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ADJUSTING OF THE "BIOPAC" INVESTIGATION MINILAB FOR MEASURE THE REACTION SPEED TO THE VISUAL STIMULUS

Abstract

The appearance of Personal Computers and the computerized mini-labs marked a quality improvement in the technological development. By means of the new technology, a larger amount of information is being processed, information which is then stored for later use.

The concrete purpose of the scientific investigation was to determine how the BIOPAC investigation mini-lab can be used to measure the reaction speed to a visual stimulus, in order to use it for further as a tool for researchers, teachers of coaches who are in charge of identifying and measuring the ability.

As a conclusion to the study we can state that: The complex made up of the BIOPAC student investigation mini-lab and the notebook can be successfully used to measure the reaction speed to the visual stimulus. Moreover, the system offers mobility and multiple possibilities of analyzing the data, since it has a reduced weight, it is compact and easy to move and it has a large data storing capability

Key words: *test, reaction speed, visual stimulus, BIOPAC*

INTRODUCTION

At present, the performances achieved have reached high levels, thus leading to complex demands on the individual qualities. That is the reason why the process of discovery and selection must be continuously improved from the point of view of the somatic, motion, and functional structure of the individual.

In the case of the high level performance players, the demands imposed due to the technical and tactical value are extremely high, and the energy spent during the game is considerable, being characterized by a large number of high speed motion activities (especially implying the performance and reaction speed) movements.

Most of the great achievements made lately in the field of science and technology are also due to the science of computers, which has created new opportunities for making some complex calculations and for processing large amounts of information in a short time. The creation of personal computers and of the computerized minilabs is the great improvement realized by the technological evolution. By means of the new technologies, a large amount of information is being processed and then stored for later use. This development is the germ and the essence of the new technical and scientific revolution.

PURPOSE

The actual goal of the scientific investigation was to determine the possibility of using the BIOPAC student lab investigation minilab for measuring the reaction speed to the visual stimulus, in order to use it as a working tool for the researchers, teachers or coaches who are trying to identify and quantify this motion quality.

CONTENT

Modern technology, and especially future technology, with its amazing dynamic is certainly going to leave a mark on the specific equipment for high performance sports.

As a consequence of these aspects we have considered that the use of a complex technical device which would allow us to get some actual quantifiable information

concerning the reaction speed to the visual stimulus could be an interesting subject. We have tried to find a practical, efficient method, which would save time and especially one which would be mobile, offering possibilities for investigation, storage and analysis of data for a greater number of subjects.

The BIOPAC student lab investigation minilab (photo 1,2) is a complex device of analysis and investigation for no less than 17 functional parameters. The device is made up of a series of sensors, a central unit for analysis which has an interface for transmitting the data in a graphical form to a P.C.

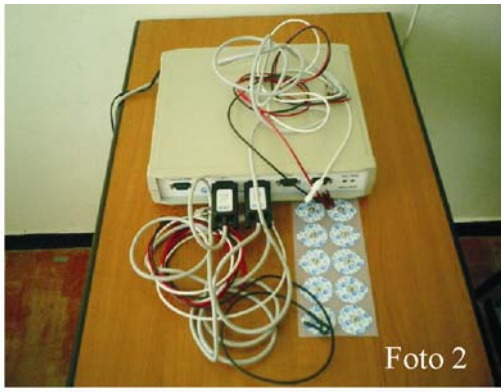

Photo 1, 2, 3 *The BIOPAC student lab investigation minilab*

The investigation device can be made in a standard form by following certain procedures which are presented in a user's manual. The system has the great advantage of being a mobile investigation lab, easy to use if the testing stages are respected, it can be efficiently used as a didactic material in the educational institutions, and an interactive communication system with the device makes the usage parameters to be clear, not allowing any possible usage error.

The BIOPAC can make measurements of the following indexes: electromyography (EMG); electroencephalography (EEG) the rhythm of the alpha, beta, delta end theta waves of the brains; electrocardiography (ECG) the mechanical actions of the heart, the peripheral pressure etc.; the breathing cycle, the breathing rate; the galvanic response time on the level of the epidermis; polygraph; electro-oculogram (EOG); the time of reaction to auditory stimuli; lung functions – volumes and capacities; cardiovascular and respiratory adjustments during the aerobe physical exercise, ECG during and after the performance of the exercises, heat exchanges etc.; the blood system - ventricular systoles diastoles, arterial pressure, etc.

For our research we have used the BIOPAC connected to a Toshiba Tecra A2 notebook (photo 4), and we have adjusted the test for measuring the reaction speed to auditory stimuli in order to measure the reaction speed to a visual stimulus following a pre-established standard protocol . The data has been gathered in a data base which has been used later.

Photo 4 *Progress of the test*

The investigation protocol supposes the presentation of the method of carrying out the test for the whole group of subjects, and then the test itself will take place with a single subject in the lab (gym, office etc.).

At irregular intervals, 10 signs will appear on the screen of the PC (photo 5), signs materialized into some triangles (A). Every time they appear, the subject will have to press the switch as quickly as possible (photo 3). In the end, the subject's results will be displayed and stored, results including the difference between the apparition of the stimulus and the moment when the switch was pressed, as well as the average per exercise.

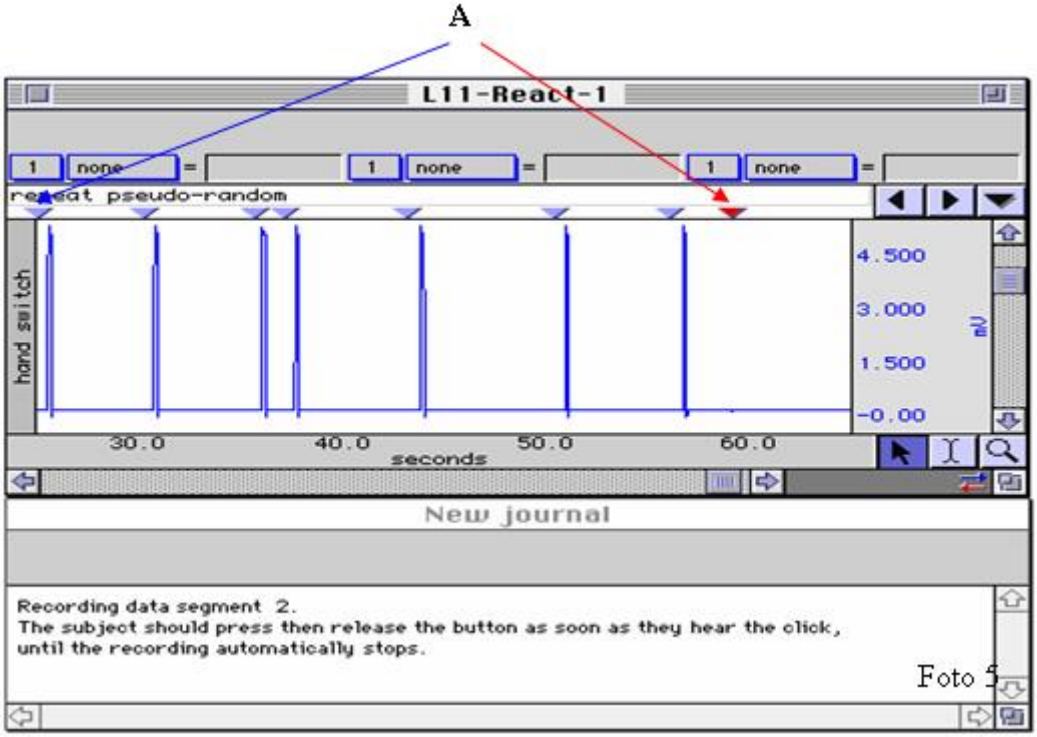

Photo 5 *Image with signs on the screen of the PC*

The study has been carried out on 90 subjects, pupils in the second form at Miron Costin School in Bacău (8 month). As a result of the measurements carried out, a data base has been made up (tab.1) which also included identification data, sex, values of the height, weight and span, by means of which a hierarchy could be drawn up to show the subjects' skills for practicing performance sports from the point of view of the values of the reaction speed to a visual stimulus.

nr	Indicator	sex	cl	DN	Î	G	A	Biopac V
	name/ first name			year	cm	kg	cm	sec
1	M.P.	b	2D	97	127	25,8	132	0,346
2	G.D.	b	2A	96	133	33,0	136	0,357
3	N.T.	f	2A	97	134	24,2	128	0,386
89	S.E.	f	2C	95	126	24,0	132	0,574
90	P.A.	f	2B	97	135	43,1	133	0,588

Table1. *Example of the data base by means of which the hierarchy of the subjects has been drawn up*

CONCLUSIONS

The technical device: BIOPAC student lab investigation minilab. + notebook has proved its usefulness. Small, compact, easy to move, having a great power of storing and analyzing the data, the complex technical device can be successfully used for measuring the reaction speed to visual stimulus.

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