

DOES GROUP COHESION PREDICT TEAM SPORT ATHLETES' SATISFACTION?

***Evangelos Brisimis¹, Evangelos Bebetos²,
& Charalampos Krommidas¹***

¹University of Thessaly ²Democritus University of Thrace

Abstract: Many social and sport psychologists consider that group/ team cohesion as well as athletes' satisfaction has a major impact on team performance. The aim of this study was to examine if there were significant differences in group cohesion and athletes' satisfaction as a function of gender (male, female), type of team sports (soccer, basketball, volleyball, handball, water polo) and sport division (professional, semi-professional). A second aim was to analyze the relationship between group cohesion and athletes' satisfaction in team sports. Participants were 615 professional and semi-professional team-sport athletes from Greece, aged 15 to 36. They completed two questionnaires: (a) the *Group Environment Questionnaire* (Individual Attraction to Group - Task: ATG-T; Individual Attraction to Group - Social: ATG-S; Group Integration - Task: GI-T; Group Integration - Social: GI-S) and (b) the *Athletes' Satisfaction Scale* (Personal Outcome, Leadership). Separate three-way MANOVAs revealed that type of team sports, but not gender or sport division, had a significant effect on group cohesion and athletes' satisfaction. Moreover, canonical correlation analysis revealed significant multivariate relationship between group cohesion and athletes' satisfaction. Overall, results indicated the important role of group cohesion, gender and team sports on Greek athletes' satisfaction.

Key words: Athletes' satisfaction, Gender, Group cohesion, Team sports

Address: Evangelos Bebetos, School of Physical Education & Sport Science, Democritus University of Thrace, Komotini 69100, Greece. Tel.: +30-25310-39712, Fax: +30-25310-39723. E-mail: empempet@phyed.duth.gr

INTRODUCTION

The idea of group cohesion in the field of sports has attracted the attention of researchers, mainly those who deal with sports teams. Group cohesion is a concept which refers to the team level and is interpreted as the bond which the members of a team have created among them (Molleman, 2005). Researchers ascertain that group cohesion is influenced by coaching as well as social conditions (Rico, Martin-Diana, Frias, Barat, Henehan, & Barry-Ryan, 2007; Shapcott, Carron, Burke, Bradshaw, & Estabrooks, 2006). Many scholars have tried to give a conceptualization of the term “*group cohesion*”. However, the definition which is accepted by most of the researchers and is widely used by contemporary studies comes from Carron, Brawley, and Widmeyer (1998, p. 213), who defined the cohesion of a group as “a dynamic process reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs”. Group cohesion is multidimensional concept, and this means that many factors can influence the coherence of a team, and the impact of the same factors can vary from team to team (Carron, Hausenblas, & Eys, 2005). Following the model of Carron and Hausenblas (1998), these factors/ characteristics are personal, environmental, related to the group and to the leadership.

More specifically, according to Carron and his colleagues (e.g., Carron, Widmeyer, & Brawley, 1985; Carron et al., 2005; Carron, Colman, Wheeler, & Stevens, 2002), team cohesion consists of four dimensions: 1) *Individual Attractions to Group-Task (ATG-T)*, which refers to “the extent to which athletes are attracted to the team to achieve important goals”; 2) *Individual Attractions to Group-Social (AGT-S)*, which refers to “the extent to which athletes are attracted to the team by its social environment”; 3) *Group Integration-Task (GI-T)*, which refers to “how the team functions to achieve important team goals”, and 4) *Group Integration-Social (GI-S)*, which refers to “how the team functions at a social level” (Ntoumanis & Aggelonidis, 2004, p. 262).

Many social and sport psychologists consider team performance an important subject of study. The emphasis given by professional coaches and players on the relationship between the cohesion of the team and its performance is significant and the conjecture is that the greater the cohesion, the higher the performance is (Hardy, Eys, & Carron, 2005; Loughhead & Hardy, 2006). In accordance with the above, Carron and his colleagues (2002) conducted a meta-analysis to examine the relationship of cohesion with performance in sport. Results of 46 studies revealed a significant moderate to large relationship between cohesion and team performance. In addition, Bruner, Eys, Wilson, and Côté (2014), having a sample of 424 male and

female adolescent athletes, found that high levels of team cohesion played an important role in positive youth development in sports.

Moreover, researchers tried to examine the factors that might influence team cohesion, such as gender or level of competition. For example, in the meta-analysis of Carron et al. (2002) it was found that the cohesion – performance relationship was higher in female teams. Ntoumanis and Agelonidis (2004), having a sample of 586 male and female volleyball athletes of elite and regional competition level, found significant gender differences only in the *Group Integration-Task*, with male athletes having a higher slope than females. Regarding competition level, Ntoumanis and Agelonidis (2004) found that elite volleyball players had higher scores in *Individual Attractions to Group-Task* compared to the regional level ones, while regional volleyball players had higher scores in *Individual Attractions to Group-Social* and *Group Integration-Social* compared to elite players. A few years later, Carron, Eys, and Burke (2007) examined the influence of gender on group cohesion and they also found a significant effect of gender on team cohesion.

Another important factor associated with group cohesion is the level of athlete's satisfaction, which has been defined as a "positive affective state resulting from a complex evaluation of the structures, processes, and outcomes associated with the athletic experience" (Chelladurai & Riemer, 1997, p. 133). Athletes' satisfaction is a multidimensional concept and it is influenced by many factors such as leadership, personal performance, team participation, facilities, team performance, and performance of other teams. In the present study, we focused mainly on the *Leadership* and *Personal Outcome* dimensions of athletes' satisfaction. Leadership refers to how satisfied are athletes from their coach's behavior, while Personal Outcome refers to how satisfied are athletes from their own performance (Bebetos & Theodorakis, 2003). The widespread belief, especially among coaches, that there is a strong relationship between athletes' satisfaction and their efficiency, shows even further the importance of investigating this specific topic (Riemer & Chelladurai, 1998). More specifically, Bebetos and Theodorakis (2003), having a sample of 234 male and female youth handball players, found that athletes' satisfaction was positively related to their leaders' behavior and their personal outcomes. Also, no significant differences emerged between male and female handball players in their satisfaction (Bebetos & Theodorakis, 2003).

The association between group cohesion and satisfaction of its members has been investigated by Hope (2006) who reported statistically significant relationships of three of the four dimensions of cohesion (individual attraction to task, individual attraction to social relationships and group integration for the task) with the five factors of athletic satisfaction (leadership factors, personal, organizational, group and

individual performance factors). Similarly, Ramzaninezhad, Keshtan, Shahamat, and Kordshooli (2009) found that team cohesion was positively related with collective efficacy in volleyball. A few years later, Ona and Tepeci (2014), having a sample of 360 amateur and professional athletes from various team sports, revealed that athletes' satisfaction and intent to remain with the team were positively related with team cohesion, team norms and intra team communication.

Regarding research on team cohesion, literature review showed that there is still a small number of studies worldwide that have examined the role of factors affecting group cohesion, such as gender or competition level (e.g., Carron et al., 2002; Carron et al., 2007; Ntoumanis & Agelonis, 2004). However, most of these studies have focused on each team sport separately and have not examined possible differences in cohesion due to different type of sport. Finally, regarding research on athletes' satisfaction, literature review showed that the number of studies examining the possible relationship between team cohesion and athletes' satisfaction is still limited (e.g., Hope, 2006; Ona & Tepeci, 2014; Ramzaninezhad et al., 2009).

The present study

Based on the above, the aim of this study was: a) to assess whether there are effects of gender (male, female), type of team sports (soccer, basketball, volleyball, handball, water polo) and sport division (professional, semi-professional) on group cohesion and athletes' satisfaction, and b) to investigate the associations between group cohesion and athletes' satisfaction among different team sports in Greece. Based on the existing literature (e.g., Carron et al., 2007; Ntoumanis & Agelonis, 2004), initially we hypothesized that there would be a significant interaction effect between gender, type of sports and sport division on group cohesion and athletes' satisfaction (Hypothesis 1). Secondly, we hypothesized that group cohesion variables would positively correlate with athletes' satisfaction (Hypothesis 2).

METHOD

Participants

The sample consisted of 615 (290 males and 325 females) professional and semi-professional athletes, aged 15 to 36 ($M = 24.2$, $SD = 4.8$). Participants involved in various team sports, such as soccer ($n = 265$), basketball ($n = 146$), handball ($n = 51$), volleyball ($n = 70$) and water polo ($n = 83$). Two hundred and sixty-two athletes

participated in the 1st Greek National Division, while 353 of them played in the 2nd Greek National Division.

Instruments

Group Environment Questionnaire

The Greek version (Aggelonidis, Kakkos, Zervas, & Psychountaki, 1993-1994; Ntoumanis & Aggelonidis, 2004) of the Group Environment Questionnaire (Carron et al., 1985) was used to evaluate group cohesion and assess participants' perceptions of team work and social relationships. This questionnaire includes 18 items, which form four dimensions: i) *Individual Attractions to Group-Task* (ATG-T; 4 items, e.g., "I'm happy with my play-time in the games"), ii) *Individual Attractions to Group-Social* (AGT-S; 5 items, e.g., "I enjoy participating in my team's social events"), iii) *Group Integration-Task* (GI-T; 5 items, e.g., "Our team is united while trying to achieve the seasonal goals") and iv) *Group Integration-Social* (GI-S; 4 items, e.g., "Our team members (players) often hang-out together"). All answers were given in a 9-point Likert-type scale, ranging from 1 (Totally Disagree) to 9 (Totally Agree).

Scale of Athlete Satisfaction

The Greek version (Bebetos & Theodorakis, 2003) of the Scale of Athlete Satisfaction (Chelladurai, Imamura, Yamaguchi, Oimnuma, & Miyauchi, 1988; Chelladurai & Riemer, 1997). The questionnaire consists of 10 items measuring athletes' satisfaction in two dimensions: i) *Leadership* (7 items, e.g., "The leadership provided by my coach"), ii) *Personal Outcome* (3 items, e.g., "The way I was performing"). Responders were instructed to indicate the extent of their satisfaction in each item on a 7-point Likert-type scale ranging from 1 (extremely dissatisfied) to 7 (extremely satisfied).

Procedure

Before one of their trainings, athletes completed the two questionnaires. The order of presentation of the questionnaires was counterbalanced. Participation was voluntary. All participants were assured for confidentiality and that they could stop whenever they wanted.

Data analysis

Initially, Confirmatory Factor Analysis (CFA) was conducted using AMOS version 20.0 to examine the questionnaires' factorial validity. To estimate the parameters of

each model in CFA, the method of Maximum Likelihood was used (Maximum Likelihood - ML), while for the examination of each model the following model fit indices were selected: the chi-square (χ^2), the Tucker-Lewis Index (TLI: values > .95 or close to 1), the Comparative Fit Index (CFI: values > .95 or close to 1) and the Root Mean Square Error of Approximation (RMSEA: values close to .06), which assesses the lack of adjustment in relation to the complete model (e.g., Arbuckle, 2011; Cheung & Rensvold, 2002; Hu & Bentler, 1999).

Then, to check whether the values of the examined variables followed a normal distribution, the absolute values of skew (skewness) and kurtosis (kurtosis) were used. In large samples (> 300), when the absolute values of skewness are smaller than 2, and the absolute values of kurtosis are less than 7, then the sampling seems to follow the normal distribution (Kim, 2013). In addition, descriptive statistics and reliability analysis using Cronbach's α were conducted (Cronbach, 1951).

Two three-way MANOVAs were performed with gender (male, female), team sports (soccer, basketball, handball, volleyball and water polo) and sport division (A = professional, B = semi-professional) as independent variables and the dimensions of the Group Environment Questionnaire (ATG-T, ATG-S, GI-T, GI-S) and Scale of Athlete Satisfaction (personal outcome, leadership) as dependent variables, respectively.

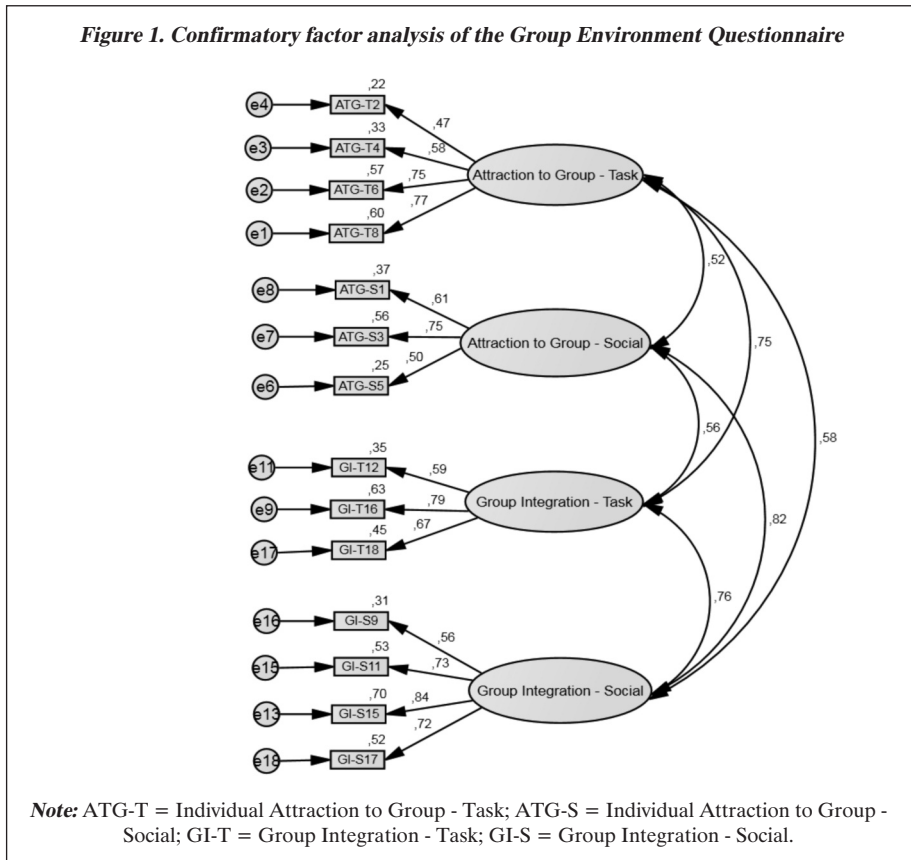
Finally, canonical correlation analysis was also conducted to examine the multivariate relationship between group cohesion (Individual Attractions to Group - Task: ATG-T; Individual Attractions to Group - Social: ATG-S; Group Integration - Task: GI-T; Group Integration - Social: GI-S) and athletes' satisfaction (Personal Outcome, Leadership). According to Hair, Anderson, Tatham and Black (1998), "in situations with multiple dependent and independent variables, canonical correlation is the most appropriate and powerful multivariate technique" (as referred by Cichy, Kim, & Cha, 2009, p. 176; Unegbu & Adefila, 2011, p. 846). All the above analyses were conducted using the statistical package PASW Statistics version 18 for Windows.

RESULTS

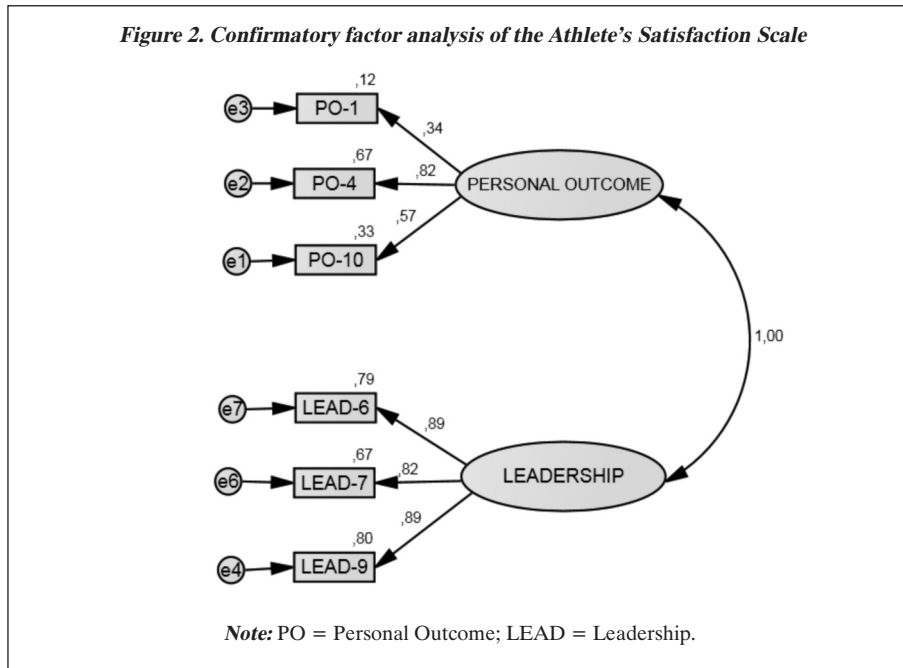
Confirmatory factor analysis

Initial CFA of the Group Environment Questionnaire revealed not acceptable goodness-of-fit indices: $\chi^2(129) = 973.0$, TLI = .789, CFI = .822, RMSEA = .103, RMSEA 90% CI = .097 - .109. After removing four items due to high covariation with other variables (Item 7 loading the ATG-S factor, Items 10 and 13 loading the

GI-T factor and Item 14 loading the GI-S factor were removed), CFA showed the following goodness-of-fit indices: $\chi^2(71) = 256.69$, TLI = .920, CFI = .938, RMSEA = .065, RMSEA 90% CI = .057 - .074. The factor loadings (14 items) ranged from .47 to .84 (see Figure 1).



In addition, initial CFA of the Athlete’s Satisfaction Scale revealed not acceptable goodness-of-fit indices: $\chi^2(34) = 505.7$, TLI = .827, CFI = .869, RMSEA = .150, RMSEA 90% CI = .139 - .162. After removing four items due to high or negative covariance with other variables (Items 2, 3, 5 and 8 loading the Leadership factor were removed), CFA showed the following goodness-of-fit indices: $\chi^2(8) = 39.33$, TLI = .971, CFI = .985, RMSEA = .080, RMSEA 90% CI = .056 - .106. The factor loadings (8 items) ranged from .34 to .89 (see Figure 2).



Descriptive statistics, reliability analysis and normal distribution

Descriptive statistics, Cronbach's alpha and the absolute values of skewness and kurtosis for the Group Environment Questionnaire and the Athlete's Satisfaction Scale are presented in Table 1. Results from reliability analysis indicated acceptable internal consistency ($\alpha = .61 - .90$).

Gender, team sports and division effects – Group environment

We conducted a three-way MANOVA to examine the effects of gender (male, female), team sports (soccer, basketball, handball, volleyball and water polo) and sport division (professional, semi-professional) on the dimensions of the Group Environment Questionnaire (ATG-T, ATG-S, GI-T, GI-S). The results showed no significant interaction effect between gender and team sports, Wilks' $\lambda = .976$, $F(16, 1812) = .899$, $p = .570$, $\eta_p^2 = .006$; between gender and sport division, Wilks' $\lambda = .998$, $F(4, 593) = .234$, $p = .919$, $\eta_p^2 = .002$, between team sports and sport division, Wilks' $\lambda = .977$, $F(16, 1812) = .872$, $p = .602$, $\eta_p^2 = .006$, and between gender, team sports and sport division, Wilks' $\lambda = .985$, $F(8, 1186) = 1.160$, $p =$

Table 1. Descriptive statistics, reliability analysis and normal distribution for the Group Environment Questionnaire and the Athlete's Satisfaction Scale

Variables	<i>M</i>	<i>SD</i>	Cronbach's α	Skewness	Kurtosis
ATG-T	6.72	1.41	.72	-.77	.30
ATG-S	6.84	1.38	.61	-.58	.09
GI-T	6.81	1.39	.71	-.95	1.55
GI-S	6.45	1.35	.80	-.60	.28
Personal Outcome	5.33	.97	.62	-.82	.88
Leadership	5.33	1.25	.90	-.98	.76

M = Mean; *SD* = Standard deviation; ATG-T = Individual Attraction to Group - Task; ATG-S = Individual Attraction to Group - Social; GI-T = Group Integration - Task; GI-S = Group Integration - Social.

.320, $\eta_p^2 = .008$. Moreover, there was no significant main effect of gender, Wilks' $\lambda = .989$, $F(4, 593) = 1.664$, $p = .157$, $\eta_p^2 = .011$. However, there was a significant main effect of team sports, Wilks' $\lambda = .954$, $F(16, 1812) = 1.747$, $p < .05$, $\eta_p^2 = .012$. Univariate analysis revealed that there was a significant effect of team sports on ATG-S, $F(4, 596) = 3.665$, $p < .01$, $\eta_p^2 = .024$, and GI-S, $F(4, 596) = 2.541$, $p < .05$, $\eta_p^2 = .017$, and nonsignificant effect on ATG-T, $F(4, 596) = 1.472$, $p = .209$, and GI-T, $F(4, 596) = 1.074$, $p = .368$. Post hoc LSD test showed that team sports differed significantly in ATG-S ($p < .05$) and GI-S variables ($p < .01$), respectively. Regarding the ATG-S variable, the examination of the means showed that handball players ($M = 6.22$, $SD = 1.45$) had lower scores compared to soccer ($M = 6.79$, $SD = 1.45$), basketball ($M = 6.87$, $SD = 1.38$), water polo ($M = 6.99$, $SD = 1.13$) and volleyball players ($M = 7.27$, $SD = 1.12$). Regarding the GI-S variable, examination of the means showed that handball players ($M = 6.07$, $SD = 1.32$) had lower scores compared to soccer ($M = 6.40$, $SD = 1.51$) and water polo players ($M = 6.77$, $SD = .95$).

Gender, team sports and division effects - Athlete's satisfaction

We conducted a three-way MANOVA to examine the effects of gender, team sports and sport division in the dimensions of the Athlete's Satisfaction Scale (Personal Outcome, Leadership). The results showed no significant interaction effect between gender and sport division, Wilks' $\lambda = .999$, $F(2, 595) = .446$, $p = .640$, between team sports and sport division, Wilks' $\lambda = .989$, $F(8, 1190) = .839$, $p = .568$, and between gender, team sports and sport division, Wilks' $\lambda = .988$, $F(4, 1190) = 1.745$, $p = .138$. Moreover, there was no significant main effect of gender, Wilks' $\lambda = .993$, $F(2, 595) = 2.123$, $p = .121$, and sport division, Wilks' $\lambda = 1.000$, $F(2, 595) = .069$, $p = .933$. However, there was a significant main effect of team sports, Wilks' $\lambda = .970$, $F(8, 1190) = 2.319$, $p < .05$, $\eta_p^2 = .015$, and a significant interaction effect

between gender and team sports, Wilks' $\lambda = .971$, $F(8, 1190) = 2.220$, $p < .05$, $\eta_p^2 = .015$. Univariate analysis showed that there was a significant interaction effect between gender and team sports in Leadership, $F(4, 596) = 3.506$, $p < .01$, $\eta_p^2 = .023$, and nonsignificant effect in Personal Outcome, $F(4, 596) = 1.535$, $p = .190$. Analyzing the interaction, results showed that only male athletes had significant differences in Leadership between team sports, $F(8, 1190) = 3.939$, $p < .001$, $\eta_p^2 = .026$, while female athletes had no significant differences in Leadership between team sports, $F(8, 1190) = 1.753$, $p = .082$. Post hoc LSD test showed that male athletes differed significantly in Leadership ($p < .01$) between team sports. Examination of the means showed that handball male players ($M = 4.81$, $SD = .98$) had lower scores in Leadership compared to soccer ($M = 5.10$, $SD = 1.17$) and water polo male players ($M = 5.81$, $SD = .95$). Descriptive statistics (means, *the s*) and significant differences for Group Environment Questionnaire and Athlete's Satisfaction Scale based on gender, team sports and sport divisions are presented in Tables 2, 3 and 4.

Table 2. Descriptive statistics and significant differences in Group Environment Questionnaire and Athlete's Satisfaction Scale for male athletes, team sports and sport division

Male athletes							
Variables	Division	Soccer <i>M(SD)</i>	Basketball <i>M(SD)</i>	Handball <i>M(SD)</i>	Volleyball <i>M(SD)</i>	Water polo <i>M(SD)</i>	Total <i>M(SD)</i>
ATG-T	A	6.52 (1.58)	6.23 (1.22)	-	5.93 (1.09)	-	6.40 (1.47)
	B	6.44 (1.70)	6.80 (1.20)	6.09 (.84)	6.50 (0.0)	7.21 (1.22)	6.63 (1.47)
	Total	6.48 (1.63)	6.58 (1.23)	6.09 (.84)	5.98 (1.05)	7.21 (1.22)	5.54 (1.47)
ATG-S	A	6.87 (1.43)	6.43 (1.39)	-	6.58 (.90)	-	6.75 (1.38)
	B	6.37 (1.44)	6.84 (1.49)	6.10 (1.05)	8.00 (0.0)	7.25 (1.24)	6.62 (1.43)
	Total	6.62 (1.45)	6.69 (1.46)	6.10 (1.05)	6.69 (.95)	7.25 (1.24)	6.67 (1.41)
GI-T	A	7.14 (1.39)	6.77 (1.35)	-	6.42 (1.94)	-	6.99(1.44)
	B	6.11 (1.51)	6.79 (1.25)	5.86 (1.15)	7.00 (0.0)	6.64 (1.34)	6.36 (1.42)
	Total	6.64 (1.53)	6.78 (1.28)	5.86 (1.15)	6.47 (1.86)	6.64 (1.34)	6.63 (1.46)
GI-S	A	6.37 (1.38)	6.19 (1.26)	-	6.05 (1.78)	-	6.30 (1.39)
	B	6.03 (1.62)	6.36 (1.28)	5.66 (.70)	6.75 (0.0)	6.73 (1.25)	6.21 (1.44)
	Total	6.21 (1.51)	6.30 (1.27)	5.66 (.70)	6.10 (1.71)	6.73 (1.25)	6.25 (1.41)
Personal Outcome	A	5.27 (1.07)	5.11 (.93)	-	5.18 (1.25)	-	5.23 (1.05)
	B	5.10 (1.16)	5.39 (.92)	4.38 (.87)	-	5.79 (.85)	5.23 (1.08)
	Total	5.19 (1.12)	5.29 (.93)	4.38 (.87)	5.17 (1.19)	5.79 (.85)	5.23 (1.07)
Leadership	A	5.14 (1.34)	5.00 (1.23)	-	5.24 (1.41)	-	5.12 (1.31)
	B	4.86 (1.40)	5.67 (1.26)	4.81 (.98)	4.00 (0.0)	5.81 (1.08)	5.22 (1.34)
	Total*	5.00 (1.37)*	5.41 (1.28)	4.81 (.98)*	5.14 (1.40)	5.81 (1.08)*	5.18 (1.33)

Note: * $p < .01$; *M* = Mean; *SD* = Standard deviation; ATG-T = Individual Attraction to Group - Task; ATG-S = Individual Attraction to Group - Social; GI-T = Group Integration - Task; GI-S = Group Integration - Social.

Table 3. Descriptive statistics and significant differences in Group Environment Questionnaire and Athlete's Satisfaction Scale for female athletes, team sports and sport division

Variables	Division	Female athletes						Total <i>M (SD)</i>
		Soccer	Basketball	Handball	Volleyball	Water polo		
		<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>		
ATG-T	A	7.10 (1.57)	7.09 (.96)	6.50 (.74)	6.46 (1.27)	6.52 (1.51)	6.87 (1.34)	
	B	7.05 (1.45)	6.96 (1.33)	6.65 (1.39)	6.86 (1.21)	6.72 (1.35)	6.88 (1.33)	
	Total	7.07 (1.50)	7.03 (1.15)	6.60 (1.21)	6.78 (1.22)	6.62 (1.42)	6.88 (1.34)	
ATG-S	A	6.90 (1.29)	6.89 (1.20)	5.94 (1.84)	7.19 (.69)	6.88 (.99)	6.84 (1.24)	
	B	7.26 (1.49)	7.22 (1.36)	6.41 (1.47)	7.44 (1.21)	6.87 (1.15)	7.12 (1.37)	
	Total	7.08 (1.40)	7.05 (1.28)	6.26 (1.59)	7.39 (1.12)	6.88 (1.06)	7.00 (1.32)	
GI-T	A	7.42 (.99)	6.75 (1.02)	6.97 (.93)	6.86 (1.03)	6.73 (.91)	7.01 (1.01)	
	B	7.17 (1.43)	6.95 (1.44)	7.00 (1.77)	6.77 (1.65)	6.94 (1.10)	6.97 (1.49)	
	Total	7.29 (1.23)	6.85 (1.24)	6.99 (1.53)	6.79 (1.53)	6.83 (1.00)	6.99 (1.31)	
GI-S	A	6.60 (1.25)	6.18 (1.07)	6.02 (1.39)	6.69 (.64)	6.84 (.66)	6.49 (1.10)	
	B	6.86 (1.65)	6.99 (1.21)	6.33 (1.53)	6.64 (1.31)	6.74 (.88)	6.74 (1.37)	
	Total	6.73 (1.47)	6.57 (1.21)	6.23 (1.47)	6.65 (1.20)	6.79 (.77)	6.64 (1.27)	
Personal Outcome	A	5.53 (.93)	5.45 (1.02)	5.17 (.76)	5.11 (.89)	5.21 (.65)	5.38 (.89)	
	B	5.58 (.82)	5.26 (.85)	4.96 (.92)	5.59 (.83)	5.60 (.61)	5.44 (.84)	
	Total	5.56 (.87)	5.36 (.94)	5.03 (.87)	5.49 (.86)	5.40 (.65)	5.41 (.86)	
Leadership	A	5.71 (1.16)	5.39 (1.10)	5.17 (1.31)	5.14 (.94)	5.05 (1.34)	5.39 (1.19)	
	B	5.84 (1.17)	5.26 (1.01)	5.25 (1.22)	5.54 (1.14)	5.58 (1.02)	5.53 (1.23)	
	Total	5.77 (1.16)	5.32 (1.05)	5.23 (1.23)	5.45 (1.10)	5.32 (1.21)	5.47 (1.16)	

Note: *M* = Mean; *SD* = Standard deviation; ATG-T = Individual Attraction to Group - Task; ATG-S = Individual Attraction to Group - Social; GI-T = Group Integration - Task; GI-S = Group Integration - Social.

Canonical correlation analysis

Canonical correlation analysis was conducted to examine the multivariate relationship between team cohesion (ATG-T, ATG-S, GI-T, GI-S) and athletes' satisfaction (Personal Outcome, Leadership). Only one significant canonical function emerged which yielded a canonical correlation, $r_c = .69$, Wilks' $\lambda = .513$, $\chi^2 = 407.73$, $p = .001$, while the second one was not significant, $r_c = .07$, Wilks' $\lambda = 995$, $\chi^2 = 2.871$, $p = .412$. The proportion (%) of variance explained by the first canonical variate was significant (48.4%). Redundancy analysis showed that 24.6% of the variance in team cohesion was explained by athletes' satisfaction variables. On the contrary, 42% of the variance in athlete's satisfaction was explained by team cohesion variables. High canonical loadings had the variables of the Individual Attractions to Group - Task (ATG-T) and the Group Integration - Task (GI-T) from the Group Environment Questionnaire. Lower but significant canonical loading emerged for Group Integration - Social (GI-S) and Individual Attractions to Group - Social (ATG-S). In addition, high loadings showed both variables of the Athlete's Satisfaction Scale

Table 4. Descriptive statistics and significant differences in the Group Environment Questionnaire and the Athlete's Satisfaction Scale for total athletes, team sports and sport division

Variables	Division	Total athletes					
		Soccer <i>M (SD)</i>	Basketball <i>M (SD)</i>	Handball <i>M (SD)</i>	Volleyball <i>M (SD)</i>	Water polo <i>M (SD)</i>	Total <i>M (SD)</i>
ATG-T	A	6.73 (1.59)	6.73 (1.15)	6.50 (.74)	6.21 (1.19)	6.52 (1.51)	6.65 (1.42)
	B	6.67 (1.63)	6.87 (1.25)	6.45 (1.24)	6.85 (1.19)	6.96 (1.30)	6.76 (1.41)
	Total	6.70 (1.61)	6.81 (1.21)	6.46 (1.14)	6.64 (1.22)	6.81 (1.38)	6.72 (1.41)
ATG-S	A	6.08 (1.37)	6.70 (1.29)	5.94 (1.84)	6.90 (.84)	6.88 (.99)	6.79 (1.31)
	B	6.71 (1.52)	7.01 (1.44)	6.30 (1.33)	7.45 (1.19)	7.05 (1.19)	6.89 (1.42)
	Total	6.79 (1.45)*	6.87 (1.38)*	6.22 (1.45)*	7.27 (1.12)*	6.99 (1.13)*	6.85 (1.37)
GI-T	A	7.24 (1.26)	6.76 (1.16)	6.97 (.93)	6.65 (1.51)	6.73 (.91)	7.00 (1.23)
	B	6.52 (1.56)	6.86 (1.33)	6.59 (1.66)	6.77 (1.63)	6.79 (1.22)	6.68 (1.48)
	Total	6.88 (1.46)	6.82 (1.25)	6.68 (1.52)	6.73 (1.58)	6.77 (1.12)	6.82 (1.39)
GI-S	A	6.46 (1.34)	6.18 (1.14)	6.02 (1.39)	6.38 (1.32)	6.84 (.66)	6.40 (1.24)
	B	6.35 (1.68)	6.65 (1.28)	6.09 (1.32)	6.64 (1.29)	6.74 (1.07)	6.49 (1.43)
	Total	6.40 (1.51)**	6.44 (1.24)	6.07 (1.32)**	6.56 (1.30)	6.77 (.95)**	6.45 (1.35)
Personal Outcome	A	5.37 (1.02)	5.31 (.99)	5.17 (.76)	5.14 (1.05)	5.21 (.65)	5.31 (.97)
	B	5.29 (1.07)	5.33 (.88)	4.75 (.94)	5.58 (.83)	5.69 (.74)	5.34 (.97)
	Total	5.33 (1.04)	5.32 (.93)	4.85 (.91)	5.44 (.92)	5.53 (.74)	5.33 (.97)
Leadership	A	5.35 (1.30)	5.23 (1.16)	5.17 (1.31)	5.19 (1.16)	5.05 (1.34)	5.26 (1.26)
	B	5.24 (1.40)	5.48 (1.16)	5.09 (1.15)	5.50 (1.15)	5.70 (1.04)	5.38 (1.24)
	Total	5.29 (1.35)	5.37 (1.17)	5.11 (1.18)	5.40 (1.15)	5.48 (1.19)	5.33 (1.25)

Note: * $p < .05$, ** $p < .01$; *M* = Mean; *SD* = Standard deviation; ATG-T = Individual Attraction to Group - Task; ATG-S = Individual Attraction to Group - Social; GI-T = Group Integration - Task; GI-S = Group Integration - Social.

Table 5. Canonical correlation results of the Group Environment Questionnaire and Athlete's Satisfaction Scale

Variables	First Canonical Variate*	
	Standardized canonical coefficients	Canonical loadings
Team Cohesion		
Individual Attractions to Group - Task	-.830	-.978
Individual Attractions to Group - Social	-.045	-.488
Group Integration - Task	-.145	-.689
Group Integration - Social	-.109	-.602
Athlete's Satisfaction		
Personal Outcome	-.627	-.950
Leadership	-.449	-.901
Canonical Correlation		.69
Variance explained		48.4%

Note: * $p < .001$; Only the first canonical variate was statistically significant.

(Leadership, Personal Outcome). Canonical correlation loadings of the first variate are presented below in Table 5.

DISCUSSION

The first aim of this study was to examine if there were significant differences in group cohesion and athletes' satisfaction because of gender (male, female), team sports (soccer, basketball, volleyball, handball, water polo) and sport division (A = professional, B = semi-professional). Results showed that team cohesion was influenced by the type of team sports. More specifically, there were significant differences in the Individual Attractions to Group - Social (ATG-S) and Group Integration - Social (GI-S) variables due to team sport. Volleyball players had higher scores in ATG-S than the other team sports' players, while handball players had lower scores in GI-S compared to the others. This finding suggests that handball players are not attracted to their team by its social environment (e.g., teammates are their best friends, participate in team social events) and by the way their team functions at the social level (e.g., go out with their teammates, keep friendship with their teammates after the end of the sport season) compared to the other team sports.

Moreover, there was a significant interaction in the Leadership variable between gender and team sports, with handball male players having lower scores in Leadership compared to the other team sports' male players. This finding is partly agreeing with the results obtained by Galanis, Salogiannis, Kouli, and Hatzigeorgiadis (2009), who showed a significant effect of gender on all four aspects of group cohesion. In addition, similar results were found in research by Carron et al. (2007), as well as Carron et al. (1998).

A potential reason for the above results is the small number of handball players that took part in this study (only 51 athletes) and the level of competition involved (most of them were semi-professional players). Therefore, these findings should be interpreted with caution. Nevertheless, it might be advisable handball coaches to try more than the others to increase their team cohesion through team-building strategies as proposed by Carron and Spink (1993).

Regarding gender, there were no statistically significant differences between male and female athletes in the examined variables of team cohesion and athlete's satisfaction. Perhaps, this finding shows that female athletes do not perceive differently the concepts of group cohesion and athletes' satisfaction than males and have similar demands from their coach both in technical and behavioral level as males. As mentioned above, this finding is inconsistent with Carron's et al. (2002) research who found that female teams are more cohesive than male ones.

Additionally, the results of the study suggest that there were no significant differences in the dimensions of group cohesion and athletes' satisfaction due to sport division (professional, semi-professional). This finding contradicts the previous work

by Ntoumanis and Aggelonidis (2004), who investigated 586 volleyball athletes who took part in the national championship and found that there were statistically significant differences in the dimensions of group cohesion between athletes' competition level (elite players, regional players). This finding could be attributed to the "problems" of professionalism, since a large proportion of the athletes taking part in the A National category (professional category), mainly water polo, volleyball and handball, were not practically professional (i.e., with contracts and remuneration).

A second aim of this study was to investigate the relations between group cohesion and athletes' satisfaction. The results from canonical correlation analysis revealed significant multivariate relationship between group cohesion and athletes' satisfaction. More specifically, we found that 24.6% of the variance in team cohesion was explained by athletes' satisfaction variables. On the contrary, 42% of the variance in athlete's satisfaction was explained by team cohesion variables. These findings suggest that the more satisfied athletes are, the more group cohesion there is. Similar results came from Bebetos and Theodorakis (2003), Ona and Tepeci (2014), and Ramzaninezhad et al. (2009), where researchers demonstrated that group cohesion is directly linked to athletes' satisfaction.

Limitations and future directions

Practical limitations in the present study should also be considered. Despite the fact that the sample was representative, it should be noted that this survey was limited to Greek athletes involved in team sports and, more specifically, to those of football, basketball, handball, volleyball and water polo. Another limitation was that all the evidence was gathered within a relatively short period of time without taking into consideration possible longitudinal changes in the teams.

Results of this study can be a basis for subsequent research. It is proposed to repeat the study with longitudinal design. It would be interesting the first measurement to take place at the beginning of a team's preparation (start of the season), at the end of the first round and at the end of the season. Moreover, the expansion of research to other team sports (e.g., rugby, hockey), other age groups (e.g., children aged 12 to 15 years) and sports divisions (e.g., semi-professional or local level sport divisions) would help researchers to draw safer and more generalizable conclusions. In addition, as the concepts of satisfaction and group cohesion are multidimensional, they might have been influenced by factors such as coach behavior, player's position in the game and team's overall performance.

It is well established that coaches play the most crucial role on team building (e.g., Blair Evans, Eys, Bruner, & Kleinert, 2014). Therefore, coaches should educate

themselves in the team-building strategies proposed by Carron and Spink (1993) to enhance their team cohesion, increase their athletes' satisfaction and improve their team's performance. According to Blair Evans et al. (2014, pp. 523-525), these strategies concern group environment (e.g., "create group symbol", "travel together as team", "organize team meals"), group structure (e.g., "establish team captains", "individual player meetings with coach to discuss roles", "establish routines") and group processes (e.g., "set team goals", "add cooperative activities", "encourage partner feedback"). Further details about Carron and Spink's team building strategies are quoted by the authors themselves (Carron & Spink, 1993) and by other researchers (e.g., Blair Evans et al., 2014; Carron, Spink, & Prapavessis, 1997). It is important to mention here that in a previous review of 28 team-building interventions in sports, the results showed a significant positive effect of team-building interventions on group cohesion (Rovio, Arvinen-Barrow, Weigand, Eskola, & Lintunen, 2010). Additionally, future research could implement long-term team-building interventions based on the strategies proposed by Carron and Spink's (1993) team building conceptual framework to examine their impact on group cohesion.

In summary, this study provided evidence that there is a multidimensional relationship between group cohesion and athletes' satisfaction in the context of sport teams. Moreover, the present research showed that both group cohesion and athletes' satisfaction were affected by the different type of team sports. These findings could have a practical implementation and might help coaches comprehend and interpret more effectively the concepts of cohesion and athletes' satisfaction.

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