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RUNNING HEAD: GROUP COHESION, AFFECTS AND COPING

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Abstract

The study aimed to identify group cohesion profiles in athletes and examine whether athletes from distinct profiles significantly differed in affects and coping in competition. A total of 296 competitive athletes participated in the study and completed a series of self-report questionnaires in a temporal design with different measurement points. The athletes completed the questionnaires two days before competition, two hours prior to competition and two hours after competition. Results from LPA model revealed that three profiles were the most suitable solution: (a) Low group cohesion profile, (b) a mixed group cohesion profile and (c) a high cohesion profile. In particular, (c) athletes from the high group cohesion profile revealed lower scores in intensity of negative affects after the competition, lower precompetitive relaxation, lower precompetitive mental distancing, lower precompetitive mental distraction, lower intracompetitive relaxation, lower intracompetitive logical analysis, lower intracompetitive mental distancing, lower intracompetitive mental distraction and lower intracompetitive disengagement. As a whole, the (b) mixed group cohesion profile revealed the worst combination of the three profiles in terms of coping strategies, which may be a profile at risk of not performing in competition. Thus, it is necessary to understand group cohesion as a multivariate experience for a better comprehension of this phenomenon.

Keywords: Cohesion, sport, LPA, performance.

Group cohesion profiles in athletes: Relationships with two waves of coping and affects in competition

The study of group cohesion in sporting contexts has a long history as this concept has been widely investigated throughout the last fifty years. This is because it is an essential construct to reach group purposes as well as satisfaction with group participation.[1-6] For instance, previous research has revealed a connection between group cohesion and sports performance.[1,4,6] In particular, the enhancement of group cohesion may increase performance and, subsequently, could improve sports satisfaction.[2,4,6] A theoretical model that has been largely adopted within the sporting contexts is Carron's model of group cohesion.[7] As such, the aforementioned model was taken in this study due to their degree of application to the sporting contexts as well as the multivariate experience of the distinct factors in which the model is divided.[4-6] According to this theoretical approach, cohesion is a multidimensional construct characterized by its instrumental and affective characteristics.[7] This multidimensional conceptualization signifies that a person can join and pertain to a group for several reasons. The instrumental factor reveals that a purpose must be made within each group, and it is needed to have a purpose for group actions. Otherwise, the affective factor involves that the group refers to a context in which people can make social relationships (that can be positive or negative).

Moreover, Carron et al.[8] pointed out that group cohesion might be dichotomized into social versus task cohesion. Social cohesion represents the quality of the social relationships inherent to the environment within the group. Task cohesion means that the pursuit of the group goals is central and at the origin of a union in working towards such achievements. Therefore, a four-dimensional taxonomy on the concept of group cohesion in sport has been postulated within Carron's model:[8] Individual Attractions to the Group-Social (ATG-S), Individual Attractions to the Group-Task (ATG-T), Group Integration Social (GI-S) and Group Integration-Task (GI-T). ATG-S refers to the degree to which an athlete is implicated in the group socially (e.g., The team is one of the most important social groups I belong to) whereas ATG-T refers to the

involvement of an athlete in the group carrying out the group-tasks (e.g., "On this team, I can do my best). GI-S is the perception of the integration and the unity of the group (e.g., Team members would like to spend time together in different situations rather than training and games), whereas GI-T is the unity and integration of the goals on the way to pursue achievement and to work for them (e.g., Team members are united in their efforts to reach their performance goals in training sessions and matches).

Previous studies have revealed that cohesion is positively related to collective efficacy, role involvement, self-esteem, pleasant mood, communication, satisfaction and leadership as well as negatively related to state-anxiety in the competition, among others.[9-10] As a whole, this literature was focused on bivariate relationships between the four dimensions of group cohesion and other variables which neglects the multivariate nature of the group cohesion' construct. However, the four core dimensions of group cohesion (ATG-S, ATG-T, GI-S and GI-T) could operate in conjunction with each other. In particular, the effect of a particular group cohesion dimension can depend on the levels of other group cohesion dimensions. Thus, much information might be lost if group cohesion dimensions are examined discretely and in isolation from one another, as this does not encompass the systemic nature of the construct of group cohesion. As such, rather than considering group cohesion as the addition of several dimensions, the present study was grounded within a multivariate approach in which the four core dimensions of group cohesion can coexist within each athlete but to a varying degree.[11] Identification of prototypical subgroups of athletes with particular configurations of the four core dimensions of group cohesion could offer a robust heuristic to examine group cohesion within a more holistic approach to unpack their complex associations with key athletic outcomes. Coping and affective states were selected because they seem particularly poignant for competitive athletes as they have a direct impact on sports performance.[14-15]

Affective states and coping are inherent to the lives of athletes participating in sports competitions as they are involved in adaptational processes.[16-17] A conceptual model that seems

particularly useful for understanding coping and affective states in sports settings is Lazarus' Cognitive-Motivational-Relational Theory (CMRT).[14] This theoretical approach points out that the coping strategies used and the affective states experienced by an athlete depend on the evaluation of the environment and the situations that appear in the competition.[14,16] Coping may be conceptualized as "a set of cognitive and behavioural efforts carried out to handle the internal and/or external demands evaluated as exceeding their perceived resources".[17] The bewildering richness of coping responses to manage the demands of sports competition led several authors to suggest that the construct of coping needs more detailed specification.[17,18] A hierarchical approach of coping has been proposed in the sports context by Gaudreau and collaborators.[19,20] Task-oriented coping includes strategies that deal directly with stressful situation and the resulting thoughts and affects (relaxation, logical analysis, seeking support, imagery, thought control). Disengagement-oriented coping comprises strategies through which the athletes escape from the stressful situation (resignation, venting of unpleasant emotions). Distraction-oriented coping includes strategies that put attention to other stimuli than the ones that cause the stressful situation (distancing, mental distraction). Nevertheless, the fact that a single coping strategy may serve multiple macrolevel functions generated difficulties in classifying specific coping strategies by the macro-level function they are intended to serve.[15] As a result, in the present study, we examined a wide variety of coping strategies used by athletes to cope with sport competition including mental imagery, effort expenditure, thought control, seeking support, relaxation, logical analysis, distancing, mental distraction, venting of unpleasant emotions and disengagement.

Affective states, despite their idiosyncratic specificities, can be dichotomized according to their valence (pleasant vs. unpleasant). Positive affects (PA) represent optimal states of energy and pleasurable engagement whereas negative affects (NA) denote a sense of distress and unpleasant engagement.[21] Contemporary research has provided evidence of the usefulness of considering their directionality in addition to their intensity.[22,23] Directionality refers to the

perceived facilitating or debilitating effects of athletes' affective states on their performance.[24] PA or NA experienced at a particular intensity level could thus be interpreted as facilitating for performance for a certain athlete at a particular point in time and as debilitative for the same athlete at other points in time or another athlete at the same time point.[24,25]

The environment in which athletes are grounded largely impact affective states experienced by athletes and coping strategies used to cope with sport competition through the process of cognitive appraisals.[14,23] In this perspective, group cohesion could impact affective states and coping. However, little is known about the relationship between group cohesion and coping in sports.[26-28] Wolf et al.[28] revealed that athletes who perceive their team as more ATG-T cohesion face their competitions more as a challenge rather than a threat. Besides, the more cohesive to the task athletes mainly used task-oriented coping strategies.[28] Other studies provided indirect evidence for a positive relationship between group cohesion and the use of task-oriented coping strategies. In particular, group support has been positively related to self-efficacy and perception of control[26,27], which have been related to task-oriented coping strategies in other studies.[29]

Although the literature has shown the salience of affective states regarding group cohesion[30-34], previous studies were mainly focused on collective physical activity contexts rather than on sport settings.[31-34] Higher levels of ATG-T were related to lower levels of state anxiety in the competition.[34] Loughead and his collaborators[30,32,34] showed that ATG-T was a mediator in the relationships between leadership and a wide variety of affective outcomes such as exercise satisfaction, attendance, perceived exertion, or PA and NA. Based on these results, Loughead et al.[34] suggested considering the creation of a positive task-environment to foster athletes' PA. Confirming these preliminary results, Al-Yaaribi and Kavussanu[30] showed a positive relationship between ATG-T and PA as well as a negative relationship between ATG-T and NA.

In sum, the examination of group cohesion profiles among competitive athletes could further our understanding of how the four core dimensions of group cohesion may operate between individuals within a competitive environment. In turn, this could help practitioners (psychologist, coaches) adapt their intervention according to the needs of specific groups of individuals with particular patterns of group cohesion profiles. Thus, the purposes of this study were to: (a) identify group cohesion profiles of athletes involved in competitive settings; and (b) explore whether athletes from distinct group cohesion profiles significantly differed on coping and intensity and direction of PA and NA. Given the scant literature on group cohesion profiles, it was deemed premature to formulate specific hypotheses regarding the group cohesion profiles which could emerge. Finally, in light of the aforementioned theoretical rationale and empirical evidence regarding the relationships between group cohesion, coping and affective states. We broadly hypothesized that athletes belonging to a profile characterized by high scores on ATG-T would report the highest levels of PA intensity, the direction of NA and PA as well as relaxation, logical analysis, seeking support, imagery, and thought control. On the opposite, athletes belonging to a profile characterized by low scores on ATG-T would report the highest levels of NA intensity, resignation, venting of unpleasant emotions, distancing and mental distraction.

Method

Participants

The sample was made up of 296 French athletes (M*age* = 21.61; *Age range* = 18-42; *SD* = 6.32) of which 33% were female and 67% were male. The sample was also used by ……. Nevertheless, the articles' rationales, aims, variables' relationship, methodology and results are different. All participants were competitors with which the average time competing is 9.25 years (*SD* = 4.06). The competition levels were regional (54.1%), national (40.2%) and international (5.7%). Athletes trained an average of 6.45 hours per week (*SD* = 4.58). The

gender of athletes' coaches is mainly male (87.2% men and 12.8% women). Athletes practised athletics, badminton, basketball, cycling, gymnastics, handball, soccer, swimming or tennis.

Measures

The French version of the Group Environment Questionnaire (GEQ; [8,35]) is made up of 18 items in a 7-point scale which are divided into four factors: Individual attractions to the group-social (e.g., I'm unhappy with my team's level of desire to win; ATG-S; 5 items; = .63), individual attractions to the group-task (e.g., I'm not happy with the amount of playing time I get; ATG-T; 4 items; = .76), group integration - social (e.g., Our teams members rarely party together; GI-S; 4 items; = .58), and group integration - task (e.g., If members of our team have problems in practice, everyone wants to help them so we can get back together again; GI-T; 5 items; = .59). The GI-S and GI-T measure individual's perceptions about group integration as a social unit and around group tasks, respectively. The ATG-S measures a participant's interpersonal attraction to group social interactions while the ATG-T measures feelings about personal involvement concerning group productivity and objectives. Although the alpha coefficient was acceptable for ATG-T, the alpha coefficients were rather low for GI-T ($\alpha = .59$), GI-S ($\alpha = .58$) and ATG-S ($\alpha = .63$). Some scholars showed that Cronbach's alpha tends to increase with a higher number of items in a scale, leading several researchers to consider that .60 is an adequate cut-off value for subscales with four or five items.[36,37] Other scholars prefer the use of the raw mean inter-item correlation as a statistical marker of internal consistency.[36] Clark and Watson[36] offered a rule of thumb that recommends an average inter-item correlation that ranges from .15 to .50. The mean inter-item correlations for GI-T, GI-S and ATG-S were .16, .26 and .17 respectively, providing evidence for the reliability of these factors.

The Coping Inventory for Competitive Sport (CICS;[19]) is a French questionnaire with 39 items measuring the coping strategies used by athletes before or during competition. The items were rated on a 5-point Likert scale ranging from 1 (does not correspond at all) to 5 (corresponds very strongly). The 10 subscales are: mental imagery (e.g., I visualized that I was in total control

of the situation; 4 items; α pre-competition = .60 , α intra-competition = .57), thought control (e.g., I tried not to be intimidated by other athletes; 4 items; α pre-competition = .69, α intra-competition = .61), effort expenditure (e.g., I applied myself by giving a consistent effort; 3 items; α pre-competition = .80 , α intra-competition = .81), seeking support (e.g., I asked someone for advice concerning my mental preparation; 4 items; α pre-competition = .71 , α intra-competition = .68), logical analysis (e.g., I analysed my past performances; 4 items; α pre-competition = .69, α intra-competition = .55), relaxation (e.g., I tried to relax my body; 4 items; α pre-competition = .84 , α intra-competition = .85), mental distraction (e.g., I occupied my mind in order to think about other things than the competition; 4 items; α pre-competition = .74 , α intra-competition = .75), distancing (e.g., I took my distance from other athletes; 4items; α pre-competition = .80, α intra-competition = .80), venting of unpleasant emotions (e.g., I expressed my discontent; 4 items; α pre-competition = .73 , α intra-competition = .83) and disengagement (e.g., I let myself feel hopeless and discouraged; 4 items; α pre-competition = .74, α intra-competition = .70). It is noteworthy that the mean inter-item correlations for pre-competitive and intra-competitive mental imagery, intra-competitive thought control and intra-competitive logical analysis were .37, .25, .30 and .24 respectively.

The French version of the Positive and Negative Affect Schedule including a direction scale (PANAS-D;[24]) was used to evaluate affects before and during competition. The scale contains two scales for assessing intensity (e.g., I In this moment I feel “Interested”; 10 items; α pre-competition = .81, α intra-competition = .79) and direction of PA (e.g., Effect of this intensity on your performance in the upcoming competition: “Interested”; 10 items; α pre-competition = .73, α intra-competition = .82) as well as intensity of NA (e.g., I In this moment I feel “nervous”; 10 items; α pre-competition = .73, α intra-competition = .79) and direction of NA (Effect of this intensity on your performance in the upcoming competition: “nervous”; 10 items; α pre-competition = .83, α intra-competition = .84). Athletes were asked to respond to: (a) the intensity of each symptom on a 5-point Likert scale ranging from 1 (not at all or very slightly)

to 5 (extremely); and (b) the degree to which the intensity of each symptom experienced was either facilitative or debilitative to subsequent performance (directional interpretation) on a 7-point Likert scale ranging from - 3 (very debilitative) to 3 (very facilitative).

Procedure

The research was carried out following international ethical guidelines and anonymity was preserved. Informed consent was obtained from participants before participating in the study. A temporal design was used in the study. Firstly, the participants completed the GEQ two days before the competition. Secondly, the athletes completed the PANAS-D and the CICS within two hours before the competition in order to not interfere with the preparation routines of the athletes. Thirdly, participants fulfilled the PANAS-D and the CICS two hours after competition to assess their affects and coping skills during the competition. This design was adopted to not interfere with competition performance. Besides, measuring affects and coping at different time points inside the competition is a natural way to depict these variables and further understand their patterns in distinct situations.

Data Analyses

The statistical package utilized was M plus version 7.3.[38] A Latent Profile Analysis (LPA) approach was utilized to test the hypotheses and to know the number and combination of profiles of group cohesion. LPA is a multivariate statistical model which posits that an underlying grouping variable (e.g., group cohesion profile) is not observed but can be inferred from a set of indicators.[16] Firstly, to examine the model that best suits the group cohesion profiles, a series of models were performed to reach the best solution.[15] In particular, LPA models are grounded in a series of modelling steps, beginning with the specification of a one-class model. Thus, the number of classes is increased until there is no further improvement of the model, when adding another class would result in meaningless classes.[15] Several statistical indicators are measured to evaluate the model fitness to the data in LPA models. Thus, to decide which model fit the best, a combination of statistical indicators was utilized: log-likelihood

value, Akaike information criterion (AIC)[39], Bayesian information criterion (BIC)[40]; Adjusted BIC (ABIC)[41], entropy, and Lo, Mendell, and Rubin likelihood ratio test (LRT)[42]. As a result, the model that contains the smallest values on the AIC, BIC, and ABIC, as well as the highest values on the log-likelihood value and the entropy, indicates the best-fitting model.[16] In addition, the LRT was utilized to compare the distinct models (chi-square difference test). Although in LPA there are no clear rules of thumb in terms of the required sample size, Collins and Lanza[43] and Park and Yu[44] advised a minimum N of almost 250. In addition, an issue in LPA is that profiles with a little number of participants (e.g., less than 5% of the total sample) could be difficult to interpret or validate. Thus, it is recommendable to select profiles comprising more than 5% of the total sample.[43] Likewise, another problem is the number of indicators.[16] Particularly, adding indicators to a LPA model may increase possible response patterns, which may lead to data sparseness.[43] Hence, scholars prefer to utilize fewer indicators (from 4 to 10 indicators) with LPA, although there are no clear rules of thumb regarding this issue.[43]

Thirdly, due to the limitations in the use of classify-analyse approaches (e.g., ANOVA) to compare distal outcomes (affects and coping before and during competition) across group cohesion profiles[44], we utilized the Bolck, Croon, and Hagenaars[44] method (BCH method) to examine group cohesion profile differences on athletes' affects and coping. Adding outcome variables (affects and coping) in mixture models increase the complexity because the LPA model (group cohesion profiles) may change completely when shifting from the unconditional latent profile measurement model to a structural equation mixture model including the group cohesion profiles.[45] The BCH method facilitated to compute athlete affects and coping dimensions as consequences rather than indicators of group cohesion profiles. To perform the different analyses a confident interval of 95% was taken. Finally, a series of chi-square tests and MANOVA analyses were conducted in order to identify demographic differences across

the three group cohesion profiles such as athletes' gender, level of sports practice (international, national and regional), coach's experience and athletes' experience.

Results

Preliminary Descriptive Statistics

Table 1 shows the descriptive statistics of the variables examined in the study. Regarding to the scores of the examined variables, group cohesion variables revealed low to moderate values. Moreover, group cohesions' standard deviation showed that participants ranged in both poles of the scores. On the other hand, affects before and during the competition revealed moderate to low values. In addition, the affects' standard deviation revealed that participants scored from the middle to the lower end of the scale. Besides, precompetitive coping and intracompetitive coping revealed moderate to low scores in all variables, showing slight standard deviations among the variables. Finally, the correlation analysis did not reveal collinearity among the variables examined in the study (Table 1).

Group cohesion latent profiles

The LPA models were run from testing a two-class model and then exploring more classes models. Table 2 includes fit information (log likelihood ratio, AIC, BIC, ABIC, entropy, and LRT) for LPA models from two to five classes. For the AIC, BIC, and ABIC, there were big drops between two and three classes and between three and four classes. The LRTs also found that three classes fitted better than two, four classes fitted worse than three, five classes showed better fit than four, but five classes did not make sense from a theoretical point of view in testing the scores of the distinct profiles. Thus, to reach a balance between theoretical and statistical considerations, the model parameters were used to make sense of the classes and decide which model fits best. Considering the interpretation of the distinct group cohesion profiles and the LPA statistical indicators, a three-class solution was selected (i.e., the three-class solutions made more theoretical sense and added substantive meaning to the understanding of group

cohesion profiles than the two-class solution whereas a fourth and fifth class did not add anything substantive to the understanding of group cohesion profiles).

The GEQ factors were used to differentiate and add substantive meaning to the group cohesion profiles (Table 3). The group cohesion profiles were labelled as: (a) Low group cohesion profile comprising athletes with low scores in GI-T, GI-S, ATG-T and ATGS (n = 30); (b) A mixed group cohesion profile comprising athletes with high scores in GI-T and medium scores in GI-S, ATG-T and ATG-S (n = 132); and (c) a high cohesion profile comprising athletes with high levels of GI-T, GI-S, ATG-T and ATG-S (n = 134). (Table 3).

Cluster group differences on affects and coping variables

Table 4 presented the results of LPA using the BCH method and provided evidence of the statistically significant differences in athlete's affects and coping across the profiles. To prevent type I error a Bonferroni correction was performed, and the real significance level was (p <.0017). Results revealed that: (a) athletes from the low group cohesion profile revealed marginally significantly higher scores in precompetitive thought control ($p < 0.05$) than the profile (b) mixed group cohesion profile. On the other hand, the mixed (b) group cohesion profile revealed marginally significantly higher scores in intracompetitive relaxation ($p < 0.05$), significant differences in intracompetitive logical analysis ($p < 0.0017$), intracompetitive mental distancing ($p < 0.0017$), venting of unpleasant emotions ($p < 0.0017$) and marginally significantly disengagement ($p < 0.05$), than athletes from the (a) low group cohesion profile. In addition, (a) athletes from the low group cohesion profile revealed marginally significantly lower scores in: intensity of PA before the competition ($p < 0.07$), intensity of NA after competition ($p < 0.05$), significant differences in higher precompetitive though control ($p <$ 0.0017), marginally significantly higher precompetitive relaxation ($p < 0.05$), higher precompetitive mental distancing ($p < 0.05$), higher intracompetitive relaxation ($p < 0.07$) and lower intracompetitive venting emotions ($p < 0.05$) than the profile (c) high group cohesion profile. Moreover, (c) athletes from the high group cohesion profile revealed significantly

differences lower scores in intensity of NA after the competition ($p < 0.0017$), lower precompetitive relaxation ($p < 0.0017$), lower precompetitive mental distancing ($p < 0.0017$), marginally significantly lower precompetitive mental distraction ($p < 0.05$), lower intracompetitive relaxation ($p < 0.0017$), marginally significantly lower intracompetitive logical analysis ($p < 0.07$), significant differences in lower intracompetitive mental distancing ($p < 0.0017$), lower intracompetitive mental distraction ($p < 0.0017$) and lower intracompetitive disengagement ($p < 0.0017$) than the (b) mixed group cohesion profile.

In order to rule out the possibility that athletes from the group cohesion profiles had the same levels of affects and coping, already experienced before the competition than those experienced during the competition, it was performed a series of multiple regression analyses in which each of the distal outcomes (i.e., intra competitive coping strategies and affective states) were regressed on the dummy variable representing the distinct group cohesion profiles and the pre-competitive level of each outcome (i.e., intra competitive coping strategies and affective states). Among the twelve significant relationships between the group cohesion profiles and intracompetitive coping and affects, six relationships remained significant in using multiple regression analyses (mental imagery, thought control, social support, intensity of positive affects, direction of positive affects and direction of negative affects). These results are available on request to the correspondence author.

Cluster differences on demographic variables

Results of chi-square tests did not show significant differences across group cohesion profiles on athletes' gender (χ^2 (3) = 1.63; $p > .05$). However, the results revealed significant differences in the level of sports practice (χ^2 (3) = 66.29; $p < .05$). The majority of athletes belonging to low-mixed group cohesion profiles were international athletes (94.11%). Finally, results of MANOVA showed a significant difference on coach experience (F (4) = 3.49, $p <$ .05, $\eta^2 = .02$), but no differences in athletes' experience across the three group cohesion profiles.

In particular, most experienced coaches pertained to the mixed group cohesion profile (45.13%).

Discussion

The study aimed to identify group cohesion profiles in competitive athletes and examine whether athletes from distinct profiles significantly differed in pre-competitive and intra-competitive affects and coping. Results of latent profile analyses provided evidence for three distinct group cohesion profiles labelled as (a) low group cohesion profile, (b) mixed group cohesion profile and (c) high group cohesion profile. These three profiles furthered the literature on group cohesion in sports settings in demonstrating that the four core group cohesion dimensions co-occurred at varying levels among athletes in distinct profiles. Furthermore, the particular configurations of the four core dimensions of group cohesion (group cohesion profiles) are a first step to identifying prototypical subgroups of athletes according to the group cohesion in the sports context. This methodological approach advanced previous studies that mainly adopted a bivariate approach which neglected the multivariate nature of the construct of group cohesion.[26,27,28,30,31,33,34] Low group cohesion profile comprising athletes with low scores in GI-T, GI-S, ATG-T and ATGS. In addition, the mixed group cohesion profile comprised athletes with high scores in GI-T and medium scores in GI-S, ATG-T and low scores in ATG-S. It is particularly salient that in the mixed group cohesion profile GI-T and ATG-S did not report average scores as the rest of the variables. However, these scores support the idea of the multivariate experience of group cohesion in sporting settings, according to previous works.[6] Finally, the high cohesion profile comprised athletes with high levels of GI-T, GI-S, ATG-T and ATG-S. It is insightful to see the combination of profiles that were shown in this study, as previous studies have revealed a paramount impact of high social cohesion in amateur athletes.[26,27] Likewise, in this study most of the international athletes belonged (94.11%) to the low-mixed group cohesion profiles. These outcomes may advert that the international athletes from the sample may be perceiving a dysfunctional group cohesion profile that could enhance

their presence of intensity of NA, distancing and disengagement coping strategies. Moreover, it would be interesting to study whether the results in other samples follow the same pattern shown in this study. Besides, it is necessary to unravel which variables may influence the group environment experienced by international athletes to examine how to improve it. Thus, the combination of the mixed and low group cohesion profiles should be taken cautiously by coaches due to the possible implication of a higher experience of NA intensity during competition, disengagement and distraction coping strategies. As such, coaches should emphasize a high group cohesion environment in athletes, enhancing: team gatherings, social events, belongingness, sharing goals, interdependence, among others.

In addition, the high group cohesion profile revealed the most adaptive strategies in terms of coping as there were fewer scores in the variables of disengagement-oriented coping and distancing-oriented coping strategies. Mostly, the experience of less intensity of NA in intracompetitive measures, helps this profile to experience less disengagement and distraction-oriented coping strategies according to the previous literature.[16] Nevertheless, it is comprehensible that each of the profiles examined in the sample has a distinct coping experience, independent of their sports performance in the competition, but the experience of a distinct degree of affects maybe modified by the profile of group cohesion which influenced to handle a distinct coping strategy. This means that athletes from the high cohesion profile, due to the social cohesion they are experiencing, may feel fewer stressors in competition which may display fewer coping strategies to face them. Otherwise, the experience of the low and mixed group cohesion profile may display more coping strategies to face the number of stressors experienced in competitive settings. Moreover, it is important to highlight that the profiles with less group cohesion may experience less coping and negative affects, as previous studies highlighted the need for social context in creating more coping strategies.[48]

In offering naturally occurring configurations of the four core dimensions of group cohesion in sports settings, this study allowed to examine group cohesion within a more holistic

approach. This is to unpack their complex associations with key athletic outcomes such as pre-competitive and intra-competitive affective states and coping. Results revealed that athletes from the mixed group cohesion profile reported higher scores of pre-competitive relaxation and distancing. According to the previous evidence[12,27,28] the absence of distancing coping strategies within the pre-competitive period may prevent focusing athletes on the task at hand within the competition.[12,20,27] As a whole, the higher probability of using precompetitive relaxation and distancing among athletes from the mixed group cohesion profile is noteworthy as it would be necessary for these athletes to increase focus on sports competition in order to prevent the experience of negative outcomes during the pre-competition period.[26-28]

Results also revealed that athletes from the mixed group cohesion profile reported higher scores during competition in NA intensity, relaxation, distancing, mental distraction and disengagement in comparison to athletes from the high group cohesion profile. In line with the results obtained on pre-competitive measures, athletes from the mixed group cohesion profile reported higher scores of negative outcomes during competition based on the rationale that they reported high levels of intra-competitive NA intensity, distancing, mental distraction and disengagement coping strategies. These results are in line with a previous study that suggested that ATG-T is an empowering factor of performance.[28] Nevertheless, the absence of a high ATG-T score in the low and mixed group cohesion profile may explain the presence of those disengagement and distraction coping strategies.[28] Although an excessive orientation to the task can make the athlete obsessed and engender negative feelings, a group social-environment could focus on social interactions trying to keep them in an ideal atmosphere that may decrease the negative feelings engendered by a task environment. Thus, athletes from a mixed and low group cohesion profile might be at risk of withdrawing from sport, which should be considered in future interventions.

Applied implications

The findings of the present study could be used to enhance applied psychology consultants' efforts with individuals immersed in a competitive environment. The profile approach used in the present study may be useful in identifying higher risk profiles for athletes in need of targeted and adaptive intervention approaches, designed to tailor the program to groups of individuals with particular group cohesion characteristics. In particular, the study of group cohesion using a multivariate profile approach might help practitioners to shed light on naturally-occurring patterns of the four core dimensions of group cohesion in the ecological competitive environment. In this perspective, a profile approach can help in preventing and detecting the dysfunctional profiles that can turn into dysfunctional affective outcomes just before and/or during competition and thus lead athletes to negative performance.[11,16,48] Therefore, the use of a profile approach would allow practitioners (coaches, sports psychologists) to create personalized interventions for the need of specific groups of athletes.

Limitations and Future Directions

As no study has adopted a profile approach for examining the concept of group cohesion in sport settings, future research needs to replicate the present findings with athletes from different ages, cultures, and practice levels to demonstrate the tenability of group cohesion profiles emerging in the present study. Another limitation is that in the present study it was not measured the result of the competition as a variable that may covariate. Thus, in future research it would be interesting to add this variable as a possible covariable. Otherwise, future research could consider the effect of variables for predicting group cohesion profile membership such as coach variables (e.g., coach leadership, coach behaviours) or team or individual success. On the other hand, as explained previously, it would be interesting to unravel which variables influence international athletes to experience low-mixed group cohesion. This would help to create strategies for intervention. Finally, future research could examine the effect of membership of group cohesion profiles on other key psychological outcomes in sport settings such as athletes' sport motivation, sports burnout and engagement. Hence, it would be interesting to examine

coaches' burnout as the covariations result from the present study revealed a higher presence in mixed group cohesion profile (b) of most experienced coaches.[49,50] Thus, these outcomes may be influenced by the number of years of experience in coaching.

Notwithstanding these limits, the profile approach used in the present study might be especially useful in identifying higher risk profiles for individuals involved in competitive environment settings. Understanding relationships of group cohesion profiles with key sports outcomes such as pre- and intra-competitive affective states and coping is paramount for designing prevention and intervention strategies that will be most salient to a particular athlete. Moreover, knowing which of the group cohesion profiles are likely to decrease versus increase athlete adjustment in competition could help practitioners in targeting athletes who could benefit the most from changing their affective states. From this perspective, it could be particularly useful to target interventions to help competitive athletes change their dysfunctional group cohesion profiles. The characteristics of such group cohesion profile (i.e., scores on the four core dimensions of group cohesion) could allow practitioners (sports psychologists, coaches) tailoring intervention efforts to the needs of specific groups of athletes.

Data Availability Statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Tables

Table 1. Correlation and descriptive statistics of the variables examined.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1. Group Integration Task	x																															
2. Group Integration Social	.13	x																														
3. Individual Attractions to the Group-Social	.07	.51**	x																													
4. Individual Attractions to the Group-Task	-.04	.43**	.61**	x																												
5. Intensity of Positive Affects Before the Competition	.10	.04	.01	.11	x																											
6. Direction of Positive Affects Before the Competition	.03	-.05	-.04	.05	.57**	x																										
7. Intensity of Negative Affects	-.02	-.01	.00	-.09	.15**	-.02	x																									

Before the Competition 8. Direction of Negative Affects	-.00	.03	-.02	.07	.16**	.17**	-.06	x						
Before the Competition 9. Intensity of Positive Affects	.01	-.03	.01	.04	.46**	.36**	.19*	.10	x					
During the Competition 10. Direction of Positive Affects	-.05	-.02	.01	.02	.25**	.40**	-.04	.04	.59**	x				
During the Competition 11. Intensity of Negative Affects	.03	-.16**	-.14*	-.17**	.12*	.06	.39*	.05	.14*	-.17**	x			
During the Competition 12. Direction of Negative Affects	.01	.01	-.02	.08	.02	.05	-.05	.38**	.12*	.36**	-.19**	x		
During the Competition 13. Precompetitive Mental Imagery	-.03	-.06	.08	.03	.34**	.17**	.20*	.06	.22**	.09	.08	-.06	x	
14. Precompetit	.11	.05	.18**	-.00	.28**	.08	.14*	.01	.14*	.10	.05	-.00	.39**	x

ive Effort Expenditure																						
15. Precompetitive Thought Control	-.02	-.06	.04	-.09	.24**	.12*	.31**	.02	.23**	.15**	.10	-.02	.53**	.42**	x							
16. Precompetitive Social support	-.01	.05	.11	-.01	.16**	.06	.22**	-.01	.07	.03	.05	-.09	.33**	.25**	.46**	x						
17. Precompetitive Relaxation	.05	-.08	-.11	-.25**	.06	-.06	.17**	-.08	.03	.09	-.01	.01	.28**	.14*	.36**	.34**	x					
18. Precompetitive Logical Analysis	.02	.01	.09	-.01	.23**	.07	.31**	-.02	.15**	.05	.08	-.03	.53**	.39**	.55**	.51**	.43**	x				
19. Precompetitive Mental Distancing	-.03	-.06	-.03	-.09	.036	-.12*	.310**	-.05	.14*	.06	.09	-.04	.31**	.29**	.44**	.25**	.31**	.40**	x			
20. Precompetitive Mental Distraction	.02	-.02	.01	-.09	.01	-.05	.17**	-.02	.09	.10	.07	.01	.23**	.08	.42**	.37**	.34**	.30**	.29**	x		
21. Precompetitive Venting Emotions	-.02	.07	.08	.01	.09	.06	.24**	.05	.09	.02	.20**	.03	.12*	.12*	.09	.16**	.01	.19**	.16**	.13*	x	
22. Precompetitive Disengagement	-.01	.11	.03	.02	-.19**	-.24**	.19**	-.01	-.16**	-.15**	.13*	-.01	-.02	-.15*	.01	.12*	.05	.01	.12*	.10	.37**	x

23. Intracompetitive Mental Imagery	.01	-.07	.02	-.07	.23**	.09	.21*	.06	.36**	.19**	.07	.01	.47**	.15**	.28**	.18**	.12*	.28**	.28**	.17**	.09	.08	x					
24. Intracompetitive Effort Expenditure	.02	-.09	.02	-.05	.24**	.12*	.14*	-.07	.46**	.34**	-.01	-.01	.18**	.35**	.24**	.12*	.06	.17**	.17**	.09	-.07	-.19**	.33**	x				
25. Intracompetitive Thought Control	.05	-.03	.06	-.07	.21**	.09	.20*	.01	.39**	.25**	-.02	.01	.26**	.20**	.52**	.31**	.26**	.42**	.29**	.34**	.01	-.02	.45**	.44**	x			
26. Intracompetitive Social support	-.03	-.03	.07	-.01	.16**	.11*	.23*	-.06	.15**	.09	.09	-.10	.26**	.11*	.30**	.48**	.17**	.27**	.11*	.20**	.07	.07	.33**	.22**	.41**	x		
27. Intracompetitive Relaxation	.08	-.13*	-.19**	-.29**	.01	-.09	.16*	-.09	.03	.02	.08	-.01	.10	.09	.15**	.18**	.54**	.22**	.27**	.26**	-.05	-.02	.21**	.15**	.23**	.20**	x	
28. Intracompetitive Logical Analysis	.10	.02	.07	-.01	.18**	.10	.24*	.02	.29**	.12*	.03	.03	.20**	.14*	.28**	.26**	.18**	.43**	.20**	.19**	-.02	-.05	.40**	.31**	.44**	.34**	.25**	x
29. Intracompetitive Mental Distancing	.12*	-.16**	-.14*	-.22**	.06	-.06	.30*	-.10	.06	-.13*	.32**	-.21**	.17**	.16**	.20**	.13*	.31**	.16**	.39**	.10	-.03	.04	.31**	.19**	.27**	.24**	.44**	.21**	x
30. Intracompetitive Mental Distraction	.09	.01	-.04	-.17**	.07	-.10	.20*	-.07	-.01	-.12*	.11	-.10	.19**	.08	.24**	.26**	.27**	.24**	.22**	.43**	.09	.10	.34**	.10	.35**	.41**	.38**	.25**	.34**	x

31. Intracompetitive Venting Emotions	.10	.06	.03	.07	.17**	.08	.16*	-.01	.11	-.10	.42**	-.15**	.01	-.03	-.04	-.06	-.07	-.02	.01	-.02	.25**	.06	.02	.05	-.02	.04	-.06	.15**	.19**	.02	x	
32. Intracompetitive Disengagement	.12*	-.02	-.12*	-.21**	-.01	-.05	.23**	.01	-.23**	-.28**	.41**	-.10	.01	.02	.08	.12*	.17**	.09	.07	.14*	.19**	.30**	-.03	-.18**	-.03	-.01	.14*	.08	.24**	.24**	.36**	x
Mean	5.51	4.48	4.65	4.23	3.33	1.23	1.80	-.06	3.17	1.01	2.02	-.04	2.65	3.18	2.78	1.92	2.22	2.60	1.83	2.22	1.69	1.52	2.57	3.56	2.78	2.00	2.25	2.76	1.83	1.69	2.31	1.75
Range	7.33	6.25	8	8	3.5	3.8	2.5	5.9	3.6	6	4	6	4	4	4	3.5	4	4	3.75	4	2.75	3.25	4	4	4	3.25	4	3.5	4	4	4	3.5
Standard Deviation	1.36	1.41	1.74	2.14	.64	.68	.50	.90	.68	.88	.68	.87	.78	1.03	.92	.82	.96	.85	.73	.87	.73	.62	.77	.93	.87	.79	1.01	.77	.82	.81	1.04	.78
Variance	1.85	2.00	3.05	4.58	.41	.46	.25	.81	.46	.78	.46	.77	.61	1.07	.85	.68	.93	.73	.53	.76	.53	.76	.60	.88	.76	.63	1.03	.60	.68	.66	1.10	.61
Asimmetry	-.67	-.09	.47	.07	-.53	-.35	.75	-.44	-.45	-.77	1.06	.30	.25	-.25	-.02	.79	.56	.08	.91	.66	1.00	.66	.32	-.57	-.06	.56	.58	-.03	1.30	1.54	.71	1.13
Kurtosis	.32	-.73	-.42	-1.27	.16	.18	.41	1.32	-.01	1.62	1.82	2.09	-.45	-.59	-.63	-.13	-.42	-.63	.80	.13	.10	1.56	-.18	-.28	-.55	-.41	-.60	-.53	1.80	2.71	-.42	.84

Note. ** $p < .01$; * $p < .05$.

Table 2. Fit Indices for Latent Profile Analysis Models.

No. of classes	2	3	4	5
No. of free parameters	13	18	23	28
log likelihood	-2263.023	**-2125.47**	-2037.84	-2037.84
AIC	4276.94	**4177.58**	4121.687	4086.69
BIC	4324.91	**4244.01**	4206.565	4190.22
ABIC	4283.68	**4186.92**	4133.62	4101.22
Entropy	0.85	**0.88**	0.84	0.88
LRT	265.76*	**105.64**	63.65*	43.46*

Note: AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; ABIC = Adjusted BIC; LRT = Lo. Mendell. and Rubin Likelihood Ratio Test;

** $p < .05$; Bold entries reflect selected model.*

Table 3. Cluster differences in the group cohesion scores.

Estimates of latent GEQ scores and prevalence of group cohesión profiles	Group Cohesion		
	(a) Low Cohesion Profile (n = 30)	(b) Medium Cohesion Profile (n = 132)	(c) High Cohesion Profile (n = 134)
Group Integration Task	2.91	6.29	5.33
Group Integration Social	2.98	4	5.3
Atraction to the Group Task	2.21	2.73	6.19
Atraction to the Group Social	2.83	3.77	5.94

Table 4. Profile Differences in Affects and Coping.

	(a) Low Cohesion Profile (n = 30)	(b) Medium Cohesion Profile (n = 132)	(c) High Cohesion Profile (n = 134)	Chi-square tests			
	M (SE)	*M (SE)*	*M (SE)*	*overal test*	*(a) vs. (b)*	*(a) vs. (c)*	*(b) vs. (c)*
Intensity of Positive Affects Before the Competition	3.13 (0.11)	3.35 (0.06)	3.37 (0.05)	3.46	2.62	3.39+	0.05
Direction of Positive Affects Before the Competition	1.12 (0.16)	1.21 (0.06)	1.28 (0.06)	1.12	0.21	0.73	0.62
Intensity of Negative Affects Before the Competition	1.90 (0.09)	1.84 (0.04)	1.74 (0.04)	3.58	0.41	2.54	1.94
Direction of Negative Affects Before the Competition	-0.21 (0.14)	-0.09 (0.07)	-0.00 (0.09)	1.57	0.49	1.5	0.55
Intensity of Positive Affects During the Competition	3.08 (0.10)	3.16 (0.06)	3.20 (0.05)	1.02	0.4	1.01	0.17
Direction of Positive Affects During the Competition	1.09 (0.17)	0.92 (0.08)	1.09 (0.07)	2.31	0.74	0.00	2.2
Intensity of Negative Affects During the Competition	2.13 (0.11)	2.16 (0.06)	1.86 (0.06)	11.76**	0.04	4.21+	10.71**
Direction of Negative Affects During the Competition	-0.20 (0.13)	-0.09 (0.08)	0.03 (0.08)	2.49	0.47	2.21	1.04
Precompetitive Mental Imagery	2.78 (0.13)	2.65 (0.07)	2.62 (0.07)	1.1	0.7	1.09	0.07
Precompetitive Effort Expenditure	2.99 (0.22)	3.30 (0.08)	3.10 (0.09)	2.91	1.61	0.21	2.11
Precompetitive Thought Control	3.16 (0.11)	2.85 (0.08)	2.63 (0.08)	12.71**	4.26+	12.63**	2.77
Precompetitive Social support	2.00 (0.15)	1.93 (0.07)	1.89 (0.07)	0.43	0.15	0.39	0.13
Precompetitive Relaxation	2.26 (0.14)	2.53 (0.09)	1.91 (0.08)	23.73**	2.23	4.30+	23.28**
Precompetitive Logical Analysis	2.64 (0.12)	2.68 (0.07)	2.51 (0.08)	2.08	0.08	0.7	2
Precompetitive Mental Distancing	1.93 (0.08)	1.96 (0.07)	1.68 (0.06)	8.81+	0.05	4.81+	7.35**
Precompetitive Mental Distraction	2.19 (0.13)	2.35 (0.08)	2.10 (0.07)	4.32	0.97	0.35	4.31+
Precompetitive Venting Emotions	1.63 (0.13)	1.67 (0.06)	1.74 (0.06)	0.75	0.04	0.44	0.53
Precompetitive Disengagement	1.46 (0.08)	1.50 (0.05)	1.56 (0.06)	1.1	0.13	0.96	0.55
Intracompetitive Mental Imagery	2.57 (0.13)	2.61 (0.07)	2.53 (0.06)	0.61	0.08	0.06	0.61
Intracompetitive Effort Expenditure	3.66 (0.17)	3.61 (0.07)	3.49 (0.09)	1.19	0.06	0.73	0.88
Intracompetitive Thought Control	2.80 (0.16)	2.88 (0.07)	2.68 (0.08)	2.9	0.18	0.41	2.88
Intracompetitive Social support	2.13 (0.15)	1.99 (0.07)	1.98 (0.07)	0.77	0.64	0.73	0.00
Intracompetitive Relaxation	2.19 (0.15)	2.65 (0.09)	1.86 (0.08)	35.57**	6.18+	3.34+	35.56**
Intracompetitive Logical Analysis	2.50 (0.11)	2.88 (0.06)	2.69 (0.07)	8.50+	7.65**	1.79	3.41+
Intracompetitive Mental Distancing	1.58 (0.14)	2.18 (0.07)	1.55 (0.06)	37.65**	13.15**	0.02	35.74**
Intracompetitive Mental Distraction	1.60 (0.15)	1.90 (0.07)	1.50 (0.06)	13.22**	2.77	0.31	13.14**
Intracompetitive Venting Emotions	1.83 (0.18)	2.41 (0.09)	2.32 (0.09)	7.67+	7.46**	5.73+	0.38
Intracompetitive Disengagement	1.66 (0.15)	2.02 (0.07)	1.51 (0.05)	25.75**	4.39+	0.79	25.74**

Note. + $p \leq .09$ ** $p < .0017$ (After Bonfenroni correction)