

New Technologies in Sport – 3rd International Symposium
INVITED LECTURE

PROCESSES UNIVERSALITY

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Abstract

With special methodology using comprehensive process procedures constant and consistent processes were isolated and described as stabile and repetitive functions. Regardless initial variable type or type of the sample or population, only if data can ensure statistically representative set of information same function were always derived. These functions describe:

1. initial uncontrolled release of energy,
2. variations caused by uncontrolled acting,
3. acquisition of materials or perceptions,
4. cognition or learning,
5. external expansion of additional resources, and
6. preparation for opening a new comprehensive space.

For efficient function recognition, we present these functions according to orthonormal (orthogonal and normalized) logic, although information about function relations exist, as well as information about functions normalized to other values.

UNIVERZALNOST PROCESA

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Sažetak

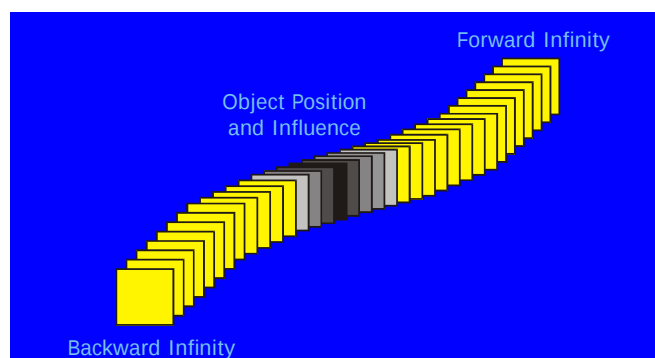
Posebnim metodološkim postupkom koji koristi procedure spoznajnih procesa stalni i konzistentni procesi su izolirani i opisani kao stabilne i ponovljive funkcije. Bez obzira na vrstu inicijalnih varijabli ili tip uzorka ili populacije, samo ako podaci mogu osigurati statističku reprezentativnost skupa informacija identične funkcije su uvijek derivirane. Te funkcije opisuju:

1. inicijalno nekontrolirano oslobađanje energije,
2. varijacije izazvane nekontroliranim djelovanjem,
3. prikupljanje materijala ili spoznaja,
4. spoznavanje ili učenje,
5. eksternu ekspanziju uz pomoć dodatnih resursa, i
6. pripremu za otvaranje novog spoznajnog prostora.

U svrhe prepoznavanja funkcija, prezentirane su funkcije u skladu s ortonormalnom (ortogonalnom i normaliziranom) logikom iako informacije o relacijama funkcija mogu postojati, baš kao i informacije o funkcijama normaliziranim na neke druge vrijednosti.

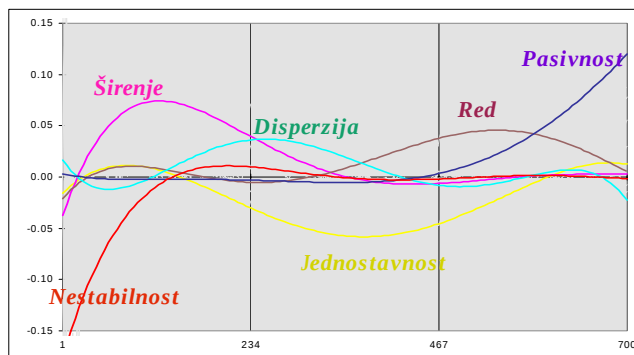
Introduction

Process identification is severe and complex field in kinesiology that, only in the last century, became interesting to authorities in sport and physical education. This is a logical outcome of exceptional complexity matter that only lately was thematically brought to an issue according to condition research that prevailed in the past (Bonacin, 2004 a; Bonacin, 2004 b). System process identification in the past was aimed to determining of some function distinction into two time situations defined by the same control parameters within which functioned at least one set of not unexpected (deliberate) events interpreted as a process. (Bonacin, 2004 a). This kind of logics, certainly, could not result with quality or serious answers to the change issues that have occurred between these two control points. That is why the new methodology base for process identification was defined (Bonacin i sur., 2002 a i b; Bonacin i sur., 2004) and was formed by Bonacin as Cognition continuum i.e. “Comprehensive continuum” (Bonacin, 2005). According to these cognitions it was defined that the base of this continuum is absolute and does not depend on matrix, brand or type of applied parameters or variables not even described entities (Bonacin, 2004 a; Bonacin, 2006). This multivariate continuum was summarized on the graph 1.



Graph 1. Comprehensive continuum (Bonacin, 2005)

According to previous research, numerous valuable elements needed for process and process attributes definitions were defined (Bonacin, 2006; Bonacin i Bonacin Da., 2007; Bonacin Da. i Bonacin, 2007 a i b). Also fundamental process was decomposed and on the level of two attributes represent Determinism and Development, and based on three processes represent Persistency, Educability and Controllability. These processes are very similar to the ones described as “Defense”, “Offense” and “Connection” (Bonacin i sur., 2005). However, Međutim, especially interesting processes were identified on the level of six attributes (Bonacin i sur., 2002 a).



Graph 2. Processes on the level of 6 attributes (Bonacin i sur., 2005 a)

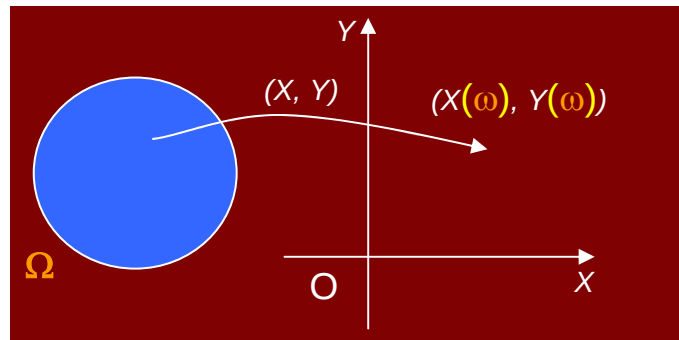
Problems and the goal

Usually in standard models of kinesiology transformation and data analysis we forget that entities described with some set of variables are nothing else but objects that, according to some criteria, belong to the set of possible outcome Ω . Within this set, without copying into some arranged set (like some xOy set) we don't have information about what function we can join them, if the function is arbitrary already determined, then all parameters are also determined so real process identification does not exist. This is especially the case in condition analysis, because this analysis according to classic (factor and similar models) can not indicate whether any process was recognized since that is not their task. Certainly, even if analysis of such conditions assume to be used for process analysis, these procedures are already contaminated in foundations with definitions that are not related to process identification (Bonacin, 2004 a). So in almost same situations they are being identified as totally different process attributes, which is scientifically unacceptable and unsustainable not even to mention transparency impossibility of such cognitions. The model of process identification we seek has to meet a few basic attributes so the real authenticity in different problem situations could be achieved and that is: a) repeatability (ability to identify same processes virtually in the same conditions) b) stability (ability that local appliance of initial definitions doesn't affect final identification) and c) universality (ability to appliance of identified processes through different conditions of objects and variables they are described with) Then we can talk about objective identification (Bonacin, 2007; Bonacin i sur., 2008).

Model

Process as the term represent set of seemingly accidental and obviously simultaneous events that can be connected through some successive criteria on some systematic development scale. The scale assumes any set of events metrics that can identify object changes. This indicates processes can be performed in time domain but also that process, as a term, can be defined differently, e.g. on cognition or some other scale. In fact under assumption that some event can be described with at least one parameter, then it is possible to allocate one object that differs potentially from another with at least one parameter.

If e.g. we observe some object ω which we describe with one parameter, let's say V , then Ω can be recognized as a set of all objects among and ω is randomly chosen among them then $V(\omega)$ are the values of the object on given parameter. Then V is random variable because it can define more then one values V , i.e. (V) for each object. So let's say $Y = Y(\omega)$ is random variable defined by the same set of possible results Ω . Assorted value (Y) we will name: one dimensional random variable. Then (Y) can be perceived as random point on the line or curve y , if we are familiar with event probabilities $\{(Y) \in S\}$ for each set of points S from Oy. It is same if we observe some object ω described with two parameters V and T , then Ω can be recognized as the set of all objects and ω is randomly chosen among them, $T(\omega)$ i $V(\omega)$ are the object values on those two parameteres. Then T and V are random variables because we can define several pairs T and V , i.e. (T, V) fore each object one pair. So if $X = X(\omega)$ i $Y = Y(\omega)$ are two random variables defined by the same set of possible results Ω . Assorted pair (X, Y) we will name: twodimensional random variable. Then (X, Y) can be perceived as the random point in the plane xOy if we are familiar with event probabilities $\{(X, Y) \in S\}$ for each set of points S from xOy (graph 3.) Certainly, this is applicable through several dimensions.



Grafikon 3. Twodimensional mapping from set Ω into set xOy

It is obvious this is the case of copying into space of assorted dimensions and with that we conducted obvious transformation of initial data into the set of transformed data that keeps their basic positional values, if necessary according to some complete and exact set of the rules to enable for some object, who is a part of some homogenous set of objects, to attach mark or the number (X, Y) referred to some specific attributes, so any two objects that differ according to their attributes can be different, or any two objects that are identical according to their attributes can be recognized as identical. (Bonacin, 2004 b). It is clear that in this way we define measuring task i.e. joining values with some objects.

However, with this operation we don't define process but the object $T(\omega)$ i $V(\omega)$ position is clearly defined in new referent frame, e.g. (X, Y) if given probabilities are $\{(X, Y) \in S\}$ in that specific frame, i.e. for each set of points S from xOy came out of Ω . Process identification is brought to discovering legalities that exist in S according to the regulations that can always be parameterized in the same way.

Universal processes

To objectively identify some process that process has to be repetitive. This condition clearly ensures that in the procedure of virtually same initial conditions same objects are included which has to lead to the same processes. (Bonacin, 2004 a). Processes are stable if the certain level of condition change doesn't result with different final solutions. Universality, however, comes from the essence of Universum and determining all processes, no matter whether we are able to recognize them or not. (Bonacin, 2008). For this purpose we conducted whole series of analysis with diverse type of objects (objects, computer-generated figures, children, sportsman ...) with described series of variables (physical values, mathematic and esthetic variables, morphological and motor tests...) applied for process identification.

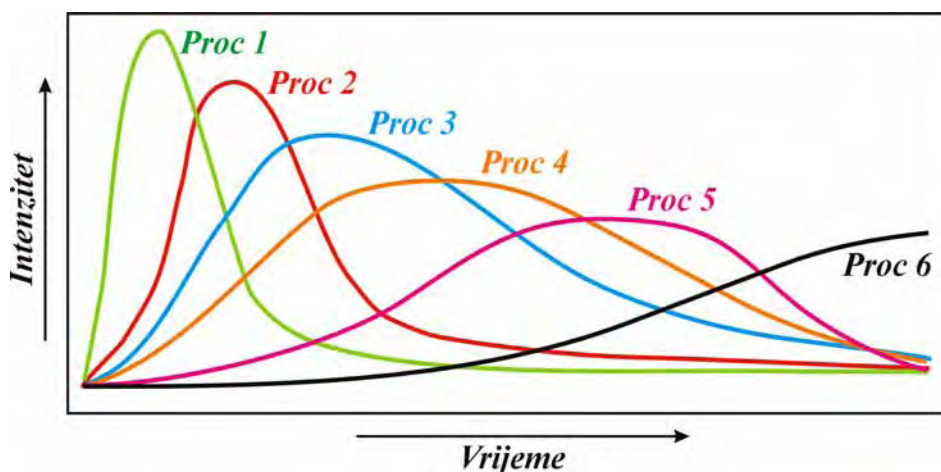
It was proven that used methods and procedures (usually CumInd – Bonacin i sur., 2002 a i b; Bonacin, 2004 a i b; Bonacin, 2006, ali i CumOrb, CumVar,...) always led to easily recognized and similar processes, so we named this procedure **Universal process decomposition** (Bonacin, 2004 a) and always in accordance with the basic definition of Comprehensive continuum as well as with **Unique process object existence theory** (Bonacin, 2007). Process universality was unquestionably proven with this. Then decomposition can go in two directions: a) decomposition regarding appeared manifestations (graph 2) which is certainly cognition process domain (Bonacin, 2005), and b) decomposition regarding development dimensions (graph 4) which is certainly time process domain. Just because of extreme interest of the second domain, it was emphasized in this scientific work.

Methods, results and review

Let's say that arbitrary set of objects o_i ($i := 1...n$) from population O described with arbitrary set of variables v_j ($j := 1...m$) from population V , i.e. each object o_i was joined with one value on each variable v_i , which means that $B = O \otimes V$. Algorithm operation CumInd (Bonacin, 2004 b) leads to a forming of matrix p of significant vectors c_k ($k := 1...p$) which contains orthogonalised (for easier identification) values of the process phases where some phases manifest and some of processes dominate. Such rescaled vectors contain cognitive-developing distribution of process attributes in accordance with actual object development in pitched space, since the crucial fact for process identification is cognitive not chronological age of object which is extremely important for kinesiology. These processes, certainly, can be rescaled into time domain, if there is information about ability of sorting objects according to their actual chronological status. Sorting according to presentation on graph 2 and 4 we can recognize in:

1. Proc 1: initial uncontrolled release of energy,
2. Proc 2: variations caused by uncontrolled acting,
3. Proc 3: acquisition of materials and perceptions,
4. Proc 4: cognition or learning,
5. Proc 5: external expansion of additional resources, and
6. Proc 6: preparation for opening a new comprehensive space.

Literally all objects pass through all this phases and can not avoid it. These processes are final absolute processes and occur unconditionally for each object in every virtual space where such object is included, according to the progress, in Comprehensive continuum (constructive processes) and the object is being built in updated objects adding its attributes. If retrogression occurs (destructive processes) object lose its certain attributes and drops through Comprehensive continuum towards lower levels actually decomposing and becoming material for other object formation. It is obvious that only a **higher level of integration** is certainly developing and constructive process, because that is the only process that retains attributes of repeatability, stability and universality. Ultimately, each process that tends to integration can be Universal process, because ultimately tends to integration of whole Universum, exactly according to the rules in this Universum. Otherwise it is not universal or integrative. For the purposes of this work (graph 4) set of decomposed processes was presented from example described in graph 2, data scaled into time scale with expressed phase's maximization.



Graph 4. Time decomposition of universal processes (Bonacin)

Conclusion

Modern technology accessing resources of children, youth, sportsman, amateurs and all other entities involved in system transformational processes is largely bonded with local cognitions about processes that can not be used for its purposes not even to mention long term cognition appliances. The reasons for this can be found in insufficient knowledge of Universal processes, and all because of incorrect assumption about inability to find process legalities. Based on various process researches, in this work we introduce methodology and the results that are enabling objective process identification. It was proven that processes need to be decomposed into comprehensive and then time scale with more than clear process indicators. The value of this work is based on setting model which describes integrative constructive process values.

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