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Relationships between cohesion, collective efficacy and performance in professional basketball teams: An examination of mediating effects

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Abstract
The main aim of this study was to examine mediating effects in the relationships between cohesion, collective efficacy and performance in professional basketball teams. A secondary aim was to examine the correlates of collective efficacy in a professional sport. A total of 154 French and foreign professional players completed French or English versions of questionnaires about cohesion and collective efficacy. Two composite measures of individual performance were used (pre- and post-performance). Individual-level analyses were performed. Regression analyses supported two mediating relationships with collective efficacy as a mediator of the pre-performance – Group integration-task relationship, and Group integration-task as a mediator of the pre-performance – collective efficacy relationship. Statistical analyses indicated that neither Group integration-task nor collective efficacy was a better mediator in the relationship between pre-performance and the other group variables. Results also revealed positive relationships between three dimensions of cohesion (i.e. Individual attractions to the group-task, Group integration-task, Group integration-social) and collective efficacy. These findings suggest that in professional basketball teams, staff members should look after athletes who perform at a lower or below their usual level because their performances might lead them into a downward cohesion – collective efficacy spiral. Staff members should also develop a high quality of group functioning, both *on* and *off* the basketball court, given its relationship with collective efficacy.

Keywords: *Cohesion, collective efficacy, individual performance, professional, basketball*

Introduction

In sports that require interaction and interdependence to perform a task, coaches have intuitively recognized that cohesion and collective efficacy are important variables to ensure successful outcomes. A recent definition in the sport context conceptualized cohesion 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, Brawley, & Widmeyer, 1998, p. 213). Since the mid-1980s, most researchers have considered this construct from the perspective of a conceptual framework advanced by Carron and colleagues (Brawley, Carron, & Widmeyer, 1987; Carron, Widmeyer, & Brawley, 1985; Carron *et al.*, 1998; Widmeyer, Brawley, & Carron, 1985). In their conceptual model, cohesion consists of four dimensions based on two levels of distinction. The first level distinguishes individual attractions to the group and group integration; the second level distinguishes the task and social aspects of group involvement. Thus, four constructs are identified: Group integration-task (GI-T), Group integration-social (GI-S), Individual attractions to the group-task (ATG-T) and Individual attractions to the group-social (ATG-S).

The construct of collective efficacy was first proposed by Bandura (1986, 1997) as an extension of self-efficacy theory because many human activities require interaction among people working in groups. Zaccaro, Blair, Peterson and Zazanis (1995) defined collective efficacy as ''a sense of collective competence shared among individuals when allocating, coordinating, and integrating their resources in a successful concerted response to specific situational demands'' (p. 309). Bandura (1990, 1997) suggested that this construct has important implications for sport teams because it should affect team choices, effort, persistence and performance, especially in sports that required interaction and interdependence to achieve task success (e.g. basketball).

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Subsequent to Bandura's suggestion, research has examined collective efficacy, especially in relation to cohesion and performance in sport. Some research has focused on the relationship between cohesion and collective efficacy, in particular because Zaccaro *et al.* (1995) proposed that group qualities, especially cohesion, can contribute to a team's sense of efficacy. Spink (1990) found that both Individual attractions to the group-task and Group integration-social differentiated significantly between elite volleyball players in high and low collective efficacy groups; the high collective efficacy teams rated cohesiveness higher. On the other hand, no significant differences were found in recreational teams.

More recently, Paskevich, Brawley, Dorsch and Widmeyer (1999) reported strong correlations between task-related aspects of cohesiveness and members' shared beliefs about collective efficacy. Volleyball players from university and club teams who perceived high task cohesion also tended to perceive high overall collective efficacy in their team. The authors also noted that relationships between cohesion and collective efficacy were reciprocal.

Similar results were found by Kozub and McDonnell (2000) in a study involving seven rugby union teams. They found that the two task cohesion dimensions were positive predictors of collective efficacy, with Group integration-task being slightly better than Individual attractions to the group-task. Moreover, Kozub and McDonnell reported that despite positive significant correlations between the two social cohesion scales and collective efficacy, they did not add significantly to the prediction of collective efficacy. Taken together, previous research provides support for a task cohesion–collective efficacy relationship.

In addition to being related to each other in bivariate relationships, both collective efficacy and cohesion also have been found to be associated (independently) with performance. For example, a positive relationship has been reported between collective efficacy and performance in both laboratory (Greenlees, Graydon, & Maynard, 1999, 2000; Hodges & Carron, 1992) and field settings (Feltz & Lirgg, 1998; Paskevich, Myers, Feltz, & Short, 2004a; Myers, Payment, & Feltz, 2004b; 1995; Spink, 1990; Watson, Chemers, & Preiser, 2001). In so far as the latter is concerned, Spink (1990) determined that elite volleyball teams with higher perceptions of collective efficacy finished significantly higher in a competitive tournament than did those with lower collective efficacy. More recently, Paskevich (1995) demonstrated that the collective efficacy of university and club volleyball teams assessed at the beginning of the season was a significant predictor of the percentage of victories at mid-season.

Other studies have extended previous findings by examining the reciprocal nature of the collective efficacy–performance relationship. Watson *et al.* (2001) focused on the antecedents and consequences of collective efficacy in 28 college basketball teams tested at both the beginning and end of a season. The authors reported that collective efficacy beliefs at the beginning of the season predicted later collective efficacy and overall team performance at the end of the season. They concluded that sport teams develop persistent efficacy beliefs relatively early, and these have a positive influence on subsequent performance. Moreover, Watson and his colleagues found that past performance was a positive predictor of collective efficacy at the group level. These findings were replicated and extended by Feltz and her colleagues (Feltz & Lirgg, 1998; Myers *et al.*, 2004a,b) in three studies surveying ice hockey or American football teams within 24 h of competitions over consecutive weekends. In general, their results indicated that collective efficacy was a positive predictor of team performance within teams (Feltz & Lirgg, 1998; Myers *et al.*, 2004a,b), as well as within weeks and across teams (Myers *et al.*, 2004a). Moreover, previous performance appeared to be a positive predictor of subsequent collective efficacy within teams (Myers *et al.*, 2004b), as well as across games and teams (Feltz & Lirgg, 1998; Myers *et al.*, 2004a). Taken together, these results support a reciprocal relationship between collective efficacy and team performance.

Historically, a considerable amount of research has also focused on the relationship between cohesion and performance (for a review, see Carron, Colman, Wheeler, & Stevens, 2002). On the basis of their recent meta-analysis, Carron *et al.* (2002) concluded that a significant positive moderate to large relationship exists between cohesion and performance. This relationship was observed independently of type of cohesion (i.e. task vs. social), gender, sport type (i.e. co-active vs. interactive) or skill/experience of the competitors (i.e. high school, intercollegiate, club, professional). Moreover, both task and social cohesion were related to performance in a reciprocal fashion.

In their discussion, Carron *et al.* (2002) pointed out that their meta-analysis offered insight of a *descriptive* nature but it did not provide an *explanation* – answers associated with the ''why'' or ''when'' of the cohesion–performance relationship. The search for *why* cohesion is related to performance pertains to the search for possible mediators; the search for *when* cohesion is related to performance pertains to the search for possible moderators. The authors concluded that future research should examine how the different manifestations of group dynamics influence this relationship.

Given that in a mediating effect the predictor, mediator and dependent variable must be significantly correlated (Kim, Kaye, & Wright, 2001),

Carron *et al.* (2002) suggested concentrating on group variables that have been shown to be correlated with both cohesion and team success. The research reviewed above provides strong support for the proposition that one important mediator of the cohesion–performance (and performance–cohesion) relationship may be collective efficacy. As was pointed out above, positive reciprocal relationships have been found to exist between cohesion and performance (e.g. Carron *et al.*, 2002), collective efficacy and performance (e.g. Myers *et al.*, 2004b), and cohesion and collective efficacy (e.g. Paskevich *et al.*, 1999). Players in more cohesive teams may hold stronger shared beliefs in their team's competence, which in turn may lead to greater team success. And group performance success may increase players' perceptions of collective efficacy, which in turn may contribute to the development of cohesion.

But research also indicates that the three variables operate within an interdependent causal structure involving triadic reciprocal causation. Cohesion, collective efficacy and performance operate as interacting determinants that influence one another bidirectionally. Therefore, perceptions of cohesion also should mediate the collective efficacy–performance (and performance–collective efficacy) relationship. Players perceiving higher collective efficacy within their team may develop stronger perceptions of cohesion, which in turn may lead to greater team success. And group performance success may increase players' perceptions of cohesion, which in turn may increase perceived collective efficacy. Thus, the general purpose of the present study was to examine the mediating effects within the cohesion–collective efficacy–performance causal triangle in professional sport teams. Given the specificity of the sample (i.e. professional basketball players) and the limited research done on group dynamics within professional teams, no specific *a priori* hypothesis was advanced regarding which group variable (i.e. cohesion or collective efficacy) would mediate the relationship between the other and performance. Moreover, based on previous results indicating that both task and social aspects of cohesion were related to collective efficacy and performance, the four constructs of Carron and colleagues' (1985) conceptual model were used.

The sample chosen – professional basketball players – represents an important extension over previous research. No research to date has examined the nature and/or correlates of collective efficacy in professional sport. There is some direct and indirect support for the suggestion that professional athletes are a unique group. For example, in their meta-analysis Carron *et al.* (2002) observed a strong cohesion–performance relationship in high school and intercollegiate sport (effect sizes of 0.769 and 0.811 respectively), but a weak relationship in professional sport (effect size of 0.192). Also, whereas positive correlations were found by Spink (1990) between cohesion and collective efficacy in elite volleyball teams, none was found in recreational teams. Finally, cohesion and collective efficacy, although they are group constructs, are assessed through individual perceptions. The extent to which the two are group properties is indicated by the level of consensus (i.e. the degree to which those beliefs are shared). Zaccaro *et al.* (1995) have pointed out that the social nature of the group influences how shared beliefs develop. Professional and amateur sport represent vastly different social milieux. Thus, a second question of interest was to examine the correlates of collective efficacy in a professional sport.

The measure of performance used also represents an important extension of previous research. Bray and Whaley (2001) recently questioned the use of a team's win/loss record as the primary measure of performance effectiveness. They highlighted the many coaches who believe that team success depends on the combination of players' individual performances (e.g. Wooden, 1976, 1980; Westering, 1990). Therefore, they suggested that individual performance is an objective, sensitive performance measure that "could be more effective at revealing the true relationship between cohesion and performance" (Bray & Whaley, 2001, p. 262).

Research also provides some support for the proposition that playing status is related to cohesion. For example, Granito and Rainey (1988) reported that starters perceived stronger task cohesion than non-starters. Spink (1992) found similar results except that team success was a moderator. That is, perceptions of cohesion were different in less successful teams (with starters holding stronger perceptions of team cohesiveness) but no different in more successful teams. Thus, playing status (operationally defined by playing time) was introduced as a covariate in the analysis of the cohesion–collective efficacy–performance relationship in professional sport teams.

Methods

Participants

The original sample consisted of 154 male basketball players from 17 teams involved in the first ($n = 7$) or second ($n = 10$) division of a professional league. These athletes were aged 26.2 ± 4.5 years, had been professionals for 70.5 ± 51.7 months, members of their respective teams for 22.0 ± 32.2 months and possessed 183.1 ± 70 months of basketball experience.

Of the 154 players, 105 were French nationals, 34 were Americans and 15 were from other European countries. Responses from five European athletes were disregarded: they completed a French version of the questionnaires without any indication that they understood written French. In the final sample, teams were made up of 11 – 56% of foreigner players. Within each team, participation rate varied from 55 to 100% (five teams) of the team roster.

Measures

Cohesion. Given the differences in language capabilities within the sample, two cohesion inventories were used. Foreign participants completed the Group Environment Questionnaire (GEQ; Carron *et al.*, 1985) while the French players completed a French version of the GEQ called the Questionnaire sur l'Ambiance du Groupe (QAG; Heuzé & Fontayne, 2002). Both of these inventories contain 18 items and assess four aspects of cohesion:

- Individual attractions to the group-task (ATG-T): 4 items, e.g. 'I do not like the style of play on my team';
- Individual attractions to the group-social (ATG-S): 5 items, e.g. 'Some of my best friends are on my team';
- Group integration-task (GI-T: 5 items, e.g. 'Members of my team are united in trying to reach the goals for performance'; and
- Group integration-social (GI-S): 4 items, e.g. 'Members of my team rarely party together'.

For both inventories, responses are made on a 9-point Likert scale anchored at the extremes by ''strongly disagree'' (1) and ''strongly agree'' (9). Thus, higher scores reflect stronger perceptions of cohesiveness. Participants' responses on each scale were averaged to yield a scale score. Cronbach's alpha (Cronbach, 1951) values computed with the sample used in the present study were as follows: ATG-S ($\alpha = 0.44$ and 0.35), ATG-T ($\alpha = 0.79$ and 0.66), GI-T ($\alpha = 0.68$ and 0.69) and GI-S ($\alpha = 0.68$ and 0.76) for the QAG and GEQ respectively. Given the low reliability values for the ATG-S scale, it was not used in subsequent analyses.

Collective efficacy. Initially, an expert coach (i.e. coached professional teams for 20 years) and the authors (one of whom was a former coach of the French national junior basketball teams and is currently employed with the French Federation of Basketball) developed a series of items designed to reflect important game competencies (i.e. offensive and defensive skills, strategies) in accord with Bandura's (1986) recommendations for constructing efficacy measures. Next, the clarity and relevance of the items were scrutinized by three professional basketball players, one of whom was bilingual. Editing suggestions were adopted if considered appropriate. Finally, the bilingual athlete, the coach and the researchers translated the items into English. The bilingual player scrutinized the English version to ensure that it was identical to the French version and understandable for English-speaking players. The result was a 27-item measure (presented in both French and English) designed to assess both offensive (e.g. ''Our team's confidence in our ability to handle the ball against defensive pressure is ...'') and defensive (e.g. ''Our team's confidence in our ability to play all floor defence is ...'') skills. The preamble to each item focused on the group's confidence to accomplish a specific task (Moritz & Watson, 1998): ''Answer the following questions with respect to what you believe your team thinks about its confidence in its ability to do certain things in basketball''. Consistent with recommendations for the measurement of efficacy advanced by McAuley and Mihalko (1998), responses were made on an 11-point scale anchored at the extremes by ''not at all confident'' (0%) and ''extremely confident'' (100%). Higher scores represented stronger perceptions of collective efficacy. Participants' responses on the 27-items were coded from 1 (0%) to 11 (100%) and averaged to yield a collective efficacy score.

When the data from the present sample were analysed, Cronbach's alpha (Cronbach, 1951) values were found to be acceptable for the French and English measures of collective efficacy ($\alpha = 0.90$ and 0.96 respectively).

Performance. The French National League of Basketball computes (and posts on its website: http://www.lnb.fr) a measure of individual performance for every competitor for every game. The purpose of this measure is to account for the different roles that athletes can fulfil on the court, not only the offensive roles. This measure of individual performance is derived from individual game statistics inserted into the following equation:

$$\begin{aligned} \mathrm{PERF} = {} & (4 \times \mathrm{SS}_3 + 3 \times \mathrm{SS}_2 + 2 \times \mathrm{SFT}) \\ & - (\mathrm{AS}_3 + \mathrm{AS}_2 + \mathrm{AFT}) \\ & + (\mathrm{OR} + \mathrm{DR} + \mathrm{AG} + \mathrm{SG}) - \mathrm{LB} \end{aligned}$$

where PERF represents individual performance, SS_3 is the number of successful 3-point shots, SS_2 is the number of successful 2-point shots, SFT is the number of successful free throws, AS_3 is the number of 3-point shots attempted, AS_2 is the number of 2-point shots attempted, AFT is the number of free throws attempted, OR is the number of offensive rebounds, DR is the number of defensive rebounds,

AG is the number of assists per game, SG is the number of steals per game, and LB is the number of turnovers per game.

Given the reciprocal nature of the relationships between cohesion, collective efficacy and performance, two measures of performance were obtained. The ''pre-test performance'' measure was the average for individual performance for the eight games prior to testing for cohesion and collective efficacy. The ''post-test performance'' measure was the average for individual performance for the eight games subsequent to testing for cohesion and collective efficacy. The number of games was chosen to improve the reliability of performance measures and have an equal number of home and away games.

Playing time. French professional basketball teams are typically composed of French nationals and imports (i.e. two from the USA and others from European countries). Typically, foreign players record more playing time and superior individual performance scores. As indicated above, previous research has shown that playing status (starters and non-starters) influences perceptions of cohesiveness (Granito & Rainey, 1988; Landers & Crum, 1971; Spink, 1992; Westre & Weiss, 1991). Thus, the amount of playing time (operationally defined by number of minutes an athlete played per game) was used as a covariate and was the average for individual playing time for the eight games before versus after testing for cohesion and collective efficacy.

Procedure

During the 2000 – 2001 championship, nine head coaches were contacted in January to determine their interest in becoming involved in the study, of whom six agreed to participate. To increase statistical power, it was decided to contact professional coaches again before the following season (2001 – 2002 championship). At this time, one of the authors gave an invited address to a conference for professional basketball coaches. At the end of the talk, the study was described and coaches were invited to participate. Coaches representing 20 of the 32 professional teams agreed and took questionnaires. Ultimately, however, data were obtained from only 11 additional teams.

The procedure for data collection was identical in both periods (i.e. seasons). That is, each coach, although unaware of the specific hypotheses of the study, was informed that the general purpose was to assess the effectiveness of group functioning in professional basketball teams. An appointment was made between the first and the second third of the season for questionnaire administration. The specific timing of test administration ensured that team members would have sufficient opportunities to interact and develop both cohesion and collective efficacy beliefs.

The questionnaires were administered before team training sessions in the middle of the week (with games generally being played on Saturday evenings). Coaches distributed questionnaires and the athletes read instructions written on the first questionnaire sheet. Informed consent forms were provided and completed. Each athlete indicated biographical information on the first questionnaire sheet (name, age, etc.) and completed his questionnaires independently. To ensure confidentiality, envelopes containing no identifying characteristics were provided. The athletes inserted the completed questionnaires into these envelopes and sealed them. Sealed envelopes for each team were immediately returned to the authors.

Results

Descriptive statistics

Given that the sample consisted of French and foreign athletes, descriptive statistics were computed separately for players' age, playing experience, professional experience in basketball, team tenure, cohesion, collective efficacy, pre- and post-performance, and pre- and post-playing time. The results are presented in Table I.

Due to the different nationalities, comparisons between French and foreign players were performed for descriptive variables (age, playing experience, team tenure, professional experience in basketball) and playing time. Given the different number of French and foreign players in our sample, a set of Mann-Whitney *U*-tests was performed. Results revealed significant differences for: (a) age ($U = 1373.50$, $P < 0.001$), with foreign players being older; (b) playing experience ($U = 1717.50$, $P < 0.05$), with foreign players being more experienced; (c) team tenure ($U = 1262.00$, $P < 0.001$), with French players being members of their team for a longer period; (d) pre- and post-playing time ($U = 765.00$, $P < 0.001$ and $U = 866.00$, $P < 0.001$, respectively), with foreign players having more playing time.

Level of analysis

Given that this study involved a hierarchical data structure (i.e. athletes nested into teams), the level of analysis was a concern. Recently, Papaioannou, Marsh and Theodorakis (2004) suggested that multi-level modelling should always be chosen whenever the data have a multi-level structure. This statistical technique allows one to examine relations occurring at each level and across levels. However,

Table I. Descriptive statistics, intraclass correlations and eta-squared values of the cohesion and collective efficacy scales, pre- and post-performance

Variable	French athletes ($n = 105$) (mean ± s)	Foreign athletes ($n = 44$) (mean ± s)	ICC	$F_{16,132}$	P
Age (years)	25.31 ± 4.64	28.50 ± 3.49			
Playing experience (months)	177.26 ± 72.55	198.33 ± 72.71			
Professional experience (months)	67.51 ± 52.11	76.78 ± 53.45			
Team tenure (months)	28.32 ± 37.22	8.56 ± 6.71			
ATG-T	6.79 ± 1.74	6.20 ± 1.96	0.22	3.48	0.000
GI-S	4.35 ± 1.60	5.05 ± 1.79	0.16	2.68	0.001
GI-T	6.89 ± 1.18	6.09 ± 1.55	0.13	2.30	0.005
Collective efficacy	7.44 ± 0.80	7.74 ± 1.34	0.03	1.29	0.212
PREPERF	5.91 ± 4.62	13.59 ± 5.89	−0.08	0.34	0.992
POSTPERF	6.38 ± 5.39	14.27 ± 6.67	−0.05	0.56	0.906
PREPLAY (min)	16.53 ± 10.09	28.39 ± 7.92			
POSTPLAY (min)	16.91 ± 10.45	27.98 ± 8.60			

Note: ATG-T = Individual attractions to group-task; GI-S = Group integration-social; GI-T = Group integration-task; PREPERF = pre-performance; POSTPERF = post-performance; PREPLAY = pre-playing time per game; POSTPLAY = post-playing time per game.

studying professional athletes often results in small sample sizes. In this study, 17 teams finally participated in the data collection. Moreover, groups were not complete given that some players missed the questionnaire administration. Thus, data collections clearly weakened the examination of relations occurring at the group level and across levels (Raudenbush & Bryk, 2002). Finally, performance was recorded at the individual level. Therefore, a decision was made to examine the relationships among the variables at the individual level. We adopted this level of analysis because within-group differences have potential motivational and behavioural consequences (Watson *et al.*, 2001).

Nonetheless, intraclass correlation coefficients (ICCs) (Kenny & La Voie, 1985) were calculated to determine whether a group effect occurred. Table I summarizes ICCs for the cohesion, collective efficacy and performance measures. The results indicated that, for each cohesion scale, a significant percentage of variance was at the group level. However, Myers (1972) suggested using a liberal criterion (i.e. $\alpha < 0.25$) to test for group phenomena rather than the conventional one (i.e. $\alpha < 0.05$). With the use of such a liberal criterion, the intraclass correlation coefficient for collective efficacy was also consistent with a group effect. Nonetheless, the ICCs varied from 0.03 (collective efficacy) to 0.22 (Individual attractions to the group-task), indicating that the largest amount of variance in collective efficacy and cohesion was within groups and that considering the relationships between the studied variables at the individual level was meaningful.

Therefore, because (a) group effects occurred, (b) French and foreign athletes were given different questionnaires (i.e. French vs. English version) and (c) had different playing times, which are related to individual performances, we controlled statistically for group effect, nationality and playing time. A dummy variable was created for each team. Also, nationality was dummy coded (i.e. 1 was assigned to French players and 0 to foreign players). As correlations between playing time and nationality ($r = -0.47$, $P < 0.001$ for pre-playing time, $r = -0.42$, $P < 0.001$ for post-playing time) did not exceed the limit for multicollinearity of 0.90 (Tabachnik & Fidell, 1995), a set of multiple regression analyses was performed with playing time (pre or post), nationality and team as independent variables, cohesion scales (i.e. three), collective efficacy scale and performance (pre- or post-performance) as dependent variables. Residuals from these multiple regression analyses were saved and used as input data in the subsequent analyses (for more information about this procedure, see Madon, Jussim, & Eccles, 1997).

Mediating effects

Table II summarizes bivariate partial correlations among variables with playing time, nationality and group membership held constant. Results revealed significant positive correlations between the cohesion scales (ATG-T, GI-T and GI-S) and collective efficacy (range 0.17 to 0.48). Pre-performance was significantly related to Group integration-task (0.21) and collective efficacy (0.19), whereas post-performance was not correlated with any of the cohesion and collective efficacy scales.

Based on these correlations (Kim *et al.*, 2001), mediating effects were only examined using: (a) pre-performance as the independent variable,

Table II. Partial correlations between cohesion, collective efficacy and performance with nationality, playing time and group membership held constant

	ATG-T	GI-S	GI-T	CE	PREPERF
ATG-T	—	0.26**	0.25**	0.17*	0.05
GI-S	0.28**	—	0.46***	0.40**	0.01
GI-T	0.27**	0.46***	—	0.42***	0.21*
CE	0.17*	0.40***	0.41***	—	0.19*
POSTPERF	0.03	−0.11	0.03	0.05	—

Note: ATG-T = Individual attractions to group-task; GI-S = Group integration-social; GI-T = Group integration-task; CE = collective efficacy; PREPERF = pre-performance; POST-PERF = post-performance.
***$P < 0.001$; **$P < 0.01$; *$P < 0.05$. Bivariate correlations between group variables and pre-performance are above the diagonal. Bivariate correlations between group variables and post-performance are below the diagonal.

collective efficacy as the mediating variable, and Group integration-task as the dependent variable; or (b) pre-performance as the independent variable, Group integration-task as the mediating variable, and collective efficacy as the dependent variable. Following Baron and Kenny's (1986) suggestions, a set of simple and multiple linear regression analyses was undertaken and four conditions were examined.

According to Baron and Kenny's (1986) first condition, the predictor (i.e. pre-performance) must affect the mediator (i.e. collective efficacy or Group integration-task). In the second condition, the predictor must be significantly related to the dependent variable (i.e. Group integration-task or collective efficacy). The correlations indicated previously revealed that the two conditions were satisfied.

The third condition requires that the mediator affects the dependent variable when regressed with the predictor. Group integration-task was significantly predicted by collective efficacy ($\beta = 0.39$, $t_{2,146} = 5.11$, $P < 0.0001$) when collective efficacy was regressed with pre-performance. Also, collective efficacy was significantly predicted by Group integration-task ($\beta = 0.40$, $t_{2,146} = 5.12$, $P < 0.0001$) when Group integration-task was regressed with pre-performance.

The last condition implies that the effect of the predictor on the dependent variable must be less when regressed with the mediator than when regressed without it. The effect of pre-performance on Group integration-task was non-significant when regressed with collective efficacy ($\beta = 0.14$, $t_{2,146} = 1.77$, $P > 0.05$), but significant when regressed without it ($\beta = 0.21$, $t_{1,147} = 2.56$, $P < 0.05$). In addition, the effect of pre-performance on collective efficacy was non-significant when regressed with Group integration-task ($\beta = 0.10$, $t_{2,146} = 1.34$, $P > 0.05$), but significant when regressed without it ($\beta = 0.19$, $t_{1,147} = 2.27$, $P < 0.05$). Therefore, the results revealed two mediating relationships: collective efficacy was a significant mediator in the pre-performance – Group integration-task relationship, and Group integration-task was a significant mediator in the pre-performance – collective efficacy relationship.

Discussion

The main aim of this study was to examine the mediating effects within the cohesion – collective efficacy – performance causal triangle in professional basketball teams. A series of regression models was estimated to test for mediation at the individual level. The results of this study provide evidence of a mediating effect of collective efficacy in the prior performance – Group integration-task relationship. Athletes' individual performances contribute to their perceptions of collective efficacy, which in turn contribute to their perceptions of Group integration-task. The results also supported a mediating effect of Group integration-task in the prior performance – collective efficacy relationship. Athletes' individual performances influence their perceptions of Group integration-task, which in turn influence perceived collective efficacy. Moreover, results indicated perfect mediations: prior performance had no effect (a) on Group integration-task when collective efficacy was controlled or (b) on collective efficacy when Group integration-task was controlled (Baron & Kenny, 1986). Other points regarding the results should be highlighted.

One of these pertains to the direction of the mediating relationships. Our results did not support a triadic reciprocal causation between collective efficacy, cohesion and performance. Collective efficacy and cohesion (i.e. Group integration-task) only appeared as consequences of prior individual performances. This result is consistent with both theory and some previous studies that supported a relationship between performance and cohesion (e.g. Mullen & Copper, 1994), or described prior performance as a source of collective efficacy (e.g. Bandura, 1997; Greenlees *et al.*, 1999, 2000; Hodges & Carron, 1992; Zaccaro *et al.*, 1995). On the other hand, it is partially consistent with research that supported reciprocal relationships between cohesion or collective efficacy and performance (e.g. Carron *et al.*, 2002; Feltz & Lirgg, 1998; Myers *et al.*, 2004b).

A reason for the present findings could be related to the characteristics of professional basketball. At this level of performance, professional coaches emphasize players' individual performances (e.g. Wooden, 1976, 1980; Westering, 1990) to understand team performances; team results are always assessed by means of individual statistics (e.g. in the regular 2002 – 2003 season of the National

Basketball Association, it was pointed out that the San Antonio Spurs did not lose a game when its point-guard scored 20 points or more). Moreover, offensive and defensive systems of play are based on the use of individual skills. This orientation highlights individual skills and each athlete's performance in group functioning. Thus, players with good individual results (i.e. individual statistics) and, therefore, high playing time in this sample, may feel involved in team functioning and as contributing to team performance. This can foster their perceptions of their team efficacy and cohesion (i.e. Group integration-task). This orientation can also explain the low ICCs found for cohesion and collective efficacy.

The specific timing of test administration can also help to explain the present results. By measuring group perceptions between the first and the second thirds of the season, we ensured that team members would have sufficient opportunities to interact and develop both cohesion and collective efficacy beliefs. But at this time, the athletes also had played several official games. In such a social milieu, results are important stimuli that affect individual beliefs about group functioning, as revealed by Feltz and Lirgg (1998) for amateur teams.

However, reciprocal relationships between performance and cohesion or collective efficacy do not mean that at each instant of group development, these group variables are both antecedents and consequences of performance. At the beginning of a season when professional teams still have not played official games, a team's results cannot be a source of information for cohesion or collective efficacy beliefs. These beliefs should be based on group functioning during previous practices or training games. In the early season, it is assumed that cohesion and collective efficacy predict individual performances measured over the first official games (e.g. see Paskevich, 1995, for the collective efficacy–performance relationship). Later in a season, when each professional team has played several official games, results are now available as a source of information for collective efficacy and cohesion beliefs. As these constructs are dynamic, we can assume that individual beliefs would be adjusted on the basis of that new information and then collective efficacy and cohesion would appear as consequences of prior performance. Future research should investigate the dynamic nature of cohesion and collective efficacy, from pre-season to end of season, for a better understanding of the direction of the mediating relationships within the cohesion–collective efficacy–performance causal triangle.

A second point that should be highlighted pertains to the results of the mediations. Both Group integration-task and collective efficacy served to mediate the relationship between pre-performance and the other group variable (i.e. collective efficacy and Group integration-task respectively). Moreover, both mediations were perfect in so far as pre-performance had no effect on collective efficacy or Group integration-task when Group integration-task or collective efficacy was controlled. Finally, the statistical values of the two mediations were similar, indicating that neither Group integration-task nor collective efficacy was a better mediator in the relationship between pre-performance and the other group variable. Therefore, variations in individual performance influence individual perceptions of both collective efficacy and Group integration-task, each of them influencing one another. To some extent, these findings are consistent with Paskevich and colleagues' (1999) study, which demonstrated a reciprocal relationship between task cohesion and collective efficacy at the individual level. Our results support the suggestion that, at this level and in professional basketball teams, Group integration-task and collective efficacy operate as interacting determinants that influence one another bidirectionally within a dynamic system. These findings have practical implications for professional coaches and their staffs. They should look after athletes who perform at a lower or below their usual level because poor individual performances might lead athletes into a downward cohesion–collective efficacy spiral that might isolate them within their team.

Another point pertains to the level of analysis. In our sample, the number of teams, the fact that they were not whole and the measure of performance led us to examine the relationships among the variables at the individual level. Clearly, the present findings cannot be extended at the group level. Moreover, data collection did not allow us to examine cross-level effects (Moritz & Watson, 1998; Raudenbush & Bryk, 2002) – that is, the effects of teams on individual perceptions and the effects that individuals have on emergent group products such as cohesion and collective efficacy. Consequently, this preliminary examination of the relationships between cohesion, collective efficacy and performance at a professional level underestimates the influence of cross-level effects on those relations. Future research should use a larger number of whole teams and both individual- and team-level performances to study in greater depth cross-level effects by using multi-level statistical methodologies (Castro, 2002; Kenny, Mannetti, Pierro, Livi, & Kashy, 2002).

Related to the second question of interest of this study, other results that should be highlighted pertain to the relationships between cohesion and collective efficacy in professional teams at the individual level. Professional athletes who perceived higher

levels of task cohesion and Group integration-social in their team tended to perceive greater team collective efficacy. In general, these results were consistent with previous studies by Spink (1990), Paskevich *et al*. (1999) and Kozub and McDonnell (2000). But the magnitude of the relationships was somewhat different, with Group integration-task and Group integration-social found to be better related to collective efficacy than Individual attractions to the group-task. Whereas some previous studies indicated that collective efficacy is more related to task cohesion than social cohesion (e.g. Kozub & McDonnell, 2000; Paskevich *et al*., 1999), our results highlight the importance of Group integration-social in French professional basketball teams. They also suggest that a general quality of group functioning is required in these teams, both *on* (i.e. Group integration-task) and *off* (i.e. Group integration-social) the basketball court, given its relationships with collective efficacy.

The relationship between Group integration-task and collective efficacy can be explained by the fact that the former has direct relevance for perceptions of collective efficacy in interactive sports (Bandura, 1997); Group integration-task reflects the extent to which the members of a team work together to achieve a common goal (Carron *et al*., 1985). Thus, ''the more one perceives their team as working together to achieve common goals, the more confidence one should have in the team's capability to successfully perform tasks that require a high degree of coordination and teamwork'' (Kozub & McDonnell, 2000, p. 126). As far as the Group integration-social – collective efficacy relationship is concerned, Spink (1990) explained it by suggesting the possible contribution of some mediators: Group integration-social is associated with individual adherence behaviours that promote team stability; finally, stable teams are more able to develop a higher level of collective efficacy than unstable teams. But to date, no study has investigated Spink's suggestion. Again, future research should investigate the Group integration-social – collective efficacy relationship in greater depth and look for mediating variables.

The results of this study shed some light on the relationships between cohesion, collective efficacy and performance at a professional level. They underscore the importance of the different dimensions of cohesion that are related to collective efficacy and prior performance. It leads us to suggest that in professional basketball teams, coaches and/or sport psychologists would do well to develop multiple aspects of cohesion, rather than only task cohesion, and increase collective efficacy due to the strong relationships between these group properties and individual performances.

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