


Original Article

The relationship between emotional intelligence, self-determined motivation and performance in canoeists

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ABSTRACT

The results of recent studies indicate that athletes differ in the degree in which they perceive, process and regulate their emotions. The present study aims to utilize these findings in order to examine if self-determined motivation in sport could explain individual variations in emotional intelligence (EI) and results of sport competitions. A model of structural equations has proven these relationships in 386 canoeists from 35 countries. These results support the mediating factor of EI in relation to autonomous motivation and performance index (PI). The stability of EI and gender differences were analysed as a secondary objective. The results showed that EI stays relatively stable independent from the years of practice. However, rather surprisingly, men scored higher than women in emotional control and regulation as well as in empathy. These findings contribute to the study of EI in sport and have important implications for human performance in sport competition at high level. **Key words:** EMOTIONAL INTELLIGENCE, SELF-DETERMINATION, PERFORMANCE, CANOEING.

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INTRODUCTION

Currently the cognitive and emotional aspects are considered to be complementary systems instead of antagonistic processes. In the same way that emotions influence thought processes, they also mediate between emotional states (Mayer, Salovey, Caruso & Cherkasskiy, 2011). Mayer, Caruso and Salovey (1999) propose that emotional intelligence (EI) is a capacity or ability that, due to an appropriate process of sensory information, allows individuals a better adaptation to their environment. Therefore, in the context of research it should be evaluated with performance measurements (Petrides, 2011). On the contrary, Schutte, Malouff and Bhullar (2009) define EI as a compound of self-perceptions, dispositions and motivations that share some elements with the main characteristics of personality (Petrides, Pita & Kokkinaki, 2007; Petrides, Pérez-González & Furnham, 2007). Unlike the model of capacity, the EI trait model includes mental skills as well as stable traits of behaviour and personality, social skills and adjustment indicators (Fernández-Berrocal & Extremera, 2008; Mayer, Salovey & Caruso, 2008). It also incorporates the inherent subjectivity that relates to personal emotional experience, which means that for its study it should be evaluated through measurements of self-report (Bar-On, 2006). According to Petrides and Furrman (2001) the first compound places EI in the field of intelligence and the other in the sphere of personality. In the first case, EI is a skill sensitive to being improved, whilst personality traits are characteristics that are more stable and long-lasting throughout life (Kotsou, Nelis, Grégoire & Mikolajczak, 2011; Nelis et al., 2011). In the area of sport, Lane, Thelwell, Lowther and Devonport (2009) analysed the factorial validity of the Emotional Intelligence Scale (EIS: Schutte et al., 1998) to be used with athletes for the first time. Based on the initial contributions of Mayer and Salovey (1997), Arruza, González-Rodríguez, Palacios-Moreno, Arribas-Galarraga and Telletxea-Artzamendi (2013) constructed a scale of self-report to measure specifically EI in sport competition or the perceived emotional intelligence in sport (Salovey, Mayer, Goldman, Turvey & Palfai, (1995). In the first case these perceptions are indicators for predispositions or individual traits (e.g. "I have control over my emotions"), while in the second they measure specific behaviours in sport competition (e.g. "when I face a competition I control my emotions"). In either case, we believe that this does not modify the fact that they still measure relatively stable individual traits. Apart from these subtle but important differences the scales evaluate distinct dimensions.

Another subject we are going to study in the framework of the self-determination theory is the organismic integration theory which establishes that motivation varies throughout a continuum that goes from amotivation to intrinsic motivation (Ryan & Deci, 2000a; 2002). Based on this principle, measures have been constructed that include different types of motivation. Perreault, Mask, Morgan and Blanchard (2014) examined the decisive factor of self-determination in EI and proposed the hypothesis that EI measures the relationship between general self-determination and psychological well-being. In other words, in their model general self-determination predicts EI. This model is based on the idea that higher self-determination provides a person with a greater degree of flexibility in potentially threatening situations and facing them in more efficient ways due to better emotional regulation (Weinstein, Deci & Ryan, 2011; Weinstein & Hodgins, 2009).

Perreault et al. (2014) proposed that these competencies are attributed partly to the inter-related skills of EI. According to this theory, autonomous motivation also influences performance even when people have the same level of competence (Deci & Ryan, 1991; Ryan & Deci, 2000b). From the self-determination theory point of view, these types of motivation can predict specific confrontation patterns when facing stress in sport competition. Amiot, Gaudreau & Blanchard (2004) observed that self-determination motivation predicted positively the use of confrontation strategies during a stressful sport competition.

The study of EI is relatively new. However, some of the investigations that studied EI in sport found that EI

could be a key factor in sport performance because in the context of high level sport competitions athletes may experience anxiety and stress (Mellalieu, Neil, Hanton & Fletcher, 2009). Before a competition EI is positively linked to emotions that improve performance (Lane et al., 2010). It is also related to lower pre-competitive anxiety (Lu, Li, Hsu & Williams, 2010). Additionally, it is associated with the use of confrontation strategies in stressful sport situations (Laborde, You, Dosseville & Salinas, 2012). Even though some evidence has been found which supports the idea that emotions are related to performance, few studies address the direct relationship between EI and elite sport. The general conclusion of these studies is that EI in high performance athletes is positively associated with objective sport results (Crombie, Lombard & Noakes 2009; Perlini & Halverson, 2006; Zizzi, Deaner & Hirschhorn, 2003).

Fernández-Berrocal, Cabello, Castillo and Extremera (2012) tried to establish if women were emotionally more intelligent than men or if this was merely another stereotype. They concluded that it is necessary to be cautious when such statements are made without having examined the possible interactions that other variables may cause in relation to gender. However, a meta-analysis of EI that includes gender differences (Joseph & Newman, 2010) reached the conclusion that women scored higher than men in all of the EI dimensions. Nevertheless, it is important to bear in mind that gender, as an explanatory factor of conduct, always operates in complex interactions with other demographic elements such as socio-cultural factors (McIntyre & Edwards, 2009). For instance, Fernández-Berrocal et al. (2012) observed that the gender difference initially found in the context of EI, remain completely mediated by age in the areas of facilitation and comprehension, strategic sphere and total scoring, and partially, in emotional management on the "Mayer-Salovey-Caruso emotional intelligence test".

The main objective of this present study is to examine the determining role of autonomous motivation in sport performance and if this relationship is mediated by EI. As secondary objectives the following were formulated: a) investigate if EI is a relatively stable trait in sport; b) analyse if female athletes show different scores in EI.

MATERIAL AND METHODS

Participants

Participants were 386 canoeists from 35 different countries, 165 males [age, $M(s) = 27.87(7.43)$], and 73 females [age $M(s) = 25.57(7.19)$]. 57 of the participants had never won a medal at none of the competitions included in the present study, and the rest had won at least a medal at National Championships ($n = 329$), Continental Championships ($n = 119$), World Championships ($n = 85$) or Olympic Championships ($n = 11$). The sample was obtained by direct contact via e-mail by the third author (2x world champion) after consulting the lists of the International Canoeing Federation.

Variables and measurement scales

Performance

Participants were asked about the number of medals that they had won: a) National Championships (CNA); b) Continental Championships (CCT); c) World Championships (CMU); d) Olympic Games (JOL). In all the questions, the possible answers were: 1 = none; 2 = from 1 to 3 medals; 3 = more than 3 medals. The performance index was used to calculate performance (IP) = $[CNA + (CCT * 2) + (CMU * 3) + (JOL * 4)]$.

Emotional intelligence

It was measured with the "Questionnaire of perceived emotional intelligence in sport/competition contexts" created by Arruza et al. (2013). The questionnaire consists of 39 items distributed in 5 sub-scales that evaluate: empathy (7 items, e.g. "During the competition, I understand easily how my teammates and/or

opponents feel"), emotional control and regulation (7 items, e.g. "I am good at controlling my level of pressure before competing"), management of negative emotions (6 items, e.g. "I often struggle understanding my teammates' emotions"), refereed reactivity (3 items, e.g. "I stay calm when a referee error happens") and emotional recognition (8 items, e.g. "I am aware of my emotions when I compete"). For this study the empathy, emotional control and regulation, and emotional recognition factors were used.

Cronbach alphas were: .86 (Spanish version) and .81 (English version) for empathy, .88 and .80 for emotional control and regulation, and .91 and .89 for emotional recognition.

Self-determined motivation

The Sport Motivation Scale (Pelletier, et al., 1995) and its Spanish version created by Núñez, Martín-Albo, Navarro and González (2006) was used. This scale consists of 28 items distributed in 7 sub-scales of 4 items each that evaluate 3 types of intrinsic motivation: IM-to know (e.g. "For the pleasure it gives me to know more about the sport that I practice"), IM-to accomplishment (e.g. "Because I feel a lot of personal satisfaction while mastering certain difficult training techniques") and IM-to experience stimulation (e.g. "For the pleasure I feel in living exciting experiences"), the three types of extrinsic motivation: external regulation (e.g. "Because it allows me to be well regarded by people that I know"), introjected regulation (e.g. "Because it is absolutely necessary to do sports if one wants to be in shape"), and identified regulation (e.g. "Because, in my opinion, it is one of the best ways to meet people"), and amotivation (e.g. "I used to have good reasons for doing sport, but now I am asking myself if I should continue doing it"). Each item answers to the question: "why do you practice your sport?"

Cronbach alphas for both the Spanish and English versions are the following: IM-to know (.80 and .80), IM-to accomplishment (.79 and .80) and IM-to experience stimulation (.75 and .77), external regulation (.79 and .75), introjected regulation (.72 and .75), identified regulation (.70 and .63) and amotivation (.74 and .75). They are clustered in two groups: autonomous motivation and controlled motivation.

Procedure

All participants completed the on-line forms voluntarily and anonymously after informed consent was obtained. Quality standards for on-line questionnaires have been followed (Arruza et al., 2013). All questionnaires were available in two languages: English $n = 179$; 36.5 %) and Spanish ($n = 311$; 63.5 %). The approximate duration for completing the questionnaires was estimated to be 20 minutes. The sampling was carried out following the criteria of the Ethical Commission of the University of the Basque Country.

Analysis

Descriptive analyses, bivariate correlations, multivariate analysis of covariance and structural equation analysis were conducted. A previous analysis of the data revealed a substantial multivariate kurtosis (7,28). An analysis based on the utilization of the Satorra-Bentler chi-square ($S-B\chi^2$; Satorra & Bentler, 1994) and the Robust Maximum Likelihood method was conducted using the statistic programme EQS 6.1. The evaluation of goodness-of-fit of the data was determined on the basis of several criteria (Byrne, 2008): a robust version of CFI (*Comparative Fit Index*; Bentler, 1990) was used as incremental adjustment index (Browne y Cudeck, 1993) and a SRMR (*Root Mean Square Residual*) was used as a measurement of absolute adjustment.

For the CFI, Hu and Bentler (1990) suggested a value of .95 as an indicator of a good adjustment and as for the RMSEA, values below a .05 indicate good fit, while values as high as a .08 represent reasonable errors of approximation. In order to complete the analysis, a confidence interval at 90% provided by the RMSEA

(see, Steiger, 1990) was included. Lastly, a SRMR with a value below .08 indicates good adjustment (Hu & Bentler, 1999).

RESULTS

Descriptive analyses and bivariate correlations

In EI the highest score can be observed in emotional recognition, followed by empathy and regulation and emotional control. This is consistent with the idea that the ramifications of emotional intelligence have a hierarchical structure (Mayer & Salovey, 1997). Moreover, a very high correlation between autonomous motivation and controlled motivation can also be observed.

As research has shown, autonomous motivation and controlled motivation are not mutually excluding but represent orthogonal constructs (Covington & Mueller, 2001). Years of practice only correlates with emotional control and regulation, and with performance.

Table 1. Means, standard deviations and covariate correlations

	M(s)	1	2	3	4	5	6
1 Controlled motivation	4.21 (1.22)	1					
2 Autonomous motivation	5.09 (1.01)	.61**	1				
3 Emotional recognition	3.89 (.79)	.25**	.27**	1			
4 Emotional control and regulation	3.31 (.87)	.20**	.22**	.53**	1		
5 Empathy	3.37 (.78)	.29**	.32**	.60**	.61**	1	
6 Years of practice	10.13 (1.46)	-.02	.05	.07	.15**	.09	1
7 Performance	13.25 (3.45)	.12*	.16**	.18**	.21**	.15**	.33**

Note: SMS autonomous motivation = $\Sigma(\text{Intrinsic M.}^1 + (\text{Identified R.})/2)$. SMS controlled motivation = $\Sigma(\text{Introjected R.} + \text{External R.})/2$. ¹Intrinsic motivation = $\Sigma(\text{IM to-know} + \text{IM to-achieve} + \text{IM to-stimulating experiences})/3$.

Multivariate Analyses

A MANCOVA was conducted using empathy, emotional recognition and emotional control and regulation as dependent variables, and SDI, IP and years of practice as gender covariables. A significant multivariate effect emerged for gender [Wilks Lambda (3, 378) = .97, $F = 4.39$, $p < .01$, $\eta^2 = .03$], and autonomous motivation [Wilks Lambda (3, 378) = .96, $F = 4.88$, $p < .01$, $\eta^2 = .04$] and performance [Wilks Lambda (3, 378) = .97, $F = 4.14$, $p < .01$, $\eta^2 = .03$], but not for years of practice [Wilks Lambda (3, 378) = .99, $F = .58$, $p = .624$, $\eta^2 = .00$] and controlled motivation [Wilks Lambda (3, 378) = .98, $F = 1.94$, $p = .123$, $\eta^2 = .01$].

The following univariate analyses showed differences in gender (scores were higher for males) for the variables of emotional control and regulation [$F_{(1, 380)} = 10.39$, $p < .001$, $\eta^2 = .03$] and empathy [$F_{(1, 380)} = 7.53$, $p < .01$, $\eta^2 = .02$]. Connections between autonomous motivation and emotional recognition [$F_{(1, 380)} = 7.94$, $p < .01$, $\eta^2 = .02$], emotional control and regulation [$F_{(1, 380)} = 6.07$, $p < .05$, $\eta^2 = .02$] and empathy [$F_{(1, 380)} = 7.36$, $p < .001$, $\eta^2 = .04$] were also found. Finally, connections between performance and emotional recognition [$F_{(1, 380)} = 6.62$, $p < .01$, $\eta^2 = .02$], emotional control and regulation [$F_{(1, 380)} = 11.15$, $p < .001$, $\eta^2 = .03$] and empathy [$F_{(1, 380)} = 4.05$, $p < .05$, $\eta^2 = .01$] were observed.

Analysis of Structural Equations

A hypothesis where self-determined motivation would have implications in performance through EI was

formulated. First a model that included all variables was tested. All calculated parameters were significant and are shown in Figure 1. Controlled motivation ($\gamma = .18, p < .01$), and autonomous motivation ($\gamma = .26, p < .001$), predicted positively EI which successively predicted performance ($\gamma = .23, p < .001$). The adjustment indexes showed that the hypothesized model fits the data well: $S-B\chi^2_{(7)} = 9.38, p = 0.311; \chi^2/d.f. = 1.34; *CFI = 0.99; *RMSEA (90\% CI) = 0.03 (0.000-0.073); SRMR = 0.03$.

In order to examine if EI mediates the influence of self-determined motivation, the four steps suggested by Baron and Kenny (1986) were followed. The first one establishes if the initial variable predicts the mediator. As Figure 1 shows, both autonomous motivation and controlled motivation predict EI. The second step established whether the initial variable predicts the result of the final variable. In order to examine this, a model where autonomous motivation and controlled motivation had a direct connection to IP was tested. The steps from EI to IP were reduced to zero. Only the step from Autonomous Motivation was significant ($\gamma = .16, p < .01$). Therefore, only the intermediation with this variable as independent is possible. The third step tests if the mediator predicts the result variable after the test conducted by the initial variable. EI was a significant predictor of IP ($\gamma = .19, p < .01$) after the test conducted by the controlled motivation. The last step, following the same model as for step 3, examined if in the presence of a mediator, the direct connection between the initial variable and the result variable is reduced to zero (complete mediation), or if it is reduced in its size but it is still different to zero (partial mediation).

In Figure 1, a direct link from sport participation to moral functioning was added; this link was not significant ($\gamma = .09$) and smaller than the original link. Therefore, it was concluded that EI mediates partially the effect of autonomous motivation in IP.

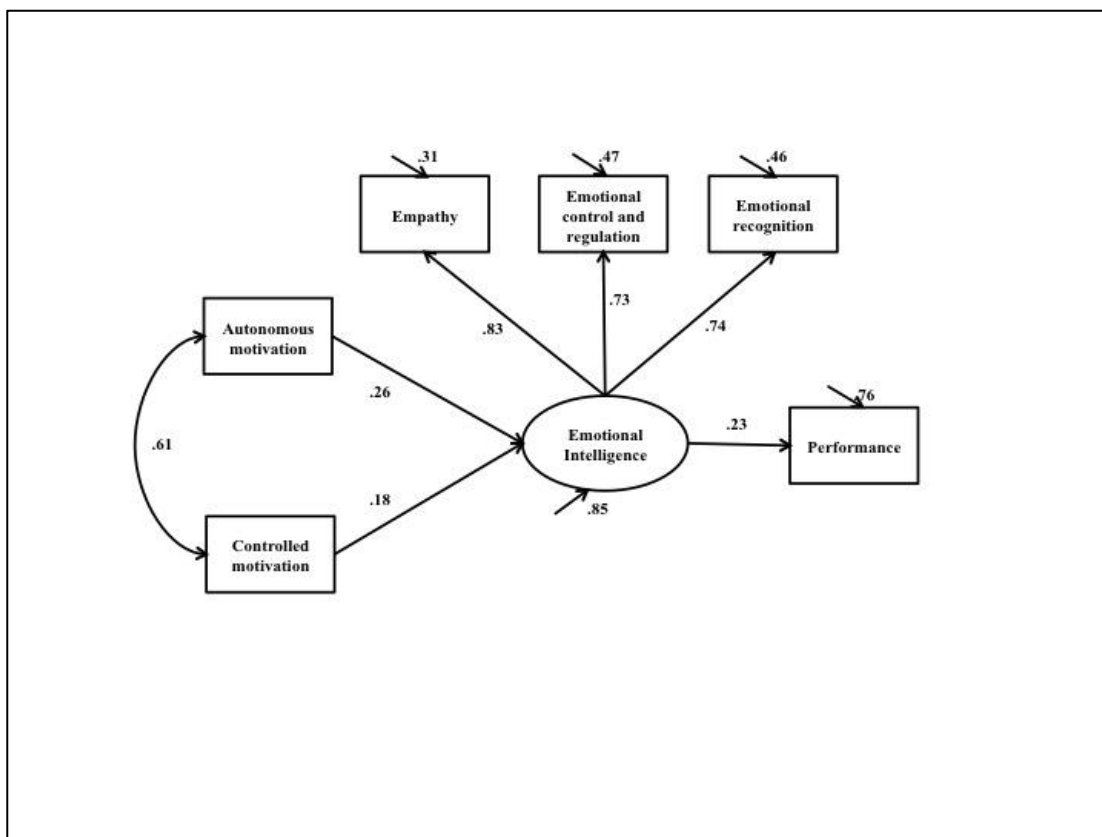


Figure 1. The influence EI and Self-determined motivation

DISCUSSION AND CONCLUSION

Those athletes who have the possibility of satisfying their autonomous motives of participation (intrinsic and identified) also have more possibilities of developing the efficiency and efficacy with which they identify, comprehend, regulate and control their emotions in competition. In the case of athletes, autonomous motivation becomes so self-defined that it represents a central characteristic of their identity. This autonomous internalization, which takes an athlete to get involved in an activity, provides a higher degree of competence to face potentially threatening situations as a result of better emotional regulation (Weinstein et al., 2011; Weinstein & Hodgins, 2009). The present study proved that autonomous motivation can provide a detailed account of the individual variation of emotional intelligence (EI) that may successively influence IP. The data obtained from our international sample of canoeists support these hypothetical relationships. In order to examine this, a model in which autonomous motivation and controlled motivation had a direct connection with IP was proven. Only the step from autonomous motivation was significant, therefore, only the intermediation with this independent variable is possible. Subsequently it was tested if EI measured the relationship between autonomous motivation and the IP. When athletes participate in sport in an autonomous way, they become more efficient in processing, comprehending and utilizing information loaded with emotions during competition with direct implications in sport performance. In fact, it has been observed that self-determined motivation predicts positively the utilization of confrontation strategies during a stressful sport competition, while at the same time it is associated with the achievement of objective results (Amiot et al., 2004). The next objective of this study was to find out if EI is a relatively stable trait in sport. The results obtained from the sample, show that the time invested in the practice of canoeing does not predict EI when it is controlled by IP, autonomous motivation, controlled motivation and gender. The self-report scale that has been used (Arruza et al., 2013) measures the behaviour of general personality traits in a specific context like sports. Personality traits are more stable and long lasting throughout life (Kotsou et al., 2011; Nelis et al., 2011). The fact that these traits have been measured in a specific context, do not seem to have modified the stability of its behaviour much. These results are consistent with the idea that part of this capacity (EI) is attributed to structural factors, like personality (Johnson, Batey & Holdsworth, 2009). The last objective was to analyse if women score differently in EI. The results have been surprising and require more discussion. Contrary to what was expected, male athletes scored higher in the dimensions of emotional control and regulation and empathy than females. The revisions carried out to date, have reached the conclusion that females score higher than men in all dimensions of EI (Joseph & Newman, 2010). So how can we interpret these findings then? Previous studies have shown that differences are limited and that they could be mediated by other variables, like age for example (Fernández-Berrocal et al. 2012). The evidence found in this study regarding the aforementioned is not conclusive and therefore further research is needed in this context.

Moreover, in the present study it has been observed that IP influences EI. However, IP does not measure objective results in competition. It is known that objective results measured by the time invested in the preparation of a race are more adaptive in males than in females, and as a consequence it could lead to more biological and psychological adaptations. We think that this could be a coherent explanation.

This study has some limitations. Firstly, the answers are limited to self-report data. Further research could examine these relationships with measures of performance (Petrides, 2011). Secondly, the correlations between autonomous motivation and controlled motivation were very high. Research has shown that intrinsic and extrinsic motivation are not mutually excluding but that they represent orthogonal constructs that are more or less independent, and in some cases they complement each other. In this context further in-depth studies with elite athletes need to be conducted. Lastly, further research to assess the influence of variables

like age on the EI of high performance male and female athletes is required.

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