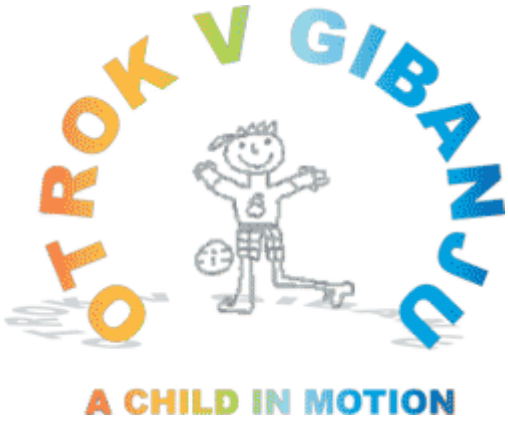

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ABOUT SOME ASPECTS OF CHILD'S DEVELOPMENT

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Abstract
This article represents new idea of motor development, funded on taxon changes monitoring under the model of development consecutive points. Such idea is possible because growing induces changes in motor space that are connected with entities flowing from one to another development point. For purposes of this work, we use a new modelling procedure that includes avant-garde cumulative sorted positions. For presentation of model, we analyze 90 male pupils aged 10.5, described with integrated set of 18 motor variables through two time points (totally one school year). Results clearly show that entities restructuring dynamic is far away from unknown regularities and that we can easily monitor and control effects of growing in motor area. Most interesting changes are produced in coordination subspace, as well as in the subspace of realization of energetic demands. No special interesting changes were recognized within synergic regulation subspace. Results and logical conclusions of presented model directs our programming work forward to development of integrated abilities and transparency of stimuli reflections into parallel development of child's motor domains.

Key words: children, processes, motor, development.

Introduction

Development of child, in sense of growth and maturation, is influenced with numerous biological and environmental factors, usually supported with moving and physical education (Bilić 2005). From scientific point of view such aspect includes knowledge and importance of predominated genetic individual characteristics and of intentional transformation process directed forward to development support (Bilić 2005, Blažević 2006). Because of that reason, process as phenomenon is especially interesting. In the broadest sense, processes imply the events, regardless of the ways in which they are defined, connected with some objects or entities within a time interval set in a particular way.

Under the classical cybernetics definitions, we are talking about compound of methods that guide us to some type of status definition and regulation, usually within at last two time points. By reasonably assuming that generally at least one permanent system of events may affect the objects, and consequently the results displayed as differences, the issue of defining a process is but a decomposition of a composite process in its parts that can be described in particular phases (Bonacin & Carev 2002). Likewise, by assuming that generally these systems of events, that is, the elements of the composite need not contain the phases that totally overlap in time, the issue of process identification apparently comes down to determining the existence, intensity, onset, duration and completion of a particular part of the process, that is, of the sub-segmented process. It is, therefore, possible to define new models of data synthesis that provide reliable process identification (Bonacin 2005). One such model is presented in this article, and explains why process identification leads to knowledge about child's development.

Methods

Upon entering the V. th class of primary school, two groups of male pupils aged 10-11 (average 10.5) years underwent standard and experimental (with basketball) specially programmed transformational procedure which lasted one school year. Experimental group consist of 47 pupils, and control group of 43 pupils. Transformation process was monitored by means of 18 control variables from the motor space that were measured at the beginning and the end of school year. We use 3 variables for description of each dimension of: agility, flexibility, frequency, explosiveness, precision and force. Data processing methods include procedures for process identification (Bonacin & Carev 2002, Bonacin 2005.).

Results and discussion

After factor and orthoblique reduction of space (defined with 18 variables) to 3 existent dimensions we easily recognize coordination regulation, energetic output regulation and synergic regulation. After that procedure, all objects data from all measurement point were concatenated in general data matrix as shown in Bonacin & Carev 2002, Bonacin 2005. In that way data were integrated in common space called “Comprehensive continuum” as shown in Bonacin 2005 or similarly in Bonacin & Blažević 2006. That process identification procedures generate continual representation of isolated dimensions, sorted from minimal to maximal comprehension in such space (Figure 1) that match individual object positions.

Most capacitive pupils are positioned just on comprehensive right points e.g. from 140 to 180, and less capacitive left e.g. from 1 to 40. Inspection of initial data confirms such hypothesis. It is obvious that energy develops in the beginning, coordination at the end of process, as well as synergic regulation gently support this two main processes.

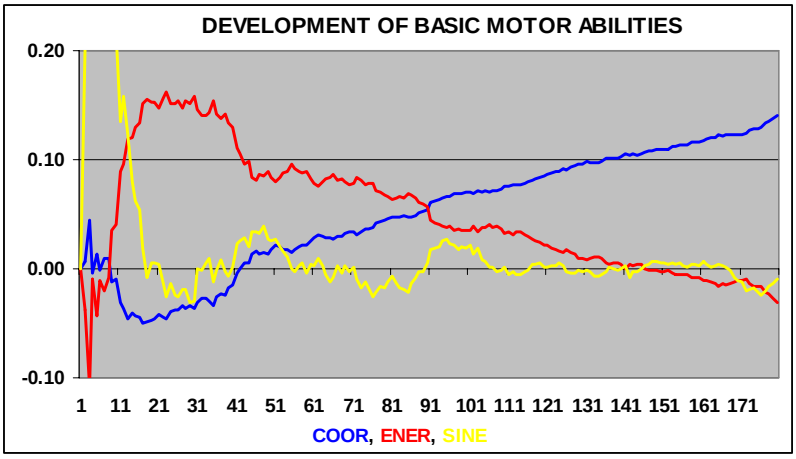

Figure 1. Processes with 180 data positions

Such result clearly explains what happens with child's abilities, and that whole sample measured twice, distribute development characteristics through comprehensive continuum instead through time points. Reasons for described situation are simple, of course, because first resource that has to be accomplished is energy accumulation. As we all know very well, without adequate energy level, there is no movement at all. In the same manner, last resource in that set naturally has to be most complex and most demanding and well organized, just like coordination is.

Continual support of gently synergic regulation explains fine control of movement learning and local segments fixation as special mechanism of movement regulation in general (Bonacin et al 2006 b). Now, we can explore different groups of subjects and different control points with rescaling general data on group positions within measurement points.

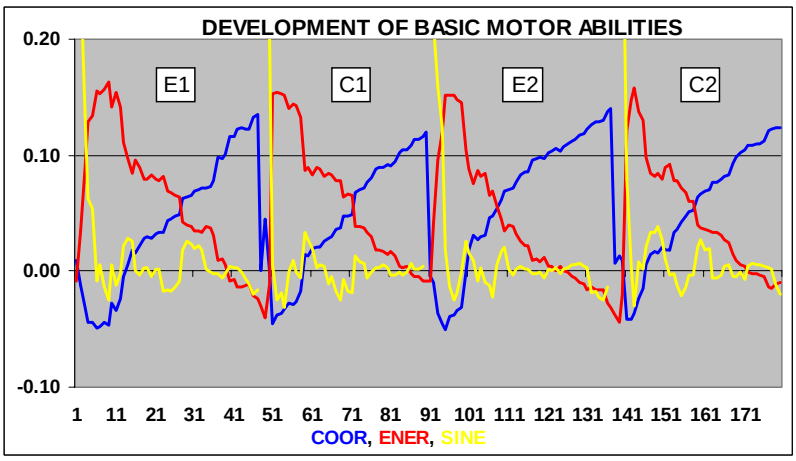

Figure 2. Processes with rescaling of 180 data positions to local processes (E=experimental, C=control group, 1=first, 2=second measurement)

As we can see, group determination within local measurements shows four models of global model reproduction, very similar as on figure 1. Main difference is espied in group E2 (experimental group in second measurement) that shows much earlier development of coordination followed by energy level decreased in the same intensity. Similar situation is recognized with C2 group, but with smaller intensity than with E2 group. Finally, synergic regulation in all samples (total and local ones) shows interesting situation. Behavior of that ability is temperate but strictly harmonized with coordination progress. First when coordination becomes actual and lately when coordination becomes dominant in motor expressions. Our conclusion stands firmly on attitude that any kind of transformation process develops child's abilities forward to energetic accumulation first, and after that forward to coordination integration, in both cases with temperate synergic support.

With special procedures for process identification we isolate rules of starting energetic regulation development, final coordination integration and continual synergic regulation development with 90 male pupils aged 10-11 measured twice with 18 motor variables (for estimation of agility, flexibility, frequency, explosiveness, precision and force) at the beginning and at the end of school year.

Our results confirm hypothesis that we can recognize process parameters, and explain rules of development in new manner. We suggest that findings of such our researches become basic for transformation process programming, especially with school children.

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