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Self-Determined Motivation as a Predictor of Burnout Among College Athletes

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In this study, we examined self-determination theory (SDT; Deci & Ryan, 1985) as a framework for understanding potential antecedents of burnout in 598 American college athletes. Using a cross-sectional design, the aims of the study were to investigate relationships among the dimensions of athlete burnout and the degree of self-determination among college athletes. As hypothesized, results indicated a strong relationship between the degree of self-determination and the dimensions of burnout, thus providing support for the utility of an SDT explanation regarding the occurrence of burnout. Findings also showed motivational variables to be the most powerful predictor of burnout (Devaluation, 44.5%; Reduced Sense of Accomplishment, 28%; Physical/Emotional Exhaustion, 15.4%). Implications of these results for researchers and practitioners are discussed.

Early on, college athletics were considered an extracurricular activity through which educational outcomes were supported. Over time, college sports have been transformed into an increasingly commercialized campus entity focused on winning—at times, above all else. This fundamental shift has diminished the emphasis placed on educational values and brought with it a professionalized approach intent on garnering attention for successful athletic programs. Given the notoriety that typically accompanies winning, it is not surprising that institutions have accepted this professionalization of sport. It is also not surprising that individuals now train for countless hours to enhance their athletic skills, with the ultimate objective of playing college sports. The time, sacrifice, and effort needed to realize this goal has caused some athletes to burnout, particularly those who are highly competitive and involved in their sport (Goodger, Gorely, Lavallee, & Harwood, 2007; Gould & Whitley, 2009).

As the professionalization of college athletics has gradually increased, so too has the interest that athlete burnout has received from national sporting organizations, coaches, and athletes due to potential negative consequences for athlete performance and well-being (Gould & Whitley, 2009). Despite the considerable concern about athlete burnout, research has been limited. In their article, *Burnout in sport: A systematic review*, Goodger et al. (2007) highlighted the need for systematic testing of theoretical frameworks to develop existing and new perspectives to conceptualize this condition so that the sources of athlete burnout are better understood. Thus, the general purpose of this correlational study was to investigate relationships among the dimensions of athlete burnout and the degree of self-determination among college athletes.

Traditionally, burnout was viewed as a phenomenon that was easier to observe than define (Gould, 1997). Initial research that focused on the realm of athletics was built upon Maslach and Jackson's (1984) definition of burnout that included symptoms of emotional exhaustion, depersonalization, and reduced personal accomplishment. However, their definition came to be seen as inadequate and inappropriate within athletic contexts (Raedeke, 1997). Raedeke and Smith (2001) expanded on the concept of athlete burnout to include elements of physical and emotional exhaustion, reduced personal accomplishment, and sport devaluation. Their definition is now widely accepted because it is multidimensional, identifies the underlying causes of sport-related burnout, and may allow research to differentiate between athletes who cease athletic participation because of burnout and those who discontinue due to unrelated reasons (Goodger et al., 2007; Raedeke & Smith, 2001).

Research (Cresswell & Eklund, 2005b, 2005c; Hodge, Lonsdale, & Ng, 2008; Lonsdale, Hodge, & Rose, 2009) has indicated that Deci and Ryan's (1985) self-determination theory (SDT) may provide an auspicious lens through which to investigate athlete burnout. In self-determination theory it is assumed that all individuals have an innate propensity to develop an ever-evolving unique and unified sense of self. That is, people have a tendency to establish relationships among aspects of their own psyches as well as individuals and social groups in their environment (Deci & Ryan, 2004). According to Deci and Ryan (2004), this overarching integrative

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tendency is a functional aspect of human life. In self-determination theory there are distinguishable psychosocial factors that support this innate inclination and discernible factors that encumber this essential process of human nature. Social environments, according to this contention, can either facilitate or hinder these integrative propensities which, in turn, can advance or undermine psychological and social development.

Deci and Ryan (1985) stressed that the reasons an individual initially participates and persists in an activity may be classified along a self-determination continuum, wherein an intrinsic motivational orientation reflects the highest degree of self-determination or a true love of the game. The absence of motivation, or amotivation, is at the opposite end of the continuum. Located at the center of Ryan and Deci's (2000) self-determination continuum is extrinsic motivation.

Extrinsic motivation reflects the decision to participate in an activity based upon external reasons such as athletic scholarships, social standing, or parental approval. Forms of extrinsic motivation reflect a shift from higher to lower degrees of self-determination. One form, integrated regulation, shares many of the characteristics of intrinsic motivation. Integration occurs when one evaluates and assimilates behavioral goals to the self. Such actions, however, are still considered extrinsic because they are done to achieve outcomes other than sheer enjoyment (Ryan & Deci, 2000). A second form of extrinsic motivation is identification regulation which is characterized by the act of consciously placing a value on an objective, such that it is personally accepted as one's own. Integrated and identified regulations have been described as self-determined or autonomous regulatory styles (Deci & Ryan, 1987).

Introjected regulation is the third form of extrinsic motivation which denotes an extrinsic source of motivation that has been internalized, albeit not fully recognized as one's own. Feelings of guilt, anxiety, and reduced self-esteem are associated with introjected regulation because individuals often base their self-worth on sport-related outcomes such as performance or winning. External regulation, which is the fourth form of extrinsic motivation, reflects the decision to participate in an activity to satisfy an external demand or reward contingency. Taken together, introjected and external regulations have been described as non-self-determined or controlled regulatory styles (Deci & Ryan, 1987).

Because it is typical for an athlete experiencing burnout to demonstrate non-self-determined forms of motivation, an SDT explanation of athlete burnout seems fitting (Cresswell & Eklund, 2005a). A shift from a self-determined involvement in a sport to an association that is characterized by a lesser degree of self-determination is a central theme among burned out athletes (Cresswell & Eklund, 2005b, 2005c). In other words, as authentic and genuine participation diminishes, the perceived costs of sustained engagement begin to outweigh the rewards afforded by the activity. Over time, an inability to cope with these negative appraisals can lead to such harmful outcomes as physical and emotional exhaustion, reduced accomplishment, devaluation and, perhaps, a complete withdrawal from the sport (Raedeke, 1997; Raedeke & Smith, 2001).

Although not grounded in SDT, preliminary research (Gould et al., 1996; Raedeke & Smith, 2001) reported relationships between athlete burnout and motivation. Specifically, Raedeke and Smith (2001) reported positive correlations between burnout and amotivation. Building on earlier work, Cresswell and Eklund (2005b, 2005c) employed more sophisticated statistical analyses to examine the relationships between burnout and behavioral regulations (motives). Their results substantiated the works of Gould et al. (1996) and Raedeke and Smith (2001) which reported a negative correlation between burnout and intrinsic motivation and a positive correlation between burnout and amotivation.

Gould (1997) argued that in competitive sports, maladaptive outcomes such as burnout are thought to follow shifts on the self-determination continuum toward more controlled regulatory styles (introjected and external regulation). By using multivariate analysis of variance (MANOVA) in comparing the means of clusters of adolescent swimmers (N = 236) based on levels of motivation, Raedeke (1997) found that those who were intrinsically motivated reported lower burnout scores than swimmers driven by extrinsic reasons. A qualitative study of 10 junior elite tennis players (ages 12–23) conducted by Gould et al. (1996) also revealed that athletes who feel pressure to participate in athletics for external reasons were more susceptible to burnout, as indicated by reportedly higher levels of perceived stress.

Of interest, Cresswell and Eklund (2005b, 2005c) and Raedeke and Smith (2001) observed insignificant or modest negative correlations among the dimensions of burnout and non-self-determined or controlled regulatory styles which would contradict previous arguments (Gould, 1997; Raedeke, 1997). While the reasons for these inconsistencies are unclear, Cresswell and Eklund (2005a) and Lonsdale, Hodge, and Rose (2008) speculated that the Sport Motivation Scale (SMS; Pelletier, Fortier, Vallerand, Tuson, & Briere, 1995), which was used to assess the degree of self-determination in previous studies, has contributed to these conflicting results. Although research has demonstrated satisfactory internal consistency statistics and provided evidence of the construct validity for the SMS (Martens & Webber, 2002), some limitations have been evident. For example, problems with the SMS prompted Cresswell and Eklund (2005b) to collapse the four extrinsic motivation scales into one scale and Raedeke and Smith (2001) needed to remove the introjected and external regulation scales from their analyses. Lonsdale et al. (2008) cited evidence that SMS scores, especially those associated with the extrinsic motivation subscales, frequently have not been related in a predictable manner to scores resulting from measures of motivational consequences.

Researchers have also investigated the relationships between burnout and specific behavioral regulations by determining a self-determination index. Over the course of a six-month competitive season, Lemyre et al. (2006),

utilizing bivariate correlation analysis, found that swimmers ($N = 141$) who reported lower burnout scores at the end of the period also demonstrated steady increases in self-determination. In comparison, swimmers who demonstrated gradual decreases in self-determination scores reported higher burnout scores. However, the study did not include assessments of all the behavioral regulations as described by SDT. As Lemyre et al. (2006) noted, the introjected and integrated regulation scales were not included. Therefore, additional research examining the full range of behavioral regulations is needed to better understand burnout among competitive athletes.

Recently, Lonsdale et al. (2009) employed the Behavioral Regulation in Sport Questionnaire (BRSQ) to investigate the relationship between the dimensions of burnout and the degree of self-determination among competitive athletes ($N = 201$). The resulting structural equation model (*SEM*) indicated a positive relationship between the dimensions of burnout and controlled regulatory styles and a negative correlation between the dimensions of burnout and autonomous regulatory styles. Although the study provides evidence supporting the reliability and validity of the BRSQ, Lonsdale et al. (2008) noted that research involving larger samples of competitive athletes is needed to more fully examine the utility of SDT as a theoretical framework for understanding the motivational possesses that may precede athlete burnout (Lemyre et al., 2006). Understanding these processes is an important step in the development of effective evaluative and preventative strategies.

Based on the purpose of the study, the following research questions were addressed:

1. How are the dimensions of athlete burnout differentially related to specific behavioral regulations, as described by SDT?
2. How does the degree of self-determination predict the dimensions of athlete burnout among college athletes?

We hypothesized that the relationships between the dimensions of burnout and particular behavioral regulations would vary according to their degree of self-determination. Specifically, controlled regulations (introjected and external regulation) would be positively correlated with dimensions of athlete burnout. In contrast, autonomous regulations (integrated and identified regulation) would be negatively correlated with dimensions of athlete burnout. We also hypothesized that non-self-determined forms of motivation would predict dimensions of athlete burnout.

Methods

Participants and Procedure

College athletes ($N = 598$) from eight National Collegiate Athletic Association (NCAA) Division I and Division III west coast universities participated in this study. The institutions were purposefully selected based on the researchers' professional relationships and the participants' accessibility and willingness to participate. Selected individuals who have an official role as either an athletic director or coach were contacted by e-mail and/or telephone to gain access to their institution, help locate college athletes, assist in the identification of institutional sport programs to participate in this study, and recommend additional college athletics programs with participants who were willing to be involved.

Each participating institution's athletic director and institutional review board granted approval for the study. Questionnaires were administered in person either by the researchers or by an athletic administrator at the participating institution. All participants completed informed consent forms and confidentiality was ensured as participating athletes placed their completed questionnaires in a sealed envelope. All data were collected during the 2010–2011 academic year. Participating college athletes completed the questionnaires at various points in the academic year when their sport was in-season.

Participants ranged in age from 18 to 24 with a mean age of 21.3. The sample was evenly divided between men (50.5%, $n = 302$) and women (49.5%, $n = 296$). The sample was distributed fairly evenly across classification levels: 27% first year ($n = 159$), 29% sophomore ($n = 174$), 24% junior ($n = 146$), and 20% senior ($n = 119$). Participants represented seven sports: football (12%, $n = 72$), basketball (20%, $n = 122$), swimming (9%, $n = 53$), baseball (12%, $n = 69$), softball (18%, $n = 106$), tennis (10%, $n = 59$), and track and field (20%, $n = 117$). Eight percent of the athletes sampled competed in multiple sports.

Measures

The two instruments employed in this study were the Behavioral Regulation in Sport Questionnaire (BRSQ; Lonsdale et al., 2008), and the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001). Both instruments have been used in previous research (Lonsdale et al., 2009) to investigate the relationship between burnout and the degree of self-determination among competitive athletes. Previous psychometric testing with data collected from professional athletes indicated the ABQ should be considered the ideal instrument for the current study (Cresswell & Eklund, 2005c; Lemyre, Roberts, & Stray-Gundersen, 2007). Research involving competitive athletes has also supported the reliability and validity of the BRSQ (Hodge et al., 2008).

Behavioral Regulation in Sport Questionnaire (BRSQ). The 24-item BRSQ includes six, four-item subscales designed to measure the degree of self-determination, as outlined by SDT. Specifically, these subscales, employing the item stem, "I participate in my sport . . . ," measured amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. The BRSQ was included under the heading "Why Do You Participate in Sport?" The title was modified because the inclusion of the term "Behavioral Regulation Sport Questionnaire"

was thought to influence participants' answers, per the authors' recommendations (Lonsdale et al., 2009). Athletes were asked to indicate to what extent each statement corresponded to one of the reasons for which they were presently participating in their sport. Responses were provided on a seven-point Likert-type scale with scores ranging from "not true at all" (1), to "somewhat true" (4), to "very true" (7). All scale scores were calculated as means across items so that the possible range of responses was from 1–7.

The developers of the BRSQ have conducted extensive research on its psychometric properties and have reported strong levels of internal consistency, test-test reliability, and factorial validity (Lonsdale et al., 2008). Internal consistency analysis using Cronbach's alpha indicated the BRSQ is a reliable scale to measure the degree of self-determination among college athletes (Lonsdale, et al., 2008). Based on data collected from 343 elite athletes affiliated with the New Zealand Academy of Sport, coefficient alphas for the six scales were as follows: intrinsic motivation (0.92), amotivation (0.90), external regulation (0.93), introjected regulation (0.88), integrated regulation (0.79), and identified regulation (0.82).

Lonsdale et al. (2008) examined the test-retest reliability of the BRSQ with 34 male rugby players in an amateur competitive league in New Zealand using a one-week period between instrument administrations. The results support the reliability of the reliability of all BRSQ scales: amotivation (.83), external regulation (.79), introjected regulation (.87), identified regulation (.88), integrated regulation (.90), and intrinsic motivation (.73).

Athlete Burnout Questionnaire (ABQ). The ABQ was developed by Raedeke and Smith (2001) to measure: physical/emotional exhaustion, reduced sense of accomplishment, and devaluation. The 15 items of the ABQ were included under the heading, "Sport Participation Questionnaire." The title was modified because the inclusion of the term "athlete burnout" was thought to influence participants' answers. A five-point scale was used to capture responses using descriptors that ranged from 1 = "Almost Never" to 5 = "Almost Always." The ABQ consists of three subscales (physical/emotional exhaustion, reduced sense of accomplishment, and devaluation) as well as a total score across all 15 items. All scores were reported as means on the five-point scale. Internal consistency analysis based on research with 208 college athletes has indicated that the ABQ is a reliable scale to measure athlete burnout among this population (Raedeke & Smith, 2001). Coefficient alphas for the three scales measuring the three dimensions of athlete burnout were as follows: physical/emotional exhaustion (0.88), devaluation (0.80), and reduced sense of accomplishment (0.76).

Data Analysis

A correlational design was chosen for this study to investigate relationships between the dimensions of burnout and the degree of self-determination among college athletes. First, the data set was screened for missing data and the degree of univariate and multivariate normality was examined. Second, descriptive statistics were used to report dispersion, central tendencies, and distribution of the data set. Third, internal consistency of the scales was determined using internal consistency analysis (Cronbach's alpha). Fourth, factor analysis was used to test the measurement models associated with scores derived from each of the scales. Fifth, bivariate correlation analysis was used to investigate relationships among dependent and predictor variables. Finally, hierarchical multiple regression analysis was used to explain the extent to which selected demographic variables, college experiential variables, and particular behavioral regulations, as described by SDT, predict dimensions of athlete burnout. Hierarchical multiple regression was chosen as the appropriate statistical analysis for this study because it enables the researcher to statistically control for demographic and contextual differences while estimating the unique effects of the predictor variables (Mertler & Vannatta, 2002).

Results

Descriptive statistics were used to report dispersion, central tendencies, and distribution for the data set (see Table 1). Participants scored relatively low on scales measuring athlete burnout, that is, physical/emotional exhaustion (m = 2.63, s = .94), reduced sense of accomplishment (m = 2.20, s = .70), and devaluation (m = 2.12, s = .88).

Participants scored relatively high on scales reflecting self-determination, including intrinsic motivation (m = 6.01, s = 1.14), identified regulation (m = 5.65, s = 1.15), and integrated regulation (m = 5.50, s = 1.18). In contrast, participants scored relatively low on scales representing a non-self-determination: introjected regulation (m = 3.35, s = 1.72), external regulation (m = 2.59, s = 1.49), and amotivation (m = 2.47, s = 1.45).

Relationship Between Motivation and Athlete Burnout

Bivariate correlation analyses were employed to examine relationships among dependent and predictor variables. The three athlete burnout scales were significantly (p < .01) correlated with each of the six behavioral regulation scales (see Table 2). The three athlete burnout scales demonstrated strong, positive relationships with introjected regulation, external regulation, and amotivation, indicating that physical/emotional exhaustion, reduced sense of accomplishment, and devaluation may be strongly linked with external sources of motivation or a lack of motivation. Devaluation showed a very strong relationship with amotivation (r = .71, p < .01) and external regulation (r = .55, p < .01). Amotivation had a strong correlation with reduced sense of accomplishment (r = .55, p < .01) and physical/emotional exhaustion (r = .55, p < .01). A strong association was also observed between physical/emotional exhaustion and external regulation (r = .42, p < .01).

Table 1 Mean Scores and Standard Deviations for Physical/Emotional Exhaustion, Reduced Sense of Accomplishment, Devaluation, Intrinsic Motivation, Identified Regulation, Integrated Regulation, Introjected Regulation, External Regulation, and Amotivation (*N* = 598)

Variable	*M*	*SD*
Athlete burnout scales (five-point scale)		
Physical/emotional exhaustion	2.63	.94
Reduced sense of accomplishment	2.20	.70
Devaluation	2.12	.88
Behavioral regulation scales (seven-point scale)		
Intrinsic motivation	6.01	1.14
Identified regulation	5.65	1.15
Integrated regulation	5.50	1.18
Introjected regulation	3.35	1.72
External regulation	2.59	1.49
Amotivation	2.47	1.45

Table 2 Correlations for Athlete Burnout Scale Scores and Behavioral Regulation Variables (*N* = 598)

Variable	Exh	Red Acc	Dev	Int Mot	Integ reg	Id reg	Introj Reg	Ext Reg	Amotivation
Exh	–	.38***	.55***	–.30***	–.12**	–.14***	.34***	.42***	.55***
Red Acc	–	–	.67***	–.48***	–.35***	–.34***	.24***	.32***	.52***
Dev	–	–	–	–.58***	–.37***	–.37***	.39***	.55***	.71***
Int Mot	–	–	–	–	.63***	.58***	–.22***	–.40***	–.57**
Integ reg	–	–	–	–	–	.66***	.08	–.10*	–.24***
Id reg	–	–	–	–	–	–	–	–.08	–.23***
Introj Reg	–	–	–	–	–	–	–	.66***	.57***
Ext Reg	–	–	–	–	–	–	–	–	.71***
Amotivation	–	–	–	–	–	–	–	–	–

*** $p = .001$; ** $p < .01$; * $p < .05$.

Abbreviations: Exh = Physical/Emotional Exhaustion; Red Acc = Reduced Sense of Accomplishment; Dev = Devaluation; Int Mot = Intrinsic Motivation; Integ Reg = Integrated Regulation; Id Reg = Identified Regulation; Introj Reg = Introjected Regulation; Ext Reg = External Regulation.

Physical/emotional exhaustion, reduced sense of accomplishment, and devaluation demonstrated moderate, positive correlations with introjected regulation and external regulation. This suggests a modest relationship between the dimensions of athlete burnout and non-self-determined or controlled regulatory styles. Specifically, introjected regulation was moderately correlated with physical/emotional exhaustion ($r = .34$, $p < .01$), reduced sense of accomplishment ($r = .27$, $p < .01$), and devaluation ($r = .39$, $p < .01$). A moderate correlation was also observed between reduced sense of accomplishment and external regulation ($r = .32$, $p < .01$).

Devaluation and Amotivation

Given the strong relationship between amotivation and dimensions of athlete burnout, a closer examination of the nature of these constructs was warranted. Motivation concerns energy, direction and persistence, all of which are aspects of activation and intention (Deci & Ryan, 2004; Ryan & Deci, 2000). On the other hand, amotivation reflects opposing traits such as lethargy, apathy, and indifference, all of which are terms commonly used to describe athlete burnout symptoms generally but particularly the aspect of burnout known as devaluation (Raedeke, 1997; Raedeke & Smith, 2001).

Studies of adolescent and college-age swimmers as well as professional rugby players indicated that amotivation was more strongly related to devaluation than physical/emotional exhaustion or reduced sense of accomplishment (Cresswell & Eklund, 2005b, 2005c; Lemyre et al., 2006, 2006; Raedeke & Smith, 2001). Lemyre et al. (2006) suggested that devaluation is perhaps the most cognitive of the burnout dimensions. Similarly, amotivation is typical when individuals determine that their efforts will not yield a desirable result and/or their

involvement no longer satisfies their basic needs for autonomy, competence, and relatedness (Lonsdale et al., 2009).

From this perspective, one could argue that amotivation could be used somewhat interchangeably with devaluation to describe a shift from a self-determined involvement in sports to an association that is characterized by an absence of motivation. Put another way, the expression of amotivation is perhaps tantamount to this dimension of burnout, particularly as it relates to individuals' perception of their sport. That is, they cease to value their involvement in athletics.

To investigate this hypothesis, additional analyses were conducted to investigate the degree to which the items of the amotivation and devaluation scales overlapped. These analyses included bivariate correlations of items from the two scales (amotivation and devaluation), internal consistency analysis (Cronbach's alpha) of the combined scales, and factor analysis of the combined scale items.

Bivariate correlation analyses demonstrated moderate-to-very strong and statistically significant ($p < .01$) relationships among all of the items of the two scales (see Table 3). The correlations ranged from a low of .38 to a high of .61 with most being in the range of .40–.50.

Internal consistency analysis using Cronbach's alpha was conducted on the combination of all nine items from both the devaluation and amotivation scales. This analysis revealed that the nine items of the scales were closely related as indicated by an alpha value of .90. Removing items from the analysis reduced the value of alpha slightly, indicating that the combined scale was strongest when all nine items were included. According to Mertler and Vannatta (2002), a "high" value of alpha is often used, along with substantive arguments and possibly other statistical measures, as evidence of an underlying (or latent) construct.

With the understanding a high alpha value does not necessarily imply a measure is unidimensional, factor analysis was employed to verify dimensionality between the amotivation and devaluation scale items. Since the meaning usually associated with "dimension" is that of a cluster or group of highly intercorrelated characteristics or behaviors, factor analysis may be used to test for their empirical existence (Rummel, 1967). Using principal components analysis, a two-factor solution of the nine items of the two scales explained 68% of the variance in the factors and revealed that the items of the amotivation scale tended to cluster into one factor and the items of the devaluation scale tended to cluster into the other factor (see Table 4). However, there were several items that were highly correlated with both factors. When all nine items were forced into a single factor solution, the factor loadings for all items were quite high (above .68), and 57% of the variance in the single factor was explained by the combined scale items (see Table 5). The result of this analysis would strongly suggest there is a single construct that is represented by the items of the amotivation and devaluation scales.

In light of these findings, the amotivation scale was excluded from the hierarchical multiple regression analyses to more clearly examine the predictive effects of the remaining behavioral regulations on burnout. In doing so, the utility of SDT as a theoretical framework for understanding the motivational processes that may precede athlete burnout could be better evaluated.

Predictors of Athlete Burnout

Results of the hierarchical multiple regression analyses are presented together to provide ease of comparison of the variance in each of the athlete burnout values (see Table 6). Findings indicated that specific behavioral regulations were the most powerful predictor of

Table 3 Correlations for Amotivation and Devaluation Scale Scores (*N* = 598)

Variable	BRSQ5	BRSQ7	BRSQ13	BRSQ21	ABQ3	ABQ6	ABQ9	ABQ11	ABQ15
BRSQ5	–	.75**	.58**	.57**	.44**	.42**	.50**	.40**	.46**
BRSQ7	–	–	.63**	.60**	.50**	.43**	.54**	.43**	.47**
BRSQ13	–	–	–	.73**	.52**	.53**	.61**	.47**	.55**
BRSQ21	–	–	–	–	.48**	.43**	.55**	.38**	.44**
ABQ6	–	–	–	–	–	.38**	.53**	.38**	.46**
ABQ6	–	–	–	–	–	–	.69**	.69**	.41**
ABQ9	–	–	–	–	–	–	–	.62**	.51**
ABQ11	–	–	–	–	–	–	–	–	.47**
ABQ15	–	–	–	–	–	–	–	–	–

*** $p = .001$; ** $p < .01$; * $p < .05$.

Abbreviations: BRSQ5 = but the reasons are not clear to me anymore; BRSQ7 = but I wonder what's the point; BRSQ13 = but I question why I continue; BRSQ21 = but I question why I am putting myself through this; ABQ3 = the effort I spend would be better spent doing other things; ABQ6 = I don't care as much about my performance as I used to; ABQ9 = I'm not into it like I used to be; ABQ11 = I feel less concerned about being successful than I used to; ABQ15 = I have negative feelings toward sport.

Table 4 Principal Component Loadings for the Amotivation and Devaluation Scale Items (Rotated Two-Factor Solution)

Scale item	Factor 1	Factor 2
BRSQ5	.81	.20
BRSQ7	.83	.22
BRSQ13	.75	.39
BRSQ21	.79	.24
ABQ3	.61	.33
ABQ6	.25	.86
ABQ9	.47	.72
ABQ11	.22	.86
ABQ15	.54	.44

Abbreviations: BRSQ5 = but the reasons are not clear to me anymore; BRSQ7 = but I wonder what's the point; BRSQ13 = but I question why I continue; BRSQ21 = but I question why I am putting myself through this; ABQ3 = the effort I spend would be better spent doing other things; ABQ6 = I don't care as much about my performance as I used to; ABQ9 = I'm not into it like I used to be; ABQ11 = I feel less concerned about being successful than I used to; ABQ15 = I have negative feelings toward sport.

Table 5 Principal Component Loadings for the Amotivation and Devaluation Scale Items (One-Factor Rotated Solution)

Scale item	Factor 1
BRSQ5	.76
BRSQ7	.80
BRSQ13	.83
BRSQ21	.77
ABQ3	.68
ABQ6	.73
ABQ9	.82
ABQ11	.71
ABQ15	.69

Abbreviations: BRSQ5 = but the reasons are not clear to me anymore; BRSQ7 = but I wonder what's the point; BRSQ13 = but I question why I continue; BRSQ21 = but I question why I am putting myself through this; ABQ3 = the effort I spend would be better spent doing other things; ABQ6 = I don't care as much about my performance as I used to; ABQ9 = I'm not into it like I used to be; ABQ11 = I feel less concerned about being successful than I used to; ABQ15 = I have negative feelings toward sport.

Table 6 Predictors of Physical/Emotional Exhaustion, Reduced Sense of Accomplishment, and Devaluation (N = 598)

	Athlete burnout scale scores		
Variable	Physical/emotional exhaustion	Reduced sense of accomplishment	Devaluation
Demographic variables			
Gender	.00	.08	.04
Year of eligibility	.03	–.05	.06
Full scholarship	–.07	–.02	–.02
Partial scholarship	.00	.05	–.05
R^2	.02	.02	.00
College experiential predictors			
Football	.09	–.04	–.05
Basketball	–.02	–.00	–.03
Swimming	.06	–.06	–.07
Baseball	–.06	.03	.01
Tennis	–.16***	–.01	–.07
Track and field	–.11*	.13*	.01
Multisport athlete	.01	–.06	–.01
Level of competition	.15	.01	.02
Injury status	.12***	.04	.02
R^2	.12	.03	.02
R^2 change	.11***	.02	.04*
Behavioral regulations			
Intrinsic motivation	–.09	–.30***	–.32***
Integrated regulation	–.01	–.15**	–.08
Identified regulation	–.08	–.08	–.11**
Introjected regulation	.10*	.18***	.11**
External regulation	.28***	.07	.33***
R^2	.27	.31	.47
R^2 change	.15***	.28***	.45***

*** p = .001; ** p < .01; * p < .05.

athlete burnout accounting for 44.5% of the variance in devaluation scale scores, 28% of the variance in reduced sense of accomplishment scale scores, and 15.4% of the variance in physical/emotional exhaustion scale scores. Intrinsic motivation, along with introjected regulation, significantly predicted scores on two of the three athlete burnout scales. Specifically, intrinsic motivation was a negative predictor of devaluation ($B = –.33$, $p = .001$) and reduced sense of accomplishment ($B = –.30$, $p = .001$) scale scores. Introjected regulation was a positive predictor of reduced sense of accomplishment ($B = .18$, $p = .001$) and physical/emotional exhaustion ($B = .10$, $p < .05$) scale scores. External regulation was also a positive predictor of devaluation ($B = .33$, $p = .001$) as well as physical/emotional exhaustion ($B = .28$, $p = .001$) scale scores. Finally, integrated and identified regulation negatively predicted scores on the reduced sense of accomplishment ($B = –.15$, $p < .01$) and devaluation ($B = –.11$, $p < .01$) scales, respectively.

Discussion

Overall, the results provide further support for the utility of SDT as a theoretical framework for understanding the motivational possesses that may precede athlete burnout (Hodge et al., 2008; Lemyre et al., 2006; Lonsdale et al. 2009). Specifically, intrinsic motivation was negatively correlated with the dimensions of burnout, while amotivation was positively correlated with the dimensions of burnout. However, contrary to previous research (Cresswell & Eklund, 2005b, 2005c; Raedeke & Smith, 2001), results demonstrated that controlled regulatory styles (introjected and external regulation) were positively correlated to dimensions of burnout and that autonomous regulatory styles (integrated and identified regulation) were negatively correlated to dimensions of burnout.

Although the reasons for these inconsistencies are unclear, Cresswell and Eklund (2005b) and Lonsdale et al. (2008) speculated that the SMS (Pelletier et al., 1995), which was used to assess behavioral regulations (motives) in previous studies, has contributed to the conflicting results. While research has demonstrated satisfactory internal consistency statistics and provided evidence of the construct validity for the SMS, some limitations have been evident (Martens & Webber, 2002). For example, problems with the SMS prompted Cresswell and Eklund (2005b) to collapse the extrinsic motivation subscales into one scale, whereas Raedeke and Smith (2001) needed to remove the introjected and external regulation subscales from their analysis. Lonsdale et al. (2008) cited evidence that SMS scores, particularly those associated with the external behavioral regulations, frequently have not been related in a predictable manner to scores resulting from measures of motivational consequences. Given that a clear understanding of these relationships has proved elusive (Cresswell & Eklund, 2005b)–possibly as a result of using the SMS to measure specific behavioral regulations–the BRSQ was employed to examine the full range of behavioral regulations, as described by SDT.

Findings regarding athlete burnout and external behavioral regulations are important because they suggest that intrinsic motivation is not the only behavioral regulation associated with lower levels of burnout (Hodge et al., 2008). Athletes who demonstrated autonomous regulatory styles were less likely to report high burnout scores than athletes who demonstrated controlled regulatory styles. Of interest, college athletes also demonstrated comparable scores on the intrinsic motivation, as well as the integrated and identified (autonomous regulatory styles), scales, indicating that individuals who participated in their sport because of enjoyment, or because the benefits afforded by the activity represented valued outcomes, were less likely to report symptoms of burnout. In accord with Lonsdale et al. (2009), these results suggest that involvement to realize extrinsic rewards may not lead to burnout if the athlete deems it to be personally important.

Considering that motivational variables explained a greater proportion of the variance in devaluation than exhaustion, it may be that different underlying processes are responsible for the perception of the two burnout symptoms. In theory, burnout is caused by physiological and psychological factors (Kentta et al., 2001). Lemyre et al. (2006) posited that devaluation is perhaps the most cognitive of the burnout dimensions, thus its link to psychological factors (motivation) is understandable. Exhaustion, on the other hand, may be more strongly influenced by physiological factors (overtraining). Studies (Cresswell & Eklund 2005a, 2005b, 2005c; Lemyre et al., 2006; Raedeke & Smith, 2001) with adult rugby players as well as college-age and adolescent swimmers support the proposition that self-determined motivation may be more strongly related to devaluation than exhaustion.

A second difference associated with devaluation and exhaustion were its relationships with external behavioral regulations. Specifically, controlled regulatory styles were positively predictive of exhaustion. However, only external regulation demonstrated a significant correlation with devaluation. In contrast, autonomous regulatory styles were negatively predictive of devaluation, but not exhaustion. Of interest, research has observed that maladaptive outcomes (exhaustion) were positively associated with external behavioral regulations (Gould et al., 1996; Lemyre et al., 2006). According to Lemyre et al. (2006), athletes who are energized by external behavioral regulations often fall prey to following an obligatory training regimen without input or variation. As a consequence, fatigue brings about self-regulation failure that, in turn, can trigger a survival-like reaction corresponding to the physiological stages of a burnout process (Davis, Botterill, & MacNeil, 2002). However, research has not distinctly examined the full spectrum external behavioral regulations in relation to athlete burnout symptoms.

The notion that the psychological processes responsible for the three burnout symptoms may be distinct is further supported as autonomous regulatory styles (integrated and identified regulation) were negatively predictive of reduced sense of accomplishment and devaluation, but not exhaustion. College athletics are heavily loaded with extrinsic rewards, including social status, social approval, and material rewards. Thus, the possibility that college athletes were motivated to achieve these valued outcomes and/or the outcomes were perceived to be in congruence with their sense of self is likely. Ryan and Deci (2000) posited that actions motivated by autonomous regulatory styles share qualities with intrinsic motivation. Indeed, as people identify and integrate external behavioral regulations, they tend to experience improved behavioral effectiveness, greater volitional persistence, enhanced subjective well-being, and better assimilation within their social group (Ryan & Deci, 2000; Ryan, Kuhl, & Deci, 1997).

On the other hand, exhaustion, which may be more strongly influenced by physiological factors, is conceded because athletes understand the physical demands associated with the attainment of valued outcomes in sport are necessary. Put differently, the sensitivity to exhaustion may be discounted if individuals perceive the external rewards afforded by the sport are meaningful. As such, the manifestation of devaluation, along with reduced sense of accomplishment (which likely represent psychological antecedents), may more clearly indicate the development of burnout in comparison with exhaustion.

Limitations and Future Research

The current study has limitations. The use of nonprobability sampling strategies implies the following: (a) there is no control or protection against bias introduced by the investigator in the selection of the sample, and (b) since the variation that inevitably occurs in sampling cannot be estimated, results from a nonprobability sample cannot be safely generalized beyond the specific sample that was used. While the researcher concedes that the sample may not necessarily be representative of the population, the findings provide useful information for addressing the particular research questions and hypotheses (Creswell, 2008).

Another limitation was the timing of data collection. While the data were collected during the competitive season, it was not necessarily collected at the same point in time in all of the participants' seasons. For example, athletes were surveyed at various points in their competitive season due, in large part, to their availability. As such, it is not implausible that the particular timing of data collection may have influenced responses. As Lonsdale et al. (2009) suggested, a longitudinal research design is likely needed to determine if a relationship does in fact exist between burnout and the timing of data collection during the competitive season.

Prospective research adopting designs that allow causal inferences to be made is advised. Specifically, the following issues should be investigated: (a) combining complementary theoretical perspectives to understand the mechanisms behind maladaptive outcomes that prompt an athlete to experience symptoms of burnout; (b) the impact of key performance variables (i.e., starting status, win/loss records, individual success) on burnout in competitive athletes; and (c) the effect of athlete burnout on student-athletes' well-being.

There is also a need to investigate the efficacy of interventions intended to reduce the likelihood of burnout. Notwithstanding the many factors that can influence athletes' intrinsic motivation and self-determined extrinsic motivation, the coach-athlete relationship may be one of the most important (Hodge et al., 2008). Research has shown that intervention programs designed to promote an autonomy-supportive leadership style can result in enhanced perceptions of self-determined motivation which, based on the findings of the current study, is strongly related to a decreased perception of athlete burnout symptoms (Hollembeak & Amorose, 2005). Because the results have yet to be tested within college sports, there is a need to examine its efficacy in college athletes.

Conclusion and Implications

The extent to which burnout negatively impacts individuals' sense of well-being and long-term view of their collegiate sport experience should be a paramount concern of athletic organizations, institutions, and researchers. Preventing burnout can be aided by understanding the potential antecedents of the syndrome. This cross-sectional study investigated relationships among the dimensions of athlete burnout and the degree of self-determination. Motivational variables accounted for significant amounts of variance in all three athlete burnout dimensions. However, controlled regulatory styles (introjected and external regulation) were positively predictive of the dimensions of burnout, while autonomous regulatory styles (integrated and identified regulation) were negatively predictive of two of the three athlete burnout dimensions (devaluation and reduced sense of accomplishment).

Notwithstanding the many factors that can influence athletes' intrinsic motivation and self-determined extrinsic motivation, the coach-athlete relationship may be one of the most important (Hodge et al., 2008; Mageau & Vallerand, 2003; Vallerand, 2001). Using cognitive evaluation theory as a framework, Mageau and Vallerand (2003) offered a set of guidelines for needs-supportive coaches to follow. Drawing on educational and psychological research to support the behaviors they proposed to have a beneficial impact on athletes' needs for autonomy, competence, and relatedness, the authors put forward the following seven guidelines: (1) including players in the decision-making process; (2) conveying a rationale

behind coaching decisions; (3) perceiving athletes as individuals with specific needs and feelings and not mere pawns that should be directed; (4) empowering athletes to assume leadership roles; (5) providing athletes with positive and constructive feedback; (6) avoiding guilt-inducing criticisms, tangible rewards, and encouragement of athletes' ego-involvement; and (7) emphasizing self-formulated performance goals and avoiding social comparisons within the team.

Studies have shown that an autonomy-supportive leadership style can facilitate athletes' basic needs (Gagne et al., 2003; Hodge et al., 2008; Hollembeak & Amorose, 2005). Despite these findings, Western culture continues to promote a controlling style of coaching (Mageau & Vallerand, 2003; Vallerand, 2000). Fortunately, research suggests that an autonomy-supportive style can be taught and that successfully implemented practices that resemble a needs-supportive leadership style can foster self-determined motivation in competitive athletes (deCharms, 1976; Deci, Connell, & Ryan, 1989; Williams & Deci, 1996).

The results of this current study strongly suggest that college athletes who identify and integrate external behavioral regulations are typically less likely to report athlete burnout symptoms. On the other hand, the inability to grasp meaning and, in turn, synthesize that meaning with respect to one's values and/or sense of self can be a principal source of distress which, in turn, can prompt the manifestation of burnout symptoms.

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