




# Do sport teams with greater team resilience perceive higher performance at the end of the season? A multilevel analysis

Miguel A. López-Gajardo<sup>1</sup>  | Desmond McEwan<sup>2</sup>  | Juan J. Pulido<sup>1</sup>  |  
Jesús Díaz-García<sup>1</sup>  | Francisco M. Leo<sup>1</sup> 

<sup>1</sup>Department of Didactics of Musical, Plastic and Corporal Expression, University of Extremadura, Cáceres, Extremadura, Spain

<sup>2</sup>Department for Health, University of Bath, Bath, UK

## Correspondence

Francisco M. Leo. Faculty of Teacher Training. University of Extremadura. C/ Avenida de la Universidad, s/n, C.P. 10003, Cáceres, Spain.  
Email: [franmilema@unex.es](mailto:franmilema@unex.es)

## Funding information

Financial support provided by the European Regional Development Fund (ERDF, GR18102), Government of Extremadura (Counselling of Economy and Infrastructure) and Government of Spain (Ministry of Education, Culture and Sports, FPU17/03489 and IJC2019-040788-I); Junta de Extremadura; Ministry of Economy; European Union; European Regional Development Fund; Ministry of Education, Culture and Sports

## Abstract

A team's ability to respond positively to adversities, problems, and obstacles during their season is an essential part of success in collective sports. Grounded in team resilience theory and using a multilevel analytical approach, this study examined the relationship of the characteristics of resilience and vulnerability under pressure with perceived individual and team performance. Participants were 676 soccer players (530 males and 146 females) aged 15–42 years ( $M = 21.40$ ,  $SD = 5.38$ ), who played on 64 senior and under-18 soccer teams of several national leagues in Spain. In the final month of the season, factors related to team resilience and individual and team performance were analyzed. We estimated multilevel models by including perceived individual and team performance as dependent variables. Characteristics of resilience and vulnerability under pressure were considered as fixed and random effects (i.e., individual- and team-level intercepts and slopes). At the individual level, results showed that characteristics of resilience were positively associated with subjective individual and team performance, whereas vulnerability under pressure was negatively related to perceived team (but not individual) performance. At the team level, only characteristics of resilience positively predicted team performance. These findings suggest that more resilient teams report more successful performance from an individual and team perspective, whereas teams that are more vulnerable under pressure report poorer team performance. Taken together, the study underscores the importance of practitioners to develop strategies that improve their teams' resilience, given that team resilience helps to achieve positive subjective individual and team outcomes.

## KEYWORDS

group dynamics, sport, sports psychology, team resilience, vulnerability under pressure

## 1 | INTRODUCTION

Adverse situations, defined as events that predict maladjustment,<sup>1</sup> are unavoidable features of many team contexts, including within sports.<sup>2</sup> Teams frequently experience difficulties or setbacks that can reduce optimal functioning.<sup>2</sup> These stressful effects are present in many situations where there is a continuous quest for achievement and can affect both individual and team functioning.<sup>3,4</sup> Resilience is considered a positive adaptation to the adversities that occur in dynamic contexts.<sup>2</sup> In sports, players' individual resilience can help overcome these difficulties. Indeed, resilience has been considered one of the main characteristics of well-adjusted and high performer athletes.<sup>1</sup> However, taking into account the nature of sports teams where players are embedded within teams and depend on each other to resolve problems, it is also critical to consider resilience at the team level.<sup>5,6</sup> Indeed, performance can improve when teams cope constructively with the problems that arise during competitions and become a resilient collective.<sup>7</sup> In other words, team resilience is not merely the sum of individual members' resilience levels; rather, it is a group-level variable entailing a team's *collective* ability to withstand, and positively adapt to, adversity that they experience.<sup>1,2,8</sup>

The relevance of team resilience for athletes' performance has received increasing attention in recent years, as the evidence of the importance of resilience has continued to accumulate.<sup>9,10</sup> For example, team resilience has been related to the satisfaction of the basic psychological needs and effort,<sup>11</sup> and higher perceptions of group cohesion.<sup>12,13</sup> Also, Morgan et al.<sup>6,14</sup> identified qualitatively several psychosocial enablers associated with team resilience, such as transformational and shared leadership, team learning, social identity, or positive emotions. However, to our knowledge, there does not yet appear to be substantive quantitative evidence showing whether—and the extent to which—team resilience differentially predicts individual performance (IP) and team performance (TP) in team sports. In the current study, we aim to extend the current body of knowledge focused on the team resilience of sports teams by using a multilevel perspective to determine the relationships between team resilience with subjective IP and TP at the end of a season.

### 1.1 | Team resilience

Team resilience has been defined as a “psychosocial process which protects a group of individuals from the potential negative effect of the stressors they collectively encounter. It comprises processes whereby team members use their individual and collective resources to positively

adapt when experiencing adversity” (p. 552).<sup>8</sup> To explain the characteristics of team resilience in the sports context specifically, Morgan et al.<sup>8</sup> carried out a qualitative study with elite team sport athletes and found that team resilience encompasses four main components: (a) *group structure* (leadership roles, player communication, and shared vision in times of tension), (b) *learning* (experiences of mastery with past difficult situations), (c) *social capital* (including perceived social support and emotional bonds among team players), and (d) *collective efficacy* (union in the face of adversity and trust in the teammates in complex situations). Hence, team resilience is a complex multidimensional construct.<sup>2</sup>

With consideration for the four dimensions of team resilience,<sup>8</sup> Decroos et al.<sup>2</sup> developed the Characteristics of Resilience in Sports Teams (CREST) Inventory to measure team resilience. Four studies were conducted to test the validity and reliability of data derived from the CREST. Team resilience was ultimately shown to comprise two factors: (a) *characteristics of resilience* (CR), which refers to teams' abilities to withstand and overcome difficulties; and (b) *vulnerability under pressure* (VP), referring to the weaknesses that teams present in the face of adversities that they cannot successfully handle or overcome. As such, teams are said to adapt positively to adversity when they demonstrate high scores of CR. In contrast, it is thought that teams who score high on VP do not have sufficient resources to deal with the problems and adversities that they face.<sup>4</sup> Moreover, Kegelaers et al.<sup>15</sup> provided evidence that CR and VP are separate dimensions rather than opposite ends of one dimension. Hence, it is important to note that a team is not necessarily resilient when they score low on the VP factor; their scores on the CR factor must also be considered in order to fully appreciate a team's resilience.<sup>2,15</sup> As such, researchers need to consider both dimensions when examining team resilience.<sup>2</sup>

According to the operationalization of team resilience, perceptions of team resilience could be conditioned by the context.<sup>7,9</sup> Indeed, Morgan et al.<sup>14</sup> proposed that “for team resilience research and measurement in sport [...], team resilience should be operationalized and assessed differently at different levels of analysis” (p. 99). Specifically, since players are nested within teams, mean-centered group scores should be used to assess resilience at the individual level (i.e., to examine individual perception of team resilience) whereas aggregated scores of all the players on each team should be used to examine resilience at the team level (i.e., group perception of team resilience).<sup>16</sup> In response to the need to not only consider individual perceptions but group-level perceptions as well, Decroos et al.<sup>2</sup> validated the CREST Inventory at these two levels of analysis.

## 1.2 | Team and individual performance

The presence of CR and VP in sports teams can have cognitive, emotional, and behavioral consequences at both a team and individual level.<sup>9,17,18</sup> From a team perspective, if team members align their thoughts and perceive that their team could withstand adversity and adapt effectively, this could lead to an increase in team performance.<sup>14</sup> When team members use their combined resources to overcome adversity, the team could achieve group benefits.<sup>8</sup> In contrast, when teams experience debilitating effects under pressure whereby they are unable to cope with these demands effectively,<sup>7</sup> their collective performance is more likely to suffer.<sup>19</sup> In this regard, despite the research investigating the characteristics and potential benefits of CR in competitive sport and the considerable advancement of this body of work over the past decade, less is known about the consequences—including performance-related outcomes—that can result from a team's ability to handle or overcome adversities.

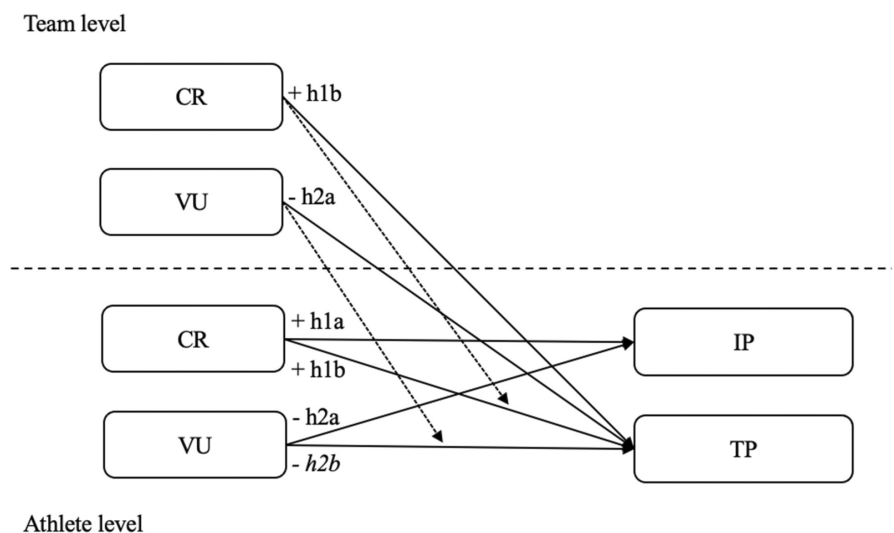
According to Hartmann et al.<sup>17</sup> developing CR can result in positive outcomes at both the group and individual levels. Players who feel supported by the team's capacity to overcome adversities might believe that they can perform at a (personally) high level by having more resources to compete and help the team. Indeed, it has been suggested that CR in elite players can predict IP in the sports context.<sup>20</sup> Moreover, other group dynamic variables (e.g., group cohesion) have been associated with improvements in individual variables in sport (e.g., role ambiguity).<sup>21</sup> For instance, players on teams with greater cohesion tend to perceive better individual performance.<sup>22</sup> Based on this collection of research, it is possible that positive perceptions of team resilience would be associated with (perceived) individual performance in sport; however, to our

knowledge, quantitative evidence supporting this assertion has not yet been demonstrated.

## 1.3 | The present study

The aim of the present study is to examine the relationship between individual- and team-level perceptions between CR and VP with TP and IP in soccer teams (see Figure 1). Considering that teams constitute a collective context, where players are nested in sports teams, it is necessary to examine team resilience from a group perspective,<sup>7,8</sup> and test its impact on performance at multiple levels.<sup>16,18</sup> One such way to examine team resilience is through multilevel modeling which reduces bias in parameter estimates when regressing a team-level outcome of the aggregated scores of a construct measured at the individual level.<sup>23</sup> Myers et al.<sup>24</sup> suggested that the use of a multilevel framework is more appropriate when testing psychosocial variables among team members compared to analyses at the individual-level only. Another benefit of multilevel modeling is that researchers can obtain a large sample to draw accurate conclusions about the impact of different relationships at each level.<sup>23</sup>

Multilevel analysis has been used in different work groups to analyze the relationship between team resilience and performance;<sup>5,25</sup> however, there is no evidence of this relationship in sports groups. Thus, there is a need to examine these relationships within sport since this context presents different characteristics from other work groups: (1) teams compete every week; (2) all team members are typically of the same gender in each team; (3) teams must beat the opponent to achieve a good performance; (4) there is more than one player in each role; and (5) some players compete in a match while others do not. Moreover,



**FIGURE 1** The hypothesized model of the multilevel relationship between CR/VP and performance. Cross-level interactions are presented through dashed lines. CR, characteristics of resilience; IP, individual performance; TP, team performance; VP, vulnerability under pressure.

in previous studies with work-group samples,<sup>5,25</sup> performance was evaluated by the group's supervisor and not by the workers themselves. Concerning the assessment of performance, due to the difficulty to measure it objectively in the sports context and based on the latest studies,<sup>26–28</sup> we intend to examine performance through player perceptions of their individual, and the team's, performance.

In summary, the proposed research could extend the current literature about the relationship between team resilience and perceived performance in sport through a multilevel analysis in male and female sport (soccer) teams during the last stage of the season (see Figure 1). Taking into account our aim and the existing scientific evidence to date, we formulated the following hypotheses:

**Hypothesis 1.** Individual- and team-level CR will be positively associated with perceived TP (h1a), and individual-level CR will be positively related to IP (h1b).

**Hypothesis 2.** Individual- and team-level VP will be negatively associated with perceived TP (h2a), and individual-level VP will be negatively related to IP (h2b).

We also sought to analyze a possible interaction between the two levels. In this way, we could determine whether individual-level CR or individual-level VP is linked to perceived performance, as a function of greater team-level CR or team-level VP. As such, these interactions could be measured in teams with low values of team-level CR and team-level VP. Considering individual- and team-level cross-level interactions, we did not formulate an a priori hypothesis because, to our knowledge, there are no studies that have analyzed the relation of the target variables of the current study from a multilevel perspective.

## 2 | METHOD

### 2.1 | Participants

The sample was composed of 676 soccer players aged between 15 and 42 years ( $M = 21.40$ ,  $SD = 5.38$ ) corresponding to 64 semi-professional teams. A total of 530 participants were male ( $M = 21.29$ ,  $SD = 5.36$ ) and 146 female ( $M = 21.67$ ,  $SD = 5.43$ ). Of the 64 teams that participated in the study (53 male and 11 female), 48 were senior teams (38 males and 10 females), and 16 competed in the under-18 national category (15 males and 1 female). Team sizes ranged from 5 to 20 players per team, with an average of 10.56 athletes per team ( $SD = 5.41$ ). Initially, a total of 689 questionnaires

were collected at the end of the season. However, following the exclusion criteria of Leo et al. (2019), 22 questionnaires (2.95%) were removed because they were incorrectly completed (not fully completed because more than 50% of the items were unanswered or the same item was answered several times, or a clear response pattern was observed). The size of this final sample exceeds sample size various recommendations for conducting multilevel regression models analyses (i.e.,  $\geq 30$  teams).<sup>29</sup>

### 2.2 | Instruments

#### 2.2.1 | Team resilience

The Spanish version<sup>13</sup> of the CREST<sup>2</sup> was used to measure team resilience. This questionnaire begins with the header: "In the last month, when my team was under pressure...", followed by a total of 20 items, 12 of which correspond to the factor of CR (e.g., "the team gained greater conviction by working together to withstand the pressure") and 8 to the VP factor (e.g., "the team couldn't persist at the most difficult times"). Each item offers a 9-point response option, ranging from 1 (*totally disagree*) to 9 (*totally agree*). Multilevel confirmatory factorial analysis (MCFA) was performed to verify that the model fit was appropriate—scores greater than 0.90 for the incremental indexes of CFI and TLI and values of 0.08 or less for the RMSEA and SRMR were considered acceptable.<sup>30</sup> Acceptable model fit was evident:  $\chi^2(338) = 693.882$ ,  $p < 0.001$ , CFI = 0.94, TLI = 0.93, RMSEA = 0.04, 95% CI [0.03, 0.05],  $SRMR_{within} = 0.04$ ,  $SRMR_{between} = 0.08$ . In addition, both CR ( $\alpha = 0.92$ ,  $\omega = 0.91$ ) and VP ( $\alpha = 0.87$ ,  $\omega = 0.87$ ) showed adequate values of internal consistency.<sup>31</sup>

#### 2.2.2 | Perceived team and individual performance

Due to the high number of interactions that take place in a competition, it is very difficult to measure performance in collective sports; indeed, there does not appear to be a standardized and validated instrument in the scientific literature to analyze performance in the sports context. Some researchers have used objective measures such as league standings.<sup>22</sup> Although this might be useful in some studies, it can also be problematic insofar as it could ignore the initial expectations and objectives of the team, the actual context of the team, or the confounding contextual factors that are generated during a season (e.g., accumulation of injuries). For example, an inexperienced team with low expectations might perform to its full potential (and even exceed expectations) but still end up near the bottom of

the league standings by the end of the year—in this case, it would probably be inaccurate to suggest that this team did not perform well. Other researchers have, therefore, used players' perceptions/self-reported ratings to estimate performance.<sup>26,28</sup> This seems to be an ecologically valid and reliable way to assess performance in team sports. Therefore, to address the purposes of our study, subjective perceptions of performance of the players of each team were evaluated. Specifically, the scale previously used by Dithurbide et al.<sup>27</sup> composed of a single item, was used. Through this item, players were asked to rate their team's performance in the season (e.g., “the team's performance during the season has been...”). This item was also adapted to measure individual performance perceived by each player (e.g., “your individual performance on the team during the season has been...”). Both items were followed by a 10-point Likert scale ranging from 1 (*poor*) to 10 (*excellent*). Such scales have been used in previous investigations of soccer teams.<sup>26,28</sup>

## 2.3 | Procedure

Firstly, the University Bioethics Committee's approval was obtained. The ethical requirements of the American Psychological Association were also met. Secondly, for the development of the study, the people in charge of each team (i.e., management teams and coaches) were contacted, informing them about the stages and objectives that would be carried out if they took part in the study. Regarding males' soccer, all 62 senior teams from national competitions and 10 youth teams from Spain's first national division were invited to participate in the research. Concerning female teams, a total of 17 teams competing in the national Spanish leagues were invited to participate. Of the 89 invited teams, 64 ultimately agreed to participate in the study.

Prior to data collection, the principal investigator of this work received the players' informed consent to participate voluntarily in the project. In the case of minor athletes (i.e., under 18 years of age), a consent form was signed by the parent or guardian as well as by the player. We emphasized that the data would be visible only to the main investigators of the work and would be processed exclusively for the field of research.

According to Meneghel, Martínez, et al.<sup>5</sup> team resilience should be measured when the participants have had extensive prior interaction and an accumulation of information about the variables under investigation. Following these recommendations, the two measures were administered at the end of the season, with a cross-sectional design. In this way, we ensured that all the players had previously competed and had enough time to develop bonds between each of the team members. Thus, participants would be more likely to have a thorough/accurate opinion

of the team's ability to overcome the problems by measuring resilience and performance at this late point in the season compared to an earlier point. To obtain the data, the participants completed the questionnaires online. The questionnaires took approximately 10 min to complete. Players were requested to complete questionnaires before a training session, individually, and without distractions or the presence of any individuals associated with the club.

## 2.4 | Data analysis

Mplus 7.3 software was used to analyze the data.<sup>32</sup> Firstly, data cleaning procedures were conducted according to prior exclusion criteria and preliminary analyses were estimated to test the validity and reliability of the data. Secondly, we calculated the descriptive statistics and Pearson's correlations between the target variables. Thirdly, we specified two null models for TP and IP to calculate the intraclass correlation coefficient (ICC). ICC values greater than 10% indicate variability in the data, showing that multilevel analysis is required.<sup>33</sup> Fourthly, a multilevel model with MLR estimator was performed for the main analysis (MLM), as the study participants were nested in groups.<sup>34</sup>

Two separate models were configured, one for each dependent variable (TP and IP), at two different levels (i.e., individual level and team level) with random slopes. These random effects reveal the variability of the slopes within the team (i.e., individual level) or between teams (i.e., team level). Therefore, we tested the degree to which CR and VP could predict TP (Model 1) and IP (Model 2). We included gender and age to control for their potential impact on the relationship between CR and VP with perceived performance (TP and IP). At the individual level, individual scores of dependent and independent variables centered at the mean of each team were included (i.e., group-mean centered) and, at the team level, the aggregated scores of the independent variables were included (i.e., CR and VP) in Model 1. Through the same model, we also explored whether team-level CR and team-level VP would moderate the proposed associations of individual-level CR and individual-level VP with TP at the individual level (i.e., cross-level interactions).

## 3 | RESULTS

### 3.1 | Descriptive statistics, correlations, and internal consistency

Table 1 shows the means, standard deviations, and correlations between each of the target variables included in this work. In general, the participants selected scores

above the midpoint in the CR factor (individual-level CR and team-level CR) and TP and IP, and below the midpoint in the VP factor (individual-level VP and team-level VP). Significant, positive relationships were observed between the relationship of individual-level CR and team-level CR with TP ( $r = 0.63$ ) and IP ( $r = 0.30$ ). In contrast, individual-level VP and team-level VP showed significant negative relationships with both TP ( $r = -0.24$ ) and IP ( $r = -0.56$ ).

### 3.2 | Main analysis

Firstly, we calculated the ICCs of the dependent variables (i.e., TP and IP; see Table 2). Values of 0.43 for TP and 0.08 for IP were found, suggesting statistically significant variability only in perceived TP (ICC > 10%; Hox et al., 2017). Secondly, neither gender nor age predicted TP and IP, showing that there were no gender- or age-related differences in perceived performance.

#### 3.2.1 | Team performance

The results corresponding to the model of perceived TP (Model 1) are shown in Table 2. At the individual level, CR was positively associated with TP ( $\beta = 0.63$ ;  $p < 0.001$ , 95% CI [0.43, 0.83]), and VP was negatively related to TP ( $\beta = -0.21$ ,  $p = 0.005$ , 95% CI [-0.36, -0.07]). At the team level, CR positively predicted TP at the end of the season ( $\beta = 1.33$ ,  $p < 0.001$ , 95% CI [0.76, 1.89]), but VP did not ( $\beta = -0.36$ ,  $p = 0.246$ , 95% CI [-0.96, 0.25]). In terms of interactions between levels, no significant interaction between CR (i.e., Individual x Team levels) and VP (i.e., Individual x Team levels) predicted TP. In terms of random effects, the residual variances in TP were significant at both at the individual level ( $\beta = 1.58$ ,  $p < 0.001$ , 95% CI [1.28, 1.88]) and the team level ( $\beta = 0.23$ ,  $p = 0.014$ , 95% CI [0.06, 0.28]). Concerning the slopes, both CR ( $\beta = 0.08$ ,  $p = 0.230$ , 95% CI [-0.05, 0.22]) and VP ( $\beta = 0.08$ ,  $p = 0.080$ , 95% CI [-0.01, 0.16]) between teams were not significant for TP.

#### 3.2.2 | Individual performance

The results concerning IP (Model 2; see Table 2) indicate that individual-level CR were positively related to the player's perceived performance at the end of the season ( $\beta = 0.41$ ,  $p < 0.001$ , 95% CI [0.19, 0.62]). However, individual-level VP was not associated with IP ( $\beta = -0.02$ ,  $p = 0.934$ , 95% CI [-0.34, 0.37]). As for the random effects, the residual variances were only significant at the individual level in IP ( $\beta = 2.60$ ,  $p = 0.012$ , 95% CI [0.48, 1.75]).

## 4 | DISCUSSION

In this study, we analyzed the relationship between CR and VP with TP and IP from a multilevel perspective. Overall, we found that (a) CR were positively associated with TP and IP at the individual level as well as TP at the team level, and (b) VP was negatively associated with TP at the individual level. The results of each hypothesis as well as the implications, limitations, and potential future research directions related to this study are discussed in the remainder of this paper.

### 4.1 | Relationships between characteristics of resilience and subjective performance

Hypothesis 1 stated that, at the individual and team level, CR would be positively associated with perceived TP (*h1a*) and, at the individual level, CR would be associated with IP (*h1b*). Firstly, considering TP as a dependent variable, our analysis revealed that players who perceived greater CR in their teams (i.e., at the individual level) also indicated that their teams had shown good TP. Likewise, teams that perceived greater CR (i.e., at the team level) claimed to have had better TP at the end of the season. Based on a qualitative study, Holt and Dunn<sup>35</sup> stated that a good resilient profile was linked to higher levels of athletic performance. Also, in the business sphere, greater worker CR were positively related to performance.<sup>5,25</sup> Hence, our

**TABLE 1** Means, standard deviations, reliability analysis and bivariate correlations of the study variables

	<i>M</i>	<i>SD</i>	$\alpha$	$\omega$	1	2	3	4
1. Characteristics of resilience	5.51	1.05	0.92	0.91	—			
2. Vulnerability under pressure	2.62	1.28	0.87	0.87	-0.76***	—		
3. Individual performance	7.90	2.04	—	—	0.30***	-0.24***	—	
4. Team performance	7.28	1.75	—	—	0.63***	-0.56***	0.38***	—

Note:  $\alpha$  = Cronbach's alpha;  $\omega$  = McDonald's omega.

\*\*\* $p < 0.001$ .

**TABLE 2** Regression coefficients and standard errors of the multilevel models predicting performance

Variables	TP		IP	
	Coefficient	SE	Coefficient	SE
Fixed effects				
Intercept	7.31***	0.41	7.19***	0.70
Individual-level predictors				
Sex	0.02	0.19	0.29	12.68
Age	−0.01	0.01	−0.03	10.17
CR	0.63***	0.10	0.41***	0.15
VP	−0.21**	0.08	−0.02	0.77
Team-level predictors				
CR	1.33***	0.29		
VP	−0.36	0.31		
Individual- x team-level interactions				
CR	0.04	0.15		
VP	−0.14	0.12		
Random effects				
Individual-level variance	1.58***	0.15	2.60***	0.21
Team-level variance	0.23**	0.25		
CR slope	0.08	0.07		
VP slope	0.08	0.04		
ICC	0.43		0.08	

Abbreviations: CR, characteristics of resilience; IP, individual performance; ICC, intraclass correlation; SE, standard error; TP, team performance; VP, vulnerability under pressure.

\*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

findings are in line with previous evidence that there is a positive relationship between the ability to overcome adversity and group effectiveness.<sup>8,9</sup>

Concerning results at the team level (i.e., the perceptions of the group as a whole), Fletcher and Sarkar<sup>20</sup> previously stated that the group influences the relationship between the CR and performance. Within team sports, Gucciardi et al.<sup>18</sup> pointed out that such positive consequences depend above all on the group to which the players belong.<sup>7</sup> In this vein, for a given team consisting of a collection of individual athletes, having high CR could lead to an increase in TP. In other words, in collective sports, the reciprocal relationship of personal and group resources appears to lead to the achievement of these individual and team results.<sup>36</sup> This study addresses a sporting context where there is constant high pressure to achieve specific performance goals—according to Bryan et al.<sup>37</sup> these stressful situations prolonged over long periods could lead to direct consequences on performance if they are not managed effectively. Therefore, it seems sensible that players who perceive that their teams are resilient will better overcome problems that emerge within the

competitive context,<sup>7</sup> thereby improving the team's performance.<sup>16</sup> Moreover, Alliger et al.<sup>38</sup> noted that “team performance and well-being are only possible when the team is resilient” (p. 177). In this regard, the group in which the player competes will be related to achieving greater further success.<sup>9</sup> Thus, our findings relating to Hypothesis 1a align with previous research and highlight the importance of the developing CR in soccer.

Second, in reference to the dependent variable of IP, players who perceived greater CR in their team in the last month of competition (i.e., at the individual level) also perceived that their IP was higher at the end of the competition. These results provide support for the assertions from Morgan et al.<sup>8</sup> who suggested that CR can be an individual opportunity to develop personal abilities. In practice, these findings indicate that, in order to achieve individual improvement in performance, it is important to perceive the team with a high capacity for coping with or overcoming adversity.<sup>36</sup> This may be because each player feels more confident, more supported by the team, and stronger to overcome failure.<sup>26</sup> These results are consistent with previous quantitative research in the sport,

where other group variables (e.g., group cohesion) were associated with individual outcomes (e.g., IP).<sup>22</sup>

## 4.2 | Relationships between vulnerability under pressure and subjective performance

The second major hypothesis suggested that, at individual and team level, VP would be negatively associated with the levels of perceived TP (*h2a*) and, at individual level, VP would be negatively associated with IP (*h2b*). Firstly, at the individual level, VP was a significant negative predictor of collective performance, thus supporting Hypothesis 2a. This means that the players who perceived greater VP in their teams during the last month of competition also observed lower TP. These findings are consistent with previous research suggesting that the difficulties that occur in competitions can reduce the team's performance.<sup>2,7</sup> The existence of a greater number of vulnerable characteristics can lead to constant maladaptive behaviors during the competition and they converge in a worsening of the collective functioning due to the team's inability to correctly respond to competition demands.<sup>2,6</sup> Previous studies have linked this vulnerability to other negative behaviors, such as ineffective player communication or a higher number of intra-group conflicts that can occur conjointly and impair performance.<sup>2</sup>

Attending the team level, there was not a significant relationship between teams showing VP (i.e., at the team level) with perceived team performance. Therefore, Hypothesis 2a is only partially supported. This result can possibly be explained by the intra-team variability in perceptions of VP—that is, the aggregate scores at the team level can balance the range of perceptions within the group (e.g., higher ratings of VP by some players could offset the low ratings given by other players). Future studies should include resilience at different levels of analysis to confirm how the group affects the relationship between VP and achieving or increasing performance. Nonetheless, in general, the results appear to suggest that in order to achieve success in a context of sports performance, it is essential to address the development of the team's CR and reduce potential vulnerabilities under pressure. Doing so can protect the teams from the adverse consequences that can emerge from the competition resulting in effective functioning particularly in terms of player's individual perceptions of their team's performance.<sup>14,20</sup>

Secondly, VP did not negatively predict IP, rejecting Hypothesis 2b. This result reveals that players who perceived greater vulnerability within their team did not report significantly worse IP during this period. It is unclear why this null relationship took place since the few

previous studies that have analyzed the individual consequences of the team's vulnerability did not find a similar result. However, one could speculate that this may be because players often have an external causality locus (i.e., each player could attribute to external reasons the team's vulnerability under pressure), and it is difficult to acknowledge that IP has dropped in situations where the team had no resources to face adversity.<sup>39</sup> That is, to accept a decline in IP in the face of adverse situations implies taking on some of the responsibility for the lack of resources. However, this reasoning is speculative; thus, determining whether there is indeed a significant (negative) relationship or not between VP and IP (and why) warrants further investigation. For example, researchers could consider analyzing the repercussions or negative consequences (beyond perceived performance) for each individual player specifically among teams that have demonstrated more vulnerability to pressure during competition.

### Practical applications

From the findings reached with this study, recommendations or practical proposals can be drawn for implementation in a competitive situation. For one, our results add to the existing literature that suggests sports managers/coaches (even all personnel within a club)<sup>1</sup> could consider the importance of team resilience in their groups.<sup>6</sup> This could include incorporating strategies progressively to improve CR, which could help the team in vulnerable moments of the season.<sup>1</sup> For instance, technical staff and sports psychologists should be aware that developing CR can allow teams to deal with adversity and overcome problems more effectively—doing so can result in better TP and IP. In particular, coaching staff should develop tasks during the training sessions that challenge the athletes by using some positive and negative consequences that increase the pressure.<sup>15</sup> According to those authors, this could generate more players' errors which then allows for the provision of feedback and problem-solving following the mistakes and, therein, an opportunity to develop positive adaptations. Coaches should also induce pressure in training sessions to develop team resilience, for which the contribution and collaboration of all players are needed to overcome the different problems presented. Thereafter, coaches might incorporate formal reflection and learning opportunities in which the group knows the positive consequences of overcoming adversities. These activities can also be developed in different work groups to generate such collaboration between workers to resolve these problems together. Hence, any strategy implemented within sport teams must focus on building shared processes between players, and group functioning.<sup>1</sup>

In addition to focusing on CR, professionals should also pay attention to situations where the team cannot



face adversity and shows clear signs of VP over the course of a season. Doing so can provide an opportunity to analyze these moments develop better collective functioning.<sup>8</sup> Specifically, when teams show signs of vulnerability in the face of problems (i.e., the team fails to overcome adversity), potential strategies could be implemented with the group to develop and acquire specific skills that manage this negative impact and prevent the players' physical and psychological exhaustion. Particularly, coaches should be familiar with the weakening elements of performance in order to promote collective protective factors and buffer teams from potentially harmful consequences.<sup>14</sup> In general, if the objective is to promote the development of team resilience, each characteristic, process, and enabler should be addressed to increase team resilience.<sup>6,8,14</sup>

#### 4.4 | Limitations and future research directions

Despite the study's contribution to the knowledge of team resilience, this study has some limitations that should be considered. Firstly, the study was performed only with Spanish soccer teams. As such, it would be worth examining the relationship between the variables of the study in other collective sports and other contexts/countries to determine the generalizability of these findings as well as their potential moderators (e.g., age or gender). Secondly, in line with the methodology used in some previous studies of team resilience and performance,<sup>5,25</sup> our investigation used a cross-sectional design, which prevents us from drawing any causal conclusions or testing the fluctuations in the variables at other times of the season. However, as Spector pointed out,<sup>40</sup> a cross-sectional design has particular value when the underlying processes being studied have already occurred and are the starting point for a research question. In this regard, our work is a preliminary study to examine the multilevel association between CR, VP, and performance in a sports context (measured at the end of the season) through a quantitative methodology. Thus, we aimed to provide initial evidence as a basis for subsequent research. For future work, it would be advisable to perform more cross-sectional studies or longitudinal research with various measures at multiple timepoints cross a competitive season.<sup>3</sup> Intervention designs could also verify the causality of self-reported variables.<sup>15</sup> These types of studies would allow investigators to examine (a) how these perceptions evolve over time, and (b) whether there are reciprocal effects between these variables. Thirdly, although the instrument used to measure (individual and team) performance has prior support for its viability,<sup>26,28</sup> it only includes a single item. Therefore, broader and more detailed scales or an instrument that

jointly measures objective and perceived performance could be developed to better assess this variable. Future research could also analyze the specific adversities (e.g., numbers and types) that the team faces during a season. Such future research could adopt a mixed-model design that uses questionnaires and semi-structured interviews to determine players' perceptions of the nature of the adversities, the process to overcome these problems, and their relationship with performance.<sup>15</sup> Finally, we recommend examining the association of the group processes underpinning the resilient characteristics (e.g., transformational leadership, shared team leadership, teamwork, or social identity) and some team resilience development enablers (e.g., challenging training, to discuss about errors, or to resolve difficult situations) which may help teams and individual athletes overcome or cope with the problems that occur over the course of a season.<sup>6,7,14</sup>

#### 4.5 | Perspectives

This study serves as a first theoretical approximation to teams' perception of their resilient characteristics to improve performance (i.e., individual and team) in sports groups. In this regard, this work offers essential keys to achieve a performance improvement. Based on the findings, these professionals need to prepare the group to cope with the problems that emerge during the season. Also, due to the protective nature of team resilience, they should prevent players from relating these moments of adversity to threats and debilitating factors, but to consider them as opportunities to optimize the individual and team's performance.

### 5 | CONCLUSION

This research highlights the relationship between team resilience and performance in the last stage of competition of a season. In particular, these preliminary results suggest that players' high perceptions of team resilience are associated with greater perceptions of team and individual performance. Indeed, teams with higher CR appear more likely to demonstrate higher subjective TP. Moreover, it seems that when players perceive that their team shows VP in the face of adversity, this has a negative relationship with the team's performance.

#### ACKNOWLEDGEMENT

This work was supported by the Junta de Extremadura (Ministry of Economy, Science and Digital Agenda) with the contribution of the European Union through the European Regional Development Fund (GR21124) and

the Government of Spain (Ministry of Education, Culture and Sports, FPU17/03489 and IJC2019-040788-I).

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## ORCID

Miguel A. López-Gajardo  <https://orcid.org/0000-0001-8364-7632>

Desmond McEwan  <https://orcid.org/0000-0001-5118-6421>

Juan J. Pulido  <https://orcid.org/0000-0003-2416-4141>

Jesús Díaz-García  <https://orcid.org/0000-0002-9430-750X>

Francisco M. Leo  <https://orcid.org/0000-0003-0971-9188>

## REFERENCES

- Fletcher D, Sarkar M. Mental fortitude training: an evidence-based approach to developing psychological resilience for sustained success. *J Sport Psychol. Action*. 2016;7:135-157.
- Decroos S, Lines RLJ, Morgan PBC, et al. Development and validation of the characteristics of resilience in sports teams inventory. *Sport Exerc Perform Psychol*. 2017;6:158-178.
- Chapman MT, Lines RLJ, Crane M, et al. Team resilience: a scoping review of conceptual and empirical work. *Work and Stress*. 2018;34(1):1-25.
- Fletcher D, Hanton S, Mellalieu SD. An organisational stress review: conceptual and theoretical issues in competitive sport. In: Hanton S, Mellalieu SD, eds. *Literature Reviews in Sport Psychology*. Nova Science; 2006:321-373.
- Meneghel I, Martínez IM, Salanova M. Job-related antecedents of team resilience and improved team performance. *Pers Rev*. 2016;45:505-522.
- Morgan PBC, Fletcher D, Sarkar M. Developing team resilience: a season-long study of psychosocial enablers and strategies in a high-level sports team. *Psychol Sport Exerc*. 2019;45:101543.
- Morgan PB, Fletcher D, Sarkar M. Recent developments in team resilience research in elite sport. *Curr Opin Psychol*. 2017;16:159-164.
- Morgan PBC, Fletcher D, Sarkar M. Defining and characterizing team resilience in elite sport. *Psychol Sport Exerc*. 2013;14:549-559.
- Bowers C, Kreutzer C, Cannon-Bowers J, Lamb J. Team resilience as a second-order emergent state: a theoretical model and research directions. *Front Psychol*. 2017;8:1360.
- Fransen K, McEwan D, Sarkar M. The impact of identity leadership on team functioning and well-being in team sport: is psychological safety the missing link? *Psychol Sport Exerc*. 2020;51:101763.
- Yang Y, Li Y, Sun Y. Psychometric evaluation of the characteristics of resilience in sports team inventory in China. *PLOS ONE*. 2020; 15(6):e0234134.
- Gorgulu R, Senel E, Adilogullari İ, Yildiz M. An adaptation study of measurement properties for the characteristics of resilience in sports team inventory. *Educ Sci*. 2018;8:139.
- López-Gajardo MA, González-Ponce I, García-Calvo T, Ponce-Bordón JC, Leo FM. Adaptation and validation in Spanish of the characteristics of resilience in sports teams inventory in different cultures. *J Sport Psychol*. 2021;29:256-265.
- Morgan PBC, Fletcher D, Sarkar M. Understanding team resilience in the world's best athletes: a case study of a rugby union world cup winning team. *Psychol Sport Exerc*. 2015;16:91-100.
- Kegeleers J, Wylleman P, Bunigh A, Oudejans RRD. A mixed methods evaluation of a pressure training intervention to develop resilience in female basketball players. *J Appl Sport Psychol*. 2019;33:1-39.
- Wagstaff CRD, Sarkar M, Davidson CL. Resilience in sport: a critical review of psychological processes, sociocultural influences, and organizational dynamics. In: Wagstaff CRD, ed. *An Organizational Psychology of Sport: Key Issues and Practical Applications*. Routledge; 2017:138-168.
- Hartmann S, Weiss M, Newman A, Hoegl M. Resilience in the workplace: a multilevel review and synthesis. *Appl Psychol*. 2019;69(3):913-959.
- Gucciardi DF, Crane M, Ntoumanis N, et al. The emergence of team resilience: a multilevel conceptual model of facilitating factors. *J Occup Organ Psychol*. 2018;91:729-768.
- Brown CJ, Butt J, Sarkar M. Overcoming performance slumps: psychological resilience in expert cricket batsmen. *J Appl Sport Psychol*. 2019;32:277-296.
- Fletcher D, Sarkar M. A grounded theory of psychological resilience in Olympic champions. *Psychol Sport Exerc*. 2012;13:669-678.
- Bosselut G, McLaren CD, Eys MA, Heuzé JP. Reciprocity of the relationship between role ambiguity and group cohesion in youth interdependent sport. *Psychol Sport Exerc*. 2012;13:341-348.
- Heuzé JP, Raimbault N, Fontayne P. Relationships between cohesion, collective efficacy and performance in professional basketball teams: an examination of mediating effects. *J Sports Sci*. 2006;24:59-68.
- Croon MA, Van Veldhoven MJPM. Predicting group-level outcome variables from variables measured at the individual level: a latent variable multilevel model. *Psychol Methods*. 2007;12:45-57.
- Myers ND, Payment CA, Feltz DL. Reciprocal relationships between collective efficacy and team performance in women's ice hockey. *Group Dyn Theory Res Pract*. 2004;8:182-195.
- Meneghel I, Salanova M, Martínez IM. Feeling good makes us stronger: how team resilience mediates the effect of positive emotions on team performance. *J Happiness Stud*. 2016;17:239-255.
- Fransen K, Decroos S, Vanbeselaere N, et al. Is team confidence the key to success? The reciprocal relation between collective efficacy, team outcome confidence, and perceptions of team performance during soccer games. *J Sports Sci*. 2015;33:219-231.
- Dithurbide L, Sullivan P, Chow G. Examining the influence of team-referent causal attributions and team performance on collective efficacy. *Small Group Res*. 2009;40:491-507.
- Leo FM, García-Calvo T, González-Ponce I, Pulido JJ, Fransen K. How many leaders does it take to lead a sports team? The relationship between the number of leaders and the effectiveness of professional sports teams. *PLoS ONE*. 2019;14:e0218167.
- Hox J, McNeish D. Small samples in multilevel modeling. In: van de Schoot R, Miočević M, eds. *Small Sample Size Solutions*:

- A Guide for Applied Researchers and Practitioners*. Routledge; 2020:215-225.
30. Browne M, Cudeck R. Alternative ways of assessing model fit. In: Bollen KA, Long JS, eds. *Testing Structural Equation Models*. Sage; 1993:136-162.
  31. Nunnally JC, Bernstein IH. The assessment of reliability. In: Nunnally JC, Bernstein IH, eds. *Psychometric Theory*. New York, NY; 1994:248-292.
  32. Muthén L, Muthén B. Mplus statistical modeling software 1998–2019. Los Angeles: Muthén & Muthén.
  33. Hox JJ, Moerbeek M, Van de Schoot R. *Multilevel Analysis: Techniques and Applications*. Routledge; 2017.
  34. Chou CP, Bentler PM, Pentz MA. Comparisons of two statistical approaches to study growth curves: the multilevel model and the latent curve analysis. *Struct Equ Model Multidiscip J*. 2009;5:247-266.
  35. Holt NL, Dunn JGH. Toward a grounded theory of the psychosocial competencies and environmental conditions associated with soccer success. *J Appl Sport Psychol*. 2004;16:199-219.
  36. Galli N, Vealey RS. “Bouncing back” from adversity: Athletes’ experiences of resilience. *Sport Psychol*. 2008;22:316-335.
  37. Bryan C, O’Shea D, MacIntyre TE. The what, how, where and when of resilience as a dynamic, episodic, self-regulating system: A response to Hill et al. *Sport Exerc Perform Psychol*. 2018;7(4):355-362.
  38. Alliger GM, Cerasoli CP, Tannenbaum SI, Vessey WB. Team resilience: how teams flourish under pressure. *Organ Dyn*. 2015;44:176-184.
  39. Szczepaniak J, Guskowska M. Causal attributions of success and failure and mood states in football players. *Pol J Sport Tour*. 2016;23:202-211.
  40. Spector PE. Do not cross me: optimizing the use of cross-sectional designs. *J Bus Psychol*. 2019;34:125-137.

**How to cite this article:** López-Gajardo MA, McEwan D, Pulido JJ, Díaz-García J, Leo FM. Do sport teams with greater team resilience perceive higher performance at the end of the season? A multilevel analysis. *Scand J Med Sci Sports*. 2023;33:701-711. doi:[10.1111/sms.14295](https://doi.org/10.1111/sms.14295)