South African Journal for Research in Sport, Physical Education and Recreation, 2016, 38(3): 113 - 126.
Suid-Afrikaanse Tydskrif vir Navorsing in Sport, Liggaamlike Opvoedkunde en Ontspanning, 2016, 38(3): 113 - 126.
ISBN: 0379-9069

EXPLORING DIRECTION BETWEEN COHESION AND COLLECTIVE EFFICACY AND RELATIONSHIPS WITH PERFORMANCE OF FOOTBALL TEAMS

Francisco M. LEO[1], Inmaculada GONZÁLEZ-PONCE[2], David SÁNCHEZ-OLIVA[2], Diana AMADO[2] & Tomás GARCÍA-CALVO[2]
[1] *Department of Didactics of Musical, Plastic and Corporal Expression, Faculty of Teacher Training, University of Extremadura, Caceres, Spain*
[2] *Department of Didactics of Musical, Plastic and Corporal Expression, Faculty of Sport Sciences, University of Extremadura, Caceres, Spain*

ABSTRACT

The direction between cohesion and collective efficacy measured at the beginning and the end of a season and their association with team performance as measured by final classification was examined. The sample comprised 146 soccer players, aged between 15 and 18 years (mean=16.96±0.76). The Spanish version of the Group Environment Questionnaire (GEQ) and the Football Collective Efficacy Questionnaire (FCEQ) were used to assess cohesion and collective efficacy. Performance was evaluated by the average between final position in the classification table and satisfaction with team performance perceived by the players. Results showed that in the first six months of competition, team cohesion had greater power to predict collective efficacy at the end of the league. However, collective efficacy did not predict team cohesion significantly. Collective efficacy was more closely related to team performance than group cohesion by the end of the season. It was concluded that during pre-season and at the start of the season, team sport coaches should focus on social and task aspects, both individually and at a group level. This would improve the perception of collective team efficacy and lead to better team performance.

Key words: Cohesion; Collective efficacy; Direction; Performance; Football teams.

INTRODUCTION

One of the main objectives in team sport is to optimise the resources of the group and to maximise the performance of the team. In this area, several studies have been carried out in the field of Social Psychology, where group processes, such as cohesion or collective efficacy play an important role due to the close relationship with performance (Carron *et al*., 2002b; Myers *et al*., 2004; Heuzé *et al*., 2006; Leo *et al*., 2010b).

With respect to group processes, Carron and Eys (2012) suggested that there is a reciprocal relationship which helps the functioning of the team. It is not known exactly when during the season, teams deal with cohesion and efficacy, but research has indicated that both variables do play a role in performance. Thus, it is necessary to investigate the role of both these variables, especially since little is known about the interaction between them (Heuzé *et al*., 2007). When a literature review was conducted, only studies which examined the relationship

between both variables or the predictive capacity in one direction, were found (Spink, 1990; Paskevich *et al*., 1999; Heuzé *et al*., 2006; Leo *et al*., 2010a). Thus, the directionality of the relationship between these variables might help to provide relevant information to develop practical interventions in professional sport.

Team cohesion has been defined as "a dynamic process that is 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" (Carron *et al*., 1998:213). This definition aligns with Carron's model (Carron *et al*., 1985; Carron & Eys, 2012), which proposes that team members hold (a) collective beliefs about the group as a unit in terms of its closeness, resemblance and affinity (GI - group integration), and (b) individual beliefs regarding the degree to which the group attracts them, thereby satisfying their needs and personal goals (ATG - individual attraction to the group).

Each of these classes of beliefs is further divided into two categories, depending on whether they revolve around task-related (T) or social (S) issues (Carron & Brawley, 2000; Carron & Eys, 2012). Thus, four aspects of team cohesion have been identified: *Group Integration-Task* (GI-T) and *Group Integration-Social* (GI-S) which reflect, respectively, members' beliefs about the degree to which the group is united to reach its objectives and to have its members socialising; and *Individual Attraction to the Group-Task* (ATG-T) and *Individual Attraction to the Group-Social* (ATG-S), which reflect members' judgments about the degree to which the group is attractive for its objectives and social relationships, respectively.

Collective efficacy, understood as "a group's shared beliefs in its capacities to organise and execute actions to produce a desired goal" (Bandura, 1997:476), is conditioned by a series of antecedents that strongly affect the perception of the players, among which is group cohesion (Spink, 1990; Paskevich *et al*., 1999; Heuzé *et al*., 2006; Leo *et al*., 2010a). Likewise, these antecedents will create a specific perception of collective efficacy in the team, which will lead to a series of cognitive, affective and behavioural consequences, among which is performance (Bandura, 1997; Feltz & Lirgg, 1998; Beauchamp, 2007; Leo *et al*., 2010a).

Regarding the relationship between cohesion and collective efficacy, cohesion has been considered as an antecedent of collective efficacy (Bandura, 1997; Kozub & McDonnell, 2000; Leo *et al*., 2010a). In fact, investigations have reported that players who perceive greater team cohesion develop stronger perceptions of collective efficacy (Heuzé *et al*., 2006; Leo *et al*., 2010a). Specifically, several studies found that some aspects of task cohesion are more closely related to the perception of collective efficacy (Paskevich *et al*., 1999; Kozub & McDonnell, 2000; Ramzaninezhad *et al*., 2009; Leo *et al*., 2014), whereas other studies established no differences between social cohesion and task cohesion in the relationship between cohesion and collective efficacy (Spink, 1990; Heuzé *et al*., 2006; Leo *et al*., 2010a). One reason for this disparity may be that the diverse studies used different participants because either the research was carried out with professional or young teams, or they used different types of sport, such as volleyball, handball, basketball or rugby.

Some authors argued that cohesion is both an antecedent and a consequence of collective efficacy (Zaccaro *et al*., 1995; Heuzé *et al*., 2007). Zaccaro *et al*. (1995) suggested that the relationship between cohesion and collective efficacy is reciprocal, and that in order to

understand the relationships between these variables, it may be necessary to differentiate between the types of cohesion considered antecedents or consequences of perceived efficacy. When cohesion is an antecedent, certain associated positive changes should enhance group performance and promote higher levels of collective efficacy (Bandura, 1997; Kozub & McDonnell, 2000; Leo *et al*., 2010a). When it is a consequence, stronger perceptions of collective efficacy should increase the desire to stick together, thereby increasing group cohesion (Zaccaro *et al*., 1995; Heuzé *et al*., 2007).

In this regard, Heuzé *et al*. (2007) hypothesised, taking into account the suggestions of Zaccaro *et al*. (1995), that depending on the type of cohesion could be an antecedent or a consequence, that Individual Attraction to the Group-Task might be an antecedent of collective efficacy, whereas Group Integration (both Task and Social) would be considered a consequence of efficacy. In their design, they controlled group performance because it may affect players' perceptions of cohesion and collective efficacy (Feltz & Lirgg, 1998; Watson *et al*., 2001; Myers *et al*., 2004; Heuzé *et al*., 2006). They found that collective efficacy measured at the beginning of the season predicted changes in Individual Attraction to the Group-Task throughout the league. Despite this fact, as was indicated by authors (Heuzé *et al*., 2007), the research had some limitations (low number of participants, deleting the ATG-S factor and measurement of the performance only by table classification) which suggested proposing new studies that attempt to reaffirm the relationship between both variables.

With respect to the relationship between psychological variables and performance in team sport, one of the first difficulties that researchers found when examining it, was the way to assess performance itself. Normally, objective criteria of the sport, such as statistics, victories and defeats, or a classification table (Heuzé *et al*., 2006; Dithurbide *et al*., 2009) have been used. Overall, most of the studies have found a positive association (Heuzé *et al*., 2006; Ramzaninezhad *et al*., 2009; Leo *et al*., 2010a). This aspect may be the key discriminator when examining the causality direction between these variables. A positive relationship between team cohesion and performance has been found previously (Carron *et al*., 2002a; Carron *et al*., 2002b; Beal *et al*., 2003), as well as between collective efficacy and performance (Feltz & Lirgg, 1998; Myers *et al*., 2004; Myers *et al*., 2007; Leo *et al*., 2014).

When performance is measured objectively, as is the case in some closer sports, such as basketball, handball, volleyball or hockey (Kozub & McDonnell, 2000; Heuzé *et al*., 2006), the measurement can be effective. On the other hand, in more open sports, such as football, performance measurement is more complex and wrong results might be obtained (Myers *et al*., 2004). To reduce these limitations, it would be interesting to use objective (classification table) and subjective assessments (satisfaction with team performance), together (Carron *et al*., 2002b; Dithurbide *et al*., 2009), to ensure that the measured performance is the real performance (Dithurbide *et al*., 2009). In this sense, satisfaction with team performance could be a subjective measure of team performance over the season. If players perceive high satisfaction with team performance, it will mean that this performance has been high and vice versa (Balaguer *et al*., 2002).

PURPOSE OF THE STUDY

In view of the prior comments, the aim of this study was to determine the direction of the relationship between cohesion and collective efficacy, and their effect on team performance, through a structural equation modelling. This allows for using more than one dependent variable, and the same variable can be dependent or independent at the same time. In this study, these variables are cohesion, collective efficacy and performance. Thus, the chief aim of this study was to determine the direction between cohesion and collective efficacy, measured at the beginning and at the end of the season, and their relationship with team performance. Thus, two longitudinal models will be generated to examine the relationships between cohesion and collective efficacy and their influence on performance in team sports.

METHOD

Participants

The sample comprised 146 male soccer players. Players belonged to 15 federative teams that played in the XI group of the National League in the sub-18 category, aged between 15 and 18 years (mean=16.96±0.76). With the selection of participants, intentional sampling was used in which all the teams of the competition participated in the study. With regard to playing position, the recruited players were 15 goalkeepers, 50 defenders, 50 midfielders, and 31 strikers. The players had a mean previous soccer experience of 9.79±2.64 years.

Instruments

Group Environment Questionnaire (GEQ)

The Spanish version of the GEQ developed by Iturbide *et al*. (2010) was used to assess team cohesion. This inventory of 18-items comprises 4 factors: Group Integration-Task (team members are united in their efforts to reach their performance goals in training sessions and matches); Group Integration-Social (team members would like to spend time together in situations other than training and games); Individual Attraction to the Group-Task ("on this team, I can do my best"); and Individual Attraction to the Group-Social ("the team is one of the most important social groups I belong to"). Responses were rated on a 5-point scale ranging from *strongly disagree* (1) to *strongly agree* (5). A confirmatory factor analysis (CFA), with the data being collected at the beginning of the season, showed acceptable model fit (χ^2/df=1.70; CFI=0.93; IFI=0.93; RMSEA=0.06; SRMR=0.05). The CFA with data from the end of the season revealed similar values to those obtained at the beginning of the season in all instruments (χ^2/df=3.40; CFI=0.94; IFI=0.94; RMSEA=0.06; SRMR=0.04). This study examined internal consistency through Cronbach's alpha, obtaining values at both measurements (at the start and the end of the season) of 0.73 and 0.76 for Group Integration-Task, 0.77 and 0.74 for Individual Attraction to the Group-Task, 0.71 and 0.73 for Group Integration-Social, and 0.74 and 0.75 for Individual Attraction to the Group-Social.

Collective efficacy

To assess collective efficacy, the "Cuestionario de Eficacia Colectiva en Fútbol" (CECF; in English, The Football Collective Efficacy Questionnaire [FCEQ]), developed by Leo *et al*. (2011) was used. This instrument starts with a stem phrase ("Our team's confidence in our

capability to…") and has a total of 26 items that refer to some offensive (13 items, such as keeping ball possession in the face of rival pressure), and defensive soccer situations (13 items, such as …to defend set piece ball situations). Responses were rated on a 5-point scale ranging from *bad* (1) to *excellent* (5). The CFA results with data taken at the beginning of the season confirmed an acceptable model fit (χ^2/df=2.73; CFI=0.90; IFI=0.91; RMSEA=0.06; SRMR=0.05), where all 26 items were grouped into a single factor. The CFA with data of the end of the season revealed similar values to those obtained at the beginning of the season in all instruments (χ^2/df=4.53; CFI=0.90; IFI=0.91; RMSEA=0.06; SRMR=0.04). Internal consistency values in both measurements were acceptable (0.73 and 0.82, respectively).

Performance

There is a general awareness about the difficulty of measuring team performance in collective sports. To date, there is no standardised performance measurement in sport, such as football. Most of the studies have used table classification or statistics (Carron *et al*., 2002b; Heuzé *et al*., 2006), without taking into account subjective measures. For example, teams may finish the season at the mid-point of the classification, but if their objectives were higher at the beginning of the season, the final classification would be very poor and the satisfaction low. However, if their objectives were lower at the beginning of the season, the final classification would be very good and satisfaction with the team is high.

With the aim to measure team performance in this study, an approach to the real team performance through satisfaction with team performance was attempted. The average was calculated between the final classification and satisfaction with team performance obtained in the league. To assess each team's final classification, the final position in the classification table at the end of the regular season was used. The data was reversed so that higher classification values (1, 2, 3, etc.) would correspond to higher scores (16, 15, 14, etc.). To assess satisfaction with team performance, a single item was used that asked the players whether they were satisfied with the team classification at the end of the season. Responses were rated on a 5-point scale ranging *not at all* (1) to *very much* (5). In this sense, the average between final position and satisfaction with team performance can reflect their real performance.

Procedure

This study received ethical approval from the University of Extremadura. The study followed the American Psychological Association ethics guidelines regarding consent, confidentiality and anonymity of responses. A correlation methodology with a longitudinal design to study the evolution of group processes was used. Two assessments at 2 different times were developed, analysing a sub-sample or specific group over a long time interval. Measurements were taken at the beginning and at the end of the season, with a difference of 20 to 22 weeks to ensure that enough time had passed, as the levels of cohesion and collective efficacy could vary.

The first set of data was collected during the first third of the competition over a 3-week period to ensure that the teams played in several official games and that team members would have had sufficient opportunities to interact and to develop both cohesion and collective efficacy beliefs. The second set of data was collected in the last third of the season over a 3-week period, following the same guidelines as in the first data collection. For the second assessment, the last third of the season was chosen, because team participation in a study is more problematic at

the end of the season. If a measurement is made just at the end of season, head coaches would not want to participate, because, in the last weeks of competition, game results are increasingly important for teams' goals, and teams often refuse to participate.

Only the players who completed the questionnaires at both the assessment times comprised the study sample. Players who either did not complete both measurements, due to injuries, illness, or studies, or who played on different teams due to a possible change during the season, were excluded. Of the 235 players who completed the first measurement, only 146 completed the second measurement. The latter comprised the final sample.

The main investigator contacted all the coaches from the juvenile teams of the National Team of Extremadura (Spain) to request permission to include their teams in the study. They were informed about the goals and procedures of the study. The XI group of the National Juvenile League was made up of 16 teams, and 15 of them agreed to collaborate. Participants were requested to answer the questions as truthfully as possible and were reassured that their responses would be strictly confidential.

A protocol was developed to ensure the similarity of data collection at both assessments with the participants in the research. Participants completed the questionnaires in the changing room before the training session. This procedure took approximately 15 to 20 minutes. They completed the questionnaires individually, in the absence of their coach, in a calm atmosphere that ensured that they would not be distracted. A researcher was always present and encouraged the participants to ask questions if they had any doubts that needed to be clarified.

Data analysis

The PASW Statistics 18.0 program was used to analyse the data, establishing sequential stages to examine the relationships among the variables. Statistical techniques employed were factor analysis and reliability analysis to verify the adequacy of the factor structure and the reliability of the instruments, as well as descriptive analyses to observe the levels in the diverse variables at both measurements. AMOS 18.0 software was also used to test the structural equation models.

Data normality was examined, obtaining skewness values between -0.7 and 0.9, kurtosis values between -0.8 and 0.7, as well as normal scores in the Kolmogorov-Smirnov statistic ($d<0.70$, $p>0.05$). The tolerance index of the variables was between 0.81 and 1.00, and the variance inflation factor (VIF) index had values between 1.00 and 1.23, which indicated that the probability of an error due to co-linearity could be discarded.

RESULTS

Descriptive analysis

Table 1 presents the descriptive results of all the variables of the research. The means of the cohesion factors were higher both at the beginning and at the end of the season, because they were above the average values of the measurement scale. However, it is important to note that the cohesion factors with the highest scores at the first assessment (Group Integration-Social,

Individual Attraction to the Group-Task and Individual Attraction to the Group-Social), decreased at the second measurement, especially Group Integration-Social, which showed the greatest decrease. In contrast, Group Integration-Task, which had the lowest score of the cohesion factors at the first assessment, showed a slight increase at the second measurement. Regarding collective efficacy, the means at the beginning and at the end of the season were high. However, at the end of the season collective efficacy decreased moderately.

Table 1. **DESCRIPTIVE RESULTS**

Variables	**Measurement 1** Mean±SD	**Measurement 2** Mean±SD
Group Integration-Social [GI-S]	4.107±0.787	3.441±0.921
Group Integration-Task [GI-T]	3.614±0.813	3.936 ±0.731
Individual Attraction to Group-Social [ATG-S]	3.888±0.746	3.724±0.739
Individual Attraction to Group-Social [ATG-T]	3.902±0.837	3.868±0.772
Collective Efficacy [CE]	3.734±0.778	3.695±0.706

Structural Equation Model

In order to determine the prediction capacity of the variables of this study, structural equation modelling was used. This statistical programme has the advantage of including all the variables in the same regression model, similar to multiple regression, with the peculiarity that this model allows the use of more than one dependent variable, and the same variable can be dependent or independent at the same time. Hence, through this technique, a theoretical model could be tested and the direction of the relationships established between the diverse variables, as well as their predictive capacity at both measurements.

In order to accept or reject a model, the most appropriate method is to use a combination of various fit indexes, as there is not consensus among researchers about which is the best index for this kind of analysis (Hoyle & Panter, 1995). Taking into account the contributions of some authors (Bentler, 1990; Bollen & Long, 1993), in this study, the following fit indexes were used: chi-square divided by degrees of freedom; the Comparative Fit Index (CFI); the Incremental Fit Index (IFI); the Tucker Lewis Index (TLI); the Root Mean Square Error of Approximation (RMSEA); and Akaike's Information Criterion (AIC). As chi-square is very sensitive to sample size (Jöreskog & Sörbom, 1996), the ratio between chi-square and the degrees of freedom (χ^2/df), which is considered acceptable when it is lower than 5 (Bentler, 1989). According to Schumacker and Lomax (1996), the incremental indexes (CFI and TLI) indicate acceptable fit when they obtain values of 0.90 or higher. Regarding the RMSEA, 0.06 has been established as an acceptable cut-off point (Hu & Bentler, 1999). AIC is one of the more popular methods to compare multiple models, taking both descriptive accuracy and parsimony into account. With lower scores indicating the best fit of the model, AIC is often

used as a measure of model adequacy in structural equation modelling (Jöreskog & Sörbom, 1996).

In the structural equation model, two of the most important psychological constructs related to group dynamics were integrated: group cohesion; and collective efficacy. Thus, to analyse the effect of the direction of causality of these variables on each other, two models were tested, using one of the variables in each model as a dependent variable. One of the variables measured at the beginning of the league as the predictor variable was entered, and the other variable assessed at the end of the season as the dependent variable. Thus, two models were used to determine which variable had more impact on the other variable at the end of the league. In Model 1, cohesion measured at the first assessment was computed as the predictor and collective efficacy at the second measurement as a dependent variable. In Model 2, collective efficacy at the first assessment was used as the predictor and cohesion at the end of the season as a dependent variable. In addition, in both models, final performance was also entered as a dependent variable of these factors, in order to verify which one of them – cohesion or collective efficacy – better predicted performance.

It is important to note that different cohesion factors are formed by latent variables through items or random group of items that make up each factor, and collective efficacy is a latent variable comprised of two groups of items, referring to attack and defence aspects. The use of these parcels or group of items gives advantages by obtaining of a parsimony model through the reduction of the parameters, the decrease of the probability of the correlation between residuals and the increase of reliability of indicators (Coffman & MacCallum, 2005). Lastly, performance is a latent variable made up of the table classification and satisfaction with the team performance.

As seen in Table 2, after analysing the structural equation models, the fit indexes of Model 1 were adequate, because they fell between the values considered acceptable for the goodness of fit of a structural equation model. The values of Model 2 were very poor. Therefore, Model 1, where cohesion at the beginning of the season was the predictor and collective efficacy at the end of the league was a dependent variable, was the only model that presented appropriate fit indexes.

Table 2. **FIT INDEXES OF STRUCTURAL EQUATION MODELS**

	Variables					
Models	χ^2	χ^2/df	CFI	TLI	AIC	RMSEA
Model 1	126.952	1.365	0.934	0.914	212.952	0.050
Model 2	186.041	1.938	0.796	0.745	266.041	0.080

CFI=Comparative Fit Index TLI=Tucker Lewis Index AIC=Akaike's Information Criterion
RMSEA=Root Mean Square Error of Approximation

Model 1 had a higher prediction index for the dependent variables (collective efficacy and performance) than Model 2. Thus, Figure 1 shows that group cohesion at the beginning of the

league positively predicted collective efficacy at the end of the season, and this latter variable, in turn, predicted final performance at the end of the league.

More specifically, Group Integration-Social and Individual Attraction to the Group-Task emerged as the strongest predictors of collective efficacy, explaining 16% of the variance. The other two cohesion factors, Group Integration-Task and Individual Attraction to the Group-Social showed no significant predictive capacity. Furthermore, collective efficacy measured at the end of the league positively predicted the players' performance in the final classification.

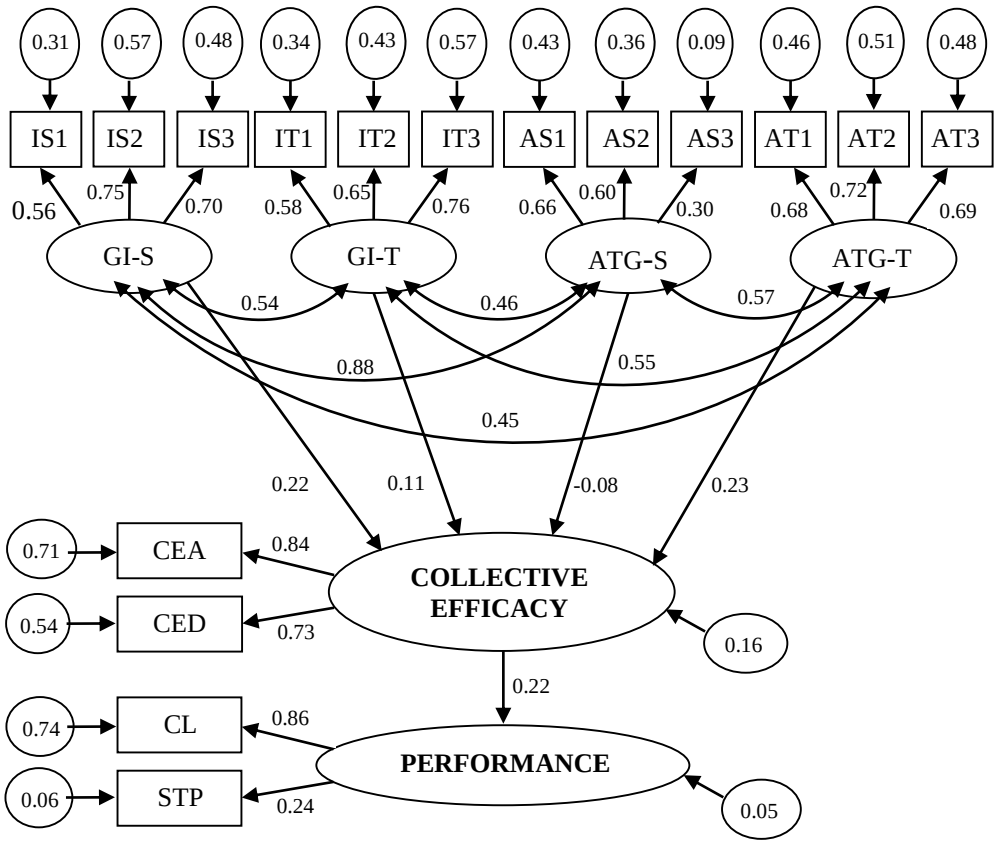

Figure 1. **STRUCTURAL EQUATION MODEL: RELATIONSHIPS AMONG COHESION FACTORS, COLLECTIVE EFFICACY AND PERFORMANCE**

GI-S=Group Integration-Social; GI-T=Group Integration-Task; ATG-S=Individual Attraction to Group-Social; ATG-T=Individual Attraction to the Group-Task; CEA=Collective Efficacy in Attack; CED=Collective Efficacy in Defence; CL=Classification; STP=Satisfaction with Team Performance.

DISCUSSION

The chief aim of this study was to determine the direction of causality between cohesion and collective efficacy measured at the beginning and at the end of the season and their relationship with team performance. Firstly, according to the results, the close relationship between cohesion and collective efficacy can be reaffirmed (Spink, 1990; Paskevich *et al*., 1999; Heuzé *et al*., 2006; Ramzaninezhad *et al*., 2009), although, in this case, team cohesion emerged as a better predictor of collective efficacy than vice versa. These outcomes are consistent with those of authors who consider group cohesion as an antecedent of collective efficacy. For example, in a study with professional rugby teams, Kozub and McDonnel (2000) postulated that players who perceived high task cohesion in their teams tended to show greater collective efficacy. Furthermore, Leo *et al*. (2010a) and Leo *et al*. (2014) found in basketball players and football players that team cohesion was the strongest predictor of the perception of collective efficacy.

In this sense, after analysing the structural equation models, both task cohesion components (mainly Individual Attraction to the Group-Task) and, to a lesser extent, Group Integration-Task and the social cohesion component (only Group Integration-Social) significantly predicted collective efficacy at the end of the season. Previously, discrepant results have been found about the strength of the relation of cohesion dimensions with the perception of players of collective efficacy. Some investigations reported that task aspects were the most relevant (Paskevich *et al*., 1999; Kozub & McDonnell, 2000; Ramzaninezhad *et al*., 2009; Leo *et al*., 2014), and other authors (Spink, 1990; Heuzé *et al*., 2006; Leo *et al*., 2010a) found no differences between task and social aspects in this relationship.

The type of participants used in the study might be one of the reasons for these differences, because the use of semi-professionals or professional male players (Paskevich *et al*., 1999; Kozub & McDonnell, 2000; Ramzaninezhad *et al*., 2009; Leo *et al*., 2014), or male and female players together (Spink, 1990), can be a motive that influences in the variety in the results. It is probable that male participants orientated to performance give more importance to task cohesion, whereas other collectives, such as young and female participants give great relevance to social aspects. Moreover, the type of sport can be a distinguishing element, because despite of being a team sport (volleyball, handball, basketball or rugby), each of them has particular characteristics that might influence the results, such as number of team players, specialisation of the different positions, number of substitutions in games, and so forth.

In contrast, despite the fact that collective efficacy predicted team cohesion, the prediction indexes were very low and, therefore, the proposals of Zaccaro *et al*. (1995) and Heuzé *et al*. (2007) of cohesion as both an antecedent and a consequence of collective efficacy, do not support these outcomes. In the current study, both Group Integration-Social and Group Integration-Task, as well as Individual Attraction to the Group-Task had a high capacity to predict perceived collective efficacy at the end of the season (Leo *et al*., 2010a). According to the results, players who perceived higher team cohesion, both in group integration and individual attraction, at the beginning of the season also perceived greater collective efficacy in their teams at the end of the league (Heuzé *et al*., 2006; Leo *et al*., 2010a; Leo *et al*., 2014). The bi-directionality of the relationship between these constructs can promote a mutual prediction (Zaccaro *et al*., 1995; Paskevich *et al*., 1999; Carron & Eys, 2012), although most

of the studies suggest a prediction of the cohesion on collective efficacy. Further research is needed to investigate the relationship between both variables.

In the analysis of the relationship between cohesion and collective efficacy, the association of these variables with performance could also influence the direction of causality between both variables, as mentioned in the introduction. In this study, collective efficacy predicted final performance; a fact that had already been reported in several previous studies (Feltz & Lirgg, 1998; Myers *et al*., 2004; Myers *et al*., 2007). As mentioned in the results section, the capacity of collective efficacy to predict performance was greater than team cohesion, which suggests that it is more relevant to achieve higher collective efficacy levels at the end of the season because this might guarantee better performance. In contrast, the relationship among performance and cohesion was lower, which is consistent with different works that showed an unstable relationship (Carron *et al*., 2002a; Carron *et al*., 2002b; Beal *et al*., 2003). This disparity in the results between both variables seems to be stronger when collective efficacy is showed (Leo *et al*., 2014). Further studies analysing the mediator effects to explain performance can be relevant to enhance the knowledge in this field of research.

A limitation of the current study was that the findings, although longitudinal with two measurements across the sport season, were correlational, and no causal inferences can be drawn as to the relationships between cohesion, collective efficacy and performance. Nevertheless, the results are consistent with theoretical predictions and previous empirical research concerning the association between these variables (Heuzé *et al*., 2006; Heuzé *et al*., 2007; Leo *et al*., 2010a). Furthermore, the scale used to assess performance has not been previously validated, however, this type of measuring performance was supported by previous studies (Dithurbide *et al*., 2009; Carron & Eys, 2012).

Another limitation of this study was that it relied exclusively on self-reports, and thus to some extent the findings are subject to potential influences of shared method variance. Future longitudinal research in this area will do well to assess objective markers of cohesion and collective efficacy (observation instruments). Finally, generalisability of the findings to other population samples and sports should be made with caution as the current sample comprised only males, from a particular sport (soccer) and from a particular country (Spain).

Despite the aforementioned limitations, this work makes a unique contribution to the literature by examining the direction of causality between cohesion and collective efficacy in football teams over an eight-month period. In this sense, it might be interesting to investigate how cohesion can modify collective efficacy and vice versa with male and female players and in different sports. Also, longitudinal and experimental studies will be necessary to improve the knowledge about the direction of the relationship between cohesion and collective efficacy. Future research can build upon this work by incorporating different levels of analysis (individual, team, sport, time, gender) to create relevant information for coaches and sports psychologists.

CONCLUSION AND PRACTICAL APPLICATION

The present study indicates that team cohesion during the first months of competition had a greater impact on their perception of collective efficacy at the end of the league. In addition, both group integration and individual attraction to the group were antecedents of collective efficacy, with high predictive capacity. Collective efficacy was more relevant than team cohesion for team performance at the end of the season. Thus, one of the main practical implications of this study is that, during pre-season and at the beginning of the season, team sport coaches should focus on social and task aspects, both individually and at a group level, because this would improve the perception of collective team efficacy at the end of the season and lead to better team performance.

Acknowledgements

The authors wish to acknowledge with thanks the funding for this research by the Foundation Fernando Valhondo Calaff.

REFERENCES

BALAGUER, I.; DUDA, J.L.; ATIENZA, F.L. & MAYO, C. (2002). Situational and dispositional goals as predictors of perceptions of individual and team improvement, satisfaction and coach ratings among elite female handball teams. *Psychology of Sport and Exercise*, 3(4): 293-308.

BANDURA, A. (1997). *Self-efficacy*: *The exercise of control*. New York, NY: Freeman.

BEAL, D.J.; COHEN, R.R.; BURKE, M.J. & MCLENDON, C.L. (2003). Cohesion and performance in groups: A meta-analytic clarification of construct relations. *Journal of Applied Psychology*, 88(6): 989-1004.

BEAUCHAMP, M.R. (2007) Efficacy beliefs within relational and group contexts in sport. In S. Jowett & D. Lavallee (Eds.), *Social psychology in sport* (pp.181-193). Champaign, IL: Human Kinetics.

BENTLER, P.M. (1989). *EQS structural equations program manual.* Los Angeles, CA: BMDP Statistical Software.

BENTLER, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2): 238-246.

BOLLEN, K.A. & LONG, J.S. (1993). *Testing structural equation models*. Newbury Park, CA: Sage.

CARRON, A.V. & BRAWLEY, L.R. (2000). Cohesion: Conceptual and measurement issues. *Small Group Research*, 31(1): 89-106.

CARRON, A.V.; BRAWLEY, L.R. & WIDMEYER, W.N. (1998). The measurement of cohesiveness in sport groups. In J.L. Duda (Ed.), *Advances in sport and exercise psychology measurement* (pp.213-226). Morgantown, WV: Fitness Information Technology.

CARRON, A.V.; BRAY, S.R. & EYS, M.A. (2002a). Team cohesion and team success in sport. *Journal of Sport Sciences*, 20(2): 119-126.

CARRON, A.V.; COLMAN. M.M.; WHEELER, J. & STEVENS, D. (2002b). Cohesion and performance in sport: A meta-analysis. *Journal of Sport and Exercise Psychology*, 24(2): 168-188.

CARRON, A.V. & EYS, M.A. (2012). *Group Dynamics in Sport* (4th ed.). Morgantown, WV: Fitness Information Technology.

CARRON, A.V.; WIDMEYER, W.N. & BRAWLEY, L.R. (1985). The development of an instrument to assess cohesion in sport teams: The Group Environment Questionnaire. *Journal of Sport Psychology*, 7(3): 244-266.

COFFMAN, D.L. & MACCALLUM, R.C. (2005). Using parcels to convert path analysis models into latent variable models. *Multivariate Behavioural Research*, 40(2): 235-259.

DITHURBIDE, L.; SULLIVAN, P. & CHOW, G. (2009). Examining the influence of team-referent causal attributions and team performance on collective efficacy: A multilevel analysis. *Small Group Research*, 40(5): 491-507.

FELTZ, D.L. & LIRGG, C.D. (1998). Perceived team and player efficacy in hockey. *Journal of Applied Psychology*, 83(4): 557-564.

HEUZÉ, J.P.; BOSSELUT, G. & THOMAS, J.P. (2007). Cohesion or collective efficacy: What should be the focus of elite female handball team coaches? *The Sport Psychologist*, 21(4): 383-399.

HEUZÉ, J.P.; RAIMBAULT, N. & FONTAYNE, P. (2006). Relationships between cohesion, collective efficacy, and performance in professional basketball teams: An examination of mediating effects. *Journal of Sports Sciences*, 24(1): 59-68.

HOYLE, R.H. & PANTER, A.T. (1995). Writing about structural equation models. In R.H. Hoyle (Eds.), *Structural equation modelling*: *Concepts, issues, and applications* (pp.158-176). Thousand Oaks, CA: Sage.

HU, L. & BENTLER, P.M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling*, 6(1): 1-55.

ITURBIDE, L.M.; ELOSUA, P. & YANES, F. (2010). A measure of team cohesion in sport. Spanish adaptation of Group Environment Questionnaire (GEQ). *Psicothema*, 22(3): 482-488.

JÖRESKOG, K.G. & SÖRBOM, D. (1996). *LISREL 8: User's reference guide* (2nd ed.). Chicago, IL: Scientific Software International.

KOZUB, S.A. & MCDONNELL, J.F. (2000). Exploring the relationship between cohesion and collective efficacy in rugby teams. *Journal of Sport Behaviour*, 23(2): 120-129.

LEO, F.M.; GARCÍA-CALVO, T.; PAREJO, I.; SÁNCHEZ-MIGUEL, P.A. & SÁNCHEZ-OLIVA, D. (2010a). Interacción de la cohesión en la eficacia percibida, las expectativas de éxito y el rendimiento en equipos de baloncesto (*trans*.: Interaction of cohesion and perceived efficacy, success expectations and performance in basketball teams). *Revista de Psicología del Deporte* (*trans*.: *Journal of Sport Psychology*), 19(1): 89-102.

LEO, F.M.; SÁNCHEZ-MIGUEL, P.A.; SÁNCHEZ-OLIVA, D. & GARCÍA-CALVO, T. (2010b). Interactive effects of team cohesion on perceived efficacy in semi-professional sport. *Journal of Sports Science and Medicine*, 9(2): 320-325.

LEO, F.M.; SÁNCHEZ-MIGUEL, P.A.; SÁNCHEZ-OLIVA, D.; AMADO, D. & GARCÍA-CALVO, T. (2011). Incidencia de la cooperación, la cohesión y la eficacia colectiva en el rendimiento en equipos de fútbol [*trans.:* Incidence of the cooperation, cohesion and collective efficacy on performance in football teams]. *Revista Internacional de Ciencias del Deporte* (*trans*.: *International Journal of Sport Science*), 7(26): 341-354.

LEO, F.M.; SÁNCHEZ-MIGUEL, P.A.; SÁNCHEZ-OLIVA, D.; AMADO, D. & GARCÍA-CALVO, T. (2014). Analysis of the group process and the performance in semi-professional soccer. *Revista Internacional de M edicina y Ciencias de la Actividad Física y del Deporte* (*trans*.: *International Journal of Medicine and Science of Physical Activity and Sport*), 14(53): 153-168.

MYERS, N.D.; FELTZ, D.L. & SHORT, S.E. (2004). Collective efficacy and team performance: A longitudinal study of collegiate football teams. *Group Dynamics*: *Theory, Research, and Practice*, 8(2): 126-138.

MYERS, N.D.; PAYMENT, C.A. & FELTZ, D.L. (2007). Regressing team performance on collective efficacy: Considerations of temporal proximity and concordance. *Measurement in Physical Education and Exercise Science*, 11(1): 1-24.

PASKEVICH, D.M.; BRAWLEY, L.R.; DORSCH, K.D. & WIDMEYER, W.N. (1999). Relationship between collective efficacy and cohesion: Conceptual and measurement issues. *Group Dynamics*: *Theory, Research, and Practice*, 3(3): 210-222.

RAMZANINEZHAD, R.; KESHTAN, M.H.; SHAHAMAT, M.D. & KORDSHOOLI, S.S. (2009). The relationship between collective efficacy, group cohesion and team performance in professional volleyball teams. *Brazilian Journal of Biomotricity*, 3(1): 31-39.

SCHUMACKER, R.E. & LOMAX, R.G. (1996). *A beginner's guide to structural equation modelling*. Mahwah, NJ: Erlbaum.

SPINK, K.S. (1990). Group cohesion and collective efficacy of volleyball teams. *Journal of Sport and Exercise Psychology*, 12(3): 301-311.

WATSON, C.B.; CHEMERS, M.M. & PREISER, N. (2001). Collective efficacy: A multilevel analysis. *Personality and Social Psychology Bulletin*, 27(8): 1057-1068.

ZACCARO, S.J.; BLAIR, V.; PETERSON, C. & ZAZANIS, M. (1995). Collective efficacy. In J.E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment*: *Theory, research, and application* (pp.305–328). New York, NY: Plenum Press.

Prof Francisco M. LEO: Faculty of Teacher Training. University of Extremadura. C/ Avenida de la Universidad, S/N, C.P.: 10003, Cáceres, Spain. Tel.: +34 927 257049, Fax.: +34 927257051, Email: franmilema@unex.es

(Subject Editor: Prof Leon van Niekerk)