RELATIONS OF PERSONALITY DIMENSIONS AND TEAM SITATIONAL EFFICIENCY IN YOUTH FEMALE VOLLEYBALL PLAYERS

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(Original scientific paper)

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Abstract

For the purpose of determining the differences in basic personality dimensions between female players of different team situational efficiency, 151 young female volleyball players, aged averagely 13.89±1.17years, filled out the Eysenck junior personality questionnaire (EPQ-J), designed by Eysenck & Eysenck (1975, 1994). It was established that the relation between the measured personality dimensions was not completely orthogonal because there was significant correlation between the dimensions of psychoticism and introversion-extraversion. Statistically significant differences were found by One-way ANOVA between the groups of players of different team situational efficiency in dimensions of neuroticism (F=8.57, p=0.00) and introversion-extraversion (F=3.70, p=0.03). This finding was also confirmed by multivariate discriminant analysis (Rc=0.40, p=0.00). A group of players with the highest team efficiency is characterized by the lowest degree of the neuroticism dimension, and a group of players with moderate team efficiency is characterized by the lowest degree of the introversion-extraversion dimension. The obtained results partially confirm the findings in literature about the influence of personality dimensions on efficiency in sports competitions.

Key words: *EPQ-J, One-way ANOVA, personality, volleyball, youth*

INTRODUCTION

Long time ago psychologists noticed the need for explaining human behaviour through a small number of basic personality dimensions. Eysenck's theory is an example of an empiric personality theory which explains the relations between basic personality traits and behaviour. The basis of the Eysenck's model is the factor analysis of data and correlation between the instruments that measure behaviour and different personality traits (Brajša-Žganec & Glavak, 2002). According to Eysenck, individual differences can be categorized under three high-order factors defined as extraversion-introversion, neuroticism-emotional stability and psychoticism (Eysenck, 1990). The extraversion-introversion personality dimension is related to the manner of excitation and inhibition of the central nervous system, the neuroticism dimension is related to the stability of the nervous system. The psychoticism dimension has been introduced in theory later on and it refers to a dispositional personality trait which is found in all people to a certain degree, and not to a psychiatric abnormality (Brajša-Žganec & Glavak, 2002). In his analyses, Eysenck established that the three basic personality dimensions were mutually orthogonal, i.e. independent. This means that the result or status of an individual in one dimension does not prejudice his/her status in another dimension, i.e. all combinations of dimensions are possible (Fulgosi, 1997). Eysenck's model is organised hierarchically. Specific responses to specific situations and individual acts or relations between individual stimuli and individual reactions are at the lowest level. Habits, act frequencies, i.e. habitual or usual responses or behaviours are at the next level, a level of higher generalisation. Characteristics, scales and facets, i.e. personality traits which are determined by correlations between habits from the lower level of generalisation are at the third level. Types of personality, which represent the highest level of generality, are at the

fourth, highest level in the hierarchical model of personality. Therefore, extraversion, neuroticism and psychoticism are at the highest hierarchical level, i.e. they represent the types of personality (Fulgosi, 1997).

Eagleton et al. (2007) state that in previous investigations on personality dimensions *extraversion* was more expressed in a population of athletes in relation to non-athletes. Tattersfield (1971, in Cox, 2005), by studying young athletes longitudinally, concluded that practicing sports before the age of maturity has developmental effects on personality, and young swimmers who were included in the five-year training programme developed higher extraversion and higher emotional stability. Čavala (2012) and Rogulj et al. (2006), by investigating young female handball players, established that players who play at the goalkeeper position in their teams have significantly higher introversion than players at other positions. Also, Čavala (2012) found no significant differences in the level of basic personality dimensions measured by the EPQ-J questionnaire between players of different level of individual player quality. Given that differences in the expression of basic personality dimensions, which have not been determined in relation to individual player quality, have been found between players at different playing positions within handball teams of younger age category, it would be interesting to determine if there were differences in the expression of personality dimensions between groups of female players who play for teams of different level of team efficiency. Therefore, the aim of this study is to determine the level and the existence of differences in basic dimensions between female players of different levels of team situational efficiency, on a sample of young female volleyball players.

SUBJECTS AND METHODS

The subject sample included 151 youth female volleyball players who have been included in the training process for averagely 3.3 years in 12 volleyball clubs in Dalmatia: OK „Marina-Kaštela, OK „Kaštela Cemex“, OK “Split“, OK “Brda“, OK “Makarska“, OK “Sinj“, OK “Trogir“, OK “Dubrovnik“, OK “Nova Mokošica“, OK “Ćilipi“, OK „Zadar“ and OK „Šibenik“. All participants, aged 13.89± 1.17 years, apart from the weekly sports engagement of 4.5 to 6 hours, also participate in weekend league matches (minimum of 22 matches during a season). Mean body height of the subjects is 171.07 cm and body mass is 57.33 kg. Eysenck junior personality questionnaire (*EPQ Junior*), designed by Eysenck & Eysenck (1993) was applied as a measure of personal characteristics of young female volleyball players. This is the most famous questionnaire for testing basic personality dimensions in children aged seven to fifteen years, and it represents a standardized psychological measuring instrument in Croatian language (Brajša-Žganec & Matešić, 1998). Junior EPQ contains 81 items divided into 4 scales: *extraversion – introversion (E)* which consists of 24 items, *neuroticism – emotional stability (N)* which consists of 20 items, *psychoticism (P)* which consists of 17 items, and the *scale of socially desirable responses or dissimulation tendencies (L)* which consists of 20 items. Given the fact that one point can be won at each item, the maximum score equals the number of items in each scale. Reliability coefficients on a sample of Croatian boys and girls aged 12 to 14 years for scales *P, E, N* and *L* range from 0.45 to 0.89 (Brajša-Žganec & Matešić, 1998), i.e. from 0.64 to 0.85 for boys and girls aged 12 to 15 years (Brajša - Žganec & Glavak, 2002). The criterion variable of *team situational efficiency* was defined by team placement at the Croatian youth volleyball championship for Dalmatia region in April 2012 in Split. The teams were divided into three clusters based on their placement at the regional championship: 1st to 4th place represents the *cluster of the most successful teams*; 5th to 8th place represents the *cluster of moderately successful teams*, and 9th to 12th place represents the *cluster of the least successful teams*. The Regional Croatian Volleyball Association gave their consent for the conduction of this study and the coaches got parents' consent for their underage children to fill out the questionnaire under psychologist's supervision. Young female volleyball players filled out the questionnaire immediately before the competition. Methods of data analysis included the calculation of descriptive statistical parameters: mean (M), standard deviation (SD), minimum (MIN) and maximum (MAX) result, measures of distribution asymmetry (SKEW) and kurtosis (KURT); and calculation of the Kolmogorov-Smirnov test value to determine the deviation of the result distribution variable from normal distribution (K-S test D). Significance of differences between the three clus-

Table 1 Means and characteristics of result distributions of the EPQ-J scales

VARIABLE	M	SD	D (K-S test)	MIN	MAX	SKEW	KURT
EPQ-J Psychoticism	3.53	2.86	0.18*	0	22	2.36	11.05
EPQ-J Extraversion	18.71	2.60	0.13	8	23	-0.94	1.88
EPQ-J Neuroticism	10.78	4.56	0.08	2	23	0.01	-0.58
EPQ-J Desirable responses (L)	7.34	4.26	0.11	0	19	0.55	-0.34

M – mean; SD – standard deviation; D (K-S test) – coefficient of the Kolmogorov-Smirnov test; * - the level of significance of the K-S test coefficient; MIN – minimum result; MAX – maximum result; SKEW – measure of distribution asymmetry; KURT – measure of distribution shape

ters of players of different team situational efficiency were determined by univariate analysis of variance (One-way ANOVA) with a *post hoc* test of differences (Tukey HSD test) and by discriminant analysis at the level of significance of p?0.05.

RESULTS AND DISCUSSION

By comparing the results obtained on this sample with the results of 285 female subjects of similar mean age (13 years and 8 months) in a study conducted by Brajša-Žganec and Glavak (2002), it was established that the results were similar, but there were also some differences between the expression levels of personality dimensions. In the sample of young female volleyball players, the *neuroticism* dimension is less expressed (10.78 as compared to 12.75), and *extraversion* and *psychoticism* dimensions are more expressed in comparison to a general sample of female students investigated by Brajša-Žganec and Glavak. This finding partially confirms the differences in the expression of personality traits between athletes and non-athletes which have been established a long time ago (Geron et al., 1986, in Cox, 2005; Eagleton et al., 2007), claiming that athletes are more extraverted and have lower anxiety. As Eysenck's personality theory is based on physiological processes in the organism, Fulgosi (1997), by interpreting the findings and attitudes of other authors, stated that the *extraversion-introversion* dimension corresponds to the *dimension of strength of the nervous system*, with extraverts having a stronger and less sensitive nervous system than introverts because their arousability is lower. Petz (2005) stated that in Eysenck's opinion, the neuroticism dimension can be related only to the instability of functioning of the *autonomic or vegetative nervous system*. Given that the differences in the expression of the *extraversion* and *neuroticism* dimensions have been determined in literature, athletes generally make their organism stronger by exercising, and it is justified to assume that this also affects better functioning of the somatic and autonomic nervous system.

Table 2 Correlations of the EPQ-J scales

VARIABLE	EPQ-J Psychoticism	EPQ-J Extraversion	EPQ-J Neuroticism	EPQ-J Desirable responses (L)
EPQ-J Psychoticism	1.00	0.11	0.28**	-0.27**
EPQ-J Extraversion	0.11	1.00	-0.04	-0.08
EPQ-J Neuroticism	0.28**	-0.04	1.00	-0.44
EPQ-J Desirable responses (L)	-0.27**	-0.08	-0.44**	1.00

** - correlation coefficient significance at p<.01

Only one correlation was found among the three personality dimensions, and that was the correlation between psychoticism and neuroticism, whereas Brajša-Žganec & Glavak (2002) found multiple correlations between the three personality dimensions. It is justified to assume that their finding about multiple correlation between the personality dimensions was determined by gender to a certain degree because they analysed correlations between personality dimensions on the overall sample, and later on in the same study they determined that boys had significantly higher results on the psychoticism scale, whereas girls had higher results on the neuroticism and lying (socially desirable responses) scale. Therefore, the findings of this study confirm Eysenck's statements about the orthogonality of the extraversion and neuroticism dimensions, but do not support the view that the psychoticism dimension is orthogonal in relation to the other two personality dimensions.

By determining the differences in expressions of personality dimensions between the clusters of players with different team situational efficiency by One-way analysis of variance, it was established that the clusters differed significantly in the

Table 3 Differences of the EPQ-J results according to the team's situational efficiency

TEAM'S SITUATIONAL EFFICIENCY CLUSTERS	VARIABLE							
	EPQ-J Psychoticism		EPQ-J Extraversion		EPQ-J Neuroticism		EPQ-J Desirable responses (L)	
	M	SD	M	SD	M	SD	M	SD
Players of the LOWEST team efficiency	3.51	2.36	18.87	1.93	11.26	4.39	7.58	4.60
Players of MODERATE team efficiency	3.61	3.71	17.42	3.31	11.85	4.62	6.10	3.30
Players of the LOWEST team efficiency	3.49	2.62	19.51	2.24	9.51	4.47	8.02	4.42
One-way ANOVA	F		F		F		F	
	0.02		8.57		3.70		2.58	
	P		P		P		P	
	0.98		0.000		0.027		0.08	

M – mean; SD – standard deviation; F - One-way ANOVA coefficient;
P – One-way ANOVA coefficient level of significance.

Table 4 Significance of Tukey HSD post-hoc test coefficients of differences between clusters

EPQ-J Extraversion	TEAM'S SITUATIONAL EFFICIENCY CLUSTERS		
	Players of the LOWEST team efficiency	Players of MODERATE team efficiency	Players of the HIGHEST team efficiency
Players of the LOWEST team efficiency	-	0,012	0,37
Players of MODERATE team efficiency	0,012	-	0,000
Players of the HIGHEST team efficiency	0,37	0,000	-
EPQ-J Neuroticism	TEAM'S SITUATIONAL EFFICIENCY CLUSTERS		
	Players of the LOWEST team efficiency	Players of MODERATE team efficiency	Players of the HIGHEST team efficiency
Players of the LOWEST team efficiency	-	0,79	0,10
Players of MODERATE team efficiency	0,79	-	0,030
Players of the HIGHEST team efficiency	0,10	0,030	-

extraversion and *neuroticism* dimensions, whereas the differences between the clusters were very close to the statistical limit value for the *socially desirable responses* variable. To determine the differences between the groups in detail, *post hoc* analysis of results was applied by Tukey HSD test.

Post hoc analysis of differences between the clusters for the *extraversion* dimension established that the cluster of players of moderate team efficiency differs significantly from both other clusters of players. They have significantly lower *extraversion* than the other two groups of players. The second *post hoc* analysis of differences between the clusters for the *neuroticism* dimension established that the cluster of players with the highest level of team efficiency differs significantly from only one cluster of volleyball players. Players with the highest team efficiency have a significantly lower level of neuroticism than the cluster of players of moderate level of team efficiency. Unfortunately, these findings cannot be compared to those of Čavala (2012) because she investigated the differences in personality dimensions among female players of different levels of individual player quality. Given the fact that the correlation between the dimensions of psychoticism and neuroticism had already been determined previously, discriminant analysis was also applied on this sample with the purpose of precisely determining the possible influence and direction of dif-

Table 5 Discriminant analysis of EPQ-J results of player's clusters according to different team's situational efficiency

FUNCTION	λ	Rc	Wilks' lambda	χ^2	df	p
1	0.19	0.40	0.83	27.66	8	0.001
2	0.02	0.13	0.98	2.50	3	0.48

VARIABLE	Structure matrix	
	1	2
EPQ-J Psychoticism	-0.04	0.03
EPQ-J Extraversion	0.78	-0.17
EPQ-J Neuroticism	-0.46	-0.75
EPQ-J Desirable responses	0.43	-0.22
TEAM'S SITUATIONAL EFICACY CLUSTERS	Group centroids	
	1	2
Players of the LOWEST team efficiency	0.05	-0.17
Players of MODERATE team efficiency	-0.65	0.08
Players of the HIGHEST team efficiency	0.44	0.11

λ – Eigen value of discriminant function; Rc – coefficient of canonical correlation; Wilks' lambda –Wilks' lambda coefficient (Wλ) of discriminant function; χ^2 – significance test of discriminant function – χ^2 test; df – degrees of freedom; p – level of statistical significance of DF (χ^2 -test).

ferences between the clusters of players with regard to the expression of personality dimensions. Also, by applying discriminant analysis, the exact relative contribution of each dimension separately in discriminating the clusters of players regarding the measured personality dimensions was determined.

By applying discriminant analysis it was established that one discriminant function differentiates the clusters of players of different team situational efficiency with statistical significance, as was expected considering the results of One-way ANOVA. As was previously established according to the expression of personality dimensions, by projection of the group's results on the discriminant function, the clusters of players of moderate and highest efficiency differ most. Relative contribution of each dimension in differentiating the clusters of players was also determined precisely. *Extraversion*, which characterizes the cluster of players of moderate team efficiency most with its low level of expression, is the personality dimension which most affects the discrimination of clusters. The second personality dimension that differentiates the clusters of players is neuroticism, which characterizes the cluster of players of the highest team efficiency most with its low level of expression. It is noticeable that the cluster of players of moderate efficiency, characterized by low extraversion and higher neuroticism, is also characterized by lower results in the giving *socially desirable responses* variable. These results indicate the possibility that within volleyball teams of young female players, due to frequent and long-term inter-personal interactions between players, specific social climate is created which leads to "selection" of certain types of personality which, in interaction with other factors, partly also affect team situational efficiency. Therefore, it seems justified to accept the explanation given by Silva (1984, in Cox, 2005), saying that athletes are very heterogeneous in their personality traits when the start practicing sports, but with long-term training and improvement the possibility that the expression of some trait will facilitate athlete's improvement and some will limit it increases, so certain "homogenization" of athlete's psychological characteristics occurs. Of course, to reach better judgement regarding these findings, the research should also determine the expression level of some other, expected determinants of team efficiency, such as weekly extent of training together, the total duration of training together for each team, the number of team members, coaching leadership style, coach's personality dimensions, etc.

CONCLUSION

Personality dimensions of female players are partially related to team situational efficiency, so it is justified to assume that some of them act in a facilitating manner (low neuroticism and higher extraversion). These findings do not indicate the necessity of additional concern of staff involved in coaching or selection of volleyball players and other athletes because the expressed dimensions are surely "projected" through different behaviours and players' decision making about the outcome of efficiency in performing player's demanding volleyball (sports) tasks. The authors recommend a similar investigation to be carried out which would include young and adult athletes from different team sports, different criteria of team efficiency (regional, national and international competition level), and measurements of other, previously mentioned determinants of team situational efficiency into analyses.

REFERENCES

Brajša-Žganec, A., & Glavak, R. (2002). Relations of basic personality dimensions and depressiveness in early adolescence [In Croatian]. *Društvena istraživanja Zagreb 4-5(60-61),* 641-658.

Brajša-Žganec, A., & Matešić, K. (1998). *Zagreb norms of Eysenck Personality Questionnaire for Children (Junior EPQ) [In Croatian].* Jastrebarsko: Naklada Slap.

Čavala, M. (2012). *Morphological, motor and psychosocial characteristics of young handball players of different quality and position - Doctoral dissertation [In Croatian].* Faculty of Kinesiology, University of Split.

Cox, R.H. (2005). *Sports Psychology - Concepts and Applications [In Croatian].* Jastrebarsko: Naklada Slap.

Eagleton, J.R., McKelie, S.J., & De Man, A. (2007). Ekstraversion and neuroticism in team sport participants. *Perceptual and Motor Skills*, *105*, 265-275.

Eysenck, H.J. (1990). Biological dimensions of personality. In: L.A. Pervin (Ed.), *Handbook of personality - theory and research*. New York: The Guilford Press. 244-276.

Eysenck H.J., & Eysenck S.B.G. (1975) *Manual of the Eysenck Personality Questionnaire (adult and junior)*. London: Hodder & Stoughton.

Eysenck H.J., & Eysenck S.B.G. (1994). *Manual of the Eysenck Personality Questionnaire (adult and junior) [In Croatian]*. Jastrebarsko: Naklada Slap.

Fulgosi, A. (1997). *Personality psychology – theories and research, 6th ed. [In Croatian]*. Zagreb: Školska knjiga.

Petz, B. (2005). *Dictionary of Psychology (2nd ed.) [In Croatian]*. Jastrebarsko: Naklada Slap.

Rogulj, N., Nazor M., Srhoj, V., & Božin D. (2006). Differences between competitively efficient and less efficient junior handball players according to their personality traits. *Kinesiology, 38(2)* 158-163

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РЕЛАЦИИ НА ДИМЕНЗИИТЕ НА ЛИЧНОСТА И ТИМСКАТА УСПЕШНОСТ КАЈ МЛАДИТЕ КАДЕТСКИ ОДБОЈКАРКИ

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(Оригинален научен труд)

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Абстракт

Со цел да се утврдат разликите во базичните димензии на личноста меѓу играчите со различна тимска ситуациско играчка успешност, 151 млади одбојкарки со просечна возраст од 13.89± 1.17 го пополни Ајзенховиот прашалник на личност за деца (EPQ-J,), од авторите Eysenck & Eysenck (1975, 1994).Утврдено е дека мерените димензии на личноста не се целосно ортогонални, бидејќи е утврдена значајна корелација меѓу димензиите на психотизам и интраверзија-екстраверзија. Со еднонасочна анализа на варијансата утврдени се статистички значајни разлики меѓу групите на играчи со различа тимска ситуациска успешност во димензиите на неуротизам (F=8.57, p=0.00) и интраверзија-екстраверзија (F=3.70, p=0.03), а добиениот резултат е потврден и со примена на мултиваријатнтата дискриминативна анализа (Rc=0.40, p=0.00). Групата на играчи со најголема тимска успешност се карактеризира со најмалку изразен степен на димензијата неуротизам, додека групата играчи од средната екипа на успешност се карактеризира со најмал изразен степен на димензијта интраверзија-екстраверзија.Добиените резултати делумно ги потврдуваат наодите од литературата за влијанието на димензиите на личноста во успешноста спортските натпревари.

Клучни зборо *EPQ-J, One-way ANOVA, персоналитs, одбојка , млади*

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