

## **Pre- to Post-Season Changes in the Intrinsic Motivation of First Year College Athletes: Relationships with Coaching Behavior and Scholarship Status**

ANTHONY J. AMOROSE

*Illinois State University*

THELMA S. HORN

*Miami University*

This study examined whether the intrinsic motivation levels of first-year college athletes changed from pre- to post-season as a function of their scholarship status or their perceptions of their coaches' behavior. Division I college athletes ( $N = 72$ ) completed questionnaires assessing their intrinsic motivation at the beginning and end of their first year of participation. They also reported their scholarship status and their perceptions of their coaches' behaviors over the season. Contrary to predictions, results revealed that neither scholarship status nor time affected the athletes' level of intrinsic motivation. Strong support for the relationship between athletes' perceptions of their coaches' behavior and changes in athletes' level of intrinsic motivation over the season, however, emerged. Increases in athletes' level of intrinsic motivation were associated with athletes' perceptions that their coaches exhibited high frequencies of training and instruction behavior, and low frequencies of autocratic behavior and social support. Results are discussed in relation to cognitive evaluation theory and previous research on intrinsic motivation.

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Address correspondence to Anthony J. Amorose, Department of HPER, Illinois State University, Normal, IL 61790-5120. E-mail: [ajamoro@ilstu.edu](mailto:ajamoro@ilstu.edu)

To play ball was all I lived for. I used to like to play so much that I loved to take infield practice. Hitting—I could do that all day. I couldn't wait to go out to the ball park. I hated it when we got rained out.

Every coach dreams of having players with the attitude illustrated by the above quote from Mickey Mantle (quoted in Ferguson, 1982, pp. 2–16). Athletes with this attitude are willing to work hard and give their best effort because they want to, not because they are getting some external rewards such as social approval from their parents and peers or money for participating. To them it is all just plain fun. But who are these athletes? Where does their inner motivation come from? Can it be developed in others? These are all questions that coaches would like to have answered and which researchers are trying to explore.

From a psychological perspective, athletes such as those described in the preceding paragraph are characterized by having a high degree of intrinsic motivation. These individuals participate in an achievement activity (e.g., sport) primarily for intrinsic (e.g., fun, pleasure, personal mastery) rather than for extrinsic reasons (e.g., money, rewards, social approval). That is, these individuals engage in the activity in order to experience the satisfaction and pleasure inherent in the activity itself (Vallerand, 1997). In an attempt to understand intrinsic motivation, a number of researchers have looked toward cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1985), which is a sub-theory embedded in Deci and Ryan's (1985, 1991) larger self-determination theory.

According to cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1985), the two main determinants of intrinsic motivation include: (a) the degree to which individuals feel self-determining in their environment and (b) the extent to which individuals feel competent in a particular domain. Specifically, intrinsic motivation for a particular activity will vary as a function to which individuals feel they have personal control or choice (i.e., self-determination) and adequate ability (i.e., competence) in that activity. Furthermore, it is suggested by cognitive evaluation theory that any event or factor which can influence an individual's perceptions of competence or self-determination will ultimately lead to changes in that individual's level of intrinsic motivation. Factors or events that enhance or facilitate self-determination or perceived competence should lead to an increase in intrinsic motivation, whereas factors or events that undermine self-determination or perceived competence should have an opposite effect.

A number of environmental and interpersonal factors have been identified as potential determinants of intrinsic motivation (see reviews by Frederick & Ryan, 1995; Vallerand, Deci, & Ryan, 1987; Vallerand & Losier, 1999). Two factors that appear to be particularly important in the sport context are coaches' leadership styles and behaviors and the use/non-use of rewards.

### *Leadership Styles and Behaviors of Coaches*

Research conducted in the sport setting has found that coaches' leadership styles and behaviors influence athletes' psychological responses such as their self-esteem, perceptions of competence, affect, and motivation (see Horn, 1992). Be-

haviors exhibited by coaches can also influence athletes' level of *intrinsic motivation*. For instance, studies examining the role of verbal feedback on intrinsic motivation have found that positive feedback is associated with higher levels of intrinsic motivation, whereas negative feedback is associated with lower levels of intrinsic motivation (Vallerand, 1983; Vallerand & Reid, 1984; Whitehead & Corbin, 1991). Black and Weiss (1992) also found that feedback from coaches influenced intrinsic motivation in a sample of adolescent swimmers. Although there were some specific age- and gender-related differences, in general coaches who were perceived to exhibit high frequencies of praise and information following desirable performances, and high frequencies of encouragement and information following undesirable performances, were more apt to have athletes who reported higher levels of perceived success, perceived competence, enjoyment, effort, and preference for optimally challenging activities. The result of these studies are consistent with cognitive evaluation theory which predicts that the provision of positive (e.g., praise, encouragement) and informational (e.g., technical instruction) feedback should lead to increases in perceptions of competence, which in turn increases individuals' levels of intrinsic motivation. Negative feedback, on the other hand, provides negative competence information and therefore decreases intrinsic motivation.

Amorose and Horn (2000) recently extended this literature by examining the influence of perceived coaching feedback patterns *and* coaches' general leadership styles on college athletes' intrinsic motivation. Although some slight gender differences emerged, the general pattern of results revealed that coaches who were perceived to exhibit high frequencies of positive, encouraging, and informational feedback, high levels of democratic behavior, as well as low levels of autocratic behavior and low frequencies of ignoring players performance attempts, had athletes who reported higher levels of intrinsic motivation (i.e., higher interest-enjoyment, perceived competence, effort, importance, choice, and lower tension-pressure). These results are consistent with the basic tenants of cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1985). A positive and informational feedback style presumably leads to higher levels of perceived competence and subsequently higher levels of intrinsic motivation. Similarly, coaches who provide higher levels of training-instruction (i.e., emphasis on improvement of skills and performance) are likely to be associated with increases in athletes' perceived competence and intrinsic motivation. Conversely, coaches who consistently ignore athletes' performance attempts provide no or possibly even negative competence information to athletes (Horn, 1987). This, in turn, would have a negative impact on the athletes' level of intrinsic motivation. Finally, a coach who makes all decisions regarding the team without consulting with the athletes (i.e., a coach with an autocratic leadership style) provides little opportunity for the athletes to feel self-determining in their environment, thus presumably leading to lower levels of intrinsic motivation.

The results of previously cited studies provide support for the influence of coaching behavior on athletes' level of intrinsic motivation. Particularly, these studies would suggest that behaviors such as the coach's leadership style (e.g., decision-

making style, level of training-instruction) and feedback patterns are important. It is possible that a number of other coaching behaviors, or factors directly under the control of the coach, may also impact his/her athletes' levels of intrinsic motivation. One example is the distribution of external rewards. Although not a specific coaching behavior, the use or non-use of external rewards (e.g., trophies, prizes, or money) are often under the control of the coach, and the distribution of these rewards and their impact on intrinsic motivation has received considerable attention in the literature (see Frederick & Ryan, 1995; Vallerand et al., 1987).

### *External Rewards*

According to cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1985), the use or non-use of external rewards have a significant influence on individuals' level of intrinsic motivation. On one hand, receiving a reward can be perceived by an individual as an indication of competence (e.g., receiving a scholarship to participate in collegiate sport), thus facilitating intrinsic motivation. Conversely, external rewards can be seen as a controller of one's behavior, therefore undermining individuals' self-determination and intrinsic motivation. Early research in the area (e.g., Lepper & Greene, 1975; Orlick & Mosher, 1978), which was often conducted in a laboratory setting, reported that the provision of external rewards generally lead to decreases in intrinsic motivation. These researchers concluded that the provision of rewards for an inherently interesting activity was detrimental to intrinsic motivation. Notwithstanding a number of criticisms (e.g., Weiss & Chaumeton, 1992), the results of these studies provided initial support for the effect of rewards on intrinsic motivation.

Research by E. Ryan (1977, 1980) attempted to extend the findings of the previous laboratory studies by testing these relationships in a more naturalistic setting. Specifically, E. Ryan conducted two field studies to examine the effects of scholarships on the intrinsic motivation of college athletes. In his first study, E. Ryan (1977) assessed the degree of intrinsic motivation in both scholarship and non-scholarship male American football players. He hypothesized that individuals on scholarship would report less intrinsic motivation than the non-scholarship players given that the athletes were essentially being paid (i.e., getting a scholarship) for doing an activity that was already intrinsically pleasing. The results from this study supported E. Ryan's hypothesis in that scholarship athletes reported a lower degree of intrinsic motivation than did the non-scholarship athletes.

In his second study, E. Ryan (1980) replicated and extended his earlier research by including male subjects from both wrestling and American football and female athletes from a variety of sports. As before, the results of this study indicated that athletes on scholarship had lower levels of intrinsic motivation than non-scholarship athletes, but this was true only for football players. No differences in intrinsic motivation were found between scholarship and non-scholarship athletes from wrestling or for any of the female sports. E. Ryan interpreted these findings in light of cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1985). He suggested that the scholarships may actually 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 may have increased the athletes' perception of competence (relative to their teammates) and correspondingly facilitated intrinsic motivation. In contrast, because most football players are on scholarship, E. Ryan suggested that such awards may have not facilitated perceptions of competence. Rather, the scholarships may be perceived in this sport context as controlling, thus resulting in a low level of intrinsic motivation.

Recently, the work by E. Ryan (1977, 1980) was replicated and extended by Amorose and Horn (2000) who found that indices of intrinsic motivation differed between scholarship and non-scholarship collegiate athletes. Contrary to E. Ryan's work, however, athletes who reported receiving a full athletic scholarship tended to report a higher level of intrinsic motivation (i.e., higher perceived competence and lower tension and pressure) than non-scholarship athletes. Consistent with cognitive evaluation theory, Amorose and Horn suggested that perhaps the scholarship athletes did not perceive their scholarships to be a controller of their behavior, but rather served as an indication of their competence, thus facilitating their intrinsic motivation relative to non-scholarship athletes. It appears then, that the use or non-use of rewards (e.g., scholarships) may be an important variable to include when attempting to understand athletes' level of intrinsic motivation for participating in sport.

In summary, research suggests that both the behavior of the adult supervisor (i.e., coach) and the achievement reward structure (i.e., scholarships) play an important role in the level of intrinsic motivation experienced by athletes. However, many questions still remain in trying to understand the factors related to the development of intrinsic motivation in athletes. For example, how do coaching behaviors and scholarship status influence intrinsic motivation over time? According to cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1985), intrinsic motivation will vary across time depending on the experiences of the individual (e.g., interpersonal relationships, environmental factors). The studies reviewed up to this point have typically examined intrinsic motivation at only one point in time (e.g., Amorose & Horn, 2000; Black & Weiss, 1992; E. Ryan, 1977, 1980). While these cross-sectional studies have provided us with important information, it seems imperative to determine the long-term effects of various interpersonal and environmental factors on intrinsic motivation. Thus, the purpose of this study was to address this issue. Specifically, this study was designed to examine whether any changes that occurred in college athletes' level of intrinsic motivation from pre- to post-season would be related to their perceptions of their coaches' behaviors and/or would differ as a function of their scholarship status.

Based on the tenants of cognitive evaluation theory and the previous research, two major hypotheses were forwarded. Although tentative, given the somewhat conflicting results, it was predicted that athletes who received a scholarship to participate were predicted to report higher levels of intrinsic motivation (pre-season, post-season, and season-long changes) in comparison to athletes who were not on scholarship. This was based primarily on the most recent findings of Amorose

and Horn (2000), which this study was modeled after. The second hypothesis predicted that the athletes' perceptions of their coaches' behavior over the course of the season would be significantly related to season-long changes in intrinsic motivation of the athletes. More specifically, it was expected that athletes who perceived their coaches to provide higher frequencies of positive feedback, higher frequencies of training-instruction, and exhibit a more democratic leadership style would show increases in intrinsic motivation from pre- to post-season. Conversely, athletes who perceived their coaches to exhibit a more autocratic leadership style would experience decreases in intrinsic motivation from pre- to post-season

## METHOD

### *Participants*

The participant sample ( $N = 72$ ) was composed of American male ( $n = 45$ ) and female ( $n = 27$ ) Division I college athletes who were in their first year of eligibility. The athletes ranged in age from 17 to 19 years ( $M = 18.33$ ,  $SD = .53$ ) and represented a variety of sports. Athletes were recruited from softball ( $n = 5$ ), swimming ( $n = 21$ ), track and field ( $n = 30$ ), and wrestling ( $n = 16$ ). The sample was composed entirely of Euro American athletes ( $n = 71$ ), with the exception of one athlete who identified him/herself as African American. A total of 2 athletes reported that they received full athletic scholarships, 30 reported they received partial scholarships, and 40 indicated that they received no athletic scholarship for participating in their respective sport.

Only first year athletes were selected given the possibility that the new experiences involved with both scholarships and college coaching behaviors will have their largest impact during the athletes' first year of college participation. That is, athletes' initial exposure to athletic scholarships occurs during their first year of intercollegiate competition. Thus, the experiences involved with receiving (or not receiving) a scholarship (i.e., perceiving the scholarship as controlling or informational) may be particularly salient at this time. Similarly, as Vallerand and Pelletier (1985, as cited in Vallerand et al., 1987) suggested, athletes who have not participated for any length of time with a particular coach may be more sensitive to that coach's leadership style and behavior. Hence, it is possible that the influence of a new coaches' behavior will have a more significant effect on the athletes' intrinsic motivation during this initial period.

### *Procedures*

Recruitment of the participants began with the principal investigator contacting the coaches prior to the beginning of their team's competitive season. For the coaches who agreed to allow their teams to participate, an initial data collection session was scheduled 2 to 4 weeks prior to the beginning of the team's competitive season (i.e., the first official competition). At this pre-season data collection athletes were given a written and verbal description of the project. Those athletes who agreed to participate completed an informed consent form and then were

provided with the pre-season questionnaires. Participants were given as much time as needed and were told that their answers would remain confidential (i.e., standard Institutional Review Board procedures).

At the end of the competitive season, a second meeting was scheduled with the athletes who completed the pre-season packet of questionnaires. At this meeting a second survey packet was administered. All post-season data was collected during the last two weeks of the competitive season (i.e., two weeks prior to the last official competition).

### *Pre-Season Measures*

*Background information.* Each participant was asked to complete a demographic questionnaire. Questions assessed the participants' age, gender, race, and primary sport. This questionnaire also inquired about the athletes' scholarship status. Participants were asked to check whether they received a full athletic scholarship, a partial athletic scholarship, or no athletic scholarship.

*Intrinsic motivation.* The Intrinsic Motivation Inventory (IMI) was originally developed by R. Ryan, Mims, and Koestner (1983) to assess the overall level of intrinsic motivation experienced by an individual engaged in an achievement oriented task. For this study a sport-oriented version of the IMI (McAuley, Duncan, & Tammen, 1989) was used. The sport version of the IMI includes four subscale which measure various underlying dimensions or indices of intrinsic motivation including: (a) interest-enjoyment, (b) perceived competence, (c) effort-importance, and (d) tension-pressure. Following the recommendations of McAuley et al. (1989), a fifth subscale, perceived choice, was included in the current study questionnaire to assess the degree to which the athletes feel they are participating in their sport by personal choice (see Amrose & Horn, 2000).

All items were scored on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Mean scores were calculated for each of the five subscales. High scores on the subscales of interest-enjoyment, perceived competence, effort-importance, and perceived choice correspond to a high level of intrinsic motivation. Conversely, a low score on the subscale of tension-pressure would indicate a high level of intrinsic motivation. The psychometric properties of the sport version of the IMI have been reported by McAuley et al. (1989) and by Vallerand and Fortier (1998).

### *Post-Season Measures*

*Intrinsic motivation.* Athletes were again administered the sport-oriented version of the IMI. The inventory was included to assess indices of the athletes' level of intrinsic motivation at the end of the competitive season.

*Coaching behavior.* In order to assess the athletes' perceptions of their coaches' behaviors over the course of the season, all athletes completed the Leadership Scale for Sports (LSS). This scale, which was developed by Chelladurai and Saleh (1978, 1980), was designed to measure a wide array of general leadership behaviors including: (a) training-instruction (i.e., the degree to which the coach con-

ducts hard and strenuous practices and is engaged in instructing athletes in skills, techniques, and tactics of the sport), (b) positive feedback (i.e., the degree to which the coach provides the athletes with positive and encouraging feedback), (c) democratic behavior (i.e., the degree to which the coach encourages the athletes to participate in decisions regarding the team), (d) autocratic behavior (i.e., the degree to which the coach stresses his/her own personal authority for decisions regarding the team), and (e) social support (i.e., the degree to which the coach exhibits concern for the personal well-being of the athletes). Items, which were prefaced with "My coach ... ", were scored on a 5-point scale ranging from 1 (*never*) to 5 (*always*) (e.g., "My coach ... lets the athletes share in decision making"). Reliability and validity of the LSS are reported in Chelladurai and Reimer (1998).

### *Data Analysis*

Prior to testing the hypotheses, the internal consistency of all measures was calculated using Cronbach's (1951) alpha coefficient. This was followed by descriptive statistics and a check for multicollinearity. To test the impact of scholarship status on intrinsic motivation, a repeated measures MANOVA was conducted. To determine the relationship between coaching behavior and the season-long changes in intrinsic motivation, a multivariate multiple regression and follow-up canonical correlation analysis was conducted.

## **RESULTS**

### *Scale Reliabilities and Correlations*

Cronbach's (1951) alpha coefficient was used to determine the reliability of each measure used in the study. A minimum acceptable criterion was set at .70 as suggested by Nunnally (1978). Examination of the pre-season measures of intrinsic motivation indicated that effort-importance and perceived choice were the only subscales which initially exceeded the set criterion. Although the pre-season measures of interest-enjoyment, perceived competence, and tension-pressure initially failed to reach the acceptable criterion level, an examination of the item intercorrelations and squared multiple correlations revealed that a single item in each of the three subscales was unreliable for the present sample. Removal of these items resulted in all five of the pre-season intrinsic motivation subscales demonstrating acceptable reliability (range .70 to .80).

To assure consistency in the post-season measures, the items found unreliable in the pre-season IMI subscales were also removed from the post-season measures. Results revealed alpha coefficients ranging from .74 to .89, indicating that all five post-season intrinsic motivation subscales were reliable. All post-season measures of coaching behavior (i.e., LSS) also demonstrated an acceptable level of reliability (range .85 to .92).

Correlations were examined to determine whether the study variables were multicollinear ( $r^2 .70$ ). Correlations among the pre-season measures (range  $r =$

-.14 to .65) and among the post-season measures (range  $r = -.37$  to .66) suggested that multicollinearity was not a problem.

### *Scholarship Status and Intrinsic Motivation*

To test whether there were differences in either the pre-season, post-season, or the changes in intrinsic motivation as a function of the athletes' scholarship status, a 2 x 2 (Scholarship Level x Time) repeated measures multivariate analysis of variance (RM MANOVA) was conducted. The dependent variables for this analysis were the five subscale scores of the IMI (i.e., interest-enjoyment, perceived competence, effort-importance, choice, and tension-pressure). The independent variables were the athletes' scholarship status and time. For the scholarship status variable, subjects were categorized into one of two groups: (a) non-scholarship ( $n = 40$ ) and (b) scholarship ( $n = 32$ ).<sup>1</sup> The time variable included: (a) pre-season and (b) post-season.

Results from this analysis revealed that the scholarship status by time interaction, the main effect for scholarship status, and the main effect for time were all non-significant ( $p > .05$ ). This indicates that neither scholarship status and/or time affected the athletes' reported level of intrinsic motivation. Table 1 shows the means and standard deviations for each of the dependent measures by scholarship status.

### *Coaching Behavior and Intrinsic Motivation*

To determine whether various coaching behaviors could predict the changes that occur in the intrinsic motivation of athletes over their first college season, a multivariate multiple regression analysis with a follow-up canonical correlation analysis was conducted.<sup>2</sup> The criterion variables were the mean change or discrepancy scores (i.e., post-season minus pre-season) on the five subscales of the IMI (see Table 1). The predictor variables were the five subscales of the LSS measuring the athletes' perceptions of their coaches' behavior. The means and standard deviations for these variables are shown in Table 2.

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<sup>1</sup> Although the demographic questionnaire asked the athletes to indicate whether they were on full, partial, or no athletic scholarship, only a very few of the athletes reported they received a full scholarship ( $n = 2$ ). Therefore, to equal out the cell sizes for the RM MANOVA, full scholarships and partial scholarships were combined into a single category.

<sup>2</sup> There is some research to suggest that there are slight gender differences in the pattern of relationship between coaching behaviors and intrinsic motivation (e.g., Amorose & Horn, 2000; Black & Weiss, 1992). However, it was decided not to run separate analyses for males and females in the present investigation for a number of reasons. First, preliminary MANOVAs indicated that there were no significant differences between males and females on the set of perceived coaching behaviors or on the changes in intrinsic motivation from pre to post-season. Second, the ratio of participants to variables if the analyses were run separately would be rather small (approximately 4:1 for males and 2:1 for females). Third, although some of the previous research has reported gender differences, the (*continued*)

**Table 1**  
**Descriptive Data of Pre-Season, Post-Season, and Changes**  
**in Intrinsic Motivation Subscales by Scholarship Status**

Subscale	Pre-Season <i>M (SD)</i>	Post-Season <i>M (SD)</i>	Change (Pre-Post) <i>M (SD)</i>
Interest/enjoyment			
scholarship	5.94 (1.09)	5.79 (0.98)	
no scholarship	5.96 (1.03)	5.96 (1.20)	
combined	5.95 (1.05)	5.88 (1.10)	-0.07 (1.00)
Effort/importance			
scholarship	6.45 (0.61)	6.24 (0.91)	
no scholarship	6.31 (0.99)	6.17 (1.25)	
combined	6.37 (0.84)	6.20 (1.10)	-0.17 (0.70)
Perceived competence			
scholarship	5.95 (0.73)	5.66 (0.96)	
no scholarship	5.41 (1.05)	5.48 (1.25)	
combined	5.65 (0.95)	5.56 (1.13)	-0.09 (1.37)
Perceived choice			
scholarship	5.88 (1.19)	5.79 (1.09)	
no scholarship	5.91 (1.06)	5.71 (1.12)	
combined	5.89 (1.11)	5.75 (1.10)	-0.15 (0.58)
Tension/pressure			
scholarship	5.05 (1.59)	5.09 (1.11)	
no scholarship	5.00 (1.35)	5.05 (1.59)	
combined	5.03 (1.45)	5.07 (1.39)	0.04 (1.45)

The overall multivariate relationship was found to be significant, Wilks' Lambda = .45,  $F(25, 231) = 2.20$ ,  $p < .001$ . Thus, the athletes' perceptions of their college coaches' behaviors were predictive of the changes that occurred in the athletes' level of intrinsic motivation from pre- to post-season. A follow-up canonical correlation analysis was conducted to provide further information regarding the relative contribution of each variable to the overall multivariate relationship. Results from this analysis revealed one significant canonical function. Table 3 presents the canonical loadings and standardized canonical coefficients for this function. The canonical loading were used to examine the relationship between the changes in intrinsic motivation and perceived coaching behavior. Consistent with Pedhauzer (1982), a canonical loading of .30 or higher was considered to be significant.

<sup>2</sup> (*cont.*) pattern of results for males and females has typically been very similar. That is, in general, the same coaching behaviors that impact the intrinsic motivation of males has also been found to impact the intrinsic motivation of females. Given this rationale, along with the fact that the primary purpose of the present study was not to examine gender differences, males and females were combined for the present investigation.

**Table 2**  
**Descriptive Data of Perceived Coaching Behaviors**

Variable	<i>M (SD)</i>
Training/instruction	3.73 (0.58)
Democratic behavior	3.04 (0.74)
Autocratic behavior	2.76 (0.93)
Social support	2.77 (0.86)
Positive feedback	3.63 (0.87)

**Table 3**  
**Canonical Loadings and Standardize Canonical Coefficients**  
**for the Relationship Between Changes in Intrinsic Motivation**  
**and Perceived Coaching Behaviors**

Variables	Canonical Loadings	Standardized Canonical Coefficients
<i>Criterion Variables</i>		
Interest/enjoyment	-.68	-.29
Perceived competence	-.77	-.47
Effort/importance	-.53	-.58
Perceived choice	.21	.60
Tension/pressure	.26	.24
percentage of variance	28.73	
redundancy	11.80	
<i>Predictor Variables</i>		
Training/instruction	-.46	-.50
Democratic behavior	.04	.19
Autocratic behavior	.50	.78
Social support	.44	.77
Positive feedback	.21	.17
percentage of variance	5.74	
redundancy	13.97	
	$R_c$	.64

**Note:** A minimum canonical loading of .30 considered significant (Pedhauzer, 1982)

An examination of the canonical loadings revealed that perceived competence was the criterion variable that contributed most to the overall relationship, followed by interest-enjoyment and effort-importance. The predictor variables that contributed the most to the relationship were autocratic behavior, followed by training and instruction and social support. An examination of the loadings and their corresponding signs suggests that there was a positive relationship between changes in athletes' intrinsic motivation (i.e., interest-enjoyment, perceived com-

petence, and effort-importance) and the level of training-instruction the athletes perceived their coaches to exhibit. A negative relationship, on the other hand, emerged between changes in athletes' level of intrinsic motivation and their perceptions of their coaches' level of autocratic behavior and social support. In other words, athletes who perceived that their coaches provided high levels of training-instruction, and low levels of autocratic behavior and social support showed an increase in intrinsic motivation from pre- to post-season. Conversely, if the athletes perceived low frequencies of training-instruction, and high frequencies of autocratic behavior and social support, the athletes exhibited a decrease in intrinsic motivation from pre- to post-season.

According to Pedhauzer (1982) a redundancy index (i.e., the amount of shared variance between the set of predictor and criterion variables) greater than 10% is considered significant and meaningful. The redundancy index revealed that the predictor variables (i.e., perceived coaching behaviors) accounted for 11.8% of the variance in the criterion variables (i.e., the changes in intrinsic motivation from pre- to post-season). Thus, the results from this analysis suggest that the combination of coaching behavior variables accounted for a significant and meaningful amount of the variance in the changes that occurred in college athletes' level of intrinsic motivation from pre- to post-season.

## DISCUSSION

The purpose of the present study was to examine the impact of scholarship status and perceived coaching behavior on collegiate athletes' intrinsic motivation. Based on the tenants of cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1985) and the previous research examining both scholarship status and coaching behavior, a number of hypotheses were forwarded. A discussion of the results related to these hypotheses are presented in the following sections.

### *Scholarship Status and Intrinsic Motivation*

One of the factors predicted to influence the athletes' intrinsic motivation was scholarship status. Based primarily on the recent findings of Amorose and Horn (2000), it was hypothesized that athletes receiving an athletic scholarship would show higher levels of intrinsic motivation (pre-season, post-season, and the season-long changes) compared to athletes who were not on scholarship. No support for these predictions, however, was found. That is, there were no differences between scholarship and non-scholarship athletes on the changes in intrinsic motivation, or on either the pre-season or post-season measures of intrinsic motivation.

The fact that there were no differences in intrinsic motivation between scholarship and non-scholarship athletes is in contrast to theory and the previous research (Amorose & Horn, 2000; E. Ryan, 1977, 1980). One possible explanation for the non-significant results is that only a very few of the athletes in the present study reported receiving a "full" athletic scholarship. Rather, most of the athletes included in the scholarship group received only partial funding. Results reported by

Amorose and Horn (2000) indicated that there were no differences in intrinsic motivation between non-scholarship and partial scholarship athletes. It is possible then, that scholarships may have varying effects on intrinsic motivation depending on the amount of the reward. In other words, a partial scholarship may not be enough of a reward to be perceived by an athlete as either a major controller of his/her behavior or as an indication of his/her competence and thus, does not have a significant impact on the athlete's subsequent level of intrinsic motivation (see Calder & Staw, 1975, for a similar argument). This interpretation is only speculative and should be examined in future studies. Perhaps more important is to examine how the rewards are perceived by the athletes. According to cognitive evaluation theory, a reward can increase or decrease intrinsic motivation depending on whether it is perceived as informational or controlling. Future studies could perhaps clarify the inconsistent findings by specifically measuring how the athletes perceive the reward. Also, it is suggested that researchers look at factors that may contribute to perceiving a reward as either informational or controlling, such as the behavior of coaches and how they use scholarships (E. Ryan, 1980).

### *Perceived Coaching Behaviors and Intrinsic Motivation*

Based on previous research and theory, it was hypothesized that athletes who perceived their coaches to provide high frequencies of positive feedback, high frequencies of training-instruction, and exhibit a democratic leadership style over the course of the season would show an increase in intrinsic motivation over time. Conversely, athletes who perceived their coaches to exhibit an autocratic leadership style were predicted to experience a decrease in intrinsic motivation from pre- to post-season. Results provided support for the influence of coaching behavior on season-long changes in intrinsic motivation; however, the hypotheses regarding the specific coaching behaviors that would be positively or negatively related were only partially supported.

As expected, there was a positive relationship between training-instruction and changes in the athletes' levels of intrinsic motivation, as well as a negative relationship between autocratic behavior, and changes in intrinsic motivation. These findings are consistent with previous research and the predictions of cognitive evaluation theory. For example, an autocratic leadership style, where the coach makes all the decisions regarding the team without consulting the athletes, would be predicted to result in lower levels of self-determination on the part of the athletes, which in turn, would be predicted to result in a decrease in the athletes' intrinsic motivation. Although the study conducted by Amorose and Horn (2000) did not examine changes in intrinsic motivation, these researchers did report that an autocratic leadership style was negatively related to college athletes' intrinsic motivation. Similar results have been found by Vallerand and Pelletier (1985, cited in Vallerand et al., 1987) who indicated that swimmers who perceived their coaches to be controlling reported lower levels of intrinsic motivation and self-perceptions. Although an autocratic and controlling leadership style are not identical,

they are likely related and would therefore be predicted to result in a lower level of intrinsic motivation.

The hypothesized positive relationship between training-instruction and changes in the athletes' intrinsic motivation from pre- to post-season was also supported in the present study. A leadership style characterized by this type of behavior would not only assist the athletes in actually improving over the course of the season, but coaches who provide their athletes with high frequencies of instruction and practice may be indirectly telling the athletes that they believe that the athletes are capable of performing well in the future (Horn, 1987; Horn, Lox, & Labrador, 1998). This expectation of future success is likely to suggest to the athletes that they have high ability, which according to cognitive evaluation theory would likely facilitate intrinsic motivation. Furthermore, Horn (1987, 1992) has suggested that athletes who consistently receive informational feedback may begin to believe that they have control over their future performance. These feelings of personal control may, in turn, contribute to a higher intrinsic motivation.

Although the findings discussed up to this point have aligned with the hypotheses, not all of the results from the present investigation were consistent with expectations. First, a number of the coaching behavior variables predicted to influence changes in intrinsic motivation were not found to be significant contributors. For instance, a democratic leadership style was not related to changes in intrinsic motivation. This is in contrast to the results reported by Amorose and Horn (2000) as well as the predictions of cognitive evaluation theory. It is unclear why no significant relationship emerged. Perhaps the critical aspect of a coach's decision making style is not that he or she frequently allows his or her athletes to be involved in the decision making process (i.e., a democratic style), rather the key may be that he or she is not seen by the athletes as forcing his or her decisions on the athletes (i.e., a more autocratic style). That is, the autocratic behavior is seen as functionally more significant. Future studies should examine these and other decision-making styles (see Chelladurai, 1993) in more detail and determine how they influence athletes' intrinsic motivation.

Another unexpected finding was the lack of a relationship between positive feedback and changes in intrinsic motivation. Based on cognitive evaluation theory and the previous research it was predicted that coaches who engaged in high frequencies of this type of feedback would have athletes who showed increases in intrinsic motivation. This is primarily based on the assumption that positive feedback should lead to increases in the athletes' perceptions of competence. One possible explanation for the results is that the measurement of the positive feedback subscale was based primarily on the *frequency* and not necessarily on the *quality* of the feedback. Horn (1985, 1987) suggests that the feedback needs to be given *contingent* and *appropriate* to the level of performance demonstrated by the athlete. Perhaps some of the athletes viewed the positive feedback as inappropriate for the situation (e.g., excessive praise for success at a very easy skill), and therefore the feedback did not have a positive impact on the athletes' perceptions of competence or intrinsic motivation. Future research should examine how the *quality* not just the *quantity* of feedback impacts athletes.

Another unpredicted finding that emerged from the present study was the influence of social support. No specific hypotheses were forwarded for this particular variable because the results by Amorose and Horn (2000) found that it was not significantly related to intrinsic motivation. However, socially supportive behavior has been found to be related to other positive psychological responses reported by athletes, such as satisfaction (e.g., Weiss and Friedrichs, 1986). Relatedness, which refers to the psychological need for developing secure and satisfying interpersonal relationships, has been identified as another important construct associated with intrinsic motivation (see Deci & Ryan, 1985; R. Ryan & Powelson, 1991). It could be argued that coaches who provide higher frequencies of socially supportive behaviors towards their athletes may facilitate feelings of relatedness within the sport context, and subsequently enhance intrinsic motivation. Nevertheless, the findings from the current study indicate an opposite pattern emerged. That is, perceived social support from the coach was negatively related to changes in intrinsic motivation.

It is unclear why this negative relationship emerged in the present study. One possible explanation is that a strong interpersonal bond between an athlete and a coach who demonstrates care and concern for the well-being of their athletes may begin to form over time. Athletes who share this concern and admiration for his/her coach may begin to feel some pressure to maintain effort and involvement in their sport because they do not want to let down their coach. That is, the athletes may participate in the activity not so much for its own sake, but rather to avoid disappointing his/her coach. This would be consistent with a more extrinsic or less self-determined form (i.e., introjected regulation) of motivation (Deci & Ryan, 1985; Vallerand, 1997). Thus, high frequencies of socially supportive behavior may ultimately be interpreted as controlling the athletes' behaviors. Although this may help explain the unexpected results, additional research is needed before definite conclusions can be made.

While some unexpected relationships emerged, overall the results of the current study provide support for the link between perceived coaching behaviors and athletes' intrinsic motivation. What is particularly noteworthy is that the results indicated that specific coaching behaviors were predictive of the *changes* that occurred in the athletes' intrinsic motivation from pre- to post-season. Previous research in this area has only examined these relationships at one point in time, and therefore the current study provides an important extension of the literature.<sup>3</sup> Fur-

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<sup>3</sup> There is considerable debate regarding the use of change or difference scores, as was done in this study. Although some scholars, most notably Cronbach and Furby (1970), have suggested that changes scores are inherently problematic and should not be used, others (e.g., Rogosa, 1988) have indicated that change scores are reasonable and not as troublesome as some believe. While the use of multiple (e.g., > 3) occasions of measurement and more sophisticated data analysis (e.g., latent growth curves, dynamic factor analysis) is clearly desirable, the use of difference scores based on two occasions of measurement is still provides information about changes in psychological constructs, and thus our results extend the current literature on coaching behavior and intrinsic motivation.

thermore, the relationship between perceived coaching behaviors and changes in intrinsic motivation was found with a sample of college athletes, suggesting that the behaviors of a new coach can have a meaningful influence even on older and more experienced athletes.

In summary, the results provide evidence consistent with the proposition that specific coaching behaviors can influence athletes' intrinsic motivation. Nevertheless, a number of limitations should be noted. First, the participant sample included in this study was comprised of only first-year Division I college athletes. It is possible that different results would be found for athletes in other age groups and/or different competitive levels. Secondly, although not intended, most of the athletes in this study were participants in individual sports, which might have impacted the results. Finally, there is some concern with the timing of the pre-season data collection. For all subjects, the pre-season data was collected two to four weeks prior to the start of the competitive season. However, all of the participants played either winter or spring sports. Due to the fact that both of these seasons started well after the athletes first arrived at college, it is likely that there was at least some contact between the athletes and their college coaches prior to the pre-season data collection. Thus, it is possible that this initial exposure may have already begun to have an impact on the athletes' level of intrinsic motivation. It is suggested that future research should attempt to alleviate these potential problems to gain a better understanding of the relationships between scholarship status, perceived coaching behaviors, and athletes' intrinsic motivation.

It would also seem appropriate for future studies to include other variables that may help explain the development of intrinsic motivation in athletes. The results from the present study suggest that coaching behaviors have a significant impact on intrinsic motivation, and these findings extend the previous research by indicating that particular coaching behaviors are associated with the season-long changes that occur in athletes' intrinsic motivation. Nevertheless, a considerable amount of the variance is still left unexplained. No doubt there are a number of other influences that affect the development of intrinsic motivation (e.g., transition to college life, new peers, new teammates, moving away from parents, etc.), and future studies should continue to examine these possible social and intrapersonal determinants (see Vallerand & Losier, 1999).

Another interesting avenue for future research is to consider how athletes' motivational orientation influences how their coach behaves toward them. Research suggests that coaches will act differently toward athletes depending on their various characteristics (see Horn et al., 1998). Recently, Pelletier and Vallerand (1996) have found that a leader's initial perception of an individual's motivation may lead him or her to act differently toward the individual. For example, a coach may act more controlling toward an athlete he or she perceives as unmotivated. In contrast, an athlete who is seen as highly motivated may receive more autonomy and support from the coach. An examination of this behavioral conformation (self-fulfilling prophecy) may provide important information regarding the link between coaching behavior and athletes' intrinsic motivation.

Finally, recent advances in theory (e.g., Vallerand, 1997) and measurement of

intrinsic motivation (e.g., Guay, Vallerand, & Blanchard, 2000; Pelletier, Fortier, Vallerand, Tuson, Brière, & Blais, 1995) should help clarify the factors that are associated with the development of motivational orientations in sport. Future studies should continue to uncover the factors that influence intrinsic motivation so that we can encourage the use of theoretically-sound strategies for promoting intrinsic motivation in athletes.

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