CONFIGURATION OF MOTOR FEATURES OF THE YOUTH PRACTISING FENCING

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INTRODUCTION

Speed in one of essential motor characteristics in many sports games (Witczak, 1977). It can be assessed by various methods. The most precise results are obtained by measuring reaction time with chronometers or, still more precise, by using various special-purpose testing equipment (Ziobro et al., 1979).

The present work is aimed at fencers' psychomotoric and attention divisibility tests, estimating their ability to perform a motor function correctly.

METHODOLOGY

The tests have been made for 16 fencers of the Wroclaw Technical University's AZS Club, being members of the Polish national fencing team at the same time. The fencers, aged 14 to 19, were practising fencing for 3 to 9 years. As a reference group, 15 University students attending obligatory physical training were employed. The psychomotoric tests in question, both of fencers and students, have been performed using a device, designed at the Wroclaw TU specifically for the purpose. The reaction-delay measuring stand consisted of 6 circles of various diameters, situated concentrically to form a half-sphere area. 24 points were available on each circle to measure the reaction time. Light stimuli were produced by lamps disposed on the circles; a TV monitor was placed in the central point of the field of view.

Tests were performed for 3 circles and 27 points, i.e. nine reaction times were evaluated for each circle (see Fig. 1). During the test, fencers assumed the basic attacking position in the distance of 150 cm from the TV monitor. They wore fencing suits and masks. The task of the fencer, being disposed to attack, was to react as quickly as possible to a lamp going on by actuating a switch held in his hand. The lamp flashing sequence was random. Two series of test, with (1) and without (2) distracting, were performed. As the distracting/interfering factor, continuous readout of numbers appearing on the TV monitor screen was used.

Results obtained have been statistically analyzed and significance of differences has been verified using the T-Student test (Guilford, 1964).

RESULTS AND DISCUSSION

An analysis of arithmetic averages for the times measured showed statistically significant differences in reaction times between fencers and students. The average time for all points tested amounts to 0.314 sec for fencers and 0.417 sec for students. The difference is statistically significant at the level of $a = 0.01$ and thus proves a sensibly higher speed of those practising fencing. Predisposition to fencing and specific training developed high reaction speed in men practising it.

Next, an analysis of reaction times in function of the field of view diameter was performed

(circle I, II, III). As can be seen from Fig. 2, the measured times change with the increase of field of view radius. This is true both for fencers and men not practicing fencing. Arithmetic averages of the times for fencers are 0.310, 0.315 and 0.316 sec. for respective circles in no-distraction conditions (1). Respective times in the presence of distracting factor are equal to 0.421, 0.414 and 0.416 sec..

Circle	Point	Fencers				Students			
		1		2		1		2	
		x	s	x	s	x	s	x	s
	C	0,321	0,07	0,429	0,10	0,391	0,08	0,525	0,10
	D	0,320	0,08	0,428	0,10	0,402	0	0,548	0,13
	E	0,Z9d	0,09	0,401	0,09	0,349	O,O7	0,519	0,T6
	L	0,347	0,12	0,430	0,11	0,399	0,08	0,496	0,08
I	M	0,334	0,T0	0,445	0,16	0,382	0,08	0,548	0,11
	N	0,312	0,09	0,420	0,11	0,361	O,O7	0,494	0,07
	U	0,282	O,O7	0,395	0,11	0,391	0,08	0,479	0,09
	V	0,263	0,05	0,407	0,09	0,371	0,08	0,498	0,09
	W	O,ƎZO	0,10	0,439	0,10	0,906	0,09	0,558	0,14
	A	0,344	0,10	0,392	0,09	0,405	0,14	0,498	0,09
	B	0,289	0,08	0,392	0,08	0,393	0,08	0,487	0,16
	C	O,ƎOZ	0,08	0,419	0,11	0,385	0,10	0,490	0,12
	D	0,339	0,09	0,454	0,12	0,371	0,10	0,495	0,10
II	V	0,295	0,07	0,388	0,08	0,347	0,07	0,493	0,14
	W	0,346	0,09	0,430	0,11	0,350	0,08	0,586	0,Ǝ0
	X	0.296	0,06	0,412	0,11	0,361	0,09	0,479	0,T9
	Y	0,301	0,09	0,432	0,10	0,364	0,09	0,538	0,17
	Z	0,Ǝ07	0,08	0,406	0,12	0,380	0,10	0,498	0,08
	A	O,ƎZZ	0,07	0,415	0,12	0,371	0,09	0,469	0,09
	B	0,334	0,10	0,455	0,14	0,385	0,10	0,559	0,Ǝ0
	G	0,293	0,08	0,408	0,11	0,352	0,08	0,495	0,13
III	F	0,Z99	0,06	0,389	0,08	0,392	0,11	0,488	0,11
	S	0,ƎZ8	0,09	0,428	0,13	0,388	0,11	0,529	0,13
	T	0,322	0,09	0,427	0,08	0,383	0,10	0,539	0,T6
	X	0,324	0,10	0,394	0,09	0,372	0,08	0,493	0,08
	Y	0,294	0,06	0,399	0,08	0,341	0,08	0,479	0,09
	Z	0,326	0,10	0,425	0,12	0,405	0,18	0,527	0,18

Table 1. Statistical distribution of fencers'/students' reaction times.
Notes: x - arithmetic average, s - standard deviation

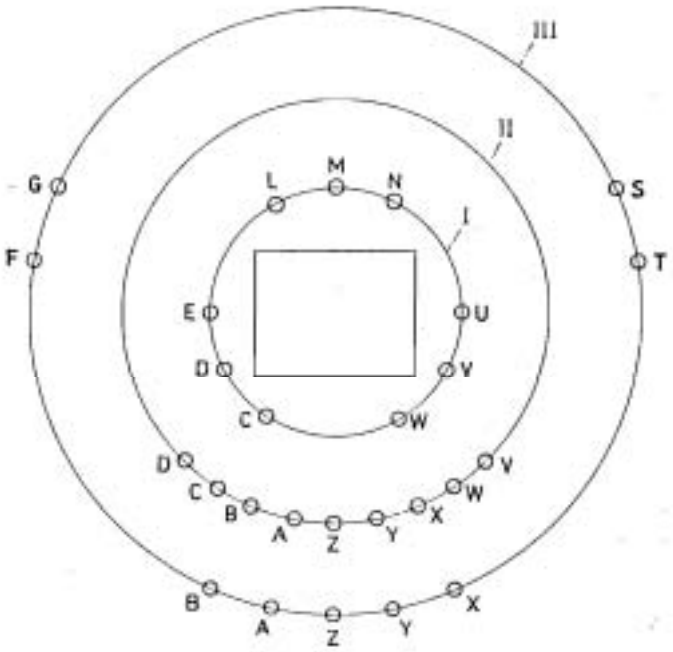

Fig.1. Positions of lamps emitting visual stimuli on the three circles.

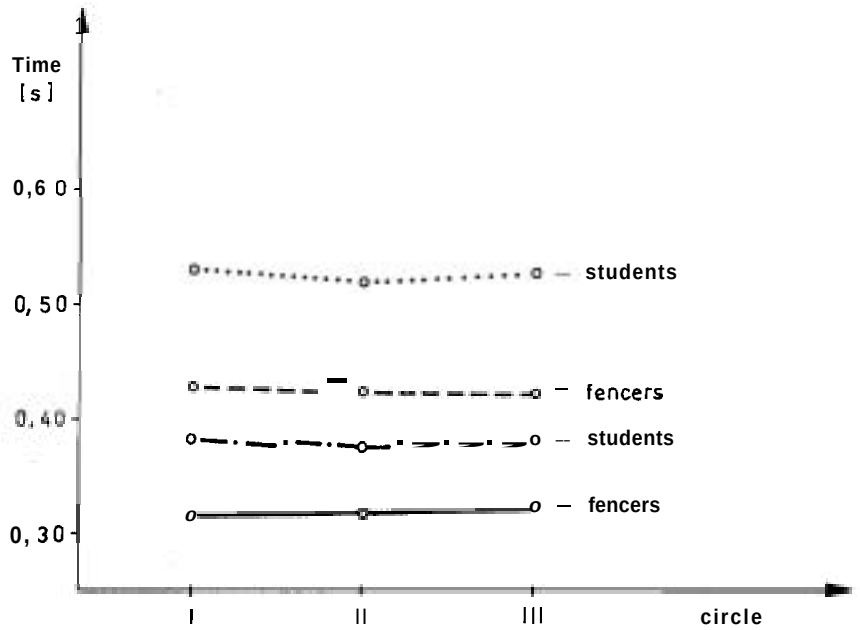

Fig.2. Fencers' and students' reaction times for different circles.

Students' speeds were evidently worse and amounted to 0.377, 0.365 and 0.374 sec. in no-distraction conditions (1) and 0.533, 0.508 and 0.513 sec. in the presence of distracting factor. The differences between fencers and students are statistically significant at the level of $a = 0.01$.

Influence of the distracting factor on fencers and students has been also studied. It can be stated with sufficient degree of certainty, that the reaction time in the presence of a distraction is longer than in the absence of it. Greater standard deviations can also be observed, particularly with students. Thus generally the influence of distraction is greater for students. Men not practising fencing concentrated more on reading numbers on the TV monitor than fencers. Lesser influence of the distracting factor on fencers' reaction time bespoke their higher divisibility of attention.

Detailed analysis of reaction times on particular circles has also been carried out (table 1). Only statistically significant differences has been taken into account. The lowest reaction time to a visual stimulus emitted from the first circle was obtained for point V (0.263 sec) situated in right-hand lower quarter of the circle. Statistically significant differences has been found in relation to points C (0.321 sec), L (0.347 sec) and M (0.334 sec). Reaction times for the second and third circles do not show any statistically significant differentiation both in no-distraction series and distracted series. Special attention deserves the reaction time of point V for fencers, which is lowest on first two circles for both test series.

Stronger dependence of the stimulus-emitting spot position on the reaction time has been observed for students. The greatest differentiation of results has been obtained for the second and third circle (table 1).

The analysis of results presented showed that the employed device enables extensive investigations upon a reaction lime to light stimuli disposed within the field of view. It may be particularly useful for individual assessment of fencer's readiness to fight.

CONCLUSIONS

1. The test results obtained proved the usefulness of the presented equipment to assess the fencers'

speed and attention divisibility.

2. A considerable advantage of the equipment consists in the reaction time being measured within the

field of view, this being of prime importance in numerous sports games e.g. fencing.

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