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Science, Movement and Health, Vol. XIII, ISSUE 2 supplement, 2013  
September 2013, 13 (2), 788-794

## RELATIONSHIP BETWEEN PSYCHOLOGICAL FACTORS OF PERSONALITY AND PERFORMANCE OF FOOTBALL REFEREE

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### Abstract

*Purpose.* Influence of psychological load connected with match on mental state of football referees was assessed. The purpose of this study was to evaluate changes of subjective psychological experiences and states of football referees during football match and to find out about any regularity of these changes.

*Methods* Two standardized questionnaires were used: SUPSO and Belov temperament test.

*Results* It has been proved that psychological state of football referees before the match has statistically significant impact on their psychological state evaluated immediately after the match.

*Conclusions* Regulation of negative pre-match mental states of football referees is an important factor of successful coping with the supervised match on a psychological level. Psychological preparation of referees therefore contributes to improving their performance.

*Key words:* Football, referee, psychological experiences, psychological states, temperament, SUPSO

### Introduction

Football is a game which attracts millions of players and fans all over the world. From the long-term historical perspective referees represent an integral part of the game. We can often see some kind of aggression towards the referees, which usually stems from a feeling of injustice in connection with some of the referees' statements and subsequent frustration of potential aggressor (Tod, Thatcher, Rahman, 2010). Each of us deals with these problems individually it is not possible to follow some simple "instruction". However, we can use already acquired knowledge as a basis to recommend using techniques to cope with stressful situations, such as coping strategies (Vašina, & Strnadová, 2009). Methodical material Booklet for referees issued before the World Cup in Germany (Lopez, Falcó, 2006) represents some kind of guidance.

In our research, we examined the dynamics of subjective psychological experiences and states of football referees (Voborný, Zeman, Blahutková, 2012) and mutual dependency of components of their current mental status both before and after the match (Voborný, Zeman, 2012).

### Methods

Our research set consisted of 26 referees, all of them were men. These referees supervise competitions governed by the football association of Vysočina county, which is one of 14 counties of the Czech Republic. The first bar chart (Fig. 1) shows the length of the practice of referees in our research set. It is clear that the biggest group is represented by referees with length of practice between 5 and 10 years (14 probands), followed by group with practice from 10 to

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15 years (7 probands).

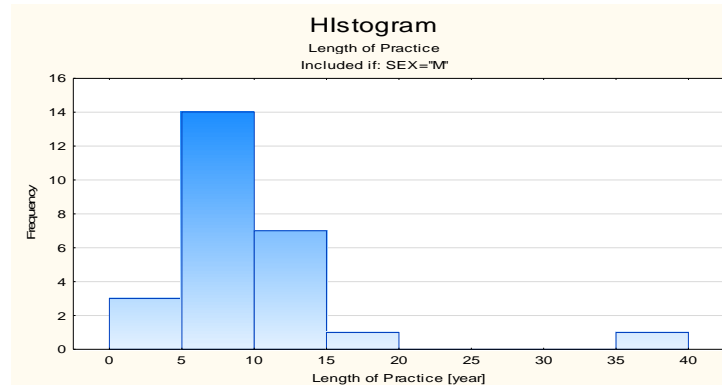


Figure 1. Graphical demonstration of the practice length of the reference group of football referees

In order to understand better the personality of the referee and the dynamics of their experience, we examined contribution of each component of temperament in football referees using Belov's temperament test. This test (in Blahutková, 1999) uses the basic standard personality theory of four temperament types: choleric, sanguine, phlegmatic and melancholic. It also works with combinations of these basic types, e.g. sanguine-choleric type. In case of these combinations the first is always the dominant temperament type (i.e. the type which was more often represented in the results). Belov's temperament test

consists of 79 questions - claims divided into four groups. These are actually sets of manifestations characteristic of each temperament type. The task for the test proband is to decide whether each claim is true or not, and their responses are recorded in the recording sheet. If the statement is true for the person, the answer is YES. Otherwise, the answer is NO. In the second box plot (Fig. 2) we can see the percentage of these components. Sanguine component is most often represented, followed by phlegmatic and choleric components. Melancholic component is significantly less represented.

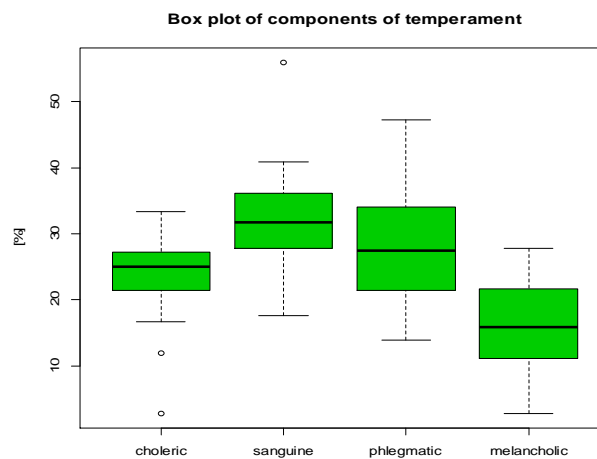


Figure 2. Box plot of the percentage of personality temperament components

The standardised questionnaire SUPSO made by prof. Oldřich Mikšik was used to describe the dynamics of subjective experience and personality

states of referee before and after the match. Questionnaire SUPSO is used to describe and evaluate the dynamics of subjective experiences and personality

states (Mikšić, 2004). Mutual interaction of proband with their external and internal environment is reflected in their mental state. Mental state can be described in its overall, integrated structure using the proportional representation of each component. The measured components of mental state are:

P = psychological well-being (feeling of satisfaction, a pleasant mood and pleasant mental warm-up, which is often accompanied by feelings of euphoria and confidence). This component shows a degree of freshness, satisfaction, peace and mental balance, optimism and good mood.

A = activity, vigorousness (feelings of power and energy which are associated with a hankering after the action). It is a readiness for active interaction among various situational variables. It can be described with the qualities of psychological phenomena, such as vigorousness and assertiveness.

O = impulsiveness, letting off steam (uncontrolled, spontaneous release of energy stress and mental tension). Described by feelings like moodiness,

difficulty in self-control, explosiveness, irritability and uncorrected aggressiveness.

N = mental restlessness, discomfort (experiencing psychological stress, when it is not possible to find ways to release it). Characteristic symptoms are mental and motoric restlessness, annoyance, discontent, impatience and restlessness.

D = mental depression, tiredness (complex of feelings and states, of which the main characteristics represent a tendency towards passivity and apathy).

U = anxious expectations and fears (complex of feelings of insecurity, experience of psychological, tension, feelings of anxiety, fear of the possible future consequences, etc.). Experiencing possible future development is being updated within inner experiences, but there is lack of readiness to deal with situational components.

S = sadness (these experiences can be expressed by adjectives sad, lonely, hypersensitive, unhappy). It can be defined as a passive experiencing of situational variables. Experiences are not turned out to interact with the outer environment, but "inside".

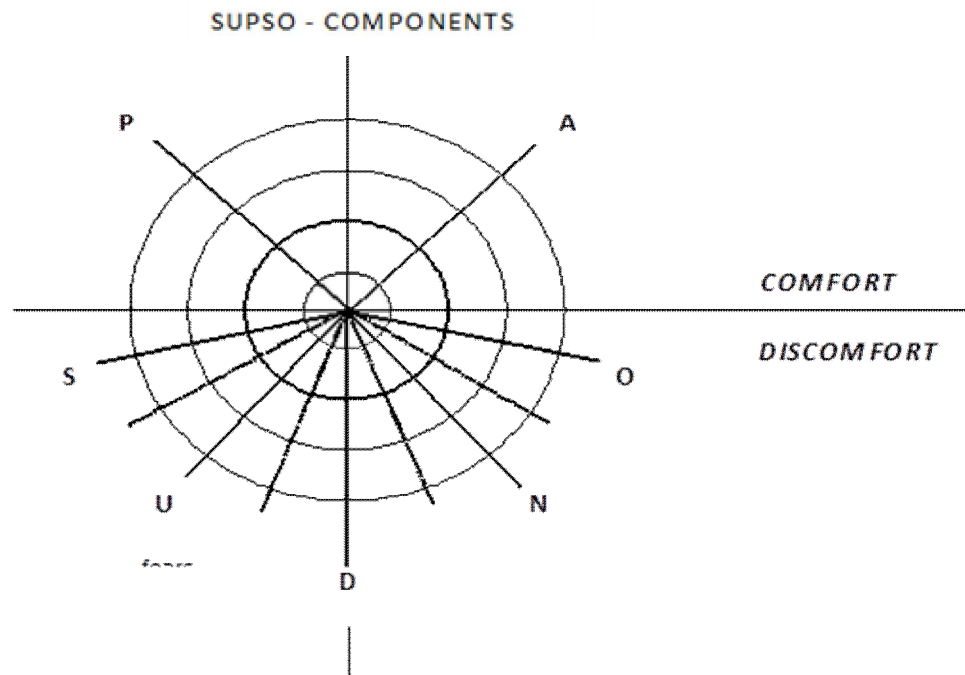


Figure 3. Target graph showing subcomponents of mental state measured by a standardized questionnaire SUPSO

The results obtained via the test SUPSO can be graphically represented and interpreted using the target graph (Fig. 3). Circle, which is marked in bold line connects average values of mental state in population. The horizontal axis divides the target graph into upper

and lower half and the vertical axis divides it into the left and right half. The intersection of the horizontal and vertical axes forms the centre of all the circles in the graph. The vertical axis divides the components of experiencing (upper left quadrant) and activation



(upper right quadrant). The scale of depression and exhaustion occupies the interfacing (right-left) neutral position. The horizontal axis separates the components of experiencing psychological well-being, of which are typical: positive mood and excitement to the activity (upper left and right quadrant) and components of psychological discomfort, of which are typical: unpleasant or demobilising mood and arousal (lower left and right quadrant).

In spatial analysis of obtained correlation matrix the method of principal components analysis (PCA) was used. Principal Component Analysis is a method of multivariate data analysis (Hebák, 2005, Hendl, 2009). Its primary aim is to reduce the number of variables. This is achieved by creating so-called principal components, i.e. newly created variables which are independent of each other and put together they explain all the variability in the data set. The first principal component is constructed to have maximum variance, i.e. to explain the biggest proportion of the total variability in the data file. The second principal component is created in the same way and it must be perpendicular to the first principal component, i.e. it is independent of it. In analogous manner we obtain another principal component. The first principal component captures the most variability, the second principal component and each other then explains always slightly less amount of variability than the previous component.

Mathematically, equations of the principal components are obtained as a linear combination of the original variables, where coefficients of these combinations are given by coordinates of eigenvectors

of covariance matrix. Eigenvalues of this matrix represent the variance explained by the respective principal component. The sum of the eigenvalues equals the sum of variances of the original variables. Number of considered principal components is chosen according to the amount of explained variability which is sufficient for our objectives. Usually, it is required that the used principal components together explain at least 70% of the total variability of the data set.

In our research, we primarily engaged in testing hypothesis in which we assumed that the current mental state of football referees before the match affects their ability to cope with mental burden represented by a completed match.

**Results**

*Correlation analysis and Principal component analysis (PCA)*

There were statistically significant correlations found, especially between components of anxiety before the match and depression after the match (Table 1). Another statistically significant dependency was confirmed in mutual correlations of components of psychological discomfort and melancholic temperament components (Table 2).

For describing relations between the variables Principal Component Analysis (PCA) was used. Correlations of original variables of current mental states with newly created principal components are shown in the chart (Fig. 4). We tried to interpret the first four principal components. Together they explain 66% of variability in data set of football referees.

Table 1. Spearman's correlation coefficients between the pre-match anxiety (U1) and depression after the match (D2), together with the respective p-values. Statistically significant coefficients are highlighted in red.

U1 X D2	N	R	p-value	partial R	p-value
1. match	26	0,352706	0,077178	0.325715	-
2. match	26	0,275498	0,173130	0.242872	-
3. match	26	0,413806	0,035599	0.398469	-
4. match	26	0,420187	0,032580	0.185825	-
5. match	26	0,395901	0,045276	0.349616	-

Table 2. Spearman's correlation coefficients describing the sequential dependency between the melancholic temperament component and the detected sub-components of criterion of psychological discomfort. Statistically significant coefficients are highlighted in red.

Melancholic component X	N	Spearman coefficients of rank correlation				
		1. match	2. match	3. match	4. match	5. match
O1	26	0,237374	0,231638	0,378974	0,152368	0,228712
N1	26	0,155913	0,219403	0,246548	0,034134	0,213376
D1	26	0,419831	0,388903	0,258407	0,261051	0,404045
U1	26	0,169869	0,083726	0,133873	0,317586	0,083456
S1	26	0,248394	0,348437	0,316233	0,103582	0,597324
O2	26	0,100297	0,015351	0,491095	0,235713	0,156688
N2	26	0,000913	0,073074	0,307430	0,459548	0,222508
D2	26	0,233268	0,177005	0,275001	0,407964	0,365865
U2	26	0,097670	-0,095665	0,328242	0,408111	0,332544
S2	26	0,038256	0,012319	0,308205	0,355762	0,498204

Out of the four principal components interpreted the third component is the one most closely associated with mental status before the match. It captures the unspecified "contribution" of the match to the psychological comfort of the referee (Fig. 4).

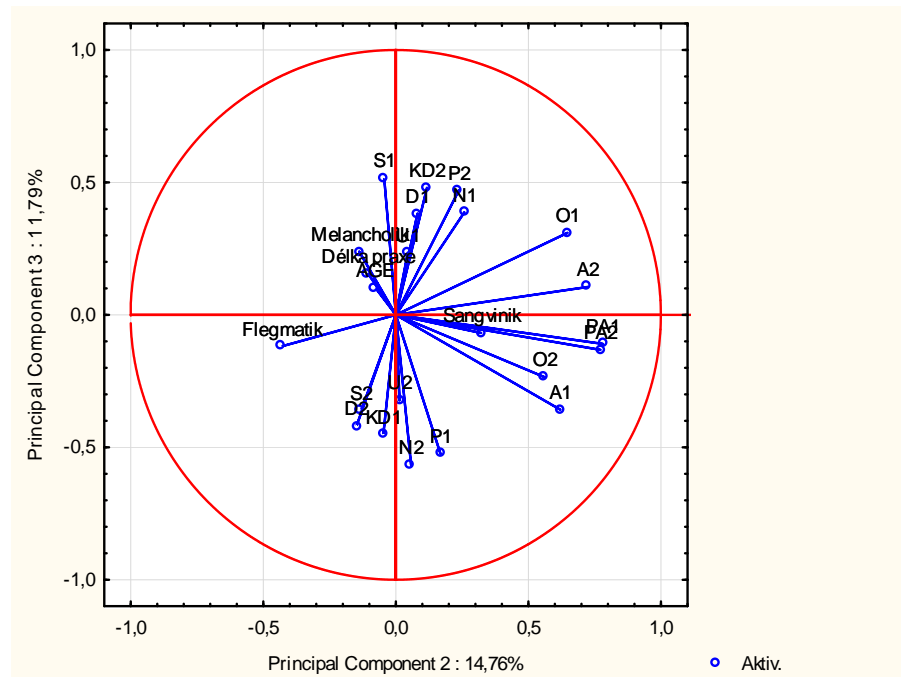


Figure 4. Correlations of original variables with the second and third principal component

The principal component n. 3 could perhaps be called "subjective perception of pre-match situation". It can be

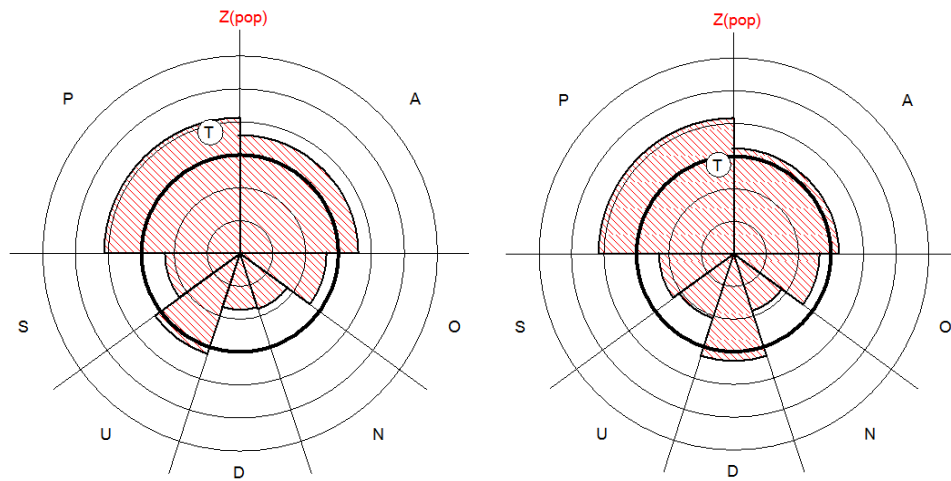


Figure 5. Target graphs showing the average values of the separate components of mental state of men-referees. Situation before the match is on the left, situation after the match is on the right.

**Discuss**, explained either by state of the referee following from anxious anticipation and fear of the match, or possibly by the reflection of current negative experiences related to their personal life (illness, problems at work, in relationships, etc.). These mental states are predominantly of negative characteristics and are associated with a pre-match discomfort (S1, U1, D1, N1, O1,  $0.25 < r < 0.5$ ) and lower level of psychological well-being (P1,  $r = -0.5$ ). However, this pre-match mental state is to some extent connected to a post-match feeling of psychological well-being (P2,  $r = 0.5$ ) and a lower level of component of psychological discomfort (S2, U2, D2, N2, O2,  $-0.2 < r < -0.6$ ).

This trend is also evident from the factual values of individual referees shown in target graphs. We assume that this may be caused by the release of mental tension due to the match. It is possible that the referees consider the match to be an opportunity to relax from the negative experiences ("letting off the steam").

#### *Comparison of mental state of football referees with the general population of the Czech Republic*

We carried out a comparison of mental state of referees before the match and after the match with average values for our population under normal living conditions, described by Mikšík (2004). Psychological state of the referees reference group before and after the match is shifted to the area of psychological comfort in comparison with the general population, which generally means a higher percentage of components of psychological well-being (P) and activity and vigorousness (A), together with a lower percentage of components of stress (S), anxious

expectations and fears (U), depression (D) and impulsiveness (O) in referees.

In target graphs we can see a shift in the scales of separate components of evaluated psychological state of referees (Fig. 5). Situation before the match is on the left, situation after the match is on the right (Fig. 5b). On the axes there are shown standardised values of proportions of each component. The mean and standard deviation of the population of men from the Czech Republic were used for standardisation, as are stated by Mikšík (2004). The highlighted circle represents the population average. The graph shows that the referees have the components of mental state before and after the match shifted to comfort, compared to the general population. Only anxiety before the match is on the level of population mean and then significantly decreases during or after the match. The same applies to the activity. However, the depression is on the low level, before the match and during, or immediately after the match increases significantly up to the average population level.

#### **Conclusions**

During hypothesis validation it was proven that there is a statistically significant dependence between the component of anxious expectations and fears before the match, and the component of depression after the match. Melancholic temperament component significantly correlates with all the sub-components of psychological discomfort. We failed to prove the dependency between the phlegmatic temperament component and the component of psychological well-being both before and after the match and there was no correlation between the length of the referee's practice and values of components of impulsiveness both before





and after the match. The obtained values of subcomponent of current of mental state of football referees were further compared with the measured values of the general population from the Czech Republic.

We found out that football referees have generally lower values of component of psychological discomfort and higher values of psychological comfort compared to common values for the Czech population. The only component of mental state within the criteria of psychological discomfort, of which the average value before the match was lower than in the average population, is the component of anxious expectations and fears. During the match, however, the value of this component decreased significantly. In contrast, as a result of the completed match, the mean value of the component of depression significantly increased, up to the level of the average value of the general population in the Czech Republic. The last component, of which the values were statistically significantly affected by the match, is the component of activity and vigorousness. The average value decreased, but it did not reach the average value for the Czech population.

Within the results of the research we proved that the match affects mental experiences and states of football referees both before and after the match. Before the match we found statistically significantly higher values of the component of components anxious expectations and fears. Like in sportsmen, also in football referees we can observe inadequate pre-start states, particularly the state of excessive activation ("pre-launch fever"). This negative emotional state is reflected both in the physical state (sweating, increased heart rate, etc.) as well as in the psychological state (aggression versus apathy, irritable behaviour, etc.). Regulation of current mental state before the match should lead to optimal activation, which allows the referee to perform optimally according to their abilities.

Specific conditions of a football match and negative expressions of emotions towards the referee are demanding for the referee's personality and his mental qualities. We would like to point out the need for integration of psychological preparation as an

integral part of the overall preparation of each referee for the match. In order to improve the quality of the referee's work during the match and also to contribute to the improvement of their lives, it is recommended to use regulation techniques for removal of negative psychological states of personality. It is always important to recommend and use these techniques individually after consultation with a psychologist.

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