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Study of a set of tests on rapidity as a mean of talent research in karate.

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Introduction

The analysis of the researches available in literature underlines that the execution rapidity of punch and kick techniques is a very important skill in sports karate (kumité). In particular match analysis has showed that the gyaku-zuki techniques (opposite punch), kizami-zuki techniques (advanced punch) and mawashi-geri techniques (circular kick) have a fundamental importance in the low energy cost of matches and the execution rapidity of one of these techniques is a common characteristic between high level athletes. A talent research project in this sport needs to examine the action rapidity of young karateka, because this skill develops mainly up to 13 years (Martin, 1982),and in particular it is important to gather specific rapidity of match techniques more used and more efficient. Works in literature about rapidity techniques evaluation, are mainly turned to athletes belonging to junior and senior categories, including therein our researches on SoP test (Speed of Punch) and on SoK test (Speed of Kick) (Villani et al. 2003-04).Fig. 2 - SoK test (modif.)
For this reason we started an experimentation to verify the opportunity to use SoP test and SoK test on a group of 11-13 boys practicing karate, confirming their reliability characteristic.

Methods

For the execution of these tests we used a computer system that gathers and integrates the signal coming from photo-cells and a piezoelectric cell platform (wrapped up around the punch bag) prepared as shown in Fig. 1-2. In the tests execution (that are modified to better adapting to young karateka skills) techniques have been performed from two different distance: 100 cm for right and left mawashi-geri techniques (with photocells line forward the advanced leg) and 80 cm for giaku-zuki and kizami-zuki techniques. The experimentation has been conducted on a 20 boys group doing karate and frequenting lower secondary school: 10 low belts (white-green; practice years 2 ½ ±1) and 10 high belts (blue-brown; practice years 5±1).Each athlete after a brief warm-up was exposed before to SoK test (4 Mawashi-G. dx and 4 Mawashi-G. Sx) and then to SoP test (4 Gyaku-Z. and 4 Kizami-Z.) and in all 4 cases was considered the best result . To value test reliability the same trials were repeated two days later.

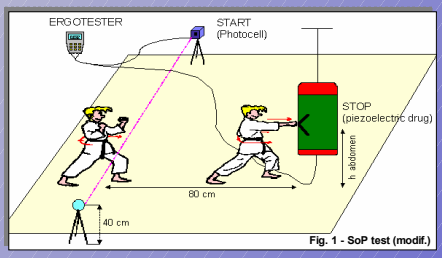

Fig. 1 - SoP test (modif.)

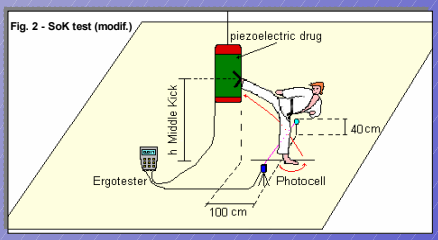

Fig. 2 - SoK test (modif.)

Tab.1 - Correlation Test-Retest	High grade - Best performance (sec)			Low grade - Best performance (sec)		
TECHNIQUE	M Test	M retest	Correlation	M Test	M retest	Correlation
Mawashi geri DX	0,208	0,197	r = 0,906 ; p<0,01	0,190	0,180	r = 0,760 ; p<0,05
Mawashi geri SX	0,229	0,216	r = 0,809 ; p<0,01	0,219	0,219	r = 0,717 ; p<0,05
Giaku Zuki	0,195	0,199	r = 0,790 ; p<0,01	0,199	0,232	r = 0,723 ; p<0,05
Kizami Zuki	0,177	0,158	r = 0,789 ; p<0,01	0,187	0,191	r = 0,793 ; p<0,01

Tab.2 - Trasversal Comparison (Anova) High grade - Low grade (belt)				
TECHNIQUE	bleu/brown	white/green	Diff%	Anova
Mawashi geri DX	0,208	0,190	-9%	p = 0,151 (n.s.)
Mawashi geri SX	0,229	0,219	-5%	p = 0,355 (n.s.)
Giaku Zuki	0,195	0,199	5%	p = 0,898 (n.s.)
Kizami Zuki	0,177	0,187	2%	p = 0,706 (n.s.)

Results

Reliability study results (test-retest correlation; Tab. 1), showed, for the high belts group, r values between 0,789 and 0,906 (p<0,01) for the 4 techniques evaluated, while in the low belts group r values have been lightly lower (between 0,717 and 0,793) but anyway significant (p<0,05). The transversal comparison instead showed no significant differences between high and low belts groups, those ones in some occasion have been faster than the high belts (Tab. 2).

Conclusions

The results of the experimentation permit us to point out in the SoK Test and SoP Test interesting characteristics of reliability (test-retest) also in young athletes (11-13 years). Reliability of two tests is in fact proportional more to the technical level than to the age of the athlete. Very interesting have been transversal comparison results: execution rapidity techniques seems to be unconcerned with the agonistic level got. So can be assumed that for karate talents individuation, would be necessary disregard from the level (belt) of young athlete, orientating our researches through boys with high specific rapidity. Reaction rapidity gathering in a stimulus answer, practicable programming in a different way the computer system that gathers and integrates the signal coming from photo-cells and piezoelectric cell platform, will be our next study.

References:

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