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CORRELATION BETWEEN COORDINATION AND PERSONALITY TRAITS OF SOLDIERS IN BATTLE UNIT OF SLOVENIAN ARMED FORCES

1. INTRODUCTION

The main goal of the article is to analyze whether there is any correlation between motor ability of coordination and personality dimensions of the soldiers in the battle unit of the SAF. The results could give more information about soldiers' motor behaviour.

Apart from some important turnovers, when Slovenia became a member of NATO and the EU and changed from a conscript army to a professional one, global security circumstances have also changed dramatically in recent years. All these changes demand a higher level of professionalization and standard combat readiness. Combat readiness is one of the main characteristics of all armies. It represents the ability and readiness of armed forces as a whole or its branches, services and units to incorporate themselves in an action in different circumstances and at different times. The motor abilities of an individual soldier as well as of a whole unit represent one of the key elements of combat readiness that is gaining its importance at training a modern army (Karpljuk et al., 2000). Novak (2003) also cites the psychological capability apart from the motor ability of an individual soldier as the basis of combat readiness. Thus it may be concluded that motor and psychological capabilities are of main importance for adequate combat readiness of an army. Readiness of the members of the SAF (Slovenia Armed Forces) is provided by planned and organized execution of physical training of the units, in sports education, and in sports competitions (Direktiva za šport, 2005). The Directive also defines that military personnel should attend sports exercises (expert-led physical training) as part of on-the-job training up to an hour daily.

The tasks of the modern military are connected to extremely high and long-lasting physical and psychological efforts, demanding proper physical training and psychological conditioning from soldiers (Tkavc, 2004). In extreme conditions soldiers can reach their physiological limits due to their exertion, in case of which the activation of the organic system influences the psychological area as well. This may cause a temporal loss of alertness and rational comprehension of the reality for some time. Many individuals come to a point at which their own bodies represent a bigger problem than the task to be completed. Therefore physical training has to be based on endurance, strength and speed training on one side and on the development of mental abilities, cohesivity within the group and cohesivity of factors, related to the conditions on the battlefield, on the other side (Picarielo, 2000).

The objective of our investigation was to find the existing common inner mechanisms that lead to certain ways of motor behaviour. Motor abilities are those psychosomatic dimensions that determine motor efficiency and performance of motor tasks (Šturm and Strojnik, 1994). Certain level of coordination is important for efficient performing of each day's tasks in the modern military, especially when it is needed to solve complex motor structure quickly. Personal traits are dimensions that determine human reaction and behaviour, respectably, in different situations. They are crucial for understanding and prediction of human behaviour (Tušak and Tušak, 1994).

On the basis of the results of previous investigations, we expected strong correlation between extraversion and coordination (Eysenk, 1970-71; Ismail, 1976; Mraković, 1977; Hayes, 1996, Caprara, Barbaranelli, Borgogni, Bucik and Boben, 1997, Pori and Burnik, 2003). Due to their high mental quickness, extroverts should be quicker in accepting, analysing and processing information, and preparing a motor response. The level of cortical arousal in the case of extroverted individuals is low, and consequently needs a higher level of stimulation, which motor tasks of coordination could provide (Morgan, 1994). Those conclusions would lead us to expect a positive association of the mentioned variables. In the dimension neuroticism (emotional instability) individuals whose characteristics were calmness, self-assurance, concentration, and emotionally controlled behaviour obtained high values. By contrast, so-called neurotics, who are characteristically tense, stiff, irritable, and anxious, obtained low values in this category. Arousal and lability of autonomous nervous system and sub-cortex centres represent the neuro-physiological background for this dimension (Eysenk, 1970-71). Sub-cortex centres of the individuals that are less emotionally stable are highly stimulated, their performance is labile and unbalanced, while the arousal itself lasts longer. Since the tests of co-ordination certain degree of composure, calmness and concentration, correlation with neuroticism could well be expected as proven by previous researchers (Ismail, 1976; Kerin, 1985). We also expected other personality dimensions to be in correlation with motor abilities (Salgado, 1998; Piedmont, Hill & Blanco, 1999). High values of masculinity are characterized by active (sometimes also physical) assertion (self-confidence, enterprise, and reliability). Coordination tests which demand quick, precise and intensive motor activity. It may be the very point connected to masculinity and active physical assertion. Mraković et al. (1974) found that in aggressive individuals' excitation prevailed over inhibition and that a higher activity of motor centres was responsible for greater motor manifestation. Aggressiveness (impulsivity) and competitiveness are important elements of masculinity.

2. MATERIALS AND METHODS

2.1. The sample

The sample of the persons tested consisted of 94 male soldiers of the SAF, aged 21 to 36 ($26,5 \pm 3,4$ years). The soldiers were serving in a battle unit in the first brigade of the SAF. On the day of testing they had to be clinically healthy. Before testing they were informed about the purpose of the study.

2.2. The variables

For the assessment of motor ability of coordination two tests were applied measuring quick and efficient solving of motor tasks (Pistotnik, 2003):

- Polygon backwards (PB) (Šturm, 1977),
- Figure-8 with ducking (F&D) (Šturm, 1977), in literature also known as running and bending test.

The variables PB and F&D represent the ability for efficient resolution of space-related problems (Pistotnik, 2003). In the first test the participant must cover a distance of 10 m as fast as possible on all fours backwards, the first obstacle should be climbed over and the second crawled through (Šturm, 1977). During the second test the participant has to run 4 times between two vertical sticks in a shape of number 8. One also has to duck as there is vertical elastic band between sticks and it is set as high as iliaca cristale. Personality trait was measured using a medium version of FPI (Freiburg Personality Inventory), adapted and standardized in Slovenia (Bele- Potočnik, Hruševar & Tušak, 1984). The version included 114 items and measured 9 personality traits of order I (neuroticism, impulsivity, depression, irritability, sociability, calmness, dominance, suppression, sincerity) and 3 personality traits of order II (extroversion, emotional instability, masculinity).

2.3. Methods

The basic statistical parameters of all the variables were computed in the first phase of the data analysis. In the second, the Pearson correlation coefficients (r) between the motor tasks and their individual correlations with working efficiency were computed. Statistical significance was tested two-sidedly, 5 % error level was used.

3. RESULTS AND DISCUSSION

As can be seen in the Table 1, the motor test correlating most with personality traits is the so called polygon backwards.

Table 1: Pearson's Correlation Coefficients and their statistic significance between variables of motor space and aerobic conditioning with personality traits of order I

	NEUR	IMPUL	DEP	IRRIT	SOCIA	CAL	DOM	SUPP	SIN
PB	,250*	,215*	,093	,061	-,172	-,152	,102	,297**	,010
	,016	,039	,373	,563	,098	,147	,331	,004	,926
F8D	-,048	-,098	-,052	-,087	-,076	-,096	-,128	,140	-,003
	,650	,348	,621	,407	,468	,360	,221	,180	,974

* correlation is statistically significant with a 5% error

* correlation is statistically significant with a 1% error

Table 2: Pearson's Correlation Coefficients and their statistic significance between variables of motor space and aerobic conditioning with personality traits of order II

	EXTRO	EM.IN	MASC
PB	-,134 ,201	,066 ,532	-,164 ,115
F8D	-,247* ,017	-,050 ,631	-,067 ,526

* correlation is statistically significant with a 5% error

First coordination test correlates slightly positively with suppression, neuroticism and impulsivity. As in this test a higher value means a worse result, this means that soldiers that were slower in the polygon backwards, show a higher degree of suppression, neuroticism and impulsivity. Apart from that, a correlation between the polygon backwards and sociability also shows that better soldiers in polygon backwards tend to be more sociable. Correlations between the figure-8 with ducking test and extroversion (Table 2) are statistically significant with a 5% error. The correlation is negative, showing that better soldiers in this test are more extroverted or less introverted.

The results showed that neurotic and impulsive individuals did worse in this motor test. Higher values in dimension neuroticism mean also higher values in impulsivity (Bele- Potočnik et.al., 1984). Ismail (1976) found that tests of coordination correlated with emotional stability, as these tests demanded concentration, calmness and mental focus. Eysenck (1970-71) found that tests of coordination were done better by emotionally stable individuals and worse by neurotic, tense, unrelaxed, irritable and anxious ones, a fact deriving from a higher degree of excitation of sub cortical centres. Anxiety, which is a sub dimension of neuroticism, is a regulator of motor behaviour because it lessens the efficiency of motor exercises, expressed in slower motion, lessened agility and worse coordination (Horga, 1979). The researches discovered that more anxious individuals had a higher tonus in hand muscles and worse coordination of flexors and extensors (Tušak and Tušak, 1994). Higher anxiety and neuroticism affect negatively such motor exercises that require a precise dosage of force (Tušak and Tušak, 1994) and exact execution (Wanner and Little, 1998). Kerin (1985) and Dolenc (2001) also found that neuroticism affected negatively the tasks, demanding a high degree of motor coordination.

Suppression appears as shyness, reserved communication with other people and sometimes disturbance or even incapability of establishing contacts. It correlates negatively with sociability (Bele- Potočnik et.al., 1984). Both dimensions are important elements of the dimension extroversion. Extroversion is manifested by people who are sociable, who want contacts with other people, who are able to establish these contacts and make new friends easily. Their characteristic is a high mental speed, which means that they are faster at receiving, analyzing and processing information, as well as preparing motor answers. That is why the characteristics of extrovert people correlate highly with the tests of coordination (Mraković, 1977; Caprara et al., 1997), demanding an activity to be executed as fast as possible. All the facts listed so far explain the results of our

research, i.e. that suppressed individuals do worse in polygon backwards and sociable soldiers achieve better results.

Positive correlation between figure-8 duck and extroversion has already been proved in some researches. Mraković (1977), Caprara et al. (1997) and Dolenc (2001) found a strong correlation between extroversion and tests of coordination demanding to execute an activity as fast as possible. The reason for this lies in the fact that intro- and extrovert behaviour are controlled by the mechanisms regulating the level of inhibition and excitation (Mraković, 1977). Extrovert individuals have a low degree of habitual cortical excitation, so they are looking for extra brain stimulation and sources of external stimulation, in order to lift their level of excitation in an optimal way. That is why they are looking for external stimuli; their activity is at high level and focused outwards. Pistotnik (2003) found coordination to be the motor skill most dependent on the activity of the central nervous system. Its functional characteristics are the genetic basis of coordination. So the manifestation of coordination depends on three factors: the system for receiving and analyzing information, the centre for motor memory and cortical and sub-cortical centres for motion forming. Thus these centres are the clue to excitation and inhibition as well as motion forming, which is the basis of coordination. That is also where the correlation between coordination and extroversion comes from.

4. CONCLUSIONS

The main goal of our research has been to find correlations between personality traits and motor ability of coordination on the sample of 94 soldiers in the battle unit of the SAF. Our findings are similar to those that have already been published by some other authors. We have found that the test of polygon backwards correlates most with personality traits. Soldiers that were slower in this test showed a higher degree of suppression, neuroticism and impulsivity and were less sociable. The second test of coordination, the figure-8 duck, correlated with extrovertedness. Better soldiers in second test of coordination are more extroverted. The results have proven the existing correlations between coordination and personality dimensions of measured sample of Slovene soldiers and represent important information about their behaviour. Including more participants and more motor variables could give even more information about their motor behaviour and could allow some generalization.

References:

1. Bele- Potočnik, Ž., Hruševar, B., & Tušak, M. (1984). *FPI Freiburški osebnostni vprašalnik, Priročnik- dopolnjena oblika. [Freiburg personal inventory, Handbook- Updated Edition.]* Ljubljana: Center za psihodiagnostična sredstva d.o.o.
2. Caprara, G.V., Barbaranelli, C., Borgogni, L., Bucik, V., & Boben, D. (1997). *Model velikih pet: pripomočki za merjenje strukture osebnosti- priročnik. [A big five personality inventory: instruments for measuring a structure of a personality- Handbook]* Ljubljana: Produktivnost, center za psihodiagnostična sredstva.

3. *Direktiva za šport. [Directive of sport]* (2005). Ljubljana: Ministrstvo za obrambo Republike Slovenije.
4. Dolenc, M. (2001). *Analiza povezanosti nekaterih motoričnih in psiholoških razsežnosti otrok, starih 7 do 11 let. [Analysis of some motor and psychological dimensions of children aged 7 to 11. In Slovenian.]* (Doctoral Thesis). Ljubljana: Fakulteta za šport.
5. Eysenck, H.J. (1970-71). *Readings and extraversion- introversion, 1,2,3.* London: Staples Press.
6. Hayes, T. L. (1996). How do athletic status and disability affect the five-factor model of personality? *Human-Performance*, 9 (2), 121-140.
7. Horga, S. (1979). *Relacije konativnih karakteristika motoričkih sposobnosti. [Relations of conative characteristics of motor abilities.]* Zagreb: Kineziologija 9, 1-2: 91-105.
8. Ismail, A. H. (1976). *Povezanost između kognitivnih, motoričkih i konativnih karakteristika. [Correlation between cognitive, motor and conative characteristics.]* Zagreb: Kineziologija, 6 (1-2), 47-58.
9. Karpljuk, D., Žitko, M., Rožman, F., Suhadolnik, M., & Karpljuk, K. (2000). *Teoretične osnove in praktična izhodišča športne vadbe, namenjenim višjim častnikom Slovenske vojske. [Theoretical basics and practical implications of physical training, designed for high- level officers of the SAF.]* Ljubljana: Ministrstvo za obrambo.
10. Kerin, M. (1985). *Nekateri vidiki nevroticizma v zvezi s stažem aktivnih športnikov. [Some aspects of neuroticism in a connection with a period of active sportsmanship. In Slovenian.]* (Master Thesis.) Ljubljana: Filozofska fakulteta.
11. Morgan, W. P. (1994). Psychological components of effort sense. *Medicine and Science in Sports and Exercise*, 26 (9), 1071-1077.
12. Mraković, M. (1977). *Relacije između ekstraverzije i brzine frekvencije pokreta. [Relations between extrovertedness and frequency of movement.]* Zagreb: Kineziologija, 7 (1-2), 69-77.
13. Mraković, M., Gredelj, M., Metikoš, D., & Oreškovič, I. (1974). *Relacije između nekih motoričkih sposobnosti i konativnih faktora. [Relations between some motor abilities and conative factors.]* Zagreb: Kineziologija, 4 (1), 30- 41.
14. Novak, M. (2003). *Razvoj motoričnih sposobnosti pripadnikov SV po standardih ameriške vojske. [Development of motor abilities of the SAF members following the USA Army standards. In Slovenian.]* (Diploma.) Ljubljana: Fakulteta za šport.
15. Picarielo, J. M. (2000). *Battle- Focused Physical Training: A Career- Long Commitment.* Botswana: 2000 International Scientific Symposium, Gaborone, 23- 27 Oct. 2000: 11- 13.
16. Piedmont, R. L., Hill, D. C., & Blanco, S. (1999). Predicting athletic performance using the five-factor model of personality. *Personality and Individual Differences*, 27 (4), 769-777.

17. Pistotnik, B. (2003). *Osnove gibanja. [Basics of movement.]* Ljubljana: Fakulteta za šport.
18. Pori, M. & Burnik, S. (2003). Correlation between selected motor and personality dimensions of girls 7 to 11 years of age. *Acta Univ. Carol., Kinanthropol.*, 39, (1), 63-76.
19. Salgado, J. F. (1998). Big Five personality dimensions and job performance in Army and civil occupations. *Human Performance*, 11 (2-3), 271-288.
20. Šturm, J. (1977). Zanesljivost motoričnih testov. [*Reliability of motor tests*]. Ljubljana: Visoka šola za telesno kulturo.
21. Šturm, J., & Strojnik, V. (1994). *Uvod v antropološko kineziologijo [Introduction to anthropological kinesiology]*. Ljubljana: Fakulteta za šport.
22. Tkavc, S. (2004). *Gibalne sposobnosti v povezavi s športno dejavnostjo in nekaterimi morfološkiimi značilnostmi ter struktura motivov stalne sestave Slovenske vojske. [Motor abilities in a connection with sport activity and some morphological characteristics and a structure of motives in compulsory reserve of the SAF. In Slovenian.]* (Master thesis.) Ljubljana: Fakulteta za šport.
23. Tušak, M., & Tušak, M. (1994). *Psihologija športa [The psychology of sport.]* Ljubljana: Znanstveni inštitut Filozofske fakultete.
24. Tušak, M., & Tušak, M. (1997). *Psihologija športa [Sport Psychology]*. Ljubljana: Znanstveni inštitut filozofske fakultete.
25. Wanner, B., & Little, D. (1998). *Validity of a big five personality inventory for children (B5P-C)*. Poster presented at the International Society for the Study of Behavioral Development Meeting, Switzerland.

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The aim of the study was to investigate the correlation between motor ability of coordination and personality traits of Slovenian soldiers.

The subject sample consisted of 94 soldiers in a battle unit of Slovenian Armed Forces (SAF) who were serving in the first brigade (age $26,5 \pm 3,4$ years).

Motor ability of coordination was assessed with two motor tasks (polygon backwards and figure 8 duck test). The structure of personality traits was measured with a FPI (Freiburg Personality Inventory) included 114 items and measured 9 personality traits of order I (neuroticism, impulsivity, depression, irritability, sociability, calmness, dominance, suppression, sincerity) and 3 personality traits of order II (extroversion, emotional instability, masculinity). The correlation between coordination and personality traits was estimated by the Pearson's correlation coefficient.

The results show that soldiers who did worse in motor test polygon backwards were more neurotic, suppressed, and impulsive. They also tend to be more sociable. The correlation between second test of coordination shows that better soldiers in this test are more extrovert or less introvert.

Keywords: *coordination, personality traits, Slovenian Armed Forces*