

ORIGINAL RESEARCH

STUDY ON THE CORRELATIONS BETWEEN CERTAIN FUNCTIONAL INDICES AND THE  
CONDITIONAL MOTOR SKILLS ON AGE GROUPS IN ATHLETES

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**Abstract**

Effort represents in sports one of the essential environmental factors, vital both in the body's harmonious development, and in maintaining its health. Motor activity, through the phenomena of adaptation, compensation and overcompensation that it generates, stimulates and in some cases guides in growth and development, has two components: a genetic one, referring to inborn characteristics, the genetic information making up the genotype and manifested as the phenotype (the external manifestation form), and an acquired one, obtained through exercises influenced by environmental conditions. The present study undertaken by means of multivariate analysis of conditional motor skills evinced that the indices of conditional motor skills may remain strongly connected during many years with certain functional indices, and then these correlations may suffer essential alterations.

**Key words:** motor skills, hemoleucogram, blood biochemistry, athletes, multivariate analysis

**Introduction**

Physical or motor skills constitute the basic motor premises or requirements the athlete needs to build his own technical skills. Demeter, A. [1], defines motor skills as those motor dimensions manifested in parameters identical to movement, with the same measurement benchmark and based on similar physiological and biochemical mechanisms. Despite methodological differences among co-existing theories a group of abilities playing a special role in the processes of motor control and learning is a general acknowledgement. These abilities were identified and named in a different way by scientists: Fleishman [2] proposed to distinguish "perceptual-motor abilities", Gundlach [3] suggested to consider "coordinative abilities" while Keele et al. [4] identified "general coordination factors". Conditional motor skills are directly dependent on physical shape, are based on the metabolic effectiveness of muscles and other apparatuses and systems (circulatory, respiratory, nervous system, etc.) [5,6]. The limiting factors are related to the quantity of energy available in the muscles and the mechanisms regulating the energy influx (enzymes), speed and strength of contraction, given by the quality and number of motor units involved in the activity. The most important stage of their development is situated at the beginning of puberty, between 12 and 17 – 18. The coordinative motor skills are mainly determined by the processes of movement control and regulation [7].

Taking into account that these motor skills have two components: a genetic one referring to the inborn characteristics, the genetic information making up the genotype and manifest as the phenotype (the form of external manifestation), and an acquired one, obtained by exercise influenced by the environmental conditions, the aim of the study is the evaluation of possible correlations on age groups between the functional indices and the conditional motor skills in athletes, by means of a multivariate study [8,9]

**Material and method**

The study included 60 voluntary male athletes aged between 14 and 16 years, all members of CSS and LPS Galați and Brăila. Three study groups were constituted as follows:

- Group 1- 20 athletes aged 14;
- Group 2- 20 athletes aged 15;
- Group 3- 20 athletes aged 16 .

For the functional indices the complete hemoleucogram was tested, as well as the blood biochemistry through the automated analysis, using biochemical analyzer Hitachi 917, Japan, together with the complete urine exam (summary and sediment) through the same automated analysis method. The initial test was



It can be noticed that irrespective of the season of measurement for these conditional motor skill indices during the first year of analysis, the performances A50I and A50N are positively correlated especially to the indices shown in Table 1.

Functional indices:	Correlation to the time of 50 m race	
	A50I	A50N
Thrombocytes	-0.125	-9.226e-02
GGT	-7.616e-02	-0.104

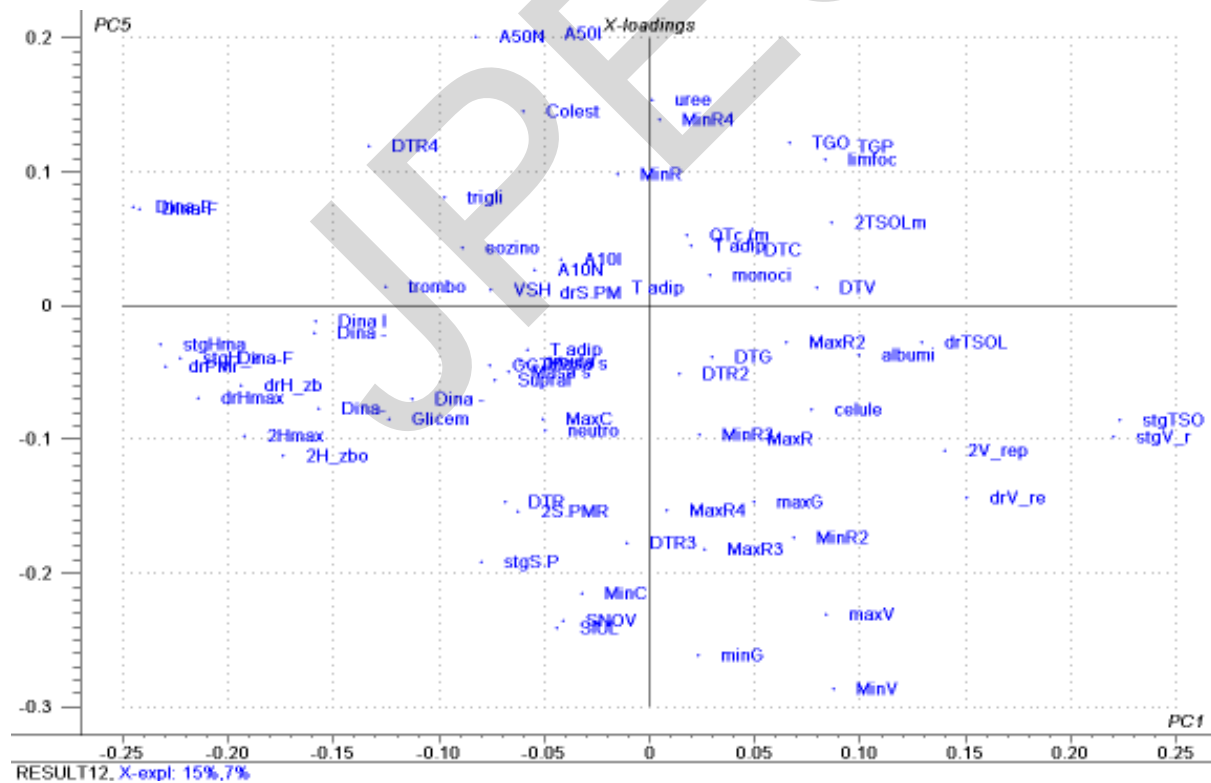
A completely different behavior is displayed by the indices of the conditional motor skills related to the length in the long jump, measured in July (variable code SIUL) and November (variable code SNOV), both characterized by low negative PC1 loadings and high positive PC2 loadings.

	PC1 loadings	PC2 loadings
SIUL	-4.389e-02	0.126
SNOV	-4.091e-02	0.131

These indices are in a very strong positive correlation to triglycerides,

The analysis shown in Fig 2 shows that PC5 distinguishes between the variables which are highly and positively correlated to A50I and A50N, respectively the variables *cholesterol*, *triglycerides* and the ones in a very strong negative correlation to A50I and A50N but in a strong positive correlation to SIUL and SNOV, respectively *neutrophils*.

Fig 2. Analysis of the loadings PC4 vs. PC1



The best discrimination between the indices of conditional motor skills and the variables multidimensionally correlated to them is provided by PC1 together with PC5 and PC6, and that is why only these main components are to be taken into account in the age groups analysis.

## Conclusions

It can be noticed that the indices of the conditional motor skills may remain strongly correlated to certain functional indices during several years, after which these correlations undergo essential alteration.

It is to be noticed that A50I and A50N are in a strong positive correlation to the VSH values in 15 and 16 year-old subjects, but not in the 14 year-old subjects. Another example is the fact that the indices A10I and A10N are in a strong positive correlation to the variable *triglycerides* in the 16 year-old subjects, but in a weaker correlation in 15 year-old subjects, and in a considerably weaker correlation in the 14 year-old subjects. Regarding the indices SIUL and SNOV, they are in a strong positive correlation to triglycerides, but the intensity varies with age.

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