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COMPARISON BETWEEN EMOTIONAL INTELLIGENCE AND REACTION TIME OF INTERNATIONAL BASKETBALL REFEREES

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ABSTRACT

The purpose of this research is to compare the emotional intelligence and reaction times of grade one and grade two international basketball referees. For this purpose, a number of 115 referees at the age of 31.8 ± 8.5 and 9.8 ± 7.2 years of arbitrage experience filled out the questionnaires of personal information and emotional intelligence. For measurement of reaction time 24 component referee software was implemented. Analyses were accomplished through descriptive statistics, M-box test, Multivariate variance analysis, two tale variance analysis and LSD post hoc test. Results indicated that there were no significant relations between components and total level of emotional intelligence of low experienced and high experienced male and female referees. Also there was no significant difference between reaction times of male and female low experienced referees and high experienced referees. Results of this research suggest that arbitrage level as an index of level of expertise can be effective on referees self-awareness, self-motivation and reaction time.

Keywords: *Emotional Intelligence, Reaction Time, Referee, Gender, Basketball*

INTRODUCTION

It has been a long time since the science of psychology has stepped into the context of sports with all its deployed dimensions in studies regarding human behavior and now it tries to clarify the behavior of people in terms of sports and issues related to it. With respect to deployment of sports and its accompanied economic issues, the context of arbitrage is considered as one of the most crucial issues in the context of sports which is of high sensitivity (Sutter and Kocher, 2004). With respect to this sensitivity, while choosing referees for important sports events it is tried to hire referees with more experience and higher arbitrage ranks. In time and correct judgment requires the referee's capability for recognition and management of such emotions.

It is believed that people with higher levels of emotional intelligence have more abilities regarding recognition and controlling their emotions as well as other's (Gellman, 1995). Previous researches indicate that emotional intelligence is directly in relation with individuals' performance in terms of cognitive works, post hoc works, contextual performance and several different managerial and career contexts (Carmela and Jose, 2006). The effect of emotional intelligence on performance on one hand and on the other hand improved arbitrage performance which is usually accompanied by promotions in arbitrage rankings and improved judgment experience, suggests that it is possible that there may be differences between emotional intelligence levels of first and second grade international referees and also the gender of referees might have effects too. Similarly, with respect to the importance of referee's reaction towards events in games the question comes up that if referees' reaction times are different in terms of gender and different ranks? In general, with respect to limitation of information in the context of arbitrage, the present research project has tried to study our country's basketball referees' emotional intelligence and reaction times in order to provide answer to the following questions: A) Are there any differences between emotional intelligence of first and second grade male and female basketball referees with respect to their international arbitrage ranking? B) Are there any differences between reaction times

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of first and second grade male and female basketball referees with respect to their international arbitrage ranking?

MATERIALS AND METHODS

Methods

Through the application of availability sampling method, a number of 115 referees including 21 international referees, 31 first grade referees and 58 second grade referees with average age of 31.8 ± 8.5 and average experience of 16.4 ± 7.9 years and average arbitrage experience of 9.8 ± 7.2 years were selected as the sample. For the purpose of data collection, a questionnaire of personal information was used in addition to Seabriashireng's questionnaire of emotional intelligence and 24 components arbitrage software for measurement of reaction time. The questionnaire of emotional intelligence included 5 sub-scales which measured the structures of self-awareness, self-regulation, self-motivation, empathy and social skills. In this regard, the five scores of components of emotional intelligence were collected along the total score and reaction time. Data analyses were accomplished through descriptive statistics, M-box test, Multivariate variance analysis, two tale variance analysis and LSD post hoc test and the SPSS software.

RESULTS AND DISCUSSION

Results

Summary of Descriptive Statistics

Descriptive statistics indicate the age, index of body mass and experience of participants of this research. As you can see in this table, participants had an average age of 31.8 years, sports experience of 16.47 years and arbitrage experience of 9.81 years. Also an average time of 3.02 years has passed since their last arbitrage certificate. In addition, their judgment experience average score was 29.95.

Table 1: Results of multivariate variance analysis

η^2	Sig	F value	Average squares	Freedom degree	Sum of squares	Dependent variable	Source of change
0.088	0.006	5.277	1.137	2	2.274	Self-awareness	Arbitrage × rank gender
0.023	0.284	1.272	0.196	2	0.392	Self-regulation	
0.103	0.003	6.276	0.603	2	1.207	Self-motivation	
0.016	0.417	0.882	0.198	2	0.396	empathy	
0.002	0.913	0.091	0.036	2	0.072	Social skill	
0.040	0.108	2.275	4.956	2	9.911	Emotional intelligence	
-	-	-	0.215	109	23.487	Self -awareness	error
-	-	-	0.154	109	16.785	Self-regulation	
-	-	-	0.096	109	10.478	Self-motivation	
-	-	-	0.224	109	24.454	empathy	
-	-	-	0.392	109	42.713	Social skill	
-	-	-	2.178	109	237.43	Emotional intelligence	
-	-	-	-	115	691.5	Self-awareness	total
-	-	-	-	115	1002.8	Self-regulation	
-	-	-	-	115	857.3	Self-motivation	
-	-	-	-	115	645.12	empathy	
-	-	-	-	115	914.7	Social skills	
-	-	-	-	115	20032.8	Emotional intelligence	

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There is no difference between emotional intelligences of male and female basketball referees with international, first grade and second grade arbitrage ranks. Table 1 indicates the results of multivariate variance analysis for testing the interactive effect of arbitrage rank and gender separately on dependent variables. According to the findings of this research, the level of components of self-awareness and self-motivation is different in a significant manner between international, first grade and second grade and male and female referees and in order to determine the two by two difference of these groups the one tale variance analysis and LSD post hoc test were used. Significant and meaningful results of this test are summarized in table 2. As you can see in this table, the average difference of self-awareness of male international referees and male first grade referees and female first grade referees and female second grade referees is significant and meaningful; it means that with respect to average difference, the level of self-awareness of international male referees is significantly lower than first grade male referees, first grade female referees and also second grade female referees. According to these results, the average difference between levels of self-awareness of first grade male referees, second grade male referees and international female referees is significant and meaningful; it means that with respect to average difference, the level of self-awareness of male first grade referees is significantly higher than second grade male and international female referees.

Results of LSD test regarding the component of self-motivation signifies that the difference in average level of self-motivation between male international referees and male first grade and second grade referees, international female referees, first grade and second grade female referees is significant; it means that with respect to the average difference, the level of self-motivation of male international referees is significantly lower than other mentioned referees. Also the difference in average level of self- motivation for first grade male referees and first grade female referees is significant and meaningful; it means that with respect to average difference, the level of self-motivation of male first grade referees is significantly higher than first grade female referees.

Table 2: Summary of results of LSD post hoc test

Sig	Test statistics Standard error	Average difference	Second group Rank-gender	First group Rank-gender	Variable
0.001***	0.179	-0.625	1 st grade - man	International-male	Self-awareness
0.048*	0.187	-0.373	1 st grade - female		
0.005**	0.168	-0.478	2 nd grade - female		
0.000***	0.138	0.533	2 nd grade - male	Grade 1- male	
0.027*	0.174	0.390	International - female		
0.002**	0.122	-0.387	2 nd grade - female	Grade 2 - male	Self-motivation
0.000***	0.120	-0.484	1 st grade - male	International-male	
0.004**	0.115	-0.340	2 nd grade - male		
0.008**	0.135	-0.367	International - female		
0.046*	0.124	-0.251	1 st grade - female		
0.001***	0.112	-0.386	2 nd grade - female		
0.028*	0.103	0.232	1 st grade- female	Grade 1 - male	

Also the findings of table 3 indicate that the effect of variable of arbitrage ranking is significant on reaction time but still the effect of gender on this variable is not significant. Also the interactive effects of variables of arbitrage ranking and gender are effective on reaction time. Findings suggest that at least there is a difference between reaction times of one group of referees including 1st grade, 2nd grade and international referees. For more precise measurements, the LSD post hoc test was used (table 4). Also the analysis of interactive effect indicates that at least there is a difference between reaction times of one group of referees including male international, 1st grade male, 2nd grade male, female international, 1st grade female and 2nd grade female referees. For determining the two by two differences between groups,

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the one tale variance analysis and the LSD post hoc test were used. Significant results of this test are summarized in table 4-9.

Table 3: Results of two tale variance analysis

η^2	Sig	F value	Average squares	Freedom degree	Sum of squares	Source of change
0.087	0.007	5.215	0.279	2	0.559	Arbitrage rank
0.026	0.091	2.907	0.156	1	0.156	gender
0.120	0.001	7.454	0.399	2	0.798	Arbitrage rank X gender
-	-	-	0.054	109	5.838	error
-	-	-	-	115	48.865	total

According to table 4, we can see that there exists a significant difference between reaction times of 2nd grade and international referees and also a significant difference between reaction times of 1st and 2nd grade referees; it means that with respect to average difference, reaction time of international and 1st grade referees are significantly higher than 2nd grade referees.

Table 4: Results of LSD post hoc test

Test statistics			2 nd group	1 st group
Sig	Standard error	Average difference	Arbitrage ranking	Arbitrage ranking
0.507	0.063	-0.042	1 st grade	international
*0.05	0.058	0.117	2 nd grade	
**0.002	0.049	0.159	2 nd grade	1 st grade

Information on table 5 indicate that there exists a significant difference between reaction times of international and 2nd grade male referees; it means that male international referees have shown longer reaction times compared to male 2nd grade referees. Also the results of LSD post hoc test indicate that the reaction times of 1st grade male referees are significantly different than reaction times of 2nd grade male, international female, 1st grade female and second grade female referees and it means that 1st grade male referees have shown significantly higher reaction times.

Table 5: Summary of results of LSD post hoc test for comparing the reaction times of 6 groups

Test statistics			2 nd group	1 st group
Sig	Standard error	Average difference	Ranking-gender	Ranking-gender
*0.024	0.086	0.195	2 nd grade-male	International-male
***0.000	0.068	0.399	2 nd grade-male	1 st grade-male
*0.028	0.086	0.193	International-female	
***0.000	0.077	0.285	1 st grade-female	
***0.000	0.065	0.243	2 nd grade-female	

Discussion and Conclusion

Results of analyses of the first hypothesis indicated that arbitrage ranking and gender are separately ineffective on components and total level of emotional intelligence of basketball referees. But the interactive effect of these two variables is statistically significant. Further analyses indicated that the interactive effect of arbitrage ranking and gender are only and only significant in terms of components of self-awareness and self-motivation. Results of this research are consistent with the findings of researches conducted by Bar-Ann *et al.*, (2009) which implied that there were no significant differences between female's and male's emotional intelligence. The results of this research are also inconsistent with the findings of Extremer *et al.*, (2006). The participants of this research are all participants of sports groups which at least have three years of arbitrage experience in the context of basketball. With respect to the

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potential and growth ability of emotions in the situation of participants of research, it is possible that the existence of lack of difference between male and female referees in terms of emotional intelligence is due to growth effect of situational variables (type of athletic field, level of arbitrated competitions and etc.) and the nature of arbitration task on psychological variables of male and female referees. Also the findings of this research provide clues regarding existence of different patterns in gender differences of emotional intelligence between different races. Still, descriptive findings indicate that although the difference between emotional intelligence of male and female referees is not significant, female referees have obtained a higher emotional intelligence score over male referees. In this research, gender differences were spotted when this variable was exposed to interaction with the variable of arbitration ranking. These findings suggest that probably there are other variables in between the relation between gender and emotional intelligence. On the other hand, it is believed that the observed differences between male and female referees are generally in sub-scale of cognition of emotions and in terms of this dimension, female referees had over performed male referees (Nikolaou & Statutes, 2002). In this research, the interactive effect of arbitration ranking and gender were on components of self-awareness and self-motivation. Self-awareness is defined as being able to deeply comprehend emotions, feelings, weaknesses, advantages and needs (Gellman, 1995). In fact the nature of observed difference in the component of self-awareness supports the findings regarding gender differences of comprehension of emotions.

Also the results of this research indicated that the effect of arbitration ranking on reaction time is significant. In this regard, the reaction times of international and 1st grade referees are significantly higher than second grade referees. Existence of a number of elements can explain these observations. The first element is the element of age and the second element is the improved level of knowledge and experience which is accompanied by growth of age and arbitration experience and increase in these informative sources leads to elongation of cognitive evaluations in these people. In this context, Drech and Paskovich (2007) found out that first grade referees are exposed to significantly higher levels of stress during their arbitrages. Existence of such stresses could be effective on prolongation of time of evaluation of a foul situation because not only the referee him/herself but also all the people around expect the referee to exhibit a high quality arbitration and therefore a more experienced referee requires more time for evaluation of his or her decision. Still, as a result of limitation of information regarding the context of referees' reaction times, judgment upon referees' cognitive comprehension abilities and different arbitration levels and ranks requires further researches. Results of this research regarding the interactive effect of arbitration ranking and gender on reaction times have been significant. Results indicated that male international referees have longer reaction times compared to second grade male referees. Also male first grade referees have significantly higher reaction times compared to male second grade male, international female, first grade female and second grade female referees. With respect to descriptive findings, these findings indicate that international and 1st grade male referees have shown longer reaction times in terms of recognition of fouls of a basketball game. Also other elements such as motivation, exercise, personality, intelligence quality, exhaustion and daily changes could be effective on the results of the present research. But still in this research, international and first grade male referees have shown significantly higher reaction times according to measurements based on tasks of basketball arbitration. These observations suggest that probably higher experiences of male referees have caused the male referees to put more time on their judgments (the average score of judgment experience for male referees was 1.5 times higher than females; 36.2 against 23.8). Because as the level of experience improves, the information resources which are used for evaluation of a situation by a referee are also increased and it prolongs the reaction time.

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