

# THE AVANT-GARDE MODEL OF MOTOR ABILITIES

<sup>1</sup>Dobromir Bonacin PhD, <sup>2</sup>Stipe Blažević PhD

The Faculty of Sport and Physical Education of the University in Sarajevo

<sup>2</sup>The Faculty of Economics of the University in Rijeka

## Summary

A new model of motor functions determined by the constant interaction of an entity and its environment has been defined and presented in the measure which is dynamic and is changed in three possible directions: a) in the direction of strengthening acute events from environment and reactions on them (On-line activity), which has the aim to engage the entity to a maximum degree and which provokes its destruction in the end, b) in the direction of cooperation of entity with other entities being around (Common activity) which, for sure, aims to create super entities taking over the parts of resources and information from each other and c) in the direction of internal and permanent accumulation of an entity becoming, in that way, able to overcome the frames of its existence and open some new categories of perception and development (Batch).

**Key words:** motor functions, structure, processes

## Introduction

Defining the patterns of kinetic transformations is a serious and very complex task. The reasons for that can be found mostly in the fact that a human organism is very complex and complicated with a number of mutually interlaced functions. In these terms, mobility abilities are usually taken into account as a joint set of functions giving possibility for movement realization in a way that their internal structure and their relations with other organism sub-segments is examined and surveyed by some adequate procedures. Morphology and mobility structures and characteristics of their development have been examined to a large extent even since hypothetical constitutional dimensions were established up to current dominant taxonomies and the most various classifications, as well as their relationship with other dimensions. Some serious trials of interpreting the regulatory mechanisms responsible for operational mobility functions at different levels of the Central Nervous System have existed since the survey performed by Luri, Anohin and Chaidze. Almost all of the trials of this kind have been based on cybernetic models which in the phenomenological sense logically simulate the supervision, control and operation being responsible for the final mobility effect, in other words for the aimed human motion ability. In that way, the focus of research has been transferred from sometimes before dominant interpretations of test tasks contents onto the description of superior functional mechanisms, and also, in a large part, onto the localization of a particular regulators of mobility output. Naturally, this kind of approach has led to a number of interesting conclusions, some of which faced a quality usage in everyday operational activities in the systematic physical exercise and especially in sport. On the other hand, it is a fact that such kind of models have left a number of unexplained questions but at the same time another set of questions related to motor ability in a more global sense have been asked.

Although it seemed that all the solutions of that kind would be solved by cybernetic, the final consequence appears to be the permanent need for management and permanent adjustment of parameters in order to achieve a minimum acceptable effects conforming with the previously defined aims of direct work. Therefore the problem of motor functions dimensions structure creation has been defined in a new, avant-garde way. It has been emphasized by the classical methodological terms that the research ways and approaches has been overloaded by the cybernetic concept to an extreme degree, and that the permanent explication of rules and patterns can be reached only by support of process methodology which is well described in literature. And, having a realistic supposition on the fact that the practical and specialistic skills in particular disciplines have been well known to a large extent, the efforts have naturally been directed to do influence on as younger age as possible. The data had initially been brought to an image position because of the maximization of common variability, and then the analysis for the process identification was applied onto the data (Bonacin 2004) and in the end the canonical correlation process analysis itself.

## **Methods**

The examinees covered by this research were represented by the pupils of the first grade of primary school ( at the beginning of that age: 7 years +/- 2 months ) measured with 26 morphology-mobility variables on three occasions with the process of transformation lasting in total 18 months. A group of 249 children of the male sex in the age of 7 (seven) were measured by 13 morphological ( height-AVIT, leg length-ADUN, arm length-ADUR, wrist diameter-ADRZ, knee diameter-ADIK, shoulders width-ASIR, body weight-ATEZ, forearm circumference -AOPL, lower leg circumference-AOPK, thorax circumference -AOKG, upper arm skin wrinkle-AKNN, back skin wrinkle-AKNL, stomach skin wrinkle-AKNT), 10 mobility ( side steps-MKUS, backward polygon-MPOL, standing on bench-MP2O, hand tapping-MTAP, leg tapping-MTAN, the long jump without running -MSDM, ball throwing-MBLD, 20 metre sprint from running start-M20V, sit-ups.-MDTS, enduring standing in the upright position-MVIS) and one functional (three minute sprint -MT3M) variable . The data had initially been brought to the image position because of the maximization of the mutual variability, and then the analysis for the process identification was applied to those data (Bonacin 2004) and in the end the canonical correlation process analysis itself.

## **Results**

The particular processes were defined in the first part of the procedural activities : length growth of bones (ALON), voluminosity development (AVOL), fatty tissue development (AMAS), width growth of bones (ATRA).

Then - Batch mobility process characterized by constant reactions (MONL), Common mobility process characterized by exchange of resources with environment (MCOM) and Batch mobility process mostly characterized by the independent accumulation (MBAT). The correspondence among the phases of the process has been described in the Table 1.

	ALON	AVOL	AMAS	ATRA	MCOM	MONL	MBAT
ALON	1.00	-0.39	0.39	-0.17	0.17	-0.10	-0.09
AVOL		1.00	0.51	-0.23	-0.15	0.05	0.11
AMAS			1.00	0.22	-0.12	0.06	0.06
ATRA				1.00	-0.18	0.14	0.05
MCOM					1.00	-0.48	-0.60
MONL						1.00	-0.41
MBAT							1.00

Table 1. The correlation of identified process variables

Hi=	69.54		
df=	12		
p=	0.0000		
<b>LEFT SET</b>	<b>KF1</b>	<b>KF2</b>	<b>KF3</b>
ALON	0.59	-0.29	-0.23
AVOL	-0.48	0.73	-0.48
AMAS	-0.40	0.18	-0.41
ATRA	-0.65	-0.34	0.59
$\sigma^2$	0.29	0.19	0.20
<b>Total <math>\sigma^2</math></b>	<b>0.68</b>		
<b>RIGHT SET</b>	<b>KF1</b>	<b>KF2</b>	<b>KF3</b>
MCOM	0.98	-0.20	0.08
MONL	-0.64	-0.65	0.41
MBAT	-0.41	0.84	-0.35
$\sigma^2$	0.52	0.39	0.10
<b>Total <math>\sigma^2</math></b>	<b>1.00</b>		

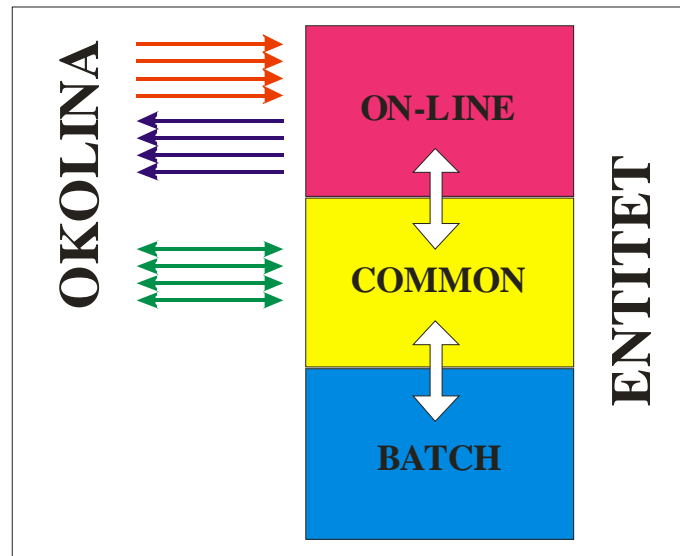
Table 2. The canonical correlation analysis of morphology and mobility processes

According to the results of the canonical correlation analysis, there appears the global conclusion that there exist a remarkable correlation between the two analysed sets of process variables. Three canonical factors, being saturated by the remarkable projections of the process variables of the primary process definition, were isolated. The isolated individual variability is also of a high degree as well as the total one (68 and 100 % respectively). It is shown that the projections are in some decrease from the first to the third factor by the structure of canonical factors, so it could be concluded that the matter involved here are the canonical factors of increasingly less importance, although their definition has still been clearly expressed.

The first canonical factor has been described in the combination of features in which the dominant role is given to the Common mobility process (0.98). All the other projections, both in the morphology and motor functions frame, are also solidly expressed, especially the longitude and negative transversal. Such a kind of entities would be tall and slim, without particularly large quantity of muscle tissue, but they would also have a mobility repertoire in which the less important role is performed by the acute activity reaction abilities. They would have weekly accumulated perceptions and resources, lower levels of energy capacity achievements and strength production, so they would need a multiple help and cooperation with other entities in their environment in order to achieve any kind of kinetic or development aims. Their distinctive feature would be explosiveness supported also by little weight as well as their coordination features. The second canonical factor has mostly been saturated by Batch mobility process feature (0.84), which means that they include superior, athletic entities having great possibilities of effects accumulation of the transforming operators application. The volume is especially joined to that model in the morphology process domain which, for sure, confirms this kind of thinking because the entity athletic constitutions are literally defined by it, probably with a strongly expressed motivation tendency towards performing training and exercise in general. That clear picture representing the process is systematically supported by all the other process characteristics. The third and the last canonical factor has been defined in the morphological set expressed by transversality and by all other morphological indexes both average and negative, while it has been defined in the motor function set by the bipolar feature by which the On-line feature is found on the positive pole and the Batch on the negative one. It is realistic to suppose that short entities that do not also have other features clearly expressed, have been involved here and as a possible consequence of it they do not have opportunity to realize the achievement of stronger power and intensive mobility. We are talking here about relatively undeveloped entities in the scope of biology whose functions have not yet been grown up enough in comparison to the sample in a whole. It has been confirmed by the motor function set because there are not any serious permanent accumulations (-0.35), which is the confirmation of the hypothesis on undeveloped state. So, it is not difficult to conclude that that we are talking here about an activity determined by the acute problem-solving. In this process, the immature children, whose functions are not even close to the ones expected, in other words the children supposed to have a start in their growth in a way similar to the case of other entities in the sample, have been described. Anyway, all the motor function tasks being settled in a successful manner by the more developed entities by help of the motor function levels of the higher degree, cannot be realized by the entities being distinguished by this kind of processes. Then, after the detailed arguments have been offered, it is not a special kind of miracle if this process was easily proclaimed hypothetically confirmed On-line process, because it is quite probable that the acute task settlement in motion is their basic feature.

## **Discussion**

Instead of having a passive position and instead of defining structure of any kind of anthropology dimensions, the results have shown that the problem of defining ‘‘structure’’ is much closer way of process identification. The assumption being consequence of that avant-garde model was that human motor functions have been developed because of reasons dealing with biology and existence and for that reason their starting basis are not found in the actual technology thesis or actual thesis of local scientific approaches of a shorter lasting values, but in more comprehensive anthropology reasons related to the total human development. It is the fact that ontogenesis represents the short recapitulation of **philogenesis**. For that reason, it may be well supposed that in the age of seven or eight , the recapitulation of that kind has not yet been finished, which allows doing analysis of many and even global development processes, and with an adequate methodology, results transparency and samples with stable functions are ensured , if all the other conditions enabling such transparency were ensured. In this respect, a new model in which the motor function set assumes a new dimension has been created, especially in relation to the morphology changes. The morphology changes have really appeared and they can be seen under the strict local parameters monitoring. But, being aware of process patterns, such a kind of changes cannot be ignored. The thing which is really new in this work is the integration of morphology changes and morphology features in the process methodology which all together defines a very dynamic model. There is no individual input events registered in that model, so under operational settings there are some adjustments done by the mechanisms of feedback relation until the satisfactory condition has been reached. There is a permanent interaction between the entity and its environment in the measure which is dynamic and is changed in three possible directions: a) in the direction of strenghtening acute events from environment and reactions on them (On-line activity), which has the aim to engage the entity to a maximum degree and which provokes its destruction in the end, b) in the direction of cooperation of the entity with other entities being around (Common activity) which , for sure, aims to create super entities taking over the parts of resources and information from each other and c) in the direction of internal and permanent accumulation of an entity becoming, in that way, able to overcome the frames of its existance and open some new categories of perception and development (Batch). So, the entity is changed by that model all the time but for us, those changes are not accidental but understandable and recognizable. The three mentioned kinds of entity activity are in a close relation and are resulted by each other because in all situations it is started as on-line, and through common, it is finished with Batch, which means that there is a clear development relation and a recognizable process.



**Graph 1. The model of dynamic structure of motor function**

The process in a whole is not anything else but the process of understanding and the three mentioned features are only its decomposed important segments. For the sake of this research, the morphology-motor functions processes have been analysed, but it definitely does not mean that they would be unrecognizable in any other kind of environment, which is the matter of thesis of possible surveys.

### **Literature**

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