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ORIENTING RECOVERY AS PREDICTOR OF HIGHER EMOTIONAL REGULATION IN SOCCER PLAYERS

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ABSTRACT

Purpose of the present study was to extrapolate intricate relationships between autonomic indices of emotionality in predicting changes in transient as well as dispositional emotionality. Performance excellence in sports and games, particularly in soccer has been referred to as resultant of mental toughness or more specifically the aspect of emotional flexibility and hardiness of the athlete. One hundred thirty five high-achiever young-adult male competitive soccer players, who were residents of Kota Bharu region volunteered as participants. All of them were subjected to evaluation of inner psychobiological status (decomposed indices of phasic skin conductance activity – viz. orienting recovery time; rise time and skin conductance adaptation levels); assessment of projective analyses of unconscious core of emotionality (employing Rorschach Ink-Blot Test) in the form of evaluation indices of impulsivity, irritability, integrity. Results however revealed corroborative relationships between psychobiological autonomic indices in predicting differential aspects of inner core emotionality. Multiple linear regression analyses were done to identify differential possibilities of direct, inverse, moderating and supportive relationships between decomposition indices of autonomic orienting activity related to cognitive-affective and affective-motivational aspects of sports behaviour. Analyses of autonomic activation and arousal modulation and various indices habituation paradigm indices were found as significant predictors of changes in dispositional emotional constellation observed in the athletes. Orienting latency was observed as the most significant contributor in influencing recovery from autonomic arousal (orienting recovery) in predicting changes in emotional hardiness as well as in flexibility.

Keywords: Emotionality, Orienting Recovery, Projective analysis, Soccer

1. INTRODUCTION

Life-stress has often been perceived as catastrophic or devastating and its characteristic all-pervasiveness has been considered as over-whelming. If detrimental consequences of over-burdening life-stress events are taken into account, we also need to be concerned with the rapidly growing individualistic demands in impetuous aspiration, which may lead to cognitive bearing of negative expectancies (Saha et al. 2013a & b). Available countless

researches have suggested that, disturbed family setups; work-pressure; strained relationships vulnerably put children and young-adult individuals with emotional turmoil (Biswas et al. 1998). Our previous researches (Chakrabarti et al. 2001; Saha et al. 1998 & 2013b) also evidenced prevalence of high-strung emotionality, distressed family-set-ups in majority of the urban societies characterized by the nuclear formation.

Thus in the field of sports these pressures become all-encompassing and young athletes with lesser coping abilities usually succumb to competitive demands leading to disruptive emotionality. Researches in sports science dealing with stress process have mostly considered the apprehensive feelings and negative expectancies in players as aspects of anxiety. Here convincing and substantiated evaluation of emotional crises becomes the key issue of concern. In psychology, compared to subjective self-report analyses, which could be mostly tainted, manipulated or biased, projective evaluations if administered following rigorous methodology and the reports are content analyzed for meaning, reveal valid contents of hidden emotions and internal conflicts (Cordon, 2005). Furthermore, the projective evaluations are based on psychosocial cognition of an individual which cannot be distorted but can derive complete descriptions of personality and its multiple interactions.

Let us pay attention to another authentic and widely accepted dimension of evaluation, which reportedly substantiate with the standardised self-report analyses, and our previous researches carried out on South-East Asian population have revealed that the psychobiological evaluation indices can provide corroborative objective as well as valid etiological information and can substantially provide equivalent information concerning hidden emotional crises and internal conflicts (Saha et al. 2013a; b & c). Here the issue of particular significance would be that, outcomes of both the projective and psychobiological evaluations cannot be manipulated and hence if utilised properly, can provide with vital information concerning cognitive-emotional processes underlying and behaviour pathology occurring in the field of sports.

The skin conductance (Sc) method is an authentic yet simple, useful and reproducible method of revealing autonomic arousal as a parameter of the sweat gland function. Any cognitively demanding stimulation capable of producing autonomic arousal can evoke the response and the amplitude of the response, which would serve as substantiated indices of subjective feelings of emotionality, and if decomposed (with both tonic and phasic components) appropriately can identify any subtle change following slightest environmental changes (Dawson et al 2000).

Usual practice of Sc researches conducted in the field of sports during the last decades are concerned with the normal values of response amplitude and latency (Axisa et al., 2003; Hillman et al., 2004 & Ray et al. 2001), while our previous researches and quite a few other relevant researches highlighted about incorporation of habituation paradigm of orienting Sc indices as valid sources of information. With such a background, we wanted to investigate into the substantiated relationship between psychobiological components and projective evaluation of emotionality to examine the aspects of facilitative as well as inhibitive mood in young adolescent competitive soccer players. Internalised or deep-seeded anxiety leading

towards apprehensions of loosing can put tremendous detrimental effects onto competitive performance, and hence our attempts would be to identify a corroborative relationship between the inner psychological processes and psychobiological explanations to behavioural aetiology. Thus this study purports –

- To identify the relationship between the autonomic indices of orienting activity along with the projective analysis of emotional impulsiveness, if any, in the young soccer players;
- To see the relationship between the skin conductance orienting reflex indices and emotional irritability, if any, in the young soccer players, and
- To justify the relationship between the skin conductance orienting recovery index and emotional integrity revealed by projective analysis, if any, in the young soccer players.

2. METHODOLOGY

2.1. Participants

One-hundred Thirty-five consistently high performing young male competitive soccer players, age range between 20 – 23 years, were recruited as participants for this study. They were mostly state selection–level athletes and they were selected unanimously by three expert coaches, while they were preparing for their forthcoming soccer season (2014). The sample size was calculated using G power 3.0.17 (Faul et al. 2007). The power of the study was set at 95% with 95% confidence interval and the effect size f^2 was set at 0.10.

2.2. Materials Used

1. Skin Conductance Apparatus (ProComp5 Infinity, USA 2000) - was used to assess the extent of autonomic regulation as index of emotionality of the participants.
2. Rorschach inkblot test (Rorschach 1942) – was administered to evaluate the personality and emotionality of the participants.

2.3. Procedure

Participants were subjected to assessment of projective evaluation of emotionality (employing the Rorschach Inkblot test) following standard method of administration (methodology detailed in Saha et al. 2013c). Finally they were subjected to evaluation of psychobiological indices of emotionality (both tonic and phasic skin conductance assessments were done - methodology detailed in Saha et al. 2005a and 2012a).

The Rorschach test, also known as the Inkblot test, consists of ten white cards, (sized as 7 by 9 inches), on each of which is printed pictures made of inkblot. The person taking the test states what the inkblot seems to resemble as he is presented with the cards one by one. Inkblot pictures may be resembled as of animals, people, flowers, in fact every conceivable kind of object and some of which may seem to be creations of imagination as well as of the world about us, are seen. By means of Rorschach's (Rorschach, 1942) technique responses given by the participants on these images can be scored objectively and interpreted to furnish a picture of the individual's psychological tendencies in his/her relationships to himself or herself and to others in the social environment.

On the basis of the scores obtained from the projective analyses of emotionality (employing RIB), emotional measures of impulsivity, irritability and integrity were derived. Tonic and phasic Sc (Sc) activity data were decomposed as – basal or tonic Sc; SF or NS-SCR (non-specific Sc response, which is also termed as spontaneous fluctuation or SF) and tonic consistency measures; and, phasic Sc, and stimulus-specific orienting response measures (viz. latency; amplitude and recovery time).

The data were treated with SPSS 20.0 statistical software for identification of the normality index, and thereafter multiple linear regression analyses were done to identify how far the different psychobiological variables (autonomic regulation and orienting reflex information obtained from skin conductance measures) contribute in the shared aetiology of changes in emotional reactions in the soccer players.

3. RESULTS

Table 1 represented somewhat consistency in most of the data on evaluated psychological parameters, while in case of psychobiological parameters relatively larger discrepancies are usual consequences, and hence moderate and lower extents of standard deviation indices in case of skin conductance parameters clarified that even though outliers were expected to create dispersions, the data were considerably free from huge inconsistencies.

Table 1 - Table of Descriptive Statistics

Statistics incorporated	Parameters Evaluated							
	Psychological Parameters			Psychobiological Parameters				
	Integrity (scores)	Impulsivity (scores)	Irritability (scores)	Tonic skin conductance (μS)	Phasic skin conductance (μS)	Orienting amplitude (μS)	Orienting latency (m.sec)	Orienting recovery (m.sec)
Mean	11.69	4.43	1.93	4.97	8.51	.87	2.68	5.13
SD	3.41	1.04	0.79	2.74	5.19	.54	2.01	3.22

Table – 2 -Model ***a*** - Summary of multiple linear regression analysis

Model ***a*** Dependent Variable – Impulsivity	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Intercept)	-14.677	2.514		-5.838	.000
Orienting Recovery	6.231	1.105	4.392	5.643	.000**
Orienting Latency	-9.417	.885	-4.658	-10.638	.000**
Tonic Skin Conductance	-3.794	1.013	-2.798	-3.745	.023*
Amplitude	3.323	1.129	1.814	2.943	.041*

(F (13, 118) = 24.37, P <0.000)) Model Adj.R^2 = 68.3%.

Result tables from Tables 2 to 4, however explained the relationships existing between different psychobiological and emotional parameters assessed. Multiple linear regression analyses were done to identify predictive associations between the psychobiological as well as projective analyses of emotionality. The Table 2 however explained that, the model ***a***

emerged significant as the psychobiological measures such as - orienting recovery; latency and amplitude as well as the tonic Sc response scores could explain 68.3% variance of changes in the extent of emotional impulsivity.

Table – 3 -Model ***b*** - Summary of multiple linear regression analysis

Model ***b*** Dependent Variable – Irritability	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Intercept)	6.812	1.742		3.911	.001
Orienting Recovery	9.368	2.319	1.032	4.039	.001**
Orienting Latency	-7.942	1.648	-1.385	-4.819	.000**
Phasic Skin Conductance	11.818	1.978	.989	5.974	.000**
Amplitude	8.164	2.481	.883	3.291	.002**

(F (11, 117) = 19.75, P <0.000)) Model Adj.R^2 = 74.1%.

The Table 3, the model ***b*** emerged significant as the psychobiological measures, viz., orienting recovery; orienting latency, and amplitude as well as the phasic Sc response scores were observed to explain 74.1% variance of changes in the extent of emotional irritability.

Table – 4 -Model ***c*** - Summary of multiple linear regression analysis

Model ***c*** Dependent Variable – Integrity	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Intercept)	-11.612	3.068		-3.985	.001
Orienting Recovery	8.821	2.516	.753	3.506	.000**
Orienting Latency	-5.951	1.807	.513	-3.293	.000**
Amplitude	9.294	3.431	-.387	2.709	.011**

(F (7, 117) = 17.68, P <0.000)) Model Adj.R^2 = 69.7%.

Outcomes of the Table 4 however revealed that the model ***c*** emerged significant, since the psychobiological measures orienting recovery, latency and amplitude could explain 69.7% variance of changes in the extent of emotional integrity.

4. DISCUSSION

Findings of the prediction analysis however suggested that the emotionality in the participants indexed from the inner unconscious core (as it was derived by employing the Rorschach Inkblot test) were extensively substantiated by the data obtained from the psychobiological autonomic indices. Furthermore, the psychobiological autonomic indices were found both directly and inversely associated with those of the measures of emotionality obtained from projective analyses. Rorschach index scores provided information with regard to corroborative inner unconscious emotional core contents, which have given us opportunity

to optimize the correlated emotional aspects, viz. extent of impulsivity, irritability and integrity. Coefficients for estimation of regression however suggested an overall explanation in terms of multiple linear influences of these variables on the emotionality of the participants.

Emotional adaptations and stability being one of the most integral predictor of skilful performance in sports (Saha et al. 2012a; 2013a; c & d), the psychobiological components of emotional regulation were observed as associated to the consequent behavioural components and the final goal-directed emotional behaviour, which were transformed into some cognitive emotional constellations (viz., impulsivity, irritability and integrity). These interactional models promote options for correlation studies and prediction analyses as well, to identify the relative strength of various relatively independent or correlated predictors in the development of any particular behaviour trajectory (Heyman 1982 and Tenenbaum et al 1992), and thus our previous study reports confirmed the inter-dependent associations between psychobiological and cognitive-emotional constellations of emotionality.

Detailed attention to the intricate relationships however more comprehensively explained this phenomenon in emotional perspectives. Model ***a*** however explained the multiple linear regression analyses, which were done to identify predictive associations between emotional impulsivity and psychobiological measures of orienting recovery, latency and amplitude along with the measure of tonic Sc component together could explain 68.3% of variance changes in the extent of emotional impulsivity (refer to Table 2). Model a however clarified that out of the psychobiological components orienting recovery and amplitude directly contributed onto the changes in impulsivity, while latency and tonic Sc changes had inhibitive influences on the impulsivity. The observed positive relationships between impulsivity and orienting recovery and amplitude explained that, participants reportedly having delayed recovery but higher autonomic amplitude were observed to have higher extent of emotional impulsivity. Similarly, negative associations revealed that, participants having relatively lesser extent of orienting latency (that means those had faster autonomic response latency) and lower extent of tonic or basal Sc were observed to have higher emotional impulsivity. Thus the regression analysis revealed a shared and substantiated contribution of psychobiological index and the cognitive-emotional index of emotionality which implied that the impulsive players were quite enough inquisitive; sensation-seeker and restless, which led them to have faster latency (faster intent to respond to stimuli) as well as higher autonomic amplitude, which got them excited but the observed delayed recovery also revealed that, they could not regulate their heightened emotionality. This characteristic feature of relations between projective is found on line with the findings of Saha et al (2013c).

Now the question might arise, with regard to how far the psychobiological indices are related to other indices of inner emotionality observed in the participants. Model ***b*** explained predictive contributions of psychobiological aspects onto the aspect of emotional irritability, which emerged significant as the predictors – such as orienting recovery, amplitude and the measure of phasic skin conductance had facilitative contribution, while orienting latency was found to have inhibitive influence on emotional irritability. The predictors together could

explain as high as 74.1% of variance changes in the extent of inner feelings of irritability in the soccer players, which implied that players who had high extent of irritability were observed to have delayed latency, perhaps which have made them more vulnerable to be more irritated, which was evident in their higher amplitude. But to make it worse for them, it was observed that quite a few of also had delayed autonomic recovery, and hence they had to tolerate their irritability for considerable period of time which might have been quite unbearable for them.

Here, based on the outcomes of models ***a*** and ***b*** we could conceive another dimension of relationships, which would pertain to the players who had both lower extents of impulsivity and irritability. Out of the relationships explained in model ***a*** it could be postulated that, players who were observed as having relatively delayed latency and lower extent of amplitude and higher tonic resting Sc indices but faster recovery from autonomic stress would have very low extent of impulsivity. Similarly, these psychobiological constellations (viz., lower extent of amplitude but faster recovery from autonomic stress) along with relatively faster latency would help the players to have lesser irritability.

At this point we had to consider for the third model of relationship, and the Model ***c***, which was conceived to explain the predictive relationships of psychobiological indices onto the inner feelings of emotional integrity emerged significant as the predictors like recovery, latency and amplitude together could explain about 69.7% changes in the extent of changes in emotional integrity. Relationships further explained that, players having higher order integrity were evident as having faster latency, higher autonomic amplitude and faster recovery from stress, which is explanatory of classical orienting reflex activity (Kimmel et al. 1979; Saha et al. 2012a). Contrary to that, players having delayed latency, lower amplitude and delayed recovery would definitely be over-burdened with higher extent of emotional disruptions leading to lower level of integrity.

Furthermore, adequate association observed in the model ***a*** between relatively higher extent of tonic Sc (which reveals higher level of autonomic regulation) and relatively faster orienting latency (which is actually a function of faster autonomic responsiveness) might have been helpful to the players to maintain attentive orientation and emotional adaptability, which have further helped them to remain focussed yet with lesser sense of impulsivity. This present findings however got adequately supported by the findings of Edelberg (1993); Levenson (1992) and Saha et al. (2012a).

Similarly observed relationships in model ***b*** explained that, participants with relatively faster orienting latency and relatively higher extent of phasic Sc evidentially had higher extent of irritability. These findings of significance of orienting latency have stimulated the discussion concerning the fluctuating role of latency in maintaining psychobiological as well as emotional adaptability. This finding could be indicative of the fact that those observed with faster latency and higher phasic Sc, had higher extent of dispositional autonomic regulation which is evidentially supported by the findings of Beauchaine (2001), proposed in his

hypothesis of BIS (behaviour-inhibition system), which however has been found on line with our previous finding (Saha et al. 2013c).

Thus the obtained outcomes of regression analyses could reveal some unique features in which, independent psychobiological components aptly predicted changes in the inner core measures of emotionality – impulsivity; irritability and integrity and the phasic decomposition factor orienting recovery emerged as significant contributor to stimulate the changes. But it must be noteworthy to acknowledge the quasi-dichotomous role of orienting latency, which actually determined the dimension of cognitive-emotional changes either to the facilitative or to the inhibitive adaptations, with respect to the higher or lower extents of impulsivity or irritability observed in the players.

5. CONCLUSION

- Relationships between the projective analysis of emotional impulsiveness and the autonomic indices of orienting activity were observed in the young soccer players;
- Skin conductance orienting reflex indices were observed as associated with the changes in emotional irritability;
- Skin conductance orienting recovery index was found to facilitate in the changes in the extent of emotional integrity revealed by projective analysis, and
- Orienting latency was found as one of the most significant contributor in stimulating changes in emotional adaptations.

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