

Elaboration of a specific test for the evaluation of frequency speed of punches in boxe

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Introduction

The rapid execution of punches is a determining factor in order to excel in the sport of boxing and the frequency's speed of punches is very important above all in amateur boxing, a sport in which the number of winning punches is much more considered than their power. Different authors have analyzed the power of punches in boxing (Smith et al, 2000; Atha et al, 1985; Villani & Preli, 2003), but few of them have studied the speed of action and the speed of frequency of the attack's combinations (Alonso & Lopez, 1983). Despite this, the training of frequency's speed of punches is used by many important boxing teams (Falcinelli, 2001) and for this reason the analysis and the observation of this speed's development plays a fundamental role. Therefore, in order to observe the development of the frequency speed, we invented a new kind of specific test called FSP (Frequency Speed of Punch). It is a valid and economic test that allows us to study the speed of a simple combination (jab-cross) and the number of punches hitting the sack in defined unities of time.



Methods

In order to carry out the FSP test, we use a foot-board with piezoelectric cells connected to a computer (ergotester Globus; Fig.1; photo A-B) and put around a boxing sack. The test is organized following 3 procedures: jab-cross (speed of the single punch), number of punches in 5" (speed of frequency) and number of punches in 15" (resistance to the speed of frequency). The experimentation of the test has been tried on a group of 20 boxing athletes, sorted out from the age of 16 till the age of 33: 10 amateurs (non agonists) (weight 74±14, h 176±8) and 10 agonists (weight 65±9, h 175±9). For the FSP jab-cross mode each athlete had to repeat the test for 3 times (and we considered just the best one), while for the other two modes (number of punches in 5" and in 15") we repeated the test just one time. In FSP 15" has been furthermore considered and observed the frequency of punches and the heart frequency (post-test recovery). In order to check the validity of the test itself, it has been repeated after 2 days (test-retest correlation). In order to study the test validity and to verify the capacity of distinction among athletes of different level, a transverse comparison between the group of agonists and the group of amateurs has been made.

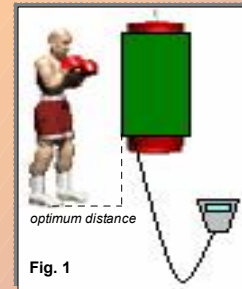


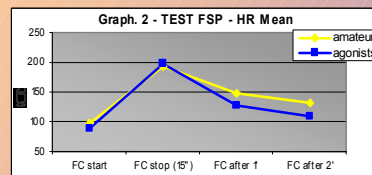
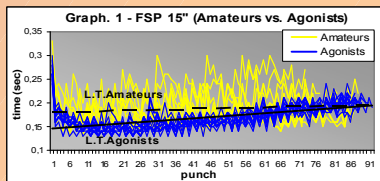
Fig. 1

Results

The results of the study on the reliability of the test (test-retest) for the 3 modes in both groups (TAB1), put in evidence values of r between 0,84 and 0,95 (p< 0,01). The transverse comparison (validity study) put in evidence a greater speed of frequency in the group of agonists than in that of amateurs (TAB 2). In fact the agonists have had a 20% best result in the 5" and a 12% best result in 15" (p< 0,01). Instead, in the jab-cross mode the difference has been only of 5% (p=0,47 n.s.). Analyzing the rhythm of punches in FSP 15" we noticed a greater regularity in the agonists if compared to the amateurs (Graph.1). The agonists also resulted as the best in the post- test recovery of the heart frequency.

Tab.1 correlation test-retest	Amateur athletes			Agonist athletes		
	M test	M retest	Correlation	M test	M retest	Correlation
jab-cross (sec)	0,169	0,165	r = 0,91 ; p<0,01	0,161	0,160	r = 0,88 ; p<0,01
N° Punch 5"	25,4	26,5	r = 0,91 ; p<0,01	30,5	30,7	r = 0,86 ; p<0,01
N° Punch 15"	79,3	81,5	r = 0,95 ; p<0,01	88,5	89,2	r = 0,84 ; p<0,01

Tab.2 - Trasversal comparison (Anova) Agonist Athlets - Amateur athletes					
FSP mode	M Amateur	M Agonist	diff. %	Anova	
jab-cross (sec)	0,169	0,161	-5%	p = 0,4742 (n.s.)	
N° Punch 5"	25,4	30,5	20%	p = 0,0061**	
N° Punch 15"	79,3	88,5	12%	p = 0,0054**	



Conclusions

The FSP test has resulted as a reliable test (test-retest correlation) and as a valid one (transverse comparison). As a conclusion, this test can be considered a valid means in order to obtain a precise and economical valuation of the frequency's speed of punches in the sport of boxing and in fighting sports in general. But, to obtain final conclusions is important to analyse with the FSP test also top level athletes. It will be the subject of our next study.

References

- Alonso J., Lopez E.G. (1983). Boletin científico-técnico INDER-Cuba (Havana) 18: 5-12
- Atha J., Yeadon M.R., Sandover J., Parsons K. (1985). British Medical Journal, 291, 1756-1757
- Falcinelli F. (2001). Metodi moderni di allenamento per la preparazione dei pugili, SSS Roma.
- Smith M.S., Dyson R.J., Hale T., Janaway L. (2000). Journal of Sport Sciences, 18: 445-450
- Villani R., Preli A. (2003). ECSS Congress Salzburg, Austria