

Team Cohesion, Effort, and Objective Individual Performance of High School Basketball Players

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Previous research has demonstrated the relationship between high cohesion and optimal team performance. This study investigated the cohesion-individual performance relationship and examined expended effort as a mediator of that relationship. At the middle and end of the regular season, 41 male and 49 female varsity high school basketball players representing eight teams completed measures of group cohesion and perceived expended effort. At the same time intervals, the players' game statistics were gathered, and coaches completed the expended effort questions regarding their players. Results partially supported the predictive ability of cohesion on objective individual performance and expended effort was a mediator of the cohesion-individual performance relationship at the end of the season. Results are discussed regarding theoretical and measurement issues. Practical implications for coaches and consultants are also provided.

For years, coaches have intuitively recognized that team unity is important in ensuring team success. The concept of team unity has been operationalized in the sport psychology literature as cohesion, described by Carron, Brawley, and Widmeyer (1998) 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" (p. 213). The definition

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of cohesion implies that higher levels of cohesion are desirable and should result in more effective team performance. However, research examining the relationship between cohesion and team performance has been somewhat equivocal, with many studies demonstrating a positive influence while others show no relationship (Mullen & Cooper, 1994). The equivocal findings may be due to a restricted focus on outcome variables related to the team as a whole rather than on the individual performance of athletes. Additionally, there is a need for clarification of potential mediating variables in this relationship (Pargman & De Jesus, 1987). Therefore, a clearer understanding of the cohesion-performance relationship may be obtained by investigating additional mediating variables in relation to the individual performance of team members.

Team Cohesion Model

Cohesion is viewed as multidimensional, dynamic, instrumental to group existence, and includes an affective (i.e., social) dimension (Carron et al., 1998). Based on these definitional properties, Carron's (1982) original model contains a variety of antecedents of cohesion, different types of cohesiveness operating within the team structure, and several consequences of cohesion. It is believed that cohesion fluctuates over time because of the developmental nature of groups (Tuckman, 1965) and the vacillating influence of antecedents within the categories of leadership factors (e.g., amount of positive feedback given by coaches; Westre & Weiss, 1991), team factors (e.g., immediate effects of win-loss; Ruder & Gill, 1982), environmental factors (e.g., team size; Widmeyer, Brawley, & Carron, 1990), and personal factors (e.g., the number of years with the team; Apple, 1993).

The antecedents, in turn, influence the four dimensions of cohesion defined by Widmeyer, Brawley, and Carron (1985). The first dimension is termed individual attraction to the group-task and is defined as one's feelings about personal involvement with the group's task, productivity, goals, and objectives. The second is called individual attraction to the group-social and is defined as one's feelings about personal involvement, acceptance, and social interaction with the group. The third dimension is termed group integration-task and is defined as one's feelings about the similarity, closeness, and bonding within the team as a whole around the group's task. Finally, group integration-social is defined as one's feelings regarding the similarity, closeness, and bonding within the team as a whole around the group as a social unit. These dimensions of cohesion lead to group and individual outcomes, such as absolute and relative performance effectiveness (Apple, 1993; Bird, 1977; Di Berardinis, Barwind, Flaningam, & Jenkins, 1983).

Based on Carron's (1982) original model, the Group Environment Questionnaire (Widmeyer, et al., 1985) was developed in order to facilitate research on the extent to which the four constructs play a role in the development, fluctuation, and consequences of cohesion. Most of the research examining the consequences of cohesion has focused on a team's win/loss record as a measure of absolute performance (e.g., Davids & Nutter, 1988; Slater & Sewell, 1994; Williams & Widmeyer, 1991). For the most part, a positive relationship between cohesion and team performance has been identified (Slater & Sewell, 1994; Williams & Widmeyer, 1991), but this relationship has not been consistent across investigations (Mullen & Cooper, 1994). Although the development of meaningful outcome

(performance) criteria can be a difficult task (Evans & Dion, 1991), it is critical to pursue this issue if we are to discover the true nature of the cohesion-team performance relationship.

A focus on meaningful performance criteria is nothing new to good coaches of all sports. Many successful collegiate team sport coaches (e.g., Westering, 1990; Wooden, 1976, 1980) focus on individual performance because they believe that team success is achieved through the combined efforts of the individuals on the team. Therefore, individual performance is an objective performance measure that could be more effective at revealing the true relationship between cohesion and performance. Since individual performance measures are more under an athlete's personal control, they should be more sensitive than a team outcome measure, such as a win/loss record, in reflecting the relationship between cohesion and performance. Several external factors beyond an athlete's control influence a team's win/loss record, such as the ability of opponents or an injury to an important player. For an individual, high cohesiveness may lead to improvements in performance, yet the athlete could still play on a "losing team." Thus, the effects of cohesion on performance could be measured more accurately through individual measures. It is at this level that cohesion needs to be examined.

Bird, Foster, and Maruyama (1980) conducted an important early study examining individual performance. In this study, the relationships among team cohesion, personal and team success, and attributions for one's own and team performance in college basketball players were examined. Teams were classified as successful or unsuccessful based upon their win/loss record, and data on the athletes' attributions of causality for their success or failure and for the team's success or failure were obtained. Results revealed partial support for the prediction that players from highly cohesive teams would show more consistency between self and team attributions for performance than players from teams with low cohesion. Such findings begin to shed light on the relationship between cohesion and individual performance, albeit an explanation of subjective individual performance.

Three years later, Di Berardinis et al. (1983) conducted a study that sought to determine if individual communication skills and levels of group cohesion could predict individual performance in collegiate women's track and field. Analyses revealed that significant shifts in a number of interpersonal communication indicators occurred and that these interpersonal skills significantly predicted individual performance. Unfortunately, the researchers did not specifically relate these results to their research question regarding team cohesion and enhanced individual performance. However, this study is important because interpersonal communication is one of the antecedents of team cohesion (Carron, 1988), and it was those skills that were found to predict subjective individual performance.

Taking the investigation into the cohesion-individual performance relationship one meaningful step further, Apple (1993) investigated how team cohesion predicted objective individual and team success in college baseball.¹ The results revealed that objective performance measures predicted and were consequences of team cohesion, and the attraction to the group-task scale emerged as the strongest predictor. Apple (1993) concluded that objective individual performance was a consequence of team cohesion. While this is an important result for the cohesion-individual performance relationship, the study did not go a step further and attempt to determine through what mechanism cohesion exerts its influence on performance. To progress from this descriptive level, potential mediating variables of the cohesion-individual performance relationship need to be examined.

Expended Effort

Effort has been the subject of considerable research in sport psychology. In the goal achievement literature, task-involved individuals define success as displaying high effort and mastery (Fry & Duda, 1997). Perceptions of effort have been shown to be positively associated with performance (Snyder & Brewer, 1994). Effort has also been shown to mediate the goal setting-performance relationship. Specifically, Locke and Bryan (1966) found that goals enhance performance by stimulating greater levels of effort. Consequently, Locke (1968) incorporated effort as a mediating variable into his goal-setting model, which hypothesizes that the motivational function of goals prompts increased effort and intensity. Literature based on this model has confirmed that goals enhance performance in part by eliciting higher levels of effort (Bassett, 1979; Latham & Locke, 1975; Terborg & Miller, 1978).

In cohesion research, Prapavessis and Carron (1997) explored the relationship between group cohesion and individual work output (effort) in various interactive sport teams. Their findings indicated that perceptions of task cohesion (the study operationally defined cohesion as individual attraction to the group-task) were positively associated with individual work output, measured as percentage of maximal $\dot{V}O_2$. The authors concluded that work output could be viewed as tautological with cohesion and/or performance, or that work output could serve as a *mediator* between cohesion and performance. Physical and cognitive effort have also been shown to be negatively related to the social loafing effect, the phenomenon in which people exert less effort in groups than when participating alone (Everett, Smith, & Williams, 1992). Thus, investigating the role of perceived expended effort on both task and social cohesion constitutes an extension of previous research. To date, no studies have explicitly investigated the mediating role of perceived effort in the cohesion-individual performance relationship.

In summary, while the relationship is not always consistent, increased cohesion usually leads to increased team performance (Davids & Nutter, 1988; Mullen & Cooper, 1994; Slater & Sewell, 1994; Williams & Widmeyer, 1991). One reason for the inconsistent findings may be the almost exclusive use of a team's win/loss record as the measure of performance. A look at the potentially more sensitive individual performance dimension and the possible mediational role expended effort may play could provide a more accurate assessment of the cohesion-performance relationship and begin to reveal how that influence occurs. Therefore, the purpose of this study was to examine the relationship between high school basketball players' perceptions of their team's cohesion and their objective individual performance and to examine whether perceived effort mediates that relationship. It was hypothesized that team cohesion would significantly predict individual performance across a basketball season and that this relationship would be mediated by expended effort.

Method

Participants

Participants were 41 males and 49 females from four boy's and four girl's high school varsity basketball teams in the Northwest United States. Players ranged from 14 to 18 years ($M = 16.5$ years, $SD = 1.1$). The players were primarily

Caucasian (89%) and the number of years on the team ranged from 0 to 3, with a mean of 1.1 years ($SD = 0.9$ years).

Measures

Team Cohesion. To measure the individual and group, as well as the task and social components of group cohesion, the Group Environment Questionnaire (GEQ; Widmeyer et al., 1985) was used. The GEQ is comprised of four scales that measure the four dimensions of cohesion defined by Widmeyer et al. (1985): (a) the individual attractions to the group-task scale (ATG-T), (b) the individual attractions to the group-social scale (ATG-S), (c) the group integration-task scale (GI-T), and (d) the group integration-social scale (GI-S).

The GEQ contains 18 items on a 9-point scale ranging from *strongly disagree* (1) to *strongly agree* (9). Several studies have demonstrated the validity and reliability of the GEQ scales (Brawley, Carron, & Widmeyer, 1987, 1988; Carron, Widmeyer, & Brawley, 1985, 1988; Li & Harmer, 1996). However, a few studies using the GEQ with populations other than college-aged individuals have reported reliability problems (Estabrooks, 2000; Schutz, Eom, Smoll, & Smith, 1994; Westre & Weiss, 1991). Recently, Carron, Brawley, and Widmeyer (1998) defended the use of the GEQ across sport types, levels of competition, and group characteristics. They cautioned only of its use cross-culturally, recommending that revisions be made when the investigator finds reason to adapt wording based on pilot data. In the present study, pilot work indicated no problems with readability or understanding of the items. In addition, Li and Harmer (1996) suggested the need for further empirical investigations and replications. Thus, while it is important to recognize possible weaknesses of the GEQ, it remains the best measure available to assess team cohesion in the sport and exercise setting.

Expended Effort. An adapted version of the expended effort scale from the Intrinsic Motivation Inventory (IMI; Ryan, 1982) specific to the high school basketball context was used to measure perceived expended effort. Players used this scale to rate their own perceived level of expended effort, and their coach rated his or her perception of each player's level of expended effort. Players and coaches were told to rate effort from the beginning of the regular season to the midpoint of the season for Time 1 and from the beginning of the regular season to the end of the regular season for Time 2. Several studies have provided adequate reliability for the effort scale of the IMI (McAuley, Duncan, & Tammen, 1989; Whitehead & Corbin, 1991). The scale consisted of four questions rated on a 7-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (7). Based on a pilot study and in an effort to increase familiarity and meaning, the term *hustle* (defined as a visual display of heart through giving situation-appropriate energetic effort) was used instead of the term expended effort. The importance item of the original scale was deleted, as it was deemed not pertinent to the current investigation.

Individual Performance. A composite measure of individual performance was used, based on Sonstroem and Bernardo's (1982) equation:

$$\text{PERF} = \text{SHOT\%} (\text{PTS} + \text{REB} + \text{AS} + \text{ST}) \cdot \text{TO} + 10$$

where SHOT% = field goal and foul shot percentage combined, PTS = points per game, REB = offensive + defensive rebounds per game, AS = assists per game,

ST = steals per game, TO = turnovers per game, and 10 = a constant to ensure positive scores. The composite score can represent a wide range of values, with Sonstroem and Bernardo reporting a range from 3.1 to 34.0. For the current investigation, the performance equation was validated in a pilot study and found to be an effective measure of overall performance regardless of player position (e.g., guard or forward) or style of offense.

Procedures

Coaches of boy's and girl's high school varsity basketball teams were contacted and invited to participate. Players' parents were then sent a letter and asked to give consent, after which the players themselves assented to participate. Participant responses were kept confidential, and it was emphasized to the players that the coaches would not know how individual players answered the questionnaire. To help ensure that the athletes felt free to respond without interference, the coaches were not present when the athletes completed the questionnaire.

At a practice occurring halfway through the season and at the end of the regular season, the athletes completed the questionnaire packet at their own pace, and the athletes' game statistics were obtained from each coach. The head coaches also answered the expended effort questions for each of their athletes. The mid-season statistics were based on all games up to that point (range = 8–13 games during approximately 1 1/2 months) and the end of the season statistics were based on all of the regular and preseason games (range = 20–25 games during approximately 3 months). At the conclusion of the second data collection, athletes were debriefed and encouraged to provide feedback regarding the study.

Data Analysis

Due to the dynamic nature of cohesion, a repeated measures design was utilized in this study with data collection occurring halfway through the regular season (Time 1) and at the end of the regular season (Time 2). The independent variables were the four components of cohesion, the mediating variable was expended effort (i.e., hustle), and the dependent variable was objective individual performance.

Descriptive statistics were examined and reliabilities for all scales were calculated. To examine the relationship between team cohesion and individual performance, separate standard linear regressions were conducted using the appropriate GEQ scale. A single multiple regression analysis was not employed because of the relatively high correlations between the independent variables (.53 - .78). To determine if expended effort mediated the relationship between cohesion and individual performance, a mediation analysis was conducted using a regression technique described by Baron and Kenny (1986). The independent variables were the team cohesion components, the mediator was expended effort, and the dependent variable was objective individual performance.

The mediation technique was used with an expended effort scale (EE) that combined the players' ratings of their own perceived effort and the coaches' ratings of their players' level of effort. This was done based on previous research in the physical education field, which found that there was little congruency between student and teacher perspectives of effort (Tjeerdsma, 1997). With this research as a foundation, a combined expended effort scale was calculated because it was hypothesized that players may overestimate their effort level by thinking they always

give their best effort, while coaches may underestimate their players' level of effort because they believe they can always get more effort out of their players. By averaging the data from the players' and coaches' perspectives, it was anticipated that a more accurate assessment of the players' level of effort could be used in the mediation analysis technique.

Unit of Analysis. Since this study examined the relationship between cohesion and individual performance, it is logical to use the individual player as the unit of analysis. However, this entails statistical problems because it wrongly assumes that the players' responses are independent of the team (Cronbach, 1976). Some researchers (Cooper & Good, 1983; Martin & Veldman, 1980) have suggested that a viable solution to this problem is to analyze data by looking at between-group and within-group differences. Analyzing for between-group differences is not feasible in this study because of the lack of a sufficient number of groups ($n = 8$). Therefore, the individual player was used as the unit of analysis, but the data were converted to z scores reflecting the number of standard deviations each player's score was from the team mean. These standardized scores allowed a comparison of individual players but also controlled for the influence of the specific team setting. Horn (1984, 1985) used a similar procedure when she examined coaches' feedback and changes in children's perceptions of their physical competence.

Results

Reliability of the Questionnaire Scales

The internal consistency of the four GEQ scales and the expended effort scale were determined using coefficient alpha (Cronbach, 1951). The attraction to the group-task ($\alpha = .371$), the attraction to the group-social ($\alpha = .626$), and the group integration-social scales ($\alpha = .574$) demonstrated unacceptable reliability at Time 1. Dropping any combination of items on the scales did not significantly improve their reliability. The group integration-task scale was reliable at Time 1 ($\alpha = .720$) and therefore was the only scale used in subsequent analyses of the research questions at Time 1. At Time 1, the alpha level of the expended effort scale ($\alpha = .772$) was acceptable.

At Time 2, the attraction to the group-task scale was the only scale that did not have acceptable internal reliability ($\alpha = .669$). To improve this scale, item number two ("I am not happy with the amount of playing time I get") was discarded, resulting in high internal consistency ($\alpha = .816$). It was this improved scale that was used on all subsequent analyses. The other three scales all reached acceptable reliability levels (ATG-S $\alpha = .778$, GI-T $\alpha = .848$, GI-S $\alpha = .773$). The internal reliability of the expended effort scale was also acceptable at Time 2 ($\alpha = .772$).

Preliminary Analyses

Correlations between variables of interest were then examined (see Table 1). At time 1, the GI-T scale was weakly associated with objective performance (.03), and effort was low to moderately associated with performance (.21). At time 2, objective performance was low to moderately correlated with the cohesion scales (.08 - .24), and the cohesion scales were moderately to highly correlated with each other (.53 - .78). However, no scale exceeded the limit for multicollinearity of .90

(Tabachnik & Fidell, 1989). The correlation between the effort scale and objective performance at time 2 was .24.

Table 1 Correlation Matrix for all Variables at Time 1 and Time 2

Variables	Time 1					
	ATG-T	ATG-S	GI-T	GI-S	EE	Perf
ATG-T	—	.20	.58	.30	-.03	.00
ATG-S		—	.32	.38	.12	.08
GI-T			—	.36	-.09	.03
GI-S				—	.03	.09
EE					—	.21
Perf						—

Variables	Time 2					
	ATG-T	ATG-S	GI-T	GI-S	EE	Perf
ATG-T	—	.54	.78	.53	.21	.19
ATG-S		—	.61	.56	.26	.24
GI-T			—	.66	.31	.11
GI-S				—	.10	.08
EE					—	.24
Perf						—

Note. GI-T = group integration-task, GI-S = group integration-social, ATG-T = attraction to the group-task, ATG-S = attraction to the group-social, EE = expended effort, Perf = overall objective performance.

Table 2 Means (M) and Standard Deviations (SD) for all Variables at Time 1

Group	ATG-T	ATG-S	GI-T	GI-S	EE	Perf
All Participants						
<i>M</i>	6.7	6.6	6.1	5.3	6.3	11.7
<i>SD</i>	1.6	1.5	1.5	1.5	0.6	2.9
Males (<i>n</i> = 40)						
<i>M</i>	6.8	6.8	6.1	6.0	6.4	12.4
<i>SD</i>	1.6	1.4	1.3	1.2	0.6	2.6
Females (<i>n</i> = 48)						
<i>M</i>	6.6	6.6	6.2	4.8	6.3	11.0
<i>SD</i>	1.6	1.6	1.6	1.5	0.7	3.0

Note. ATG-T = attraction to the group-task, ATG-S = attraction to the group-social, GI-T = group integration-task, GI-S = group integration-social, EE = expended effort, Perf = overall objective performance.

Table 3 Means (M) and Standard Deviations (SD) for all Variables at Time 2

Group	ATG-T	ATG-S	GI-T	GI-S	EE	Perf
All Participants						
<i>M</i>	6.1	6.6	6.1	5.4	6.4	11.8
<i>SD</i>	2.1	1.8	1.9	1.8	0.6	2.9
Males (<i>n</i> = 40)						
<i>M</i>	6.3	7.0	6.4	6.1	6.5	12.7
<i>SD</i>	1.8	1.4	1.6	1.4	0.5	3.0
Females (<i>n</i> = 48)						
<i>M</i>	5.8	6.3	5.8	4.8	6.4	11.0
<i>SD</i>	2.4	2.1	2.1	1.8	0.6	2.6

Note. ATG-T = attraction to the group-task, ATG-S = attraction to the group-social, GI-T = group integration-task, GI-S = group integration-social, EE = expended effort, Perf = overall objective performance.

Mean differences from Time 1 to Time 2 for the expended effort scale and the reliable team cohesion scales were minimal. A gender difference was found on the GI-S scale at Time 2, $F(1, 88) = 13.6$, $R^2 = .14$, $p < 0.01$. Therefore, the male and female data were separated for the analyses using the GI-S scale at Time 2. Tables 2 (Time 1) and 3 (Time 2) show means and standard deviations for all variables.

Cohesion Predicting Performance

At each time period, separate linear regressions for each scale of the GEQ were used to investigate the relationship between cohesion and individual performance (see Table 4). At Time 1 (midseason), the group integration-task scale did not significantly predict individual performance. At Time 2 (end of season), only the attraction to the group-social scale significantly predicted individual performance, $F(1, 86) = 5.43$, $p = .022$, and accounted for 6% of the variance.

Expended Effort Mediating the Cohesion-Individual Performance Relationship

Because there was not a significant relationship between cohesion and individual performance at Time 1, the mediation analysis technique was not conducted. However, because the attraction to the group-social scale significantly predicted performance at Time 2, this independent variable was used in the mediation analysis technique (Baron & Kenny, 1986).

To test for mediation, Baron and Kenny (1986) suggest conducting three regressions. The first regresses the mediator (expended effort) on the independent variable (team cohesion) while the second regresses the dependent variable (objective individual performance) on the independent variable (team cohesion). Finally, the dependent variable (objective individual performance) should be regressed on both the independent variable (team cohesion) and the mediator (expended effort). Four conditions must then hold to establish mediation. First, the independent variable (team cohesion) must affect the mediator (expended effort) in the first

Table 4 Team Cohesion Predicting Individual Performance Using Non-Stepwise Regression

Variable	Time 1				
	<i>B</i>	<i>SE-B</i>	β	<i>R</i> ²	ΔR^2
GI-T	0.03	0.13	.03	.00	.00
Variable	Time 2				
	<i>B</i>	<i>SE-B</i>	β	<i>R</i> ²	ΔR^2
GI-T	0.09	0.10	.11	.01	.01
GI-S					
Males	-0.01	0.19	-.01	.00	.00
Females	-0.04	0.12	-.05	.00	.00
ATG-T	0.17	0.10	.19	.04	.04
ATG-S	0.22	0.10	.24*	.06*	.06*

Note. GI-T = group integration-task, GI-S = group integration-social, ATG-T = attraction to the group-task, ATG-S = attraction to the group-social. * $p < .05$.

equation. Second, the independent variable (team cohesion) must affect the dependent variable (objective individual performance) in the second equation. Third, the mediator (expended effort) must affect the dependent variable (objective individual performance) in the third equation. Finally, if these conditions all hold in the predicted direction, then the effect of the independent variable (team cohesion) on the dependent variable (objective individual performance) must be less in the third equation than in the second.

For the expended effort scale and the attraction to the group-social scale at Time 2, all four conditions of the mediation technique were satisfied (see Table 5). More specifically, the attraction to the group-social scale significantly predicted the expended effort score ($R^2 = .07$). Second, the attraction to the group-social scale significantly predicted the performance score ($R^2 = .06$). Third, expended effort significantly affected the objective performance score ($R^2 = .09$). Finally, the effect of the attraction to the group-social scale on the performance score was less in the third equation ($\beta = .20$) than in the second equation ($\beta = .24$). Therefore, the expended effort scale was a significant mediator of the cohesion-individual performance relationship at Time 2 when looking at players' social attractions to the group. Subsequently, it appears that players who perceived higher levels of social cohesion toward the end of the season increased their effort level, which in turn was a significant factor in their increased performance level.

Discussion

The purpose of this study was to examine the relationship between team cohesion and individual performance and to examine the role of expended effort in that

Table 5 Expended Effort Mediating the Cohesion-Individual Performance Relationship Using Non-Stepwise Linear Regressions at Time 2

Variables	<i>B</i>	<i>SE-B</i>	β	<i>R</i> ²	ΔR^2
ATG-S on EE	0.31	0.12	.26*	.07*	.07*
ATG-S on Perf	0.27	0.11	.24*	.06*	.06*
ATG-S and EE on Perf*				.09*	.09*
ATG-S	0.18	0.10	.20		
EE	0.20	0.12	.19		

Note. EE = expended effort, Perf = overall objective performance, ATG-S = attraction to the group-social. * $p < .05$.

relationship. The first hypothesis that team cohesion would significantly predict objective individual performance across a basketball season was not supported at Time 1 (mid-season) but was partially supported at Time 2 (end of the season). Specifically, team members who felt positively about their personal involvement, acceptance, and social interaction with the team evidenced higher levels of individual performance at the end of the season. The second hypothesis examined whether the team cohesion-individual performance relationship was mediated by expended effort. This hypothesis was supported at Time 2, and therefore, expended effort may be one of the mechanisms through which team cohesion can positively influence individual performance.

Team Cohesion Predicting Performance

The nonsignificant midseason results of the present study match Apple's (1993) nonsignificant results for collegiate baseball pitchers at midseason. In addition, the Time 2 results of the current study match the results of the final data collection period in Apple's (1993) study with respect to the attraction to the group aspect of cohesion. Specifically, while Apple (1993) reported a significant prediction of objective individual performance using the attraction to the group-task scale (with collegiate student-athletes), the current study found that the attraction to the group-social scale significantly predicted individual performance at the end of the season with high school student-athletes. Based on the present study and the Apple study, it would seem that increased individual performance is a significant consequence of feeling more attracted to the group at the end of a season.

From a theoretical perspective, Carron's (1982) conceptual model of team cohesion was partially supported by the present study because cohesion affected the individual outcomes of expended effort and performance at the end of a high school basketball season. Perhaps this relationship becomes prevalent toward the end of a season because team members have had time to become attracted to the group's purpose, develop and maintain social relations, and consequently begin increasing their effort, productivity, and intensity. This would be consistent with cohesion research and with what we know about adolescent populations.

An emphasis on the social aspects of team interactions is not surprising in this age group. Research has shown that adolescents place a high importance on establishing peer acceptance and friendship throughout adolescence (Bukowski, Newcomb, & Hartup, 1996). In fact, research suggests that being good at sports is an important quality for boys' and girls' popularity with peers, particularly for boys (Chase & Dummer, 1992). Thus, in adolescents, one might expect the social components to overshadow the task components of cohesion. However, with the increased demand for success at the college level, it is possible that as student-athletes enter college, the task aspects of team cohesion will become more important than the social aspects.

The small amount of explained variance attributed to the attraction to the group-social scale indicates that other unmeasured variables are affecting these high school players' performances. This highlights the importance of examining individual performance in addition to team performance. Given the multiple variables influencing a player's achievements, the fact that the attraction to the group-social aspect of cohesion significantly predicted a player's individual performance is notable. Further investigations may be able to add to the list of variables that affect the cohesion-performance relationship in this age group.

Expended Effort Mediating the Cohesion-Performance Relationship

The mediation technique revealed a significant mediation effect at Time 2. Specifically, using the regression technique with the attraction to the group-social scale, the expended effort scale satisfied all four conditions of Baron and Kenny's (1986) procedure.

The significance of expended effort as a mediator of the cohesion-individual performance relationship supports Prapavessis and Carron's (1997) hypothesis that physical effort (work output) mediates the relationship between cohesion and performance. It appears in this case that cohesion (i.e., the attraction to the group-social aspect) enhances the individual performance of high school age basketball players, in part, by eliciting higher levels of physical and cognitive effort or hustle. Therefore, this study provides support for the assertion that effort is one mechanism through which increased team cohesion can positively influence individual performance. However, future research examining effort as a potential mediator of cohesion is warranted and should further clarify the relationship between cohesion and performance described in Carron's model (1982).

Limitations and Future Research Directions

It is likely that measurement issues with the GEQ played a role in limiting the findings in this study. The inadequate reliability of the GEQ scales at Time 1, as well as the need to modify the attraction to the group-task scale at Time 2, raise questions concerning the appropriateness of using the GEQ with high school populations. Although the GEQ was designed to be used across sport types and across competitive levels (Carron et al., 1998), the psychometric issues reported here are similar to those discussed by Schutz and colleagues (Schutz et al., 1994) when the GEQ is administered to populations other than college-aged individuals (Estabrooks, 2000; Westre & Weiss, 1991). Because of the reliability issues with the GEQ scales,

it could not be adequately determined if these data supported the dynamic characteristic of Carron's (1982) cohesion model. This issue deserves continued attention.

One reason for the reliability problems in this age group may be the imbalance between positively and negatively worded statements. Of the 18 items on the GEQ, 12 are worded negatively, including all the items on the attraction to the group-task scale. This dominance of negatively worded items may have been the reason for the reliability difficulties with the scales at Time 1. Participants could have been confused when filling out the negatively worded items on the GEQ because a greater perception of cohesion would be manifested in a stronger level of disagreement with the item (Estabrooks, 2000). Thomas and Nelson (1990) suggest that questionnaires should avoid negative items because they are often confusing, and the negative word is sometimes overlooked, causing an individual to answer in exactly the opposite way than was intended. Given the significantly higher internal consistencies evident at Time 2 with the same population, it seems that the participants understood or became more comfortable with the survey the second time. Since the cohesion construct is viewed as dynamic in nature, test-retest reliability has been deemed an inappropriate measure of reliability for the GEQ (Carron et al., 1998). However, based on these results, further attention to the design of the instrument appears to be warranted. Although Carron and his colleagues advise against rewriting the GEQ for every situation, perhaps the cognitive and emotional level of high school athletes demands that questions be phrased specific to that context. In the present study, pilot testing was not sufficient to eliminate all issues regarding understandability and meaningfulness.

Practical Implications

From a practical perspective, coaches should not ignore the impact team cohesion has on individual performance, especially when considering high school players' attraction to the group's social aspects. Because competition levels can be very high, every aspect that can significantly affect a team's or a player's performance should be attended to. Given this, the results of this study add to the contention that team-building techniques can be an important tool in increasing the performance of a team through individual performance. In particular, high school coaches would be well served to facilitate personal involvement with the development and maintenance of the group's social relations. One way to accomplish this is by organizing nonsport related team social events where team members can develop friendships and foster affiliation needs, thereby increasing motivation and subsequently, effort. These strategies are likely not only to impact cohesion, but enjoyment and satisfaction as well, encouraging long-term participation in the athlete's chosen sport.

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Note

¹It should be noted that Apple's (1993) study is an unpublished master's thesis and should be interpreted with caution. However, it is the only study that closely resembles the current investigation and thus serves an important foundational purpose.

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