

The Development of Psychomotrical Skills in Judo Practitioners

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Abstract

The continuous development and improvement of psychomotor capabilities, as well as their correlation with the goals of each sports field, is explained by the increasingly widespread use of the new conquests of science, especially those in the field of physiology, biochemistry, biomechanics, hygiene, psychology and pedagogy, these in their turn being stimulated by the universality of the sports phenomenon, by the increase in the competitiveness of athletes.

The study follows the evolution of some psychomotor capacities in a group of judo practitioners between the ages of 16-18. The research is based on an invoked experiment monitored over the course of a year, during which the subjects had as their main objective the accumulation of as much technical baggage as possible. The comparison of the initial and final results, in the tests carried out, confirms the opinion of the specialists according to which the accumulation of various judo techniques, through repetition in different forms, has as its purpose the development of psychomotor capacities. In other words, the practice of judo determines both a harmonious physical development, a development of motor qualities and a superior control of the body and segments in intrinsically relationship but also with the forces and segments of the partner/opponent.

Keywords: coordination, rhythm, balance, judo.

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1. Argument

Most authors (Deliu, 2014; Ștefănuț, 1983) claim that training in judo involves the need of control, coordination and restraint, and that they all stand for a method to develop psychomotor skills. The ability to execute deliberate and powerful movements in the decisive moments of a fight is one of the chief factors determining motor efficiency within a fight. Hence, such ability should be improved on ongoing basis, using the broad experience of martial arts, as well as the contemporary knowledge of biomechanics. Unlike the classic endurance training routine, a specific coordination training, directed towards the generation of extra initiation strengths in the execution of specific movements in judo, and, in a quick manner, the precise transfer of these forces, as well, may boost, up to several times, the strength of movements. (Bompa, 2001; Deliu, 2014). These extra initial forces can be knowingly generated in various segments of the musculoskeletal system as a result of a rapid eccentric sequence and concentric muscle work, trunk and hip rotation movements, adequate body, weight centre and work translocation to the feet. (Roșu & allea 2006).

The continuous development and improvement of psychomotor skills, as well as their correlation with the goals of each physical field, is explained by the increasingly wider use of the new findings of science, especially those in the field of physiology, biochemistry, biomechanics, hygiene, psychology and pedagogy, whereas, these, in their turn, being stimulated by the universality of the sports phenomenon, by the increase of the athletes' competitiveness (Mitrache & Tüdöş, 2004).

The multiple rehearsal of a technique from any martial art, does permit the acquisition of the skill and improvement of technical-tactical actions, but, at the same time, it also develops the muscle chains involved in the execution of the movement (Sava & allea, 2014; Ștefănuț, 1983). Therefore, a motor quality specific to a martial art develops depending on the manner of execution of a technical procedure, as number of retakes, the intensity of stress, the duration of breaks, etc. (Roșu & allea 2006). We believe that, under such circumstances, we cannot isolate a motor quality, but, on the contrary, the other motor qualities are equally influenced to a greater or lesser extent.

According to Alexe (1993), the coordination (skill) "stands for the ability to abruptly and thoroughly select and perform motor actions specific to a series of unforeseen situations, with increased efficiency".

Galan (2014) defines coordination as: "a psychomotor coordinative quality that develops, to a great extent, with the practice of techniques from combat styles and which it, in turn, it does condition. The acquisition of new techniques, as quickly and correctly as possible, rapidly and efficiently adopting them to the ever-changing and unpredictable conditions during combat, all such things belong to coordination".

In specialty literature, no consensus was reached, neither with regard to its definition nor to its components. The components of exhortation according to Șerbănoiu & Tudor (2007) are:

- the motor learning ability;
- the fast reaction ability;
- the ability to guide and control;
- the rhythm and tempo ability;
- the ability to combine and discriminate movements;
- the spatial and temporal orientation ability;
- the ability to adapt and transform movements;
- the ambilaterality;
- the static or dynamic balance;
- the precision, specific to combat styles.

Coordination is general and specific and combined with all motor qualities. According to Cârstea (2000), determining factors are: the level of coordination of the centres of the nervous system and elasticity of the cerebral cortex, the quality of the transmission of nerve impulses and muscle innervation, the ability of analyzers to capture information and perform the synthesis related to the analysis of the situation, the ability to anticipate the performer, the performer's memory and thinking (especially the creative one), the workload and complexity of the motor skills that the individual masters, the level of development of the other motor qualities. Mobility is an athlete's ability to perform large-amplitude movements with all body segments, via the joints, either actively or passively (Westbrook & Ratti, 2010). Dragnea (1991) claims that "mobility and flexibility are included in the

category of intermediate motor skills, placing them amongst the conditional ones (force, speed, endurance – determined by energetic processes) and the coordinating ones (influenced by movement control processes)". The lack of mobility and flexibility results in higher energy consumption with negative impact on remaining qualities, especially in martial arts where a budoka ought to be flexible and mobile.

2. Method and Methodology

In order to test the influence of judo practice on the development of coordination, we conducted an ascertaining experiment throughout the entire length of a school year. The subjects fall within a group of judoka athletes aged from 16 to 18 year-old, having practiced judo for at least four years. Acquisition and consolidation of fighting techniques from standing position and ground fighting were the single variables used. We selected various psychomotricity tests, in order to identify the dynamics of coordination.

Psychomotor tests used:

- Measurement of dynamic balance and orientation -BASS Test (Epuran, 2001);
- Static balance measurement test - "The plank" (Epuran, 2001);
- Coordination and speed measurement test - Commute (Epuran, 2005);
- Test for the checking of the ability to judge timeframes: at 3s and at 5s (Epuran, 2005).

3. Results and discussions

The data analysis highlights the fact that the experimental group subjects achieved superior results in three of the five tests, whereas, in the other two such tests, they are significant from one stage to another.

Recorded progresses are equally confirmed from a statistical viewpoint. The results of the "Commute" test record a significant difference amongst the initial testing and the final testing (Figure 1). Having in view

that this sample stands for the coordination skill in speed mode, the difference recorded is based on the increase in the coordination skills of movements. Accordingly, we record a significant increase $p < 0.01$ in the experimental group. As we have previously stated, we do believe that this difference is based on an increase in coordination, but also on the development of a capacity to perform a speed effort over a longer period, that is in endurance mode.

Table 1. Dynamics of Psychomotor Ability Indices

Assessment Means / Indices	Initial Test	Final Test	t	p
"Commute" Test (s)	26,80±0,74	24,20±0,72	3,17	< 0,01
"Bass" Test (points)	91,10±2,58	101,63±2,50	3,67	< 0,01
"Plank" Test (s)	22,90±0,66	26,41±0,60	5,19	<0,01
Judgement of Timeframes (3")	3,85±0,12	3,44±0,10	3,42	< 0,01
Judgement of Timeframes (5")	5,84±0,17	5,26±0,14	3,22	< 0,01

The coordination of movements is also based on the growing process affecting the subjects of the study. In this respect, the diversity of plans and directions in which specific movements are performed in judo stands for a direct and immediate contribution to the development of the coordination skills. As per the description of technical procedures in judo, we can easily become aware that the movements of segments are performed simultaneously in various components and directions, both from one arm to another, as well as from arms to feet.

In the "*Bass test*" the previous situation is repeated, with a significant increase from the initial to the final testing ($p < 0.01$) (Figure 1). Having in view that the test herein judges, as previously analyzed, coordination, but also distributive attention based on speed, according to the author of this test [60, p. 265], subjects fall within the "very good" category. Such difference in ranking is caused by the distributive attention required by the opponent's trunk and segments positions, at various moments of the execution of technical procedures in judo.

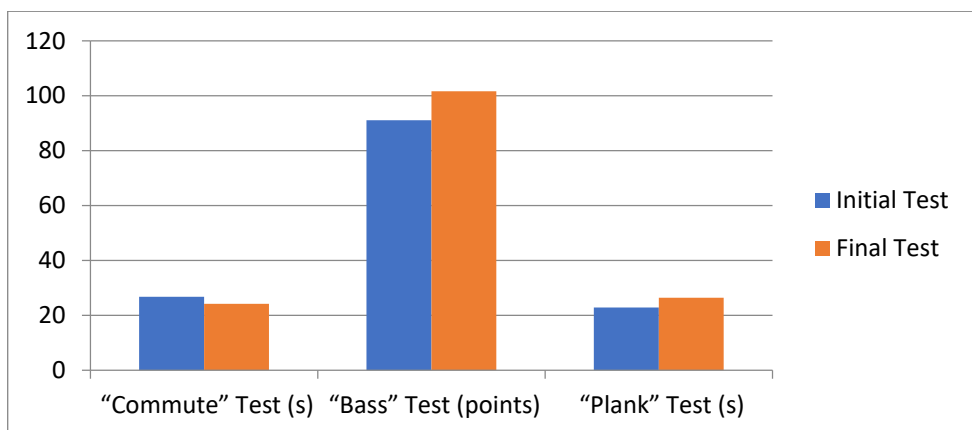


Figure 1. The results obtained in the initial testing and the final testing

In judo procedures, distributive attention is required to the maximum, regardless of the form of execution or stage of motor skills acquisition. Distributive attention does make the difference amongst the two opponents in head-to-head combat, since it requires both overall body observation, as well as details about the position of body segments. These arguments are added to those previously described, on the subjects' growth and development stage.

Static balance evaluated by the "*Plank*" test reinforces the results of the other tests, since the record of higher indices in this test requires coordination, attention and concentration ability (Figure 1). Accordingly, subjects made significant progress $p < 0.01$. The difference recorded is solely due to the evolution from the subjects' initial to final testing. All previously described qualities (coordination, attention and ability to focus) are mentioned, in specialty literature, as falling under the scope of martial arts. Among the martial arts, included in the category of means of action, those that contribute substantially to the development of the mentioned qualities are the skills of judo and aikido. Attention is a peculiarity that develops with the increase of the ability to focus and determines an inclusive development of the speed to react. One of the forms of execution of technical procedures in judo is the demonstrative form (kata) when the performer must imagine his opponent in various postures (attack or defense) and focus on the most rigorous execution. Moreover, another reason to record the identified

difference also includes the presence of technical procedures that are performed from the position of standing on one leg.

If in the other tests psychomotor qualities are requested in the test “to appreciate the timeframes of 3s and 5s (Figure 2), the sense of rhythm is particularly requested. As we can notice in Table 1, the difference from initial to final testing, in both tests, is identical for both timeframes (3s and 5s). Hence, both intervals record a significant difference ($p < 0.01$). We believe subjects record a progress, as a result of the sequencing of movements in judo and their fragmented execution. The execution of movements in a certain rhythm with each alternate segment can determine the formation of a sense of the rhythm of execution, and, implicitly, of time. We mention that within the planning of the consolidation of technical procedures in judo, there are moments of execution, upon signal, to develop the reaction speed. Therefore, in order to standardize execution, to assure the same number for all subjects, we repeatedly performed the technical procedures, upon order, by counting. Moreover, when one aimed at the development of the execution speed, we set, in most cases, an interval of 10 seconds. This form of execution determined over time the formation of a rhythm, a controlled sequence of movements.

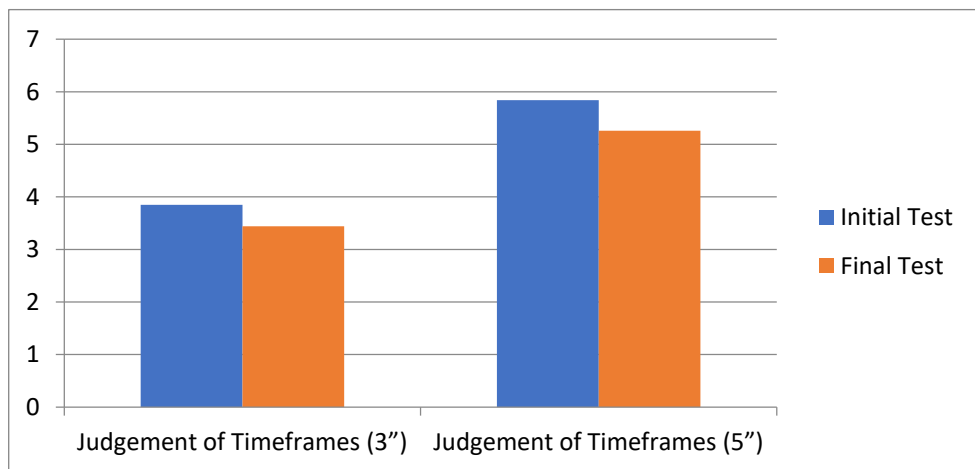


Figure 2. Judgement of Timeframes (3'' and 5'')

The almost identical results recorded at the two timeframes are due to the relatively short duration of the deployment; nevertheless, a slightly

significant difference is recorded in the 3s as compared to the 5s test, which could determine us consider that the subjects have already acquired experience from one test to another. In this respect, we must point out that the tests for both timeframes took place the same day.

4. Conclusion

Psychomotricity tests highlight the influence of the acquisition of judo-specific skills in the formation and development of balance skills, in the Bass and Orientation and coordination test the difference is very significant $P < 0.005$, whereas in the other tests the significance threshold is $P < 0.01$. This was to be expected given the various directions of the segments during the execution of technical procedures, the need to coordinate the segments in relation to one's own trunk, but also in relation to the partner's or opponent's segments. The variables herein are valid both in the case of acquiring technical procedures for demonstrative judo competitions, as well as for combat ones. To conclude with, practicing judo is a safe form of developing coordination and segment control, but equally to develop a sense of rhythm.

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