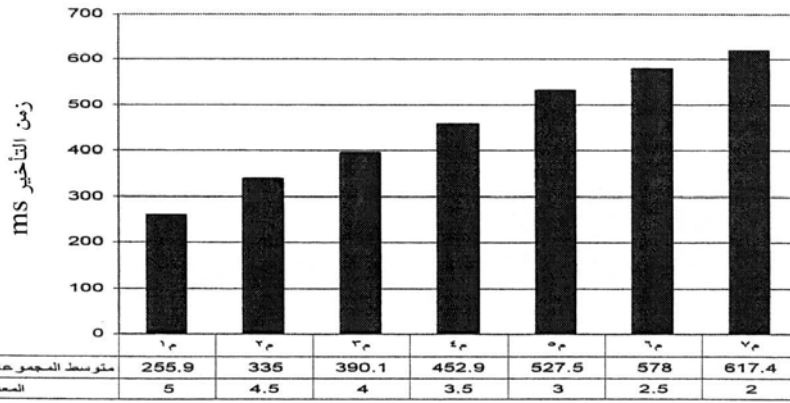
681.2 ms 1 5 171.8ms)
 6 (7 32
 (2 5) 35 :
 7 1
 .()



:) 35 (6
 (7 1) (2 5
)

(6)

2 5 7 1 (7)
) 7 1 (5)
 .((2 5)



1 (7)

(2 5 :) 7

()

() (7)

2 5 7 1

5

617.4ms 5 1 (255.9ms) :2

.2 7

(8) ()

1

(2 5) 4

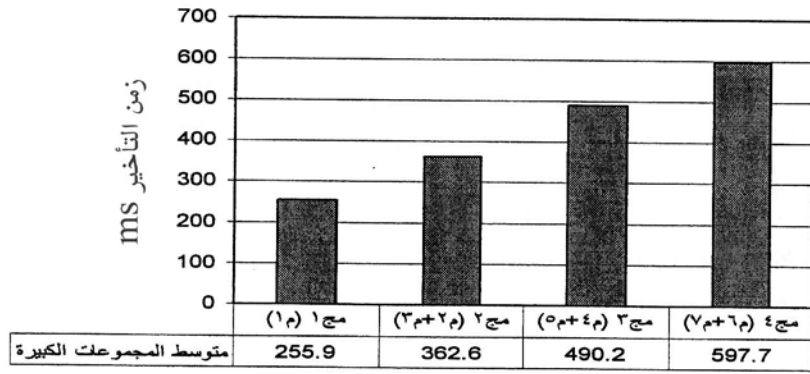
()

(7 + 6 = 4 5 + 4 = 3 3 + 2 = 2 1 = 1)

362.6 1 255.9ms)

597.7 ms 3 490.2 ms 2 ms

. 2 5 (4



1

(8)

(2 5 :)

) 4

()

ANOVA

:

EXCEL

(3)

	F			
	14.761	77.61	255.88	1
		91.57	335	2
		106.88	390.1	3
		72.99	452.88	4
		58.77	527.52	5
		68.22	577.96	6
		46.73	617.4	7
6 / 28		2.445 = F	35	

() F < () F (3)

(4)

	F			
	21.256	77.61	255.88	(1) 1
		98.39	362.55	(3 + 2) 2
		63.47	490.2	(5 + 4) 3
		33.77	597.68	(7 + 6) 4
3 / 16		3.238 = F	35	

$$(\quad) F < (\quad) F \quad (4)$$

HANS BERGER

EEG :

.(1,2,4,18,19)

(9,10,14,16)

(1) KNOTT et al 1942

1983

GASSER et al . 8

IQ

EEG:

10-13

Power Spectral Analysis

EEG :

.[4] EEG :

IQ

[21] VAN BAAL et al 1998

: () coherence

EEG

[6] 1999 GEVINS et al

EEG :

[18] SMITH et al

EEG :

Events-

[2] (ERPs) Related Potentials

[12,13]

T) T

[19] (2002) SCHMID et al
correlation analyses

(testes
EEG

EEG :

(IQ)

EEG

() EEG :

EEG :

[16]

)

() (

(100-800ms) (

:

) pulsations

:
(oscillations

[7]

)

[7] (

nervous dynamic

synaptic facilitation

reactive inertia

([11] 1960 BREMER)

)

(

[7]

)

(

(2

)

(

)

35 :

(5)

(7 1)

(6) 2 5

()

(8 7)

[20] 2004 THATCHER et al

(EEG phase delays) EEG:

[5] 1997 GEVINS et al

()

EEG : [18] 1999 SMITH et al

[17] 2002 PUTMAN

:

EEG

.feed back

Post reinforcement

:PRS) synchrony

(

stressful experiences

PUTMAN

.traumatic e.

prophylactic manner

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