SITUATION DEVELOPMENT PROFILE OF K-1 GRAND-PRIX TOURNAMENT WINNERS

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Abstract
We analyzed all matches in final Grand-prix K-1 tournament 1993-2004, and measured body height, body mass and age of each fighter. With detailed inspection of DVD recordings of all 98 matches we monitored all arm and leg offense and defense techniques, blocks, activity types, ways of match finishing, injuries, match duration, prohibited acting, tactical means, tactical fighting types and estimated personality dimensions, of totally 102 parameters. With specific data analyzing technology, we identified four profiles that we simple can describe as: a) beginner, b) technician, c) tactic expert and d) fight master. Development functions show realistic possibility of global training period's definition for energy, technique, tactics and dimensions of personality.

Key words*: fighters, situation monitoring, power functions, profiles, development*

Introduction

Martial art, as a part of total sport specific human movement organization, is special phenomenon with enormous number of elements from different anthropological sphere (Valera, 1973; Shim, 2003; Hassel 1984). Its understanding demands a lot of good will, criticism and need for new material learning with crossing bounds or limitations of so called "well known" conservative facts (Kapo, 2005). It is necessary to go forward if new discoveries and situations claim to overcome insecure methodological stereotypes (Bonacin, 2004). All great teachers teach us that the only real scientific way is constant new idea exploration. In sport, basic sense of exercise we can recognize as new motor ideograms and knowledge collecting, harmonic psycho-somatic development, competition and mental or spiritual need satisfaction (Liao & Lui, 2003; Nagamine 1976). Those facts apply for any human activity, any sport and for K-1 as well. When we explore human characteristics, because of great complexity and numerous integrated parameters we face, we have to be very serious and careful (Murphy, 1995). That is especially the case with martial arts, because one opponent actions are always related to other opponent movements and actions (Kapo, 2005). Problem elaborated in this work is simple situation profile identification of all top level sportsmen that fight on final Grand-prix tournament at Tokyo Dome 1993-2004.

Methods

Several professional judges, with very precise methodology that includes detailed and repeated overview of DVD recorded matches, registered 102 types of situation aspects of all matches on final tournaments 1993-2004. Each fighter that came to Tokyo was described with each of 102 definitions, which become variables. From such collection, data for winners and others were separated and expressed in percentage. So we can get a picture of current situation characteristics of both, winners and others fighters.

These two data vectors, were certainly different in some ways which led us to numerical expression of differences between fighters. In variable space vector of differences is *a constant range of differences*. These data were analyzed with scree technique for main tangential inflexion discovering that allows us to identify subtypes on constant range of variable average characteristics. Finally, identified subtypes were analyzed with power functions toward direction of researched results. All data are graphically presented.

Results
As we can see on Figure 1, sorted numerically, continuum with differences between winners and other fighters shows slight development at start, stable growth in the middle, and maximal level at the end.

Three points of inflexion were registered and that points divide continuum in four areas with relatively equal number of variables (22, 23, 23 and 34). These four groups of variables describe subtypes and were marked as G1 (lowest), G2 (low), G3 (high) and G4 (highest). In table form (Tables 1 - 2) we can identify four characteristic K-1 profiles with function projections differences.
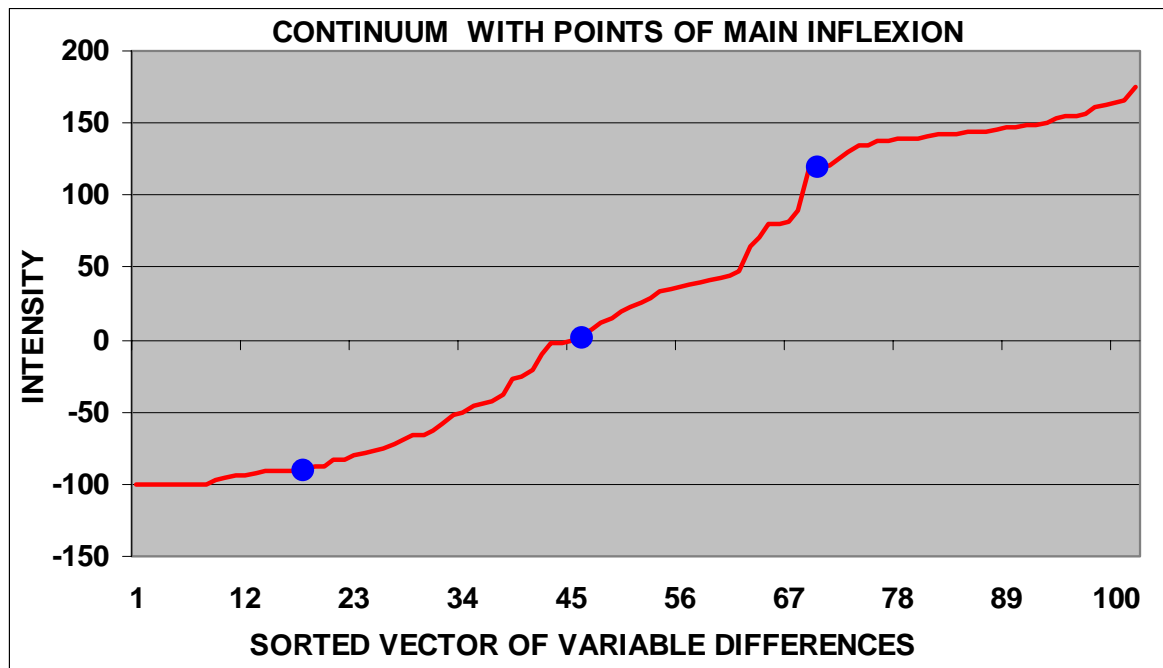

Figure 1. Sorted continuum of variable differences

Table 1. Registered actions and variable positions on continuum (groups G1 and G2)

G1 (lowest)		G2 (low)	
VARIABLE	PROJ.	VARIABLE	PROJ.
Left leg side kick forward	-100.00	Left leg knock-down	-80.00
Defensive tactic	-100.00	Right side leg forward kick	-77.78
Left arm injury	-100.00	Behaviour after knock-down	-77.44
Left leg injury	-100.00	Right arm circle kick	-75.49
Right leg injury	-100.00	Left chroshe to stomach	-71.67
Set down under bell	-100.00	Right leg knock-down	-69.70
Catch and kicking	-100.00	Extra round 1	-66.67
Talking in fight	-100.00	Right ushiro mawashi geri	-65.97
Left arm circle kick	-96.43	Right leg block from leg kick	-62.59
Left ushiro mawashi geri	-96.08	Right chroshe to stomach	-58.96
Left kakato geri	-94.74	Hanging on ropes	-52.78
Head kick	-93.75	Left arm knock-down	-50.00
Head injury	-93.06	Right back kick ushiro geri	-45.83
Right kakato geri	-91.67	Left direct to stomach	-43.64
Resign because of injury	-91.67	Right leg kick forward	-42.18
xtra round 2	-91.67	Combined technique	-38.64
Break command ignoring	-91.67	Pushing, catching opponent	-26.40
Kicking after stop command	-91.67	Right arm knock-down	-26.32
Turning back to opponent	-88.54	Left leg kick forward	-20.13
Left back kick ushiro geri	-88.10	Left arm block leg kick	-9.50
Kick under stomach	-83.33	Judge decision	-2.50
Wading and stumbling	-83.33	Body weight	-2.08
		Right uppercut to stomach	-1.09

Table 2. Registered actions and variable positions on continuum (groups G3 and G4)

G3 (high)	
VARIABLE	PROJ.
Body high	1.28
Age	6.65
Right arm block from leg kick	12.30
Right direct to stomach	14.34
Left-right thoraces moving	19.00
Avoiding	23.09
Right uppercut to head	26.01
Left leg block from leg kick	28.34
Left knee kick	33.02
Refusal	34.63
Simulation	37.33
Anxiety	37.70
Left low circle kick	39.31
Left high circle kick	41.10
Left direct to head	43.53
Knock-out win – victory	45.14
Aggressiveness	47.67
Right high circle kick	64.30
Offensive tactics	71.43
Right knee kick	80.34
Right arm block from arm kick	80.63
Right chroshe to head	81.61
Right low circle kick	89.06

| G4 (highest)	
VARIABLE	PROJ.
Positive attitude to strong opponent	119.52
Left uppercut to head	119.87
Positive attitude to weak opponent	120.98
Left arm block from leg kick	125.36
Morality	130.14
Guard breaking	134.34
Ring surface using	134.72
Motivation	137.92
Persistency	138.12
Concentration	139.11
Left uppercut to stomach	139.36
Moving	140.08
Pause	140.57
Challenge	142.19
Combinations	142.55
Right direct to head	142.95
Discipline	143.46
Analyzing	143.84
Retreat	144.30
Attack	144.93
Coldness	146.75
Distance	147.84
Tricks (feints)	148.18
Manoeuvring	149.00
Timing	150.92
Tactical cunning	154.10
Opponents errors using	154.50
Tempo regulation	155.06
Counter-attack	156.78
Left chroshe to head	160.82
Balance	162.78
Safe defence	164.35
Defence in general	165.56
Self-control	175.08
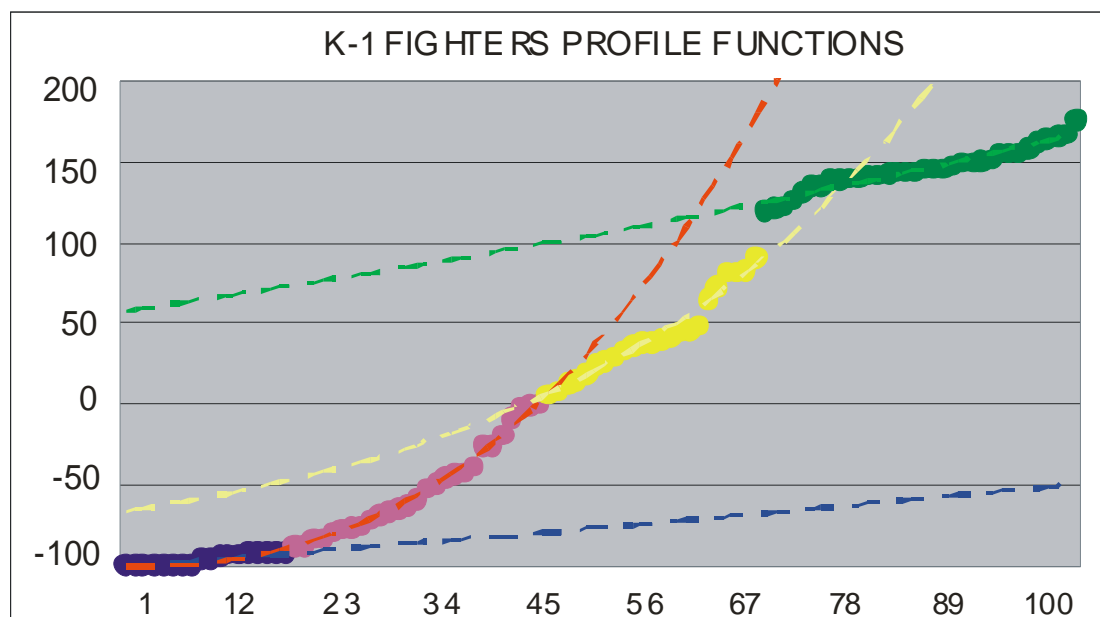
Figure 2. K-1 fighters profile development functions

Variable that is part of G1 group (lowest) obviously describe totally insufficient K-1 fighters profile on Grand-prix tournament defined by variables in table 1. Regardless of the reasons, registered events or using of other mentioned actions enormously led to match loosing.

Group G2 (low) however, is characterized with actions or events in table 1. That is still insufficient acting but much better and more progressive than activity of G1 group. G2-Low group does not include so many incorrect actions and injuries, so we can conclude that fighters with projections on this group can fight with much more stile and knowledge. However, it is still low sufficient acting, but with many individual attacks not surrounded in integrated set. Table 2 contains description of sufficient fighters (G3 – high), and winners (G4 – highest). Registered actions in those tables clarify reasons why plain fighters win all matches on those tournaments. As we can see, top level characteristics are self-control, safe defense, balance, and so on.Application of numeric procedures identifies four power functions that define logic of four sets of variables with minimal deviations, exactlyt in order with position that sets hold on differences continuum.

It is obvious that we can recognize winners and other fighters on Grand-prix tournament (Figure 2). It is clear that each of those four functions contains its own logic of methodological determination. Only first two functions have same beginning, and total picture shows many interesting situation details about K-1 sport and human acting in general as well. Under analytic data transformations, group described with G1 (lowest) variables shows projection of very weak results development that do not tend to maximum or sport top level performance in area defined with 102 parameters. Group described with G2 (low) variables shows very interesting course of explosive climbing that represents enormous accumulated energy which is irrationally expressed. As we all know, such explosive development is not acceptable, especially according to description in table 2 and low position on figure ordinate.

Group described with G3 (high) variables shows possible enormous but still generally premature development. Of course, this group still does not posses stability needed for Grand-prix tournament winning.

Finally, group described with G4 (highest) variables shows high starting position, keeps continual slight growth, long-term accumulation and stable position on all variables that define top level. It is obviously the most superior group inside total exam of fighter entities.

Discussion

Development characteristics of any top level sportsman, and specially K-1 fighters, are extremely hard to control adequately. Because of that reason, many recourses and time are spent to examine development abilities. This is important for two reasons. First one relates to selection and transformation processes programming in early years of sportsman to ensure capacities for optimal approaching to top level performance in senior age.

However, second reason is more important. Top level fighter profile determination allows complete approach to transformation strategy and technology without loosing time and optimal training procedures with final aim defined as better performance, longer sport life and without sport injuries. In that sense, we have to include many characteristics of sport profile as hypothetic personality dimensions, dimensions of tactical acting, just because those characteristics show extremely high level of transfer into every-days life of individual. Functions identified in this research represent some crucial discoveries, not only for understanding of K-1, martial arts or sport, but human in general. Genesis and development of human as a type are closely connected with ability development, action performance, defending and attacking generally in human outer space, which means in its surroundings.

Sport and martial arts especially, followed by such logics, keeps its special role and position. In that context we can easily recognize all results of this interesting research. According to obtained results, it is obvious that, from 96 fighters followed through 12 final tournaments we can recognize four types of acting, i.e. profiles of K-1 sportsman that migrate in four directions, depending of their basic situation characteristics. It is interesting that some of them participate in several Grand-prix tournaments with different successfulness so their results really fit to certain profile.

Profile details are shown in tables 1 - 2. First profile (G1-lowest) is described with set of parameters for clear recognition of whole bunch of irregular kicks or acts, and defensive tactics also with possibility of several types of injuries. Few "exotic" kicks can not pursue opponent that he deals with extremely dangerous fighter. This profile surely describes a fighter with insufficient knowledge and unfair behavior, so such sportsman can not be successful on Grand-prix tournament. Described behavior indicates beginner or a fighter who is still not deeply involved in technical knowledge and philosophy of martial art and values of K-1 as a very demanding sport. Although in Tokyo we can watch eight "kings of fighting" and kings of the ring, there are still variations between them, so some of them before top masters really seem to act like beginners as described in G1 profile.

Second profile (G2-low) is described almost exclusively with concrete attacking actions and kicks of different types. This profile clearly demonstrates higher level of technical K-1 martial art knowledge. Those fighters are extremely prepared in sense of technical elements of fight. However, their repertoire has no serious tactical or strategic elements of sports fight, nor higher performances of hypothetic personality dimensions. Attacking is, of course, immanent part of any real or symbolic destruction in sport, so we can suppose that such profile is naturally offensively oriented. But, in sense of situation following parameters, this K-1 profile is not completely balanced to win so it can not perform maximal sport results because of insisting on well trained individual acts (for example kicks). In the same time there is no integrated structure of acting seriously directed toward adequate tactical management of fight in a match. With only (well trained) individual acts, even when technique is brilliant, it is impossible to win on top level. Anyway, it is easy to recognize significance of particular actions that fulfill idea of extremely dynamic oriented fighters.

Third profile (G3-high) shows additional quality, because in sense of movement this profile performs whole collection of tactical elements and it is basic characteristic of profile. It is also possible to register set of concrete and efficient particular techniques that perfectly cover an idea of technically and tactically prepared fighter oriented to control the fight management and control the opponent.

All of that seems to represent special complex of "fight machine" that, not only increases winning chances, but mainly decrease opponent chances to apply its actions or kicks. We can clearly espy acting with important role of refusals, avoiding, side-moving and simulations. This profile is composed with mentioned characteristics because of experience with appropriate degree of anxiety and aggressiveness. Well preparation for particular fight is very important for this profile. However, unless of high level of particular technical capacities, this profile shows extremely low dynamics of fight in a match and it is oriented uppon opponent control and rare resolute attacking actions for match finishing. There is no numerous kicks exchange in matches with such fighter. It can be concluded that we talk about very rational sportsman that try to win with really minimal consumption of recourses.

Fourth profile (G4 – highest) is characterized with integrated complex of positive hypothetic personality dimensions with self-control domination. Acting of this profile is related, among other characteristics with self defense, moving, tempo regulation and appropriate pauses (low moving level) inside match. We also espy counterattacks, tactical cunning, timing, mmanoeuvring, discipline, concentration, persistency, motivation and positive attitude for strong or weak opponent fighter. For sure, we can conclude that this is a fighter of maximal level of training preparation for sports fight.

This fighter associates technical capacities, tactical acting, strategic abilities and positive hypothetic personality dimensions. Trainers talk about such sportsman with superlatives because such fighters simple satisfy all training sport demands and accomplish top level results.

Table 4 in that sense describes final aim of transformation processes in almost any sport or even in any other human activity. We talk about strategically, really well prepared people, masters of their knowledge that associate best sport elements and philosophy of sport and living into sport and other behaviours. With final tournament match analyzing, we establish another valuable set of information about techniques used in K-1 sport. E.g. often used actions are right low kick or left direct kick, and we espy rarely used of kakato geri or direct to stomach.

Together with described global profile information it is possible to detect efficient arsenal of fighting weapon and its hierarchical organisation, which strongly support training process in sense of optimal methodical applications. Such comprehensions make transformation process optimal in global determinations and objective with individual fighter characteristics forming. Efficient techniques are to be trained up to perfection as individual actions but also as integral part of special techniques set and incorporated in total psycho-physical complex of extraordinary prepared fighter.

Constitution of particular profiles in this research shows justification of applied methodological approach in sense of K-1 fighters profile identification. However, especially interesting information can be recognized from data that forms fighter's development characteristics. Those data were given in numeric format, but for this article it is presented as Figure 2. We can see that power functions allow identification of development potentials according to actual level of particular profile. For starting position determination purposes we can accept position of particular profile based on analytical functions as development rule. In that case we get extraordinary clear picture of any group possibilities. For example, we can see that G1-lowest profile group has very low starting threshold and very slow development trajectory. This situation generally describes development potentials of "beginners" in situation that they do not include enough technical knowledge of particular actions in their repertoire. In that case, development is very slow with final level not satisfactory for any serious performances. Prediction of development and sport results based on this function is unreal because it includes only elementary will for activity, but informs us about general standards of starting position in any kind of human activities. Second power function shows us what happens when beginner builds his specialist technical knowledge in his integrative sports complex. Potentials extremely arise with impression of final level prediction above real capabilities. Such sportsman spends its resources without adequate control. In concrete situation of K-1 fight, participant looses uncontrolled energy and information accumulation. Starting position is still very low (minimal) so development projection seems to be

extremely high. That is the reason why future results projection based on such function is incorrect, if fighter does not get new qualities of movement performance. Just because of uncontrolled acting, such development is simple unreal and impossible. It is trainer's and other sport specialists job to ensure further development i.e. jump into new category based on serious and systematic long-term training. Without that, it is possible to establish sports constitution in order with shown function which generate sport "explosion" that ends quickly, as we can see in many cases in real life. Third power function balances mentioned unbalanced dimensions of energy, technique and tactics with possible high aims of fighting performance. This is ensured, as mentioned before, with tactical knowledge included in stable personal repertoire. Starting position of power function is not minimal any more, reflecting different particular information accumulations showing composition of abilities that distance fighter from beginner and uncontrolled acting in match. Arising of function is something slower although we can still register unreal tendencies with many elements of general status that we can mark as premature in a sense of tournament winning. Progression of results is still not expected according to that function, because of development characterized with absence of positive personality dimensions. Good sport performance is possible, of course, and better than with G2-low group, but still impulsive so we estimate that such performance will deflate without accomplishing sport top level and final win. Accumulation of tactical means raised sportsman efficacy but still does not represent a guaranty of maximal results. Only fourth power function shows completely prepared fighter. Starting position is very high, and development is marked with continual slight rising. Top of result sphere is there after persistent and serious training. Such level is, of course, easy to retain, because there is no breaking through dangerous levels of intolerant acting. Such profile is enabled by final accumulation of most important acquired comprehensions that are incorporated as positive personality dimensions described as part of G4-highest K-1 profile. Just on this level, sportsman gives maximum of his possibilities. All those functions generate more interesting information. One of them is space between functions, as shown on Figure 3.
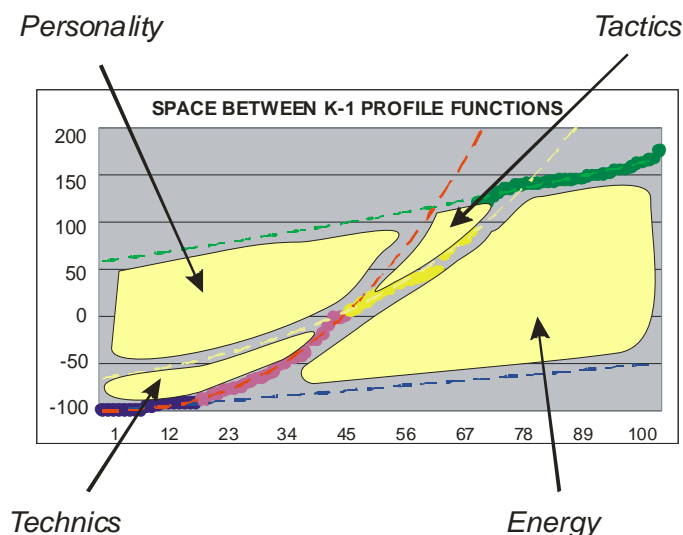
Figure 3. Space between functions

Space between functions that describes G1-lowest and G2-low development profiles informs us about used training energy marked with whole set of training procedures directed to increase energetic and functional capacities of sportsman. Space between functions that describes G2-low and G3-high development profiles informs us about quantum of training procedures directed towards technical perfection. As we can see, there are two ways as fighter distance from "beginners". First one is presented from the very beginning of training and is marked with learning of technical elements. Sportsman later continues with fight tactical means mastering that leads him to maximal performance. Once, when fighter comes to such high level and close to absolute winning master threshold, further improving of technical and tactical elements is not dominant any more but only capabilities maintenance and information refreshing. Finally, space between G3-high and G4-highest development function profiles shows us how important personality dimensions are and they are important during time even from early ages. This is especially the case because personality dimensions results with successful and complete personality much later in senior ages. As we all know, in K-1 sport and sport in general, but equally in everything else, it is easier to develop capabilities based on energetic capacities because such development is possible anytime, although probably minimally at the beginning of carrier in specific sport. It seems that optimum for developing of energetic capabilities is somewhere after status of beginner and before accomplishing maximal performances.

Of course, it is possible to elevate that status later until sportsman get biological boundaries that should not be breakthrough with some prohibitive means. It is extremely more complex with learning of technical elements of particular sport and K-1 also because of several reflections in cognitive, spiritual, motor and other domains. It is justified to claim that those two characteristics (technical and tactical) contain many similarities and parallel development functions. Of course positive personality dimensions are definitely most demanding because their development is mainly genetically predetermined and in that area we can make some steps mostly in early childhood with projections into senior age. That is embarrassing in any activity, especially in sport because everything we miss in childhood is very hard to compensate later. However, training, after primary selection can perform some transformations in that part of sportsman anthropologic status. Results of research show us that, adequate methodology can isolate existing profiles of K-1 top level fighters and identify their general development characteristics.

Conclusions

we applied analysis of situation parameters on complete population of K-1 fighters that came to Tokyo Grand-prix tournament 1993-2004. We measured body height, body mass and age of each fighter. With detailed inspection of DVD recordings of all 98 matches we monitored all arm and leg offense and defense techniques, blocks, activity types, ways of match finishing, injuries, match duration, prohibited acting,

tactical means, tactical fighting types and estimated personality dimensions, of totally 102 parameters. Data were transformed in shapes that allow K-1 profiles identification. Finally, based on those profiles we numerically and analytically isolated hypothetic development power functions for each profile. With such technology, we identified four profiles that we simple can describe as: a) beginner, b) technician, c) tactic expert and d) fight master. Development functions show realistic possibility of global training period's definition for energetic development somewhere in the middle of sportsman sports-life. Possibilities of technical support and development are located on the very beginning of sportsman career. Tactical elements have to be incorporated after sportsman gets technical perfection and before he decides to climb to the very top in his sport. Possibilities of adequate personality dimensions have to be discovered in selection process, and something can be done in early childhood just because of great genetic predefinition. Strategy can only be developed after all of those characteristics are on adequate level.

References

Bonacin, D. (2004). *Inroduction to quantity methods (In Croatian).* Kaštela. Croatia.
Hassell, R.G. (1984). *Shotokan Karate. Its History and Tradition:* Focus Publication.
Kapo, S. (2006). *Structural analysis and model of K-1 top level fighters. Disertation (In Bosnian).* Faculty of sports and physical education, University of Sarajevo. BiH.
Liao, M-S. and Lui, W-C. (2003). The study on causes of making mentality health about Tai Chi Chung. In *FISU: Proceedings of FISU universiade conference Daegu – Facing the chalenge*, pp. 468-472. Daegu.
Murphy, S. M. (1995). *Sport Psychology Interventions.* Human Kinetics Pub, USA.
Nagamine, S. (1976). *The Essence of Okinawan Karate-Do.* Tokyo: Tuttle.
Shim, S.-K. (2003). History and properties of martial art in Korea. In *FISU: Proceedings of FISU universiade conference Daegu – Facing the chalenge*, pp. 71-75. Daegu.
Valera, D. (1973). *Karate la competition Paris:* Ed Serdirey.

SITUACIJSKI RAZVOJNI PROFIL POBJEDNIKA K-1 GRAND-PRIX TURNIRA

Sažetak

U članku se analiziraju sve borbe finalnih Grand-prix K-1 turnira 1993-2004, a uključene su i visina, masa tijela i uzrast svakog borca. Detaljnom inspekcijom DVD snimaka svih 98 borbi prećene su sve ručne i nožne obrambene i napadačke tehnike, blokiranja, vrste aktivnosti, način završetka meča, povrede, trajanje borbe, zabranjene akcije, taktička i tehnička sredstva, taktički načini borbe i procijenjene dimenzije ličnosti, ukupno 102 parametra. Posebnom tehnologijom analize podataka identificirana su četiri profila koji se jednostavno mogu opisati kao: a) početnik, b) tehničar, c) taktički ekspert i d) majstor borbe. Razvojne funkcije pokazale su realnu mogućnost prepoznavanja globalnih trenažnih razdoblja za definiciju energetskih, tehničkih, taktičkih potencijala i dimenzija ličnosti.

Key words: *borci, situacijsko praćenje, power funkcije, profili, razvoj*