

EXPERIMENTAL STUDY REGARDING THE INTRODUCTION OF THE PSYCHOLOGICAL PROFILE IN THE INITIAL SELECTION FOR SPORT SHOOTING

Ioan Galea¹, Giorgiana Pinteau², Corina Dulceanu³,
Gabriel Marconi³, Pop Gheorghe⁴

¹Research Center for Physical Activities (RCPA),
“Aurel Vlaicu” University of Arad

² Athlete at “MSC” Arad, ³ “Aurel Vlaicu” University of Arad

⁴ Trainer at “MSC” Arad

Abstract

*The aim of our study is to better the initial selection process in performance target shooting, considering the psychological profile – in relation to the somato-functional side- as a decisive factor in obtaining performance. **Methods:** the study was carried out at the Arad Municipal Sporting Club (MSC) in two stages. In the first one 148 students filled out the Cattell 16FP personality test in the presence of an authorized psychologist and have performed tests specific to the initial selection (TSSI): balance test (TE), spatial coordination test (TCS), skill and precision test (TIP). Two groups were set up: group A (GR. A, N=18 subjects, 7 girls, 11 boys, Age average 13.77 ± 0.42 years) which scored above average in five categories (C, E, F, H, Q) and had an express desire to practice target shooting; and group B (GR. B, N=18 subjects, 9 girls, 9 boys, age average 13.6 ± 0.38 years) with a point average above specific test score results ($M=3$) and an express desire to practice target shooting. In the second stage the two groups have performed the shooting trial (PF) in the target range. **Results:** our study produced no evidence towards a positive and significant relationship between shooting range subject performance and the proposed psychological profile.*

Keywords: psychological test, balance test, skill and precision test, spatial coordination test, emotional balance.

Premises

The initial selection process in sport shooting raises at least two important aspects: on one hand, the great number of subjects that abandon shooting range practice after the first years and on the other the difficulty found in setting up a reliable, specific, battery of tests. The data provided by the sport shooting department of C.S.M Arad provides an image for the former aspect, thus, out of a total of 747 students tested during 2007-2008, 47 subjects have been selected (intermediary selection) and only 29 remained after 3 years of training. As for the TSSIs utilized at CSM Arad, certain clarifications must be made.

The initial selection process — regardless of the type of sport discussed - is made according to 4 criterions^{2,6}: medical, mathematical, motric and psychological. General health status is an intrinsic condition in sport shooting as opposed to the motric qualities, that define the professional athlete in the sport, which are perfectible^{3,9,10} (endurance and static equilibrium force, speed in dynamic tests). It has to be stated though that some neuro-psychical aspects (a strongly balanced and mobile nervous system type, very good neuromuscular coordination and a developed fundamental nervous process system registered with those taking part in dynamic tests) have not reached their full maturity at the age of 13-14 in order to be considered initial selection criterions.

The testing process^{1,7,8} consists of an: **equilibrium test** (balancing on one foot while time is being measured), **spatial coordination test** (the subject starts advancing towards a tennis ball suspended at shoulder level from a 2 m distance, with the right hand extended at shoulder level and the left eye covered by the left hand — the other way around for lefties-; the subject stops when he/she considers to be close enough to hit the ball by extending their index finger), **skill and precision test** (the subject has to throw a disc with a 15cm inner diameter towards a pin 2ms away) and **firing 5 shots from a standing position** (the rifle being leant against a supporting structure).

After the 4 trials it can be concluded that only the last one represents a specific sport shooting test, the other ones being

exercises that may make up a battery of tests for other sport branches. In other words, in relation with other sports, sport shooting forwards a relatively simple technical structure, however one that necessitates the precision and accuracy of the perfect movement⁴.

The training consists of repeating the same movements until they are performed flawlessly and this implies exceptional physical and psychological features, emphasized by trainers with exceptional qualities (Tao Luna): perseverance, relaxation, courage and enthusiasm and last but not least a great amount of self-confidence^{11,12}. In the process of optimizing the selection process, our study aims to identify the possibility of a significant relationship between some personality traits and sport shooting during the initial selection process.

Methodology

The subjects

148 subjects have taken part in the study (N=148, 94 males, 54 females, age 13.28 ± 0.49 years). During the first stage they have undergone TSSI and have been submitted the Cattell 16FP personality test. In the second stage two distinct groups have been configured based around the following criteria: GROUP A (above average test results in 5 items - C,E,F,H,Q- and the expressly manifested desire to practice sport shooting; N=18 subjects, 7 females, 11 males, age average 13.77 ± 0.42 years) and GROUP B (above average specific test results ($M_{TSSI}=3$) and an express desire to practice sport shooting; N=18 subjects, 9 females, 9 boys, Age average = 13.16 ± 0.38 years). In the second phase the two groups have taken the practical shooting test in the firing range. The study has been approved by the ethical committee of CCAF, trainers and members of the CSM Arad sport shooting division.

Study Design

The Cattell 16FP personality test has been applied in the presence of a chartered psychologist, also responsible for centralizing,

processing and interpreting the data. Out of the 16 items we have further analysed the following ones: C (emotional balance), E (self-confidence), F (communicational skills), H (trust manifested in own person) and Q (calmness). The shooting trial (PF) consisted of firing the gun 5 times from a standing position; marking and evaluation are made with the aid of a transparent template which is overlaid on the group table, with grading ranging from 10 points (weak) to 50 points (excellent). The selection standard (SS) is 25 points. For the TSSI the grading ranges from 1 point (weak) to 4 point (excellent) and the SS is 3 points.

The express desire to practice sport shooting, an important motivational factor in our opinion, influenced the setup of the two groups in the sense that subjects who have registered a low grading in the two tests (TSSI and Cattell 16FP) during the first stage are to be found in groups A and B and represent 11.11% (2 subjects for each group). The SPSS program (version 17.0) has been used for calculating and analysing the results.

Results

The results obtained by the subjects from the two groups are included in table 1 and 2.

Table 1. The general average and standard deviation for Cattell 16FP and PF. Group A

Group A

	<i>SUB.</i> <i>(nr.)</i>	<i>AGE.</i> <i>(years)</i>	<i>Cattel 16PF</i>				<i>PF.</i> <i>(pct)</i>
			<i>C(pct)</i>	<i>E(pct)</i>	<i>F(pct)</i>	<i>H(pct)</i>	<i>Q(pct)</i>
N	18(7E,11m)						
M		13.77	12.27	15.38	15.61	13,22	14,44
SD		0.42	2.96	2.95	3.55	3,15	3,32

Table 2. The general average and standard deviation for TSSI and PF. Group B

B

	<i>SUB.</i> <i>(nr.)</i>	<i>Age.</i> <i>(years)</i>	<i>TSSI</i> <i>(pct)</i>	<i>PF.</i> <i>(pct)</i>
N	18(9f,9m)			
M		13.16	3.05555	45.83333
SD		0.38	1.10996	5.617724

From a psychological profile standpoint Group A (Table 1) is emotionally stable (M=12, 27 in relation to the questionnaire’s standard of 11-12) — C factor; proves a good amount of self-assurance (M=15,61 compared to the questionnaire standard of 12-17)- E factor; is an open, communicative group (M=15,61 related to the questionnaire reference standard of 12-17)- F factor; as for spontaneity, the group’s daringness is situated within the standard average (M=13,22 for the group compared to a 14-21 standard average) — H factor; and a relatively high Q factor (calmness-serenity), the group averaging M= 14,44, can be explained through the nature of the experience, the age of the subjects, fear from the unknown. These aspects are represented in fig.1.

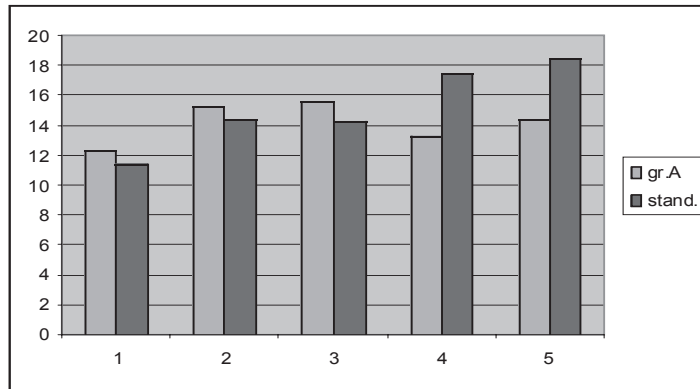


Fig.1 Graphic representation of the C,E,F,H,Q average values in relation to measurement standard average.

As for the results registered in TSSI, Group B’s setup respects the club selection criterion (M=3.05±1.10) as shown in table 2.

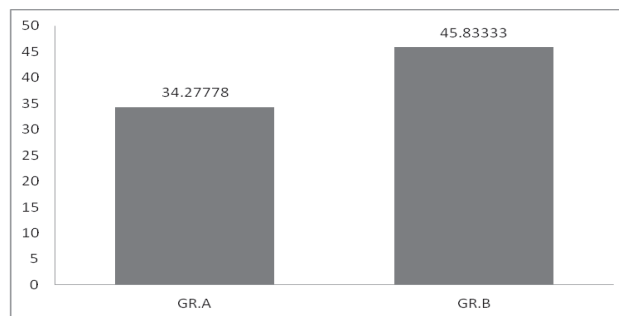


Fig.2 Graphic representation of the PF grade average for the two groups

During the second stage, both groups have fired their weapons in the shooting range after receiving guidance. Figure 2 represents the results for the two groups.

Discussion

The personality test data for group A, considered a selection criterion for this group, describes the following psychological profile: emotional stability, self-assurance, communicativeness, relative calm, i.e. the psychological profile suggested by Xie Qianqiao (Shanghai Sport Science Institut)

We have calculated the correlation coefficient (r) to determine whether there is a relationship between the 5 personality traits and shooting performance, and if present, is it significant or not. The results obtained ($r_C= 0.039075$, $r_E= -0.09996$, $r_F= 0.171393$, $r_H= -0.182$, $r_Q= -0.02525$) show that there is no significant and positive relationship between the 5 personality factors in shooting performance. In PF, the average ($M_{PF}=34.27$ points) for Group A is above the selection standard ($M_{SS}=25$ points). Standard deviation values, for both the 5 items as well as for the firing trial, suggest a less homogenous sample (Group A), resulted from the initial selection process, compared to Group B and using as a reference the psychological criterion. Calculating the correlation coefficient (r) between TSSI and PF for Group B we can see that there is no positive and significant connection ($r=-0.08447$) between the two variables, meaning the subjects with better results at specific trials have not performed at the same level during the shooting trials. Nonetheless, results registered by Group B in the firing range are better than those registered by Group A (fig. 2).

Conclusions

Based on the results obtained we have proved that sport shooting performance during the initial selection process is not influenced by the psychological profile and the results obtained during specific trials, although such a relation is suggested by the field specific literature. We can assume that the psychological factors analysed in the study are not yet fully stable at the age of 13-14,

the registered scores only showing trends. Anyway, achieving a level of great performance in sport shooting requires long years of practice aiming for perfection and this is not possible without certain psychic qualities: perseverance, self-assurance, calm and relaxation. Although there is no static liaison between the specific tests used by CSM Arad trainers during the initial selection process and shooting performance, the results obtained by Group B are better in comparison to those registered by Group A. There is an argument supporting the continued usage of these tests during the initial selection process. However further research is necessary to define a battery of tests specific for sport shooting that would also allow for a decrease in the number of those abandoning fire range activity the first 2-3 years after being selected.

Acknowledgments

We would like to thank all those taking part in our study.

References

1. American College of Sports Medicine,(2010) *Guidelines for Exercise Testing and Prescription*, 8th ed., Lippicott Williams &Wilkins, Philadelphia, USA
2. Bocu T., Tache S.(1997), *Seleția în sport*, Editura Dacia, Cluj-Napoca, RO;
3. Bompa O. Tudor (2001), *Teoria și Metodologia Antrenamentului*, ediția a II^a, CNFPA, București, RO;
4. Cișmigiu Petre (2002), *Tirul sportiv cu pistolul*, Lumina Tipo srl, București, RO;
5. Cometti Gilles (2005), *La preparation physique en football*, ed. Chiron, Paris, Fr.;
6. Drăgan I.(1989), *Seleția medico-biologică în sport*, Editura Sport-Turism, București, RO;
7. Heyward,V. (2010), *Advanced fitness assesement and exercise prescription*,6th ed., Human Kinetics, Champaign, IL, USA
8. James R. Morrow, Jr., Allen W. Jackson, James G. Disch, Dale

P. Mood (2005), *Measurement and Evaluation in Human Performance*, Human Kinetics, Champaign, IL, USA

9. Platonov V.N. (1995), *Principiile pregătirii pe termen lung, Teoria antrenamentului*, Centrul de Cercetări pentru Probleme de Sport, București, RO;

10. Teodoru, M. (2004), *Curs de tir sportiv*, Editura Cartea Universitară, București, RO;

11. Xie Qianqiao, *A Retrospect on the selection and training of the elite female shooter*, ISSF NEWS , nr. 4, pp. 19 — 25, 2004;

12. www.issf-shooting.org; (accessed 12.09.2014.)