

Intrinsic Motivation: Relationships With Collegiate Athletes' Gender, Scholarship Status, and Perceptions of Their Coaches' Behavior

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The purpose of this study was to examine the relationships among athletes' intrinsic motivation (IM), gender, scholarship status, perceptions of the number of their teammates receiving scholarships, and perceptions of their coaches' behavior. Male and female college athletes ($N = 386$) from a variety of Division I sports completed a series of paper-and-pencil questionnaires. Multivariate analyses revealed that (a) scholarship athletes reported higher levels of IM than did nonscholarship athletes, (b) male athletes reported higher IM than did female athletes, and (c) perceived coaching behaviors were related to athletes' IM. Specifically, athletes with higher IM perceived their coaches to exhibit a leadership style that emphasized training and instruction and was high in democratic behavior and low in autocratic behavior. In addition, athletes with higher levels of IM perceived that their coaches provided high frequencies of positive and informationally based feedback and low frequencies of punishment-oriented and ignoring behaviors. Results are discussed in terms of cognitive evaluation theory.

Key Words: intrinsic motivation, perceived coaching behaviors, cognitive evaluation theory

Much of the research on intrinsic motivation in the social, educational, and sport psychology literature has been conducted to identify the factors associated with motivational orientation or that may cause individuals to become predominantly intrinsically or extrinsically oriented toward any particular achievement activity. An intrinsic motivational orientation describes an individual who participates in an achievement activity primarily for internal reasons (e.g., for fun, pleasure, personal mastery). An extrinsic motivational orientation, on the other hand, describes an individual who primarily participates in an achievement activity for external reasons (e.g., to gain social approval, social status, material rewards).

According to Deci and Ryan's (1980, 1985) cognitive evaluation theory, a subtheory of their more general self-determination theory (Deci & Ryan, 1991), individuals' level of intrinsic motivation toward a particular achievement activity

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will vary as a function of the degree to which they (a) perceive themselves to be competent at that activity and (b) believe themselves to be self-determining in regard to their performance and behavior in that activity (i.e., performance and behavior perceived to be under their own or personal control). Thus, events or factors in the achievement environment that facilitate or enhance individuals' perceptions of competence and self-determination will result in increases in their intrinsic motivation. Conversely, events or factors that undermine individuals' feelings of competence or self-determination will lead to a decrease in their intrinsic motivation for that activity. Although a number of environmental and intrapersonal factors have been identified as potential determinants of an intrinsic motivational orientation, the use (or nonuse) of awards/rewards and the behavior of the adult supervisor (e.g., teacher, coach) have been shown to be particularly relevant in the academic and sport context (see Deci & Ryan, 1991; Fredrick & Ryan, 1995; R. Ryan, Connell, & Deci, 1985; Vallerand, Deci, & Ryan, 1987).

Rewards and Intrinsic Motivation

Cognitive evaluation theory (Deci & Ryan, 1980, 1985) predicts that awards/rewards given to an individual in an achievement context can either enhance or undermine that individual's intrinsic motivation, depending on how the award is perceived by the performer. If the award is given in such a way that it is primarily perceived by the performer as a positive source of information about his or her competence, then her or his intrinsic motivation will be facilitated. However, if the award is given in such a way that the performer primarily perceives the award to be a controller of his or her behavior, then the individual's feelings of self-determination are reduced. That is, the individual begins to perceive that the award is dictating his or her behavior. As a consequence of this reduction in self-determination, the individual's intrinsic motivation is undermined. Research has provided support for these theoretical predictions as they occur in educational contexts (see R. Ryan et al., 1985).

Research in the sport domain has also provided some support for the influence of awards on intrinsic motivation. Specifically, E. Ryan (1977, 1980) conducted two field studies to examine the effects of athletic scholarships on intrinsic motivation levels in collegiate athletes. In his first study, E. Ryan (1977) measured the degree of intrinsic motivation in both scholarship and nonscholarship male athletes. It was hypothesized that individuals on scholarship would score lower on intrinsic motivation than would nonscholarship players. The rationale was that the athletes were essentially being paid (i.e., getting a scholarship) for doing an activity that was initially intrinsically pleasing. Results supported E. Ryan's hypothesis, with scholarship athletes showing a lower degree of intrinsic motivation than did nonscholarship athletes.

In his second study, E. Ryan (1980) replicated and extended his earlier research by including male subjects from both wrestling and football and female athletes from a variety of sports. The results of this study also indicated that athletes on scholarship had lower levels of intrinsic motivation than did nonscholarship athletes, but this was true only for football players. Male wrestlers and female athletes who were on scholarship reported higher intrinsic motivation than did their nonscholarship teammates. E. Ryan explained these results by suggesting that the scholarships may have increased intrinsic motivation in both wrestlers and

female athletes because only a few of the athletes from each team were on scholarship. Therefore, the awarding of a scholarship in these sports increased the athlete's perception of competence (relative to their teammates) and correspondingly facilitated intrinsic motivation. In contrast, because most football players were on scholarship, such awards may not have facilitated perceptions of competence. Rather, the scholarships may have been perceived in this sport context primarily as controlling, thus resulting in a lower degree of intrinsic motivation. Thus, E. Ryan suggested that the relative number of scholarships available to athletes on a team might influence the degree to which individual athletes will primarily perceive the scholarship as a positive indicator of personal ability or as a controller of their behavior. In the first case, intrinsic motivation would be enhanced. In the second case, intrinsic motivation would be undermined.

Although the results of E. Ryan's studies (1977, 1980) provide evidence that athletic scholarships can, under certain circumstances, undermine athletes' intrinsic motivation, additional research in this area is needed. First, as Weiss and Chaumeton (1992) suggest, the gender differences that E. Ryan found in regard to the influence of scholarships on intrinsic motivation may no longer be valid given the growth in the numbers of women's collegiate sport programs and the increased availability of scholarships over the past 2 decades as a result of Title IX legislation (see Coakley, 1999; U.S. Department of Education, 1997). Second, although E. Ryan (1980) hypothesized that the impact of scholarships on collegiate athletes' intrinsic motivation may vary as a function of the number of scholarships that are given to members of a team (i.e., the percentage of players on a team that are on scholarship), the validity of this argument has not yet been tested. Third, Ryan also noted that it might not be the scholarships themselves that cause a decrease in intrinsic motivation, but rather how the coaches use the scholarships to control the athletes. In other words, the coaches' behavior toward their athletes may be another key determinant of intrinsic motivation.

Teaching/Coaching Behavior and Intrinsic Motivation

Research in the academic domain supports the idea that selected aspects of teachers' behavior can be important factors affecting the intrinsic motivation of students (see Connell & Wellborn, 1991). First, studies (e.g., Deci, Nezlek, & Sheinman, 1981; Deci, Schwartz, Sheinman, & Ryan, 1981) have shown that teachers may exhibit either a "controlling" pattern of behavior in the classroom (e.g., using rewards to motivate students, promoting competition, administering rewards in a controlling fashion) or a more "autonomy-oriented" pattern of behavior (e.g., encouraging and supporting the transfer of responsibility for student behavior to students themselves). Furthermore, this research (e.g., Deci, Nezlek, & Sheinman, 1981; Deci, Schwartz, et al., 1981) reveals that students whose teachers exhibit a more autonomous teaching style score higher on intrinsic motivation than do students whose teachers tend to be more controlling in their classroom behavior. These results are consistent with the predictions of cognitive evaluation theory (Deci & Ryan, 1980, 1985): that teachers who act in a controlling manner undermine their students' perceptions of self-determination, which in turn results in a decrease in intrinsic motivation. In contrast, teachers who exhibit a more autonomous teaching style facilitate or enhance their students' perceptions of self-determination (e.g., an internal locus of causality), resulting in increased intrinsic motivation.

From a somewhat different but certainly related perspective, R. Ryan et al. (1985) suggest that the type of feedback teachers give students in performance situations can also have a significant impact on students' level of intrinsic motivation. Specifically, R. Ryan et al. argue that positive, informationally based feedback given in response to student performances should result in increased perceptions of competence and a corresponding increase in intrinsic motivation. Similarly, Horn (1987, 1992) has also suggested that informational (corrective) feedback given in response to students' performance errors (e.g., "You undercut the ball because you dropped your elbow") should result in an increase in students' perceptions that they themselves can control future performance outcomes (i.e., an internal locus of causality), which should then increase students' level of intrinsic motivation.

Although relatively little research has been conducted in the sport setting to investigate coaching behavior as a factor affecting collegiate athletes' intrinsic motivation, studies with athletes from younger age groups have provided some support for the importance of coaching behavior. For example, Vallerand and Pelletier (1985) and Pelletier and Vallerand (1985) conducted studies with teenage swimmers that examined the relationship between coaches' tendencies to be either controlling or autonomy-oriented and their athletes' level of perceived competence and intrinsic motivation. Results of these studies provided evidence that athletes who perceived their coaches to exhibit a more autonomous interpersonal style scored higher on measures of perceived competence and intrinsic motivation than did athletes who perceived their coaches to be more controlling.

Black and Weiss (1992) also investigated the relationship between coaches' behaviors and their young athletes' (ages 10–18 years) perceptions of sport competence and intrinsic motivation. Results of this study revealed that the type of feedback athletes perceived their coaches to give during practice and competitive situations had a significant impact on the athletes' perceptions of ability and intrinsic motivation. Although there were some rather specific gender and age differences, the results, in general, suggested that athletes who perceived their coaches to exhibit high frequencies of information following desirable performances and high frequencies of encouragement and information following undesirable performances scored higher on measures of perceived competence, perceived successes, and intrinsic motivation than did athletes whose coaches exhibited lower levels of these positive and informationally based feedback responses.

In summary, the results of the studies conducted by Vallerand and Pelletier (1985; Pelletier & Vallerand, 1985) and Black and Weiss (1992) provide at least initial evidence that selected aspects of coaching behavior do have an effect on the intrinsic motivation of athletes. In addition, however, the research conducted by E. Ryan (1977, 1980) indicates that athletes' scholarship status may also affect their intrinsic motivation. The present study was conducted to replicate and extend this area of research by examining how both of these factors may affect the intrinsic motivation levels of collegiate athletes. More specifically, this study was designed with two purposes in mind.

First, we intended to replicate and extend E. Ryan's (1977, 1980) research by testing whether the intrinsic motivation levels of collegiate athletes vary as a function of their gender, scholarship status, and the number of athletes on each team that are perceived to be on scholarship. Based on previous research and theory, it was hypothesized that athletes' scholarship status would interact with their perceptions concerning the number of athletes on their team who were on scholarship to

affect their own level of intrinsic motivation. Specifically, it was anticipated that athletes who were on scholarship and who perceived that a relatively small number of their teammates were also on scholarship would have higher perceived competence and intrinsic motivation than would athletes who were on scholarship and who perceived that a relatively large number of their teammates were also on scholarship. Also, due to the post-Title IX changes that have taken place in women's collegiate athletic programs (see Coakley, 1999; U.S. Department of Education, 1997), it was hypothesized that gender would not interact with scholarship status or percentage of athletes on scholarship to affect intrinsic motivation levels.

Second, we intended to extend the research on intrinsic motivation and coaching behavior by testing whether athletes' perceptions of their coaches' behavior, in combination with athletes' scholarship status, are related to, or predictive of, their level of intrinsic motivation. Based on previous research and theory, it was hypothesized that athletes who perceived their coaches to exhibit a more democratic coaching style and to respond to players' performances with high levels of praise, encouragement, and informationally based feedback would exhibit higher intrinsic motivation than would athletes who perceived their coaches to be more authoritarian in their leadership style and to provide lower levels of praise, encouragement, and informational feedback.

The results of this study may provide important information about the factors that are associated with an intrinsic motivational orientation in college athletes. Furthermore, the study may contribute to the literature on coaching effectiveness by identifying coaching behaviors that are positively or negatively related to athletes' intrinsic motivation.

Method

Participants

The participant sample ($N = 386$) comprised male ($n = 199$) and female ($n = 187$) athletes from selected Division I colleges and universities around the United States (i.e., Midwest, North, and West). The athletes ranged in age from 17 to 23 ($M = 19.45$, $SD = 1.35$) and represented a variety of sports including football, field hockey, gymnastics, ice hockey, swimming, and wrestling. Most of the athletes identified themselves as European American (89.1%), with the rest identifying themselves as African American (7.8%), Hispanic American (1.8%), Asian American (0.5%), Native American (0.5%), and Filipino American (0.3%).

Measures

Demographic Information. Each participant was asked to complete a demographic questionnaire. Questions assessed the athletes' age, gender, race, and primary sport played. This questionnaire also inquired about the athletes' scholarship status. Athletes were asked to indicate their current scholarship status on a 5-point scale (i.e., *full scholarship, partial scholarship totaling more than half, partial scholarship totaling half, partial scholarship totaling less than half, and no scholarship*). In addition, athletes were asked to indicate (using a percentage score) how many athletes on their present college team they thought were currently receiving an athletic scholarship. Athletes' responses to this question could range from 0% to 100%.

For purposes of data analyses, athletes' responses to the two questions related to scholarships were used to group them in two ways. First, their responses to the scholarship status question were used to create three subject groups: (a) athletes on full scholarship ($n = 111$), (b) athletes on partial scholarship ($n = 163$), and (c) athletes not on scholarship ($n = 112$). This division of the athletes allowed for each of the three groups to have approximately equal numbers. Second, athletes' responses to the question eliciting their perceptions concerning the percentage of athletes on their team who were on scholarship were used to create two subject groups. The two groups, which were created using a median split method, included (a) participants ($n = 166$) who perceived that a low number ($\leq 70\%$) of the athletes on their team received scholarships and (b) participants ($n = 220$) who perceived that a high number ($\geq 75\%$) of athletes on their team received scholarships.

Coaching Behavior. To assess the athletes' perceptions of their coaches' behaviors, two questionnaires were selected. First, athletes were administered the Leadership Scale for Sports (LSS), which was developed by Chelladurai and Saleh (1978, 1980) to measure a wide array of leadership behaviors. The LSS consists of five subscales, two of which measure the coach's decision-making style (democratic and autocratic styles), two of which measure the coach's motivational tendencies (social support and positive feedback), and one of which measures the coach's instructional behavior (training and instruction). High scores on the training and instruction subscale describe a coach whose leadership style is characterized by high emphasis on training and instructing athletes (e.g., conducting hard and strenuous training sessions, clarifying the working relationship and roles of team members). High scores on the autocratic behavior subscale describe a coach whose leadership style stresses her or his own personal authority for decisions and who demands strict compliance from the athletes in relation to those decisions. In contrast, high scores on the democratic behavior subscale describe a coach whose leadership style encourages participation by athletes in decisions pertaining to group goals, practice methods, and game tactics. High scores on the positive feedback subscale describe a coach who frequently praises and reinforces athletes' performances, while high scores on the social support subscale describe a coach who establishes warm interpersonal relationships with athletes. The total LSS contains 40 items, each of which is scored on a 5-point scale (*always, often, occasionally, seldom, and never*). For each item, the athlete is asked to indicate the degree to which her or his coach exhibits that particular type of behavior (e.g., "My coach helps athletes with their personal problems"). Initial reliability and factorial and construct validity for the measure have been reported with college-age athletes (see Chelladurai & Reimer, 1998).

The second questionnaire administered to assess athletes' perceptions of their coaches' behavior was the Coaching Feedback Questionnaire (CFQ). This questionnaire was developed to assess athletes' perceptions regarding the type of feedback their coaches give them in response to their performance successes and failures. The CFQ was developed as a questionnaire version of the Coaching Behavior Assessment System (CBAS; Smith, Smoll, & Hunt, 1977). The CFQ was used in addition to the LSS because the LSS provides a more general measure of leadership style, while the CFQ provides a more specific measure of coaching behavior with regard to feedback patterns.

The CFQ, as used in this study, includes 16 items representing eight different types of feedback responses. These eight categories included three that are given by coaches in response to players' performance successes (praise/reinforce-

ment, nonreinforcement, reinforcement combined with technical instruction) and five that are given in response to players' performance errors (mistake-contingent encouragement, ignoring mistakes, corrective instruction, punishment, and corrective instruction combined with punishment). These feedback categories correspond to those categories identified in the original CBAS (Smith et al., 1977), in addition to one (reinforcement combined with technical instruction) identified in a subsequent observational study conducted by Horn (1985). For each of the 16 items, athletes were asked to indicate on a 5-point scale (*very typical* to *not at all typical*) how typical it was for their coach to give them that particular type of feedback during practices and games.¹

Intrinsic Motivation. Intrinsic motivation was assessed using a sport-oriented version of the Intrinsic Motivation Inventory (IMI; McAuley, Duncan, & Tammen, 1989). An original version of the IMI was used by R. Ryan and his colleagues (e.g., Plant & Ryan, 1985; R. Ryan, Mims, & Koestner, 1983) as a multidimensional measure of subjects' intrinsic motivation for a specific achievement activity. McAuley et al.'s sport-oriented version of the IMI contains 16 items that assess four components of intrinsic motivation, including interest-enjoyment, perceived competence, effort-importance, and tension-pressure. McAuley et al. reported acceptable psychometric properties for the four subscales.

A fifth subscale was included in the current study questionnaire based on suggestions by McAuley et al. (1989). This additional subscale, labeled *perceived choice*, included four items to assess the degree to which athletes believe they are participating in their sport by personal choice. The four items include the following: (a) "I participate in this sport because I want to", (b) "I would quit this sport if I could", (c) "Working hard in this sport is something I choose to do", and (d) "When my eligibility is up I will quit this sport."²

Each item on the IMI is followed by a 7-point Likert-type scale, with response choices ranging from *strongly disagree* to *strongly agree*. Subjects are asked to indicate their agreement or disagreement with each statement by circling the appropriate response.

Procedures

Recruitment of participants began with the principal investigator contacting coaches via phone during their competitive season. At this time, the purpose and procedures of the study were explained. Coaches who agreed to allow their teams to participate were then asked to schedule an appointment with the principal investigator or a trained research assistant. At this meeting, which typically occurred before a practice or at a study table session, athletes were given a verbal and written explanation of the study being conducted. Athletes who agreed to participate signed a consent form and were then given the questionnaires. Participants were given as much time as they needed to complete the questionnaires and were assured that their answers would remain confidential. Coaches were asked to leave the area during the administration of the questionnaires.

Data Analyses

Prior to answering the main research questions, preliminary analyses were conducted. This involved conducting an exploratory factor analysis on the CFQ and examining the psychometric properties of the measures (i.e., obtaining alpha

coefficients). Correlations among variables were also examined to determine whether multicollinearity ($r > .70$) was an issue. The main analyses were then conducted. First, a multivariate analysis of variance was used to examine whether intrinsic motivation would vary as a function of athletes' gender, scholarship status, and perceptions concerning the percentage of their teammates who were on scholarship. Second, a multivariate multiple regression analysis was conducted to examine the relationship between athletes' intrinsic motivation, their scholarship status, and their perceptions of their coaches' behavior.

Results

Preliminary Analysis

Consistent with procedures used by Smoll and his colleagues (Smoll, Smith, Curtis, & Hunt, 1978) with the original CBAS, responses from the CFQ were subjected to a principal-axis factor analysis in order to determine the structure underlying athletes' perceptions of their coaches' feedback. Initial factors were extracted using a minimum eigenvalue of 1.0, and varimax rotation resulted in the identification of three conceptually distinct factors. A minimal loading of .40 was used in the interpretation of these factors (Tabachnick & Fidell, 1996). Examination of the factor loadings (see Table 1) indicated that items loading highly on Factor 1 described a coaching feedback style characterized by high frequencies of

Table 1 Factor-Analytic Results for the CFO

Feedback type	Factor 1	Factor 2	Factor 3
1. Reinforcement	.65	-.18	-.14
2. Nonreinforcement	-.46	.23	.53
3. Reinforcement plus technical instruction	.78	.01	-.07
4. Reinforcement plus technical instruction	.72	-.01	-.13
5. Reinforcement	.57	-.07	-.25
6. Nonreinforcement	-.51	.15	.58
7. Mistake-contingent encouragement	.58	-.21	-.04
8. Mistake-contingent technical instruction	.46	.17	.03
9. Mistake-contingent encouragement	.58	-.26	-.05
10. Punishment	-.26	.72	.06
11. Punishment plus technical instruction	-.04	.76	.04
12. Punishment plus technical instruction	-.08	.76	.01
13. Punishment	-.21	.77	.07
14. Mistake-contingent technical instruction	.12	.46	-.14
15. Ignoring mistakes	-.02	-.08	.64
16. Ignoring mistakes	-.07	-.05	.83
Eigenvalue	4.4	2.3	1.3
Percent variance	27.8	14.1	7.9

positive, encouraging, and informationally based feedback and low frequencies of nonreinforcement as responses given to athletes following performance successes and errors. Example statements in this category include (a) "Great play. Now you're keeping your eyes on the ball"; (b) "Hang in there! You'll do better next time"; and (c) "You dropped your elbow. Next time keep it up." Given these loadings, Factor 1 was labeled positive and informational feedback. Items loading highly on Factor 2 suggest a coaching feedback style characterized by high frequencies of punishment-oriented feedback given in response to players' performance errors. Example statements include (a) "That was a really stupid play" and (b) "How many times have I told you to extend your elbow?" Thus, this factor was labeled punishment-oriented feedback. Finally, examination of the items loading highly on Factor 3 clearly indicates a coaching style in which athletes' performance successes and failures are ignored (i.e., coach gives no reinforcement in response to players' successes and ignores athletes' performance errors) and was thus labeled nonreinforcement/ignoring mistakes. Factor scores for each study participant were computed and used in subsequent analyses as a measure of athletes' perceptions concerning their coaches' feedback style.

The internal consistency of all study measures was calculated using Cronbach's alpha. These values are presented in Table 2. The majority of subscales demonstrated coefficients greater than .70, indicating an acceptable level of internal consistency (Nunnally, 1978). There were, however, a few measures that fell below the .70 criterion. These included the autocratic behavior subscale from the LSS (.65) and the perceived competence (.66) and tension-pressure (.62) subscales from the IMI. Due to the importance of these subscales and to the fact that the alpha coefficient did exceed a level of .60, which has been identified as an acceptable, if marginal, level of reliability for subscales with a small number of items but

Table 2 Descriptive Statistics and Alpha Coefficients for Study Variables

Variable	M	SD	α
Dependent variables			
Interest-enjoyment	6.0	0.97	.85
Perceived competence	5.7	0.79	.66
Effort-importance	6.3	0.81	.75
Perceived choice	5.7	1.09	.72
Tension-pressure	4.7	1.06	.62
Predictor variables			
LSS: training and instruction	3.9	0.58	.89
LSS: democratic behavior	3.0	0.70	.83
LSS: autocratic behavior	2.8	0.66	.65
LSS: social support	3.1	0.75	.82
LSS: positive feedback	3.8	0.74	.87
CFQ: positive-informational feedback	0.0	0.92	.72
CFQ: punishment-oriented feedback	0.0	0.92	.83
CFQ: nonreinforcement/ignoring mistakes	0.0	0.90	.78

with a demonstrated strong underlying factor structure (e.g., McAuley et al., 1989; Smith, Schutz, Smoll, & Ptacek, 1995), these subscales were retained. However, caution should be used in the interpretation of results pertaining to these measures.

Univariate correlations among the study measures were also examined. The obtained correlations ranged from 0 to .64. Given that all obtained r values were below .70, multicollinearity was not considered to be an issue.³

Main Analyses

Intrinsic Motivation, Gender, and Scholarship Status. To test whether athletes' intrinsic motivation would vary as a function of their gender, scholarship status, and perceived percentage of athletes on scholarship, a $2 \times 3 \times 2$ (gender by scholarship status by scholarship percentage) MANOVA was conducted. The dependent variables for this analysis were the five subscale scores from the IMI (interest-enjoyment, perceived competence, effort-importance, perceived choice, and tension-pressure). The independent variables were gender (male, female), scholarship status (full, partial, none), and perceived scholarship percentage (low: $\leq 70\%$, high: $\geq 75\%$). The descriptive statistics for each group are presented in Table 3.

Due to the nonorthogonal nature of the research design, the significance of the main and interaction effects was tested in hierarchical fashion (Finn, 1974; Tabachnick & Fidell, 1996). This procedure revealed a nonsignificant three-way (gender by scholarship status by scholarship percentage) interaction effect. In addition, the Scholarship Status \times Scholarship Percentage interaction, the Gender \times Scholarship Status interaction, and the Gender \times Scholarship Percentage interaction were all nonsignificant. The scholarship percentage main effect was also nonsignificant. However, both the scholarship status main effect, Wilks's lambda = .94, $F(10, 740) = 2.37, p < .01$, and the gender main effect, Wilks's lambda = .97, $F(5, 370) = 2.39, p < .04$, were significant.

In regard to the significant scholarship status main effect, examination of the discriminant function loadings (see Table 4), using a minimal value of .30 (Tabachnick & Fidell, 1996), indicates that perceived competence, effort-importance, and tension-pressure contributed most to group differences. Post hoc Scheffé means comparison tests indicated that athletes on full scholarship scored higher than nonscholarship athletes on perceived competence but lower on tension-pressure (see Table 3). In addition, results indicated that athletes on partial scholarship scored higher on effort-importance than did athletes on full scholarship. Calculation of the effect size (η^2) revealed that only 6% of the variance in athletes' intrinsic motivation could be attributed to differences in scholarship status.

In regard to the significant gender main effect, the discriminant function loadings showed that effort-importance, choice, and tension-pressure maximized group differences. Examination of the group means show that female athletes scored higher on the effort-importance and tension-pressure subscales (see Table 3). In contrast, males scored higher on the perceived choice subscale. The effect size for the gender main effect indicates that only 3% of the variability between athletes' intrinsic motivation could be explained by gender.

Intrinsic Motivation and Coaching Behavior. The second purpose of this study was to examine the relationship between athletes' intrinsic motivation, their scholarship status, and their perceptions of their coaches' behavior. To test for the hypothesized relationships, a multivariate multiple regression analysis was conducted. The dependent variables were the five subscales from the IMI, and the

Table 3 Intrinsic Motivation by Gender, Scholarship Status, and Perceived Percentage of Teammates on Scholarship

Variable	Gender		Perceived percentage of teammates on scholarship								
			Scholarship status			High ($\geq 75\%$) (<i>n</i> = 220)			Low ($\leq 70\%$) (<i>n</i> = 166)		
	Males (<i>n</i> = 199)	Females (<i>n</i> = 187)	None (<i>n</i> = 112)	Partial (<i>n</i> = 163)	Full (<i>n</i> = 111)	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Interest-enjoyment	6.0 (1.02)	6.0 (0.93)	5.9 (0.98)	6.0 (0.98)	6.0 (1.01)	6.1 (0.95)		5.9 (0.99)			
Perceived competence	5.7 (0.83)	5.7 (0.76)	5.5 (0.80)	5.7 (0.74)	5.8 (0.84)	5.7 (0.80)		5.6 (0.78)			
Effort-importance	6.2 (0.92)	6.4 (0.66)	6.3 (0.86)	6.5 (0.62)	6.2 (0.96)	6.3 (0.83)		6.3 (0.79)			
Perceived choice	5.8 (1.12)	5.5 (1.07)	5.7 (0.99)	5.7 (1.07)	5.7 (1.24)	5.7 (1.12)		5.7 (1.07)			
Tension-pressure	4.6 (1.03)	4.7 (1.10)	4.9 (0.97)	4.7 (1.08)	4.5 (1.11)	4.7 (1.09)		4.8 (1.01)			

Table 4 Discriminant Function Loadings for Scholarship and Gender Main Effect

Variable	Discriminant function loadings	
	Scholarship main effect	Gender main effect
Interest-enjoyment	.13	-.02
Perceived competence	-.42	.14
Effort-importance	.53	.55
Perceived choice	.20	-.38
Tension-pressure	.54	.39

Note. A minimal loading of .30 was considered significant.

predictor variables were the five subscale scores from the LSS and the three factor scores from the CFQ. In addition, based on results reported in the previous section showing that athletes' scholarship status is related to their intrinsic motivation, this variable was included as a predictor in order to determine whether and/or how perceived coaching behaviors and scholarship status might combine to affect athletes' intrinsic motivation. More specifically, athletes' responses to the question used in the demographic questionnaire to assess athletes' current scholarship status (*full, more than one half, one half, less than one half, none*) were used in this analysis. Finally, because the previous analyses have shown that male and female athletes differed in intrinsic motivation, the multivariate multiple regression analysis was run separately for the two gender groups.

The results of the regression analysis for the males revealed a significant multivariate relationship, Wilks's lambda = .57; $F(45, 830) = 2.43$; $p < .01$, indicating that the set of predictor variables could explain a significant amount of the variance in male athletes' intrinsic motivation. To identify which variables in the dependent and predictor sets contributed most to the multivariate relationship, the results of the canonical correlation analysis were examined. A value of .30 was considered an indication of a significant loading (Pedhazur, 1982). These results indicate that the relationship between the two data sets could best be captured by two canonical functions. The loadings from each of these functions are presented in Table 5. In the first function, interest-enjoyment, perceived competence, effort-importance, and choice contributed most highly to the multivariate relationship. In regard to the predictor variable set, three of the coaching behavior indices (training and instruction, autocratic behavior, and high frequencies of nonreinforcement and ignoring mistakes) exhibited significant loadings. Inspection of the signs for these loadings suggests that athletes who perceive their coaches to be high in training and instruction, low in an autocratic leadership style, and low in frequency of nonreinforcement and ignoring mistakes show correspondingly high levels of intrinsic motivation. Examination of the loadings from the second function show that athletes who are high in two of the IMI subscales (interest-enjoyment and perceived competence) and low in a third (tension-pressure) perceive their coaches

Table 5 Intrinsic Motivation and Perceived Coaching Behavior: Canonical Loadings

Variable	Males function		Females function
	1	2	1
Dependent variables			
Interest-enjoyment	.82	.31	-.95
Perceived competence	.59	.42	-.61
Effort-importance	.85	.09	-.61
Perceived choice	.95	-.17	-.63
Tension-pressure	.06	-.62	.18
Predictor variables			
LSS: training and instruction	.50	.37	-.80
LSS: democratic behavior	-.18	.01	-.48
LSS: autocratic behavior	-.56	.21	.37
LSS: social support	-.15	.31	-.25
LSS: positive feedback	.18	.52	-.61
CFQ: positive-informational feedback	-.06	.50	-.55
CFQ: punishment-oriented feedback	-.23	-.06	.32
CFQ: nonreinforcement/ignoring mistakes	-.76	-.07	.38
Scholarship status	.03	-.57	.10
<i>R</i> =	.51	.37	.53
<i>R</i> ² =	.26	.14	.28

Note. A minimal loading of .30 was considered significant.

to be high in training and instruction, high in social support, and high in frequency of positive and informationally based performance feedback. In addition, the negative loading on the scholarship status variable suggests that athletes who are on the lower end of the scholarship status continuum (1 = *full scholarship*, 5 = *none*) are higher in interest-enjoyment and perceived competence and lower in tension-pressure than are athletes who either receive no scholarship or lower amounts of a scholarship. Examination of the redundancy index reveals that a total of 15.8% of the variance in male athletes' intrinsic motivation is explained by the set of predictor variables. This value is higher than the minimal 10% level established by Pedhazur as necessary to indicate a meaningful relationship.

The results of the multivariate multiple regression analysis for females also revealed a significant multivariate relationship, Wilks's lambda = .58, $F(45, 776) = 2.22$, $p < .01$. Examination of the canonical correlation results (see Table 5) show that only one canonical function was found to be significant. Inspection of the canonical loadings shows that athletes who score high on four of the five IMI subscales (interest-enjoyment, perceived competence, effort-importance, and perceived choice) perceive their coaches to exhibit a high frequency of training and instruction, to exhibit

a low score on the autocratic subscale and a high score on the democratic subscale, and to give high frequencies of positive and informationally based performance feedback but low frequencies of punishment-oriented feedback and ignoring positive and negative performances. The redundancy index of 11.5% is again above the level of 10% recommended by Pedhazur (1982) as the minimal amount needed to establish a significant relationship.

Discussion

This study was conducted to test whether college athletes' intrinsic motivation would vary as a function of several factors including athletes' gender, scholarship status, their perceptions concerning the number of people on their team who were on scholarship, and their coaches' behavior. The hypothesized relationships were examined through the use of a series of multivariate analyses. The results, which provided some interesting information concerning intrinsic motivation in college athletes, are discussed in the following paragraphs.

To begin, no evidence was found in this study to support the idea that athletes on scholarship are lower in intrinsic motivation than are nonscholarship athletes. In fact, the opposite pattern was found. Specifically, athletes on full scholarship scored significantly higher on the perceived competence subscale of the IMI and lower on the tension-pressure subscale than did athletes who were not on scholarship. In light of cognitive evaluation theory (Deci & Ryan, 1980, 1985), these results suggest that athletic scholarships may serve to enhance athletes' intrinsic motivation because they convey positive information concerning the athletes' sport competence. In contrast, scholarships do not appear to result in an undermining of athletes' self-determination, because the present study results show that the three scholarship status groups (full, partial, none) did not differ on perceived choice or perceived enjoyment. Thus, the results of this study are not consistent with E. Ryan's earlier research (1977, 1980) showing that athletic scholarships undermine the intrinsic motivation of some college athletes.

One possible explanation for the inconsistency between E. Ryan's studies (1977, 1980) and the current one may lie in the athlete samples. E. Ryan's 1977 study was limited to collegiate male football players only. His second study (1980) included male football and wrestling athletes along with a sample of female college athletes from a variety of sports. The current study sample included male athletes from a wider variety of sports. Thus, it is possible that the effect of scholarships on the intrinsic motivation of male and females athletes may vary as a function of sport type.

A second difference between E. Ryan's studies (1977, 1980) and the current one revolves around the instrumentation used to measure intrinsic motivation in collegiate athletes. Specifically, E. Ryan assessed intrinsic motivation in his collegiate athlete samples by asking them a series of direct survey questions regarding their enjoyment level and their interest in playing the sport. In contrast, in the current study, a multidimensional measure (the IMI) of intrinsic motivation was used. From a conceptual and measurement perspective, such differences in the assessment process may have affected the results (see the discussion by Vallerand & Fortier, 1998, on the measurement of intrinsic motivation in sport and physical activity contexts).

This study also found no support for the notion that the effects of athletes' scholarship status on their intrinsic motivation would vary as a function of their

perceptions concerning the number (percentage) of athletes on their team who were on scholarship. Based on E. Ryan's (1977, 1980) research, it had been hypothesized for this study that scholarship athletes who perceived that a high percentage of their teammates were also on scholarship would show lower perceived competence (and lower intrinsic motivation) than would scholarship athletes who believed that only a small number (percentage) of athletes on their team were on scholarship. The multivariate results of this study indicated no support for this hypothesis. All main and interaction effects involving the scholarship percentage variable were found to be nonsignificant.

Although the nonsignificant results concerning the scholarship percentage variable suggest that athletes' intrinsic motivation does not appear to vary as a function of the number (percentage) of athletes on a team who are on scholarship, a cautionary note concerning the measurement of this variable must be made. Specifically, athletes in this study were asked to indicate (using a percentage) the number of athletes on their team who were currently on scholarship. These responses were used to group athletes into two categories: (a) those who perceived that a low number of athletes on their team were currently on scholarship, and (b) those who perceived that a high number of athletes on their team were currently on scholarship. A median split method was used to group athletes into these two categories. This median split method indicated that approximately half of the athletes in this sample perceived that 75% or more of the athletes on their team were on scholarship, while the other half of the athletes in this sample perceived that 70% or less of the athletes on their team were on scholarship. Obviously, the results from the median split suggest that the athletes in the current study sample had fairly high estimates concerning the number of athletes on their team who were on scholarship. Thus, our two comparison groups for this analysis may not have represented two "extreme" groups.

A second possibility for the lack of support regarding the effect of the scholarship percentage variable on college athletes' level of intrinsic motivation is that we did not ask athletes to differentiate in the amount of the scholarships they perceived their teammates to receive (i.e., partial or full). Such lack of specificity in the measurement of this variable may have affected the results pertaining to this variable.

In regard to gender, we had hypothesized that gender would not interact with scholarship status or scholarship percentage in this study to affect athletes' intrinsic motivation. This hypothesis was in contrast to E. Ryan's (1980) research and was based on the idea that the significant changes in women's college sport programs that have taken place over the past decade (see Coakley, 1999; U.S. Department of Education, 1997) would have resulted in a decrease in differences between male and female scholarship athletes' levels of intrinsic motivation. As expected, the results of the current study showed that all interaction effects that included gender were nonsignificant. However, a multivariate main effect for gender was found. Follow-up statistical tests showed that female athletes scored lower than male athletes on perceived choice and higher than male athletes on perceived effort-importance and tension-pressure. While these results indicate a significant difference between male and female athletes in levels of intrinsic motivation, it should be pointed out that the effect size for this gender difference main effect indicated that only 3% of the variability between athletes' intrinsic motivation could be explained by gender. Thus, although the gender main effect was statistically significant, it may not be all that meaningful in relation

to other factors that may explain a greater percentage of variance in collegiate athletes' level of intrinsic motivation. Nevertheless, these results, which suggest that females are slightly lower on a few indicators of intrinsic motivation, are somewhat surprising given other research with collegiate athletes in Canada that showed gender differences in the opposite direction (i.e., females higher than males on selected aspects of intrinsic motivation and lower on extrinsic motivation; Pelletier et al., 1995). However, the fact that female athletes in this study scored higher than did males on the tension-pressure subscale is consistent with previous research on competitive trait anxiety (Gill, 1988; Segal & Weinberg, 1984). In contrast, females' lower scores on the perceived choice subscale was unexpected and seems to suggest a lower level of perceived self-determination on the part of the female athletes. Future research should attempt to determine whether there are consistent and meaningful gender differences in intrinsic motivation and, if so, what factors contribute to these differences.

The second purpose of this study was to examine the relationship between athletes' intrinsic motivation, their scholarship status, and their perceptions of their coaches' behaviors. Based on previous research and theory, it had been hypothesized that athletes who perceived their coaches to exhibit a more democratic coaching style and to respond to players' performances with high levels of praise, encouragement, and informationally based feedback would exhibit higher motivation than would athletes who perceived their coaches to be more authoritarian in their leadership style and to provide lower levels of praise, encouragement, and informational feedback. While there were some rather specific gender differences, overall the results supported these predictions. In general, the results from the regression analyses for both the male and the female athletes suggest that coaches who exhibit a leadership style characterized by low levels of autocratic behavior and who provide high frequencies of positive, encouraging, and informationally based feedback and low frequencies of ignoring players' successes and failures may create an environment that facilitates the development of intrinsic motivation in their athletes. These results are consistent with previous research in this area examining adolescent athletes (Black & Weiss, 1992; Pelletier & Vallerand, 1985; Vallerand & Pelletier, 1985) and with the cognitive evaluation theory. Specifically, based on cognitive evaluation theory, coaches high in autocratic behavior would be expected to undermine athletes' intrinsic motivation primarily because such a coaching style is not conducive to facilitating athletes' perceptions of self-determination. Similarly, coaches who provide high frequencies of positive, encouraging, and informationally based feedback in response to players' performances should be successful in facilitating athletes' intrinsic motivation, because such coaching behaviors enhance both athletes' perceptions of competence and their sense of self-determination. These results, then, point to the importance of coaches' behavior in affecting the intrinsic motivation of athletes, even at older and more highly skilled levels of play.

While these results suggest that there is a particular set of coaching behaviors that may be associated with athletes' intrinsic motivation, the results of this study did reveal some rather specific gender differences. First, a democratic coaching style seems to be more important to female athletes' intrinsic motivation than it does to males. Second, for females, a coaching feedback pattern characterized by high frequencies of punishment-oriented feedback was negatively related to their intrinsic motivation scores, while this type of feedback was not significantly re-

lated to male athletes' intrinsic motivation. These gender-differential results are interesting because they are consistent with other research showing that female athletes exhibit higher preferences than do their male peers for a democratic coaching style (Chelladurai & Arnott, 1985; Chelladurai & Saleh, 1978). In addition, female athletes have also been found to show greater dislike than do male athletes for a feedback style that is high in punishment-oriented feedback (Horn & Glenn, 1988). Thus, these gender-differential results are consistent with other research in the coaching behavior area and seem to suggest that the effects of different types of coaching behavior on athletes may vary, at least to a certain extent, as a function of gender. Therefore, continued research in the area of coaching effectiveness should consider gender as a potentially important individual difference factor.

A third gender-specific difference that emerged in the current study was that scholarship status, when combined with perceived coaching behaviors, was significantly related to intrinsic motivation for males but not for females. Specifically, the multivariate multiple regression results for males revealed two significant canonical functions. The first function showed a significant relationship between a number of perceived coaching behaviors and athletes' scores on four of the five intrinsic motivation subscales. The second function, again, showed that selected perceived coaching behaviors, when combined with scholarship status, were significantly correlated with athletes' scores on three of the IMI subscales (interest-enjoyment, perceived competence, and tension-pressure). In regard to the scholarship status variable, the results showed that athletes who were on full scholarship seemed to be advantaged in intrinsic motivation. This advantage is particularly reflected in higher perceptions of competence and lower levels of tension and pressure. In contrast, for females, only one canonical function was found, and the loadings on this function indicated significant relationships between perceived coaching behaviors and athletes' intrinsic motivation. Scholarship status was not significantly related in any way to female athletes' level of intrinsic motivation.

Although these results indicate that scholarship status did explain some of the variance in male athletes' intrinsic motivation but not in that of the female athletes, it is important to note that even for the male athletes, perceived coaching behaviors appear to have a relatively greater influence on their intrinsic motivation than does scholarship status. For males, the first canonical function, which explained the greatest amount of variance in intrinsic motivation, included only perceived coaching behaviors. The impact of scholarship status was revealed only in the second function, which explains a unique amount of variance in the dependent variable set (intrinsic motivation subscale scores) above and beyond that explained by the first function. Thus, for both males and females, perceived coaching behaviors appear to have a relatively greater impact on intrinsic motivation than does scholarship status. This is understandable given that athletes are constantly interacting with their coaches, and these interactions are likely to result in numerous events that can influence the athletes' perceptions of competence and self-determination and, ultimately, their intrinsic motivation.

Furthermore, even though scholarships may be perceived as informational or controlling, E. Ryan (1977, 1980) suggested that it may not be the scholarships themselves that influence intrinsic motivation but how the coaches "use" the scholarships. For example, a coach can emphasize the informational aspect of the reward by highlighting the fact that the athlete is receiving the scholarship because the coach perceives he or she is a good athlete. Conversely, the controlling aspect of

the reward may be perceived as more salient if a coach uses the scholarship to control the athlete's behavior (e.g., "You better start working hard or I am going to give your scholarship to someone who will!"). Thus, the athletes' perceptions of their coaches' leadership styles and behaviors may be the key factor influencing intrinsic motivation. Of course, it should be noted that redundancy indices showed that perceived coaching behavior, in combination with athletes' scholarship status, explained only 16% of the variance in male athletes' intrinsic motivation and only 11.5% of the variance in female athletes' intrinsic motivation. Thus, there are many other factors that we did not examine that may also contribute to the development and/or enhancement of intrinsic motivation in collegiate athletes.

Although the results of this study have provided some interesting information concerning the intrinsic motivation of collegiate athletes, certain limitations should be noted. First, the sample of athletes in this study was limited to Division I players who were predominantly European American and from a selected sample of sports. Thus, this sample does not really represent an adequate cross-section of the population of Division I college players. In addition, although the participants included athletes at all academic levels (first year to senior), we did not include academic year (or year of athletic eligibility) as a factor in our examination of intrinsic motivation. Based on our review of the literature, the independent variables we did examine in this study (gender, scholarship status, and percentage of team on scholarship) appeared to be the most critical. However, there is evidence to suggest that collegiate athletes' intrinsic motivation may vary as a function of year in college (E. Ryan, 1977, 1980). Thus, further research on this factor and on its possible interaction with the other independent variables is warranted.

A second limitation concerns the instrumentation that was used in this study to measure athletes' intrinsic motivation and their perceptions of their coaches' behavior. As noted earlier, two of the subscales from the IMI and one of the subscales from the LSS showed a level of internal consistency that was below that recommended by Nunnally (1978). Although we retained these measures, we suggested that caution be used when interpreting results relevant to these subscales. As other writers and researchers have noted, it is difficult to obtain reliable and valid measures of coaching behavior (or athletes' perceptions of their coaches' behavior; see Chelladurai, 1990; Horn, 1992). However, given the consistency of the results from the coaching behavior research studies that have used either or both the LSS and a questionnaire version of the CBAS (e.g., Black & Weiss, 1992; Chelladurai, 1984; Horn & Glenn, 1988; Weiss & Friedrichs, 1986), it does appear likely that certain aspects of a coach's behavior (e.g., a democratic rather than an autocratic behavior style; high frequencies of training and instructional behavior; and positive, informationally based feedback and correspondingly low frequencies of punishment-oriented feedback and nonreinforcement/ignoring mistakes) are most highly related to athletes' intrinsic motivation, self-perceptions, satisfaction, and performance. However, there are other potentially important coaching behaviors that may need to be examined. For example, previous research has shown that coaches' tendency to be controlling versus autonomy supportive can influence intrinsic motivation (e.g., Pelletier & Vallerand, 1985; Vallerand & Pelletier, 1985). Continued efforts to improve the reliability, validity, and scope of our coaching behavior instruments are necessary.

In regard to the measurement of intrinsic motivation, the IMI appears to be adequate. However, given recent advancements in the theoretical underpinnings of intrinsic motivation (Vallerand, 1997; Vallerand et al., 1992), alternative measures

of intrinsic motivation may also provide important information. Such work has been done by Pelletier et al. (1995) using the Sport Motivation Scale. The use of this newly developed scale in future research may result in further refinement of the antecedents and correlates of an intrinsic motivational orientation.

Finally, it should be noted that this study was correlational in nature. Cognitive evaluation theory (Deci & Ryan, 1980, 1985) suggests a temporal process whereby events influence perceived competence and/or self-determination that, in turn, affect intrinsic motivation. Based on our design, we can only speculate on this process. Future research testing this temporal process and examining how these factors change over time would provide a stronger test of cognitive evaluation theory.

In summary, the results of the research presented in this paper suggest that scholarship status and coaching behavior do have an impact on the intrinsic motivation of collegiate athletes. Nevertheless, many questions still remain. Given the potential benefits of possessing an intrinsic motivational orientation (see Weiss & Chaumeton, 1992), further research on this topic is certainly warranted.

Endnotes

¹An original version of the CFQ containing only eight items (one item to assess each type of coach feedback) was used by Horn and Glenn (1988) in a study conducted with high school athletes. Subsequently, a second version of the CFQ was developed that added a second item to each of the eight subscales (feedback categories). Two pilot studies were then conducted. The first included 169 high school athletes ranging in age from 13 to 17 years. The second pilot study included 139 collegiate soccer athletes ranging in age from 17 to 24 years. Factor analysis of the 16-item CFQ (the same version as used in the current study) with the two pilot samples indicated a stable factor structure and alpha coefficients for individual subscales ranging from .62 to .91.

²The items included in this fifth subscale were developed based on pilot work with two samples of collegiate athletes ($n = 128$ and $n = 139$). The results of this pilot work indicated high internal consistency among the four items in the perceived choice subscale (i.e., alpha coefficients of .84 and .76 were obtained).

³A correlation matrix can be obtained upon request from the second author.

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Manuscript submitted: March 18, 1998

Revision accepted: November 11, 1999