Int. J. Sport Psychol., 2007; 38: 437-450

Does it take three to tango? Psychological need satisfaction and athlete burnout

STÉPHANE PERREAULT*, PATRICK GAUDREAU**,
MARIE-CLAUDE LAPOINTE* *and* CHLOÉ LACROIX*

**Université du Québec à Trois-Rivières, Canada*
***University of Ottawa, Canada*

Athletes who feel autonomous, competent, and related to significant others in sport should experience lower levels of burnout than athletes whose basic psychological needs are being neglected (Ryan & Deci, 2002). Moreover, based on recent research by Sheldon and Niemiec (2006), lower levels of athlete burnout should also be observed when the three psychological needs (i.e., autonomy, competence, and relatedness) are simultaneously satisfied (i.e., a balance in need satisfaction) in sport. The present study tested these two hypotheses with 259 high school student-athletes attending a sports school. Results indicated that the satisfaction of each of the three basic psychological needs as well as the balance of need satisfaction was correlated negatively with athlete burnout. Regression analyses further demonstrated that the balance of need satisfaction made a significant contribution to prediction of athlete burnout over and above the significant contribution of each of the three needs. The present results are discussed in line with basic needs theory (Ryan & Deci, 2002) as well as the measurement of balance of need satisfaction.

KEY WORDS: Autonomy, Competence, Relatedness, Self-determination theory.

Stéphane Perreault, Marie-Claude Lapointe, and Chloé Lacroix, Département de Lettres et communication sociale, Université du Québec à Trois-Rivières, Canada; Patrick Gaudreau, School of Psychology, University of Ottawa, Canada.

This research was supported by regular grants from Fonds Québécois de Recherche sur la Société et la Culture and from the Social Sciences and Humanities Research Council awarded to Stéphane Perreault and Patrick Gaudreau, respectively. It was also supported by grants from the University of Ottawa Research Funds and the Consortium National de Formation en Santé awarded to the second author.

For correspondence: Stéphane Perreault, Université du Québec à Trois-Rivères, Département de Lettres et communication sociale, C.P. 500, Trois-Rivières, Qc, Canada, G9A 5H7. (E-mail: stephane.perreault@uqtr.ca).

Le "*programme Sport-Études*" is quite popular in the province of Quebec in Canada. The mission of this academic program is to help high school student-athletes strive for excellence in sport while going to school. Although academic success is the priority in this setting, scholastic schedules are constructed to help student-athletes take part in sport without hindering their studies. Also, different services such as tutoring, medical care, and counseling are offered to athletes in order to facilitate the conciliation of the demands of school and sport. Despite its popularity, very few studies have examined how student-athletes fare within such an environment. They are young, train hard, sport is a central part of their identity, and perhaps, are more likely to experience athlete burnout than youth in less intensive settings (Coakley, 1992).

Athlete burnout is a multidimensional phenomenon characterized by emotional and physical exhaustion, a reduced sense of accomplishment, as well as devaluation or cynicism, an operationalization supported through the development and validation of the Athlete Burnout Questionnaire (Raedeke & Smith, 2001). Although a number of models have been proposed to assist in understanding athlete burnout (Eklund & Cresswell, 2007), Deci and Ryan's (1985, 1991) self-determination theory (SDT) has received increasing attention in recent years because researchers are now focusing their efforts on the motivational component of burnout (Raedeke, 1997). According to SDT, different types of motivation fall on a self-determination continuum ranging from amotivation to intrinsic motivation. Furthermore, self-determined motivations are believed to be associated with enhanced psychological functioning. More precisely, self-determined motivations should lead to positive consequences such as less athlete burnout whereas the non self-determined forms of motivation (especially amotivation) should be associated with negative consequences such as more athlete burnout.

To our knowledge, Gould, Udry, Tuffey, and Loehr (1996) were the first to find support for this particular postulate of SDT in that they demonstrated that burned out junior tennis players scored higher on amotivation than comparison players who were not burned out. Amotivation was also found to be positively related with athlete burnout by Raedeke and Smith (2001) for both senior age-group swimmers and college athletes. Furthermore, they also showed that intrinsic motivation was negatively associated with athlete burnout. Similar results have also been found with rugby players (Cresswell & Eklund, 2005a, 2005b, 2005c). More recently, Lemyre, Treasure, and Roberts (2006) uncovered that NCAA Division I swimmers whose motivation became less self-determined over the course of the season scored higher on athlete burnout than those whose motivation became more self-deter-

mined. While these resul
ated with enhanced funct
a careful examination of
has yet to evaluate how
are associated with athlet

According to basic
Deci, 2002), the satisfact
omy, competence, and re
ment and to prevention
they can initiate their ow
ment, and securely conne
sport should experience
basic psychological needs
tion has been found in t
(2003), who showed that
well-being of female gym
Reinboth, Duda, and Nto
cal and physical well-being
dicted by the level of satis
extent, the need for auto
found evidence linking ch
edness with changes in su
athletes.

Based on the researc
would expect greater level
lete burnout, a form of i
reviews on athlete burnou
(Cresswell & Eklund, 2006
(1986), Coakley (1992), an
an important factor in ex
(2006) also argued that th
sense of accomplishment, a
& Smith, 2001). In short,
one's need for competence
social support they are rec
relatedness is not being sa
burnout (Raedeke & Smith
their coach negatively (anot
ness is not being satisfied),
Weiss, 2000; Vealey, Armstr

mined. While these results support the idea that self-determination is associated with enhanced functioning (for a review, see Eklund & Cresswell, 2007), a careful examination of the literature relying on SDT reveals that research has yet to evaluate how feelings of autonomy, competence, and relatedness are associated with athlete burnout.

According to basic needs theory, a mini-theory within SDT (Ryan & Deci, 2002), the satisfaction of three basic psychological needs (i.e., autonomy, competence, and relatedness) is a prerequisite to psychological adjustment and to prevention of ill-being. More precisely, athletes who feel that they can initiate their own action, cope effectively with their sport environment, and securely connect with and feel understood by significant others in sport should experience higher levels of well-being than athletes whose basic psychological needs are being neglected. Support for such a proposition has been found in the sport domain by Gagné, Ryan, and Bargmann (2003), who showed that daily need satisfaction in practice led to increased well-being of female gymnasts. Moreover, using a cross-sectional design, Reinboth, Duda, and Ntoumanis (2004) demonstrated that the psychological and physical well-being of adolescent soccer and cricket players was predicted by the level of satisfaction of the need for competence and, to a lesser extent, the need for autonomy. Finally, Reinboth and Duda (2006) also found evidence linking changes in need satisfaction for autonomy and relatedness with changes in subjective vitality with a group of British university athletes.

Based on the research linking need satisfaction with well-being, one would expect greater levels of need fulfillment to be associated with less athlete burnout, a form of ill-being in sport. Theory, research, and recent reviews on athlete burnout suggest that this line of reasoning is warranted (Cresswell & Eklund, 2006, Eklund & Cresswell, 2007). For instance, Smith (1986), Coakley (1992), and Raedeke (1997) identified lack of autonomy as an important factor in explaining athlete burnout. Cresswell and Eklund (2006) also argued that the need for competence can be tied to a reduced sense of accomplishment, a key element of burnout (Raedeke, 1997; Raedeke & Smith, 2001). In short, failing repetitively at one's sport should thwart one's need for competence. Finally, when athletes are less satisfied with the social support they are receiving (an indirect indication that the need for relatedness is not being satisfied), they report experiencing more athlete burnout (Raedeke & Smith, 2001, 2004). Similarly, when athletes perceive their coach negatively (another indirect indication that the need for relatedness is not being satisfied), they score higher on athlete burnout (Price & Weiss, 2000; Vealey, Armstrong, Comar, & Greenleaf, 1998).

Although past research has shown that there is a direct link between need satisfaction and well-being, sport studies have relied on additive effect models in which the contributions of the satisfaction of the needs for autonomy, competence, and relatedness have been assessed independently. However, athletes are likely to experience differing levels of satisfaction on each of the three needs. For instance, one athlete could feel somewhat supported by his coaches (i.e., moderate relatedness; 4 on a 7-point scale) during a period of performance setbacks (i.e., low competence; 2 on a 7-point scale) while feeling empowered and free to decide the course of actions to improve future performances (i.e., high autonomy; 6 on a 7-point scale). Alternatively, another athlete could feel moderately supported, competent, and autonomous (i.e., scores of 4 on all three 7-point scales). For both athletes the total need satisfaction score is identical (i.e., 12). However, the first athlete has a clear imbalance or within-person variability in the satisfaction of the three needs whereas the second athlete has a clear balance or within-person consistency in the satisfaction of the three needs. Hence, it remains to be determined whether the three needs should be equally satisfied in order to promote the highest levels of psychological adjustment.

To our knowledge, no research in the sport domain has examined the contribution of the balance of need satisfaction. However, Sheldon and Niemiec (2006) recently conducted a series of four studies to examine the balance of the three needs in the academic life-domain. They found that balance of need satisfaction accounted for a significant amount of variance in concurrent, prospective, and daily variations of subjective well-being and happiness. Balance of need satisfaction was also negatively associated with disruptive oppositional-defiant and impulsive behaviors. Furthermore, the association between balance of need satisfaction and subjective well-being remained significant after accounting for the effect of neuroticism. Despite these promising results, it remains to be examined whether the balance of need satisfaction is associated with athlete burnout. Additionally, whether the balance of the three needs can contribute to psychological adjustment, as indexed by athlete burnout, over and above the mere effect of the satisfaction of the needs for autonomy, competence, and relatedness, has not been examined. In line with the tenets of basic needs theory (Ryan & Deci, 2002), lower levels of athlete burnout should be observed when the three psychological needs are simultaneously satisfied in sport.

In summary, the purpose of this study was to examine two hypotheses stemming from SDT. More precisely, we tested the prediction that need satisfaction would be significantly and negatively associated with ill-being. To examine this hypothesis, we examined the link between need satisfaction and

athlete burnout, predict
taken individually, woul
tions. We also tested wh
ciated with athlete burn
three needs. Based on
hypothesized that great
athlete burnout percepti

Method

PARTICIPANTS

A sample of 259 (190 ma
dent-athletes, attending a spo
They trained an average of 13.
(N = 19)[1]. Their mean age wa
their sport was 7.2 years (SD =

Measures

Need satisfaction. A four-
tions of autonomy in their spo
ing part in this sport because I
ticipants' perception of compe
Blais, 1993). A sample item is:
ness with the head coach was
the Need for Relatedness Scal
lowing stem was used "In gene
assess perceived relatedness wi
to", "safe", and "valued". All
scale ranging from 1 (*not at all*

Due to the lack of psycho
confirmatory factor analysis (C
need satisfaction measure. Co
coefficient of kurtosis = 41.37),
standard error of parameter es
1995). To assess to overall fit
NNFI and CFI (Hoyle, 1995).
indicate adequate fit of the mo

[1]A complete list of sports i

athlete burnout, predicting that greater satisfaction of the three basic needs, taken individually, would be associated with lower athlete burnout perceptions. We also tested whether the balance of need satisfaction would be associated with athlete burnout over and above the level of satisfaction on the three needs. Based on recent research (Sheldon & Niemiec, 2006), we hypothesized that greater need satisfaction balance would relate to lower athlete burnout perceptions.

Method

Participants

A sample of 259 (190 males and 69 females) Canadian French-speaking high school student-athletes, attending a sports school in the province of Quebec, participated in this study. They trained an average of 13.5 hours a week (SD = 5.9) in various individual and team sports (N = 19)[1]. Their mean age was 14.8 years (SD = 1.5) and the average playing experience in their sport was 7.2 years (SD = 3.2).

Measures

Need satisfaction. A four-item scale (α = .69) was used to measure participants' perceptions of autonomy in their sport (Blais & Vallerand, 1992). A sample item is: "I feel I am taking part in this sport because I want to". A-four item scale (α = .90) was used to measure participants' perception of competence in their sport (adapted to sport from Losier, Vallerand, & Blais, 1993). A sample item is: "I feel competent in this sport". Finally, perception of relatedness with the head coach was measured using the five-item acceptance subscale (α = .90) of the Need for Relatedness Scale (adapted to sport from Richer & Vallerand, 1998). The following stem was used "In general, with respect to my head coach, I feel..." The items used to assess perceived relatedness with the head coach were: "supported", "understood", "listened to", "safe", and "valued". All of the three basic needs items were completed using a 7-point scale ranging from 1 (*not at all in agreement*) to 7 (*complete agreement*).

Due to the lack of psychometric information on these measures in the realm of sport, a confirmatory factor analysis (CFA) was performed to examine the structural validity of the need satisfaction measure. Considering the multivariate non-normality of the data (Mardia coefficient of kurtosis = 41.37), the Satorra-Bentler rescaled chi-square ($SB\chi^2$) and the robust standard error of parameter estimates provided in the EQS 6.1 software were used (Bentler, 1995). To assess to overall fit of the model, conventional cut-offs of .90 were used for the NNFI and CFI (Hoyle, 1995). The RMSEA was also used where a value of .08 is believed to indicate adequate fit of the model to the data and values of .05 or less a good fit (Browne &

[1]A complete list of sports included in the present study is available from the first author.

Cudeck, 1993). Results from a three-factor CFA model fell short of these criteria ($SB\chi^2$ (62) = 150.28, $p < .001$; CFI = .88; NNFI = .85; RMSEA = .09). Nonetheless, the lack of fit could be explained by the redundancy between two items measuring relatedness ($LM\chi^2$ (1) = 81.17, $p < .001$): "understood" and "listened to". Upon adding a correlation between the error terms of these two items, the model adequately fit the data ($SB\chi^2$ (61) = 109.27, $p < .001$; CFI = .93; NNFI = .92; RMSEA = .06). All parameters in the revised model were significant ($p < .05$). Factor loadings ranged from .74 to .85 for relatedness, from .50 to .80 for autonomy, and from .78 to .86 for competence. The three scales were significantly correlated: relatedness and autonomy (ϕ = .57), relatedness and competence (ϕ = .41), and autonomy and competence (ϕ = .70).

Balance of need satisfaction. To assess balance of need satisfaction, we used the method proposed by Sheldon and Niemiec (2006). They operationalized this construct as the sum of the absolute difference between each pair of psychological needs. The higher this sum, the less balanced one's satisfaction of needs is. In other words, a score of zero represents perfect balance whereas higher scores should be interpreted as lower balance of need satisfaction. To ease interpretation, these scores were reverse coded as in the study of Sheldon and Niemiec (2006) so that a score of zero represents greatest imbalance and higher scores represent greater balance of the three needs. In this sample, the reversed scores ranged from 0 to 10, with a mean score of 7.5.

Athlete Burnout. A French version of the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001) was used to assess athlete burnout. The ABQ is a 15-item multidimensional measure of burnout composed of three five-item subscales measuring reduced sense of accomplishment (α = .81; e.g. "It seems that no matter what I do, I don't perform as well as I should "), sport devaluation (α = .86; "I have negative feelings toward my sport"), and emotional and physical exhaustion (α = .91; " I feel so tired from my training that I have trouble finding energy to do other things")[2]. Items are scored on a five-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*).

Because no previous study had assessed the psychometric properties of the French version of the ABQ, we tested the factor structure and the construct validity of the scale using the participants described earlier as well as two other samples of high school student-athletes (N = 613; 407 males, 205 females, and one failing to report gender; M age = 14.6 years, SD = 1.5). A CFA was performed to examine the structural validity of the French version of the ABQ. Considering the multivariate non-normality of the data (Mardia coefficient of kurtosis = 79.32), the Satorra-Bentler rescaled chi-square ($SB\chi^2$) and the robust standard error of parameter estimates were used. The three-factor model provided a good fit to the data ($SB\chi^2$ (87) = 212.61, $p < .001$; CFI = .95; NNFI = .93; RMSEA = .05). All parameters in the hypothesized model were significant ($p < .05$). Factor loadings ranged from .47 to .70 for reduced sense of accomplishment, from .70 to .81 for emotional/physical exhaustion, and from .51 to .79 for sport devaluation. The correlations between the three factors were similar to the ones reported by Raedeke and Smith (2001). More precisely, devaluation strongly correlated with reduced sense of accomplishment (ϕ = .69) and moderately correlated with emotional/physical exhaustion (ϕ = .33). The correlation between reduced sense of accomplishment and emotional/physical exhaustion was also moderate in magnitude (ϕ = .35).

[2]A copy of the French version of the Athlete Burnout Questionnaire is available from the first author.

Two alternative models
the best fit to the data. A o
1108.27, $p < .001$; CFI = .56;
than the three-factor model (
lation between devaluation a
model items from these two
and a two-factor model was te
model ($\Delta SB\chi^2$ (1) = 153.39, p
priori three-factor model ($SB\chi$
$\Delta SB\chi^2$ (2) = 121.73, $p < .05$).

To test for the construct
the components of athlete bur
student-athletes from the othe
and inversely related with enj
α = .90; r = -.29 to -.60) and so
r = -.23 to -33), as well as signi
ing a game (Lasnier & Lessard

Using the sample employ
for all three components of bu
ment (ICR = .63), sport deval
.69). In short, the psychometr
(Raedeke & Smith, 2001) and
athlete burnout with high scho

Procedures

Following approval by a
the protection of research parti
granted by the school and a lett
of the study and obtain their c
to participate or not in the stud
out penalty. Assenting student-
were instructed to complete th

Data Analysis

Pearson correlations were
nents of athlete burnout as well
and the balance of need satisfac
sample used to test our two h
formed on the total burnout sc

[3]The exact N for this test-

Two alternative models were tested in order to verify if the three-factor model provided the best fit to the data. A one-factor model provided a poor fit to the data ($SB\chi^2$ (90) = 1108.27, $p < .001$; CFI = .56; NNFI = .48; RMSEA = .14) and fit the data significantly worse than the three-factor model ($\Delta SB\chi^2$ (3) = 374.16, $p < .05$). Due to the moderately large correlation between devaluation and reduced sense of accomplishment, in the other alternative model items from these two components of burnout were combined into one latent variable and a two-factor model was tested. Although this model fit the data better than the one-factor model ($\Delta SB\chi^2$ (1) = 153.39, $p < .05$), it nevertheless provided a worse fit to the data than the a priori three-factor model ($SB\chi^2$ (89) = 355.25, $p < .001$; CFI = .88; NNFI = .86; RMSEA = .07, $\Delta SB\chi^2$ (2) = 121.73, $p < .05$).

To test for the construct validity of the French-version of the ABQ, correlations between the components of athlete burnout and theoretically-related constructs were performed using student-athletes from the other two samples. Burnout dimensions were significantly ($ps < .01$) and inversely related with enjoyment (Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993; $\alpha = .90$; $r = -.29$ to $-.60$) and social support (Sarason, Sarason, Shearin, & Pierce, 1987; $\alpha = .87$; $r = -.23$ to -33), as well as significantly and positively associated with worrying prior to or during a game (Lasnier & Lessard, 1994; $\alpha = .86$; $r = .36$ to .58).

Using the sample employed in the present study [3], adequate test-retest values were found for all three components of burnout over a period of 5 weeks: reduced sense of accomplishment (*ICR* = .63), sport devaluation (*ICR* = .71), and physical/emotional exhaustion (*ICR* = .69). In short, the psychometric results presented above replicate past research on burnout (Raedeke & Smith, 2001) and support the use of the French-version of the ABQ to evaluate athlete burnout with high school student-athletes attending a sports school.

Procedures

Following approval by a human subjects research committee, standard procedures for the protection of research participants were followed. Permission to undertake this study was granted by the school and a letter was addressed to the parents in order to explain the purpose of the study and obtain their consent. The student-athletes were informed that they were free to participate or not in the study and that they could forgo completing the questionnaire without penalty. Assenting student-athletes completed the measures in a classroom setting. They were instructed to complete the various scales with their particular sport in mind.

Data Analysis

Pearson correlations were calculated to examine the relationship between the components of athlete burnout as well as a composite score of athlete burnout with need satisfaction and the balance of need satisfaction. Descriptive statistics were also computed to describe the sample used to test our two hypotheses. Finally, hierarchical regression analyses were performed on the total burnout score and the three components of burnout, respectively.

[3]The exact *N* for this test-retest was 232.

Results

Bivariate Associations of Need Satisfaction, Balance of Need Satisfaction, and Burnout

A first goal was to examine the correlations of athlete burnout with need satisfaction and the balance of need satisfaction (see Table I). As was found in previous research, psychological needs were moderately correlated with each other (Sheldon & Niemiec, 2006). Subscales of burnout were also positively inter-correlated, thus confirming the idea that athlete burnout is a tridimensional syndrome (Raedeke & Smith, 2001). As expected, the satisfaction of each of the three needs was correlated negatively with the total burnout score and with the three components of athlete burnout. Of particular interest, the balance of need satisfaction was negatively associated with the total burnout score and with the three components of athlete burnout.

Table I
Correlations between Need Satisfaction, Balance of Need Satisfaction, and Burnout

	1	2	3	4	5	6	7	8
1. Autonomy	---							
2. Competence	.59**	---						
3. Relatedness	.47**	.37**	---					
4. Balance of need satisfaction	.14*	.26**	.74**	---				
5. Reduced sense of accomplishment	-.40**	-.57**	-.45**	-.41**	---			
6. Devaluation	-.57**	-.38**	-.42**	-.24**	.49**	---		
7. Exhaustion	-.25**	-.19**	-.26**	-.23**	.31**	.25**	---	
8. Total burnout	-.54**	-.49**	-.49**	-.38**	.76**	.77**	.73**	---
Mean	6.16	5.82	5.46	7.50	1.92	1.62	2.16	1.90
SD	0.81	0.93	1.28	1.94	0.59	0.69	0.75	0.51

Notes. $^{**}p < .01$, $^{*}p < .05$.

Unique Prediction of Burnout by Need Satisfaction Balance

To examine the incremental effect of balance of need satisfaction on burnout, four hierarchical regression analyses were performed on the total burnout score and the three components of burnout, respectively. The satisfaction of autonomy, competence, and relatedness were entered as a block at the first step and then the balance of need satisfaction was entered at the second step. As shown in Table II, in step 1 (F (3, 253) = 54.73, $p < .01$), using the composite score of athlete burnout as a dependent variable, relatedness, competence, and autonomy had standardized coefficients of -.28, -.22, and -

	To	A
Step 1	.39	
Relatedness		
Competence		
Autonomy		
Step 2	.01	
Balance of need satisfaction		

Notes. $^{**}p < .01$, $^{*}p < .05$, $^{\dagger}p < .08$.

.27, respectively (all *ps* < −.19, $p < .05$) made a sig over and above the signif = .014, $p < .05$). Using rec able, relatedness ($\beta = -.2$ significant predictors in s ance of need satisfaction prediction of reduced se .018, $p < .01$). For the dev .01) relatedness ($\beta = -.19$, nificant predictors where uniquely predict devaluat exhaustion analysis relate predictor at step 1 (F (3, ginally significant predict ($\beta = -.17$, $p < .08$) made a emotional and physical ex

Discussion

In line with basic nee diction that greater need s burnout perceptions. Cor finding is consistent with need satisfaction is associa 2003; Reinboth & Duda,

athlete burnout with need
ee Table I). As was found
oderately correlated with
of burnout were also posi-
t athlete burnout is a tridi-
expected, the satisfaction
ly with the total burnout
rnout. Of particular inter-
associated with the total
thlete burnout.

atisfaction, and Burnout

	5	6	7	8
**	---			
**	.49**	---		
**	.31**	.25**	---	
**	.76**	.77**	.73**	---
	1.92	1.62	2.16	1.90
	0.59	0.69	0.75	0.51

ACTION BALANCE

e of need satisfaction on
re performed on the total
ut, respectively. The satis-
were entered as a block at
on was entered at the sec-
3) = 54.73, $p < .01$), using
dent variable, relatedness,
ficients of -.28, -.22, and -

TABLE II
Need Satisfaction and Balance of Need Satisfaction Predicting Total Burnout and Specific Components of Burnout

	Total Burnout		Reduced Accomplishment		Devaluation		Exhaustion	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.39**		.40**		.35**		.09**	
Relatedness		-.28**		-.28**		-.19**		-.18*
Competence		-.22**		-.47**		-.04		-.04
Autonomy		-.27**		.01		-.45**		-.14†
Step 2	.01*		.02**		.00		.01†	
Balance of need satisfaction		-.19*		-.22**		-.04		-.17†

Notes. **$p < .01$, *$p < .05$, †$p < .08$.

.27, respectively (all *ps* < .01). In step 2, the balance of need satisfaction (β = –.19, $p < .05$) made a significant contribution to prediction of total burnout over and above the significant contribution of the three needs at step 1 (ΔR^2 = .014, $p < .05$). Using reduced sense of accomplishment as a dependent variable, relatedness (β = –.28, $p < .01$) and competence (β = –.47, $p < .01$) were significant predictors in step 1 of the model (F (3, 253) = 55.08, $p < .01$). Balance of need satisfaction (β = –.22, $p < .01$) made a unique contribution to prediction of reduced sense of accomplishment variance at step 2 (ΔR^2 = .018, $p < .01$). For the devaluation analysis, in step 1 (F (3, 253) = 46.17, $p <$ .01) relatedness (β = –.19, $p < .01$) and autonomy (β = –.45, $p < .01$) were significant predictors whereas in step 2 balance of need satisfaction failed to uniquely predict devaluation (ΔR^2 = .001, *ns*). In the emotional and physical exhaustion analysis relatedness (β = –.18, $p < .05$) was the only significant predictor at step 1 (F (3, 253) = 8.23, $p < .01$), though autonomy was a marginally significant predictor (β = –.14, $p < .08$). Balance of need satisfaction (β = –.17, $p < .08$) made a marginally significant contribution to prediction of emotional and physical exhaustion in step 2 (ΔR^2 = .011, $p < .08$).

Discussion

In line with basic needs theory (Ryan & Deci, 2002), we tested the prediction that greater need satisfaction would be associated with lower athlete burnout perceptions. Correlational analyses supported this hypothesis. This finding is consistent with past research showing that experiencing greater need satisfaction is associated with greater well-being in sport (Gagné et al., 2003; Reinboth & Duda, 2006; Reinboth et al., 2004). However, a careful

examination of the results from the hierarchical regressions reveals that the need for relatedness plays a key role when trying to understand the levels of athlete burnout experienced by the high school student-athletes in this sample. More precisely, relatedness with the head coach was the only basic psychological need that predicted the composite athlete burnout score as well as all three components of burnout, a result which makes sense when one considers the social context of these student-athletes. The head coach plays a central role in the lives of these athletes, giving feedback, grading performance, and organizing practice. Moreover, a lack of relatedness with the head coach is believed to be the result of a controlling coaching style (see, Mageau & Vallerand, 2003) that leads student-athletes to pursue their sport for non self-determined reasons and, in turn, to experience ill-being consequences such as athlete burnout. Future research will need to test this proposition with a longitudinal design, yet it remains that this line of reasoning is concordant with past research showing the influence of coaching behavior on athlete burnout (Price & Weiss, 2000; Vealey et al., 1998).

Beyond the variance accounted for by the need for relatedness, the other two basic psychological needs made unique contributions in explaining the different components of athlete burnout. As suggested by Cresswell and Eklund (2006), the need for competence moderately predicted athletes' sense of reduced accomplishment. Though this result will need to be replicated in future longitudinal studies, it nevertheless seems to lend credence to the suggestion that feelings of reduced accomplishment are influenced by the satisfaction of the need for competence. As for the two remaining components of burnout, both sport devaluation and emotional and physical exhaustion were significantly predicted by the satisfaction of the need for autonomy. According to Deci and Ryan (1985, 1991), a lack of autonomy is a consequence of social constraints (i.e., pleasing one's coach, parents or teammates) that lead student-athletes to pursue their sport for non self-determined reasons. Pursuing a sporting endeavor for non self-determined reasons, student-athletes may come to reduce their commitment and to devaluate their sport. Moreover, if student-athletes lack autonomy in a social environment, preventing them from developing other identities, they might invest a great deal of energy and effort in trying to validate their athletic identity, making them susceptible to greater emotional and physical exhaustion (Coakley, 1992).

Based on recent research (Sheldon & Niemiec, 2006), we also examined the hypothesis that greater need satisfaction balance would relate to lower athlete burnout perceptions. Balance of need satisfaction, a relatively new construct in SDT research, represents the equilibrium in the satisfaction of the needs for autonomy, competence, and relatedness. In the present study,

balance of need satisfaction made a significant contribution to the prediction of the composite athlete burnout score and the reduced sense of accomplishment subscale over and above the contribution of each of the three psychological needs, thus replicating past research on subjective well-being (Sheldon & Niemiec, 2006). It also made a marginally significant contribution in predicting emotional and physical exhaustion. Although balance of need satisfaction made a significant contribution in the prediction of athlete burnout, one must be cognizant of the very small amount of additional variance explained in the prediction of athlete burnout. In this regard, the results of this study are similar to the findings of Sheldon and Niemiec (2006), who reported change in R^2 ranging from 1% to 3% across their four studies. Future studies will need to determine whether such a result is due to the very high correlation between the satisfaction of the need for relatedness and the balance of need satisfaction or whether such a correlation is indicative of the key role of relatedness with the head coach in trying to understand athlete burnout in this student-athlete population.

Despite the theoretical contribution of the balance of need satisfaction construct, the present results need to be carefully examined with respect to how the balance of need satisfaction is operationalized. More precisely, when one approaches the ceiling value of each need satisfaction scale, less variability exists between the need scales, a problem also noted by Sheldon and Niemiec (2006). Furthermore, theoretically it would seem that the balance of need satisfaction is a required but insufficient condition to yield optimal well-being. A person with the lowest possible level of satisfaction of the needs for autonomy, competence, and relatedness would have the same level of balance of need satisfaction as a person with the three needs being totally satisfied. As such, future research is needed to examine if a combination of high balance with high absolute levels of satisfaction on the three needs is essential for optimal well-being.

In closing, need satisfaction and balance of need satisfaction are posited to play an antecedent role to athlete burnout in the present study. However, it is important to note that, given the cross-sectional nature of the study, it is impossible to determine the direction of the relationship between these variables. Furthermore, the hypotheses tested in the present study suggest that the satisfaction of basic psychological needs is directly related to athlete burnout. However, according to Deci and Ryan (1985, 1991), psychological needs are believed to be antecedents of motivation which, in turn, is directly related to well-being. Recall that prior research has revealed that amotivation and intrinsic motivation are significantly related to athlete burnout (Eklund & Cresswell, 2007). Hence, future research should examine multidimensional profiles of

sport motivation, preferably using all six types proposed by Deci and Ryan (1985, 1991), to provide a richer examination of the complex interplay between need satisfaction, motivation, and burnout using longitudinal designs (Vallerand, 1997). Moreover, this line of research will have to consider other factors which can influence basic psychological needs. For instance, in the present study, relatedness with the head coach was found to predict athlete burnout. To what extent do relatedness with other athletes and with assistants-coaches predict athlete burnout? Could positive relationships with teammates buffer or reduce the negative impact of a poor relationship with one's coach? Finally, student-athletes face multiple sources of stress associated with their school and sport activities. As with the extant literature, this research has treated athlete burnout without considering the influence of factors associated with involvement in other activities outside the sport domain. Given our limited self-regulatory capacities (Muraven & Baumeister, 2000) and the competitive nature of both the school and sport domains, future research should examine how inter-role conflicts influence athlete burnout. Furthermore, another promising line of research would be to investigate the context-specific need satisfaction and motivation of student-athletes and to examine the contributions of school- versus sport-related factors in the prediction of athlete burnout. Failure to satisfy basic psychological needs both in the school and in the sport domain could bolster the experience of athlete burnout, while favoring the development of hopelessness and more chronic forms of emotional distress (e.g., depression). A thorough consideration of the interplay between multiple life domains is warranted to gain more holistic insight about the experience of athlete burnout in the student-athlete population.

REFERENCES

Bentler, P. M. (1995). *EQS: Structural equations program manual.* Los Angeles: BMDP Statistical Software.

Blais, M. R., & Vallerand, R. J. (1992). *Construction et validation de l'Échelle des Perceptions d'Autonomie dans les Domaines de Vie (EPADV) (Construction and validation of the perceptions of autonomy scale in life domains).* Unpublished manuscript. Université du Québec à Montréal.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.

Coakley, J. (1992). Burnout among adolescent athletes: A personal failure or social problem? *Sociology of Sport Journal, 9,* 271-285.

Cresswell, S. L., & Eklund, R. C. (2005a). Motivation and burnout in professional rugby players. *Research Quarterly for Exercise and Sport, 76,* 370-376.

Cresswell, S. L., & Eklund, R. C
players. *Medicine & Scien*

Cresswell, S. L., & Eklund, R.
12-week league tourname

Cresswell, S. L., & Eklund, R.
research and future resea
reviews in sport psychology

Deci, E. L., & Ryan, R. M. (198
ior. New York: Plenum.

Deci, E. L., & Ryan, R. M. (199
In R. Dienstbier (Ed.), *Ne*
vation (pp. 237-288). Linc

Eklund, R. C., & Cresswell, S.
(Eds.), *Handbook of sport*

Gagné, M., Ryan, R. M., & Bargn
motivation and well-being

Gould, D., Udry, E., Tuffey, S.,
ers: I. A quantitative psych

Hoyle, R. H. (Ed.). (1995). *Str*
Thousand Oaks, CA: Sage

Lasnier, F., & Lessard, C. (199
(Stress in sport psychology:

Lemyre, P.N., Treasure, D.C., &
and affect on elite athlete

Losier, G. F., Vallerand, R. J., &
Perceptions de Compétenc
idation of the perceptions
ment, 23, 1-16.

Mageau, G. A., & Vallerand, R
model. *Journal of Sports Sc*

Muraven, M., & Baumeister, R.
Does self-control resemble

Price, M. S., & Weiss, M. R. (2
and athletes' psychological

Raedeke, T. D. (1997). Is athlet
spective. *Journal of Sport &*

Raedeke, T. D., & Smith, A. L.
burnout measure. *Journal o*

Raedeke, T. D., & Smith, A. L. (2
of stress mediated and mo
26, 525-541.

Reinboth, M., & Duda J. L. (2
indices of well-being in tea
Exercise, 7, 269-286.

Reinboth, M., Duda, J. L., & Nt
satisfaction, and the psych
and Emotion, 28, 297-313.

Cresswell, S. L., & Eklund, R. C. (2005b). Motivation and burnout among top amateur rugby players. *Medicine & Science in Sports & Exercise, 37*, 469-477.

Cresswell, S. L., & Eklund, R. C. (2005c). Changes in athlete burnout and motivation over a 12-week league tournament. *Medicine & Science in Sports & Exercise, 37*, 1957-1966.

Cresswell, S. L., & Eklund, R. C. (2006). Athlete burnout: Conceptual confusion, current research and future research directions. In S. Hanton & S. Mellalieu (Eds.), *Literature reviews in sport psychology* (pp. 91-126). Hauppauge, NY: Nova Science.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska symposium on motivation: Vol. 38. Perspectives on motivation* (pp. 237-288). Lincoln, NE: University of Nebraska Press.

Eklund, R. C., & Cresswell, S. L. (2007). Athlete burnout. In G. Tenenbaum & R.C. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 621-641). Hoboken, NJ: Wiley.

Gagné, M., Ryan, R. M., & Bargmann, K. (2003). Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology, 15*, 372-390.

Gould, D., Udry, E., Tuffey, S., & Loehr, J. (1996). Burnout in competitive junior tennis players: I. A quantitative psychological assessment. *The Sport Psychologist, 10*, 322-340.

Hoyle, R. H. (Ed.). (1995). *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: Sage.

Lasnier, F., & Lessard, C. (1994). *Le stress en psychologie du sport: Modélisation et mesures (Stress in sport psychology: Models and measures)*. Québec: Cegep de Sainte-Foy.

Lemyre, P.N., Treasure, D.C., & Roberts, G.C. (2006). Influence of variability in motivation and affect on elite athlete burnout. *Journal of Sport and Exercise Psychology, 28*, 32-48.

Losier, G. F., Vallerand, R. J., & Blais, M. R. (1993). Construction et validation de l'Échelle des Perceptions de Compétence dans les Domaines de Vie (EPCDV) (Construction and validation of the perceptions of competence scale in life domains). *Science et Comportement, 23*, 1-16.

Mageau, G. A., & Vallerand, R. J. (2003). The coach-athlete relationship: A motivational model. *Journal of Sports Sciences, 21*, 883-904.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*, 247-259.

Price, M. S., & Weiss, M. R. (2000). Relationships among coach burnout, coach behaviors, and athletes' psychological responses. *The Sport Psychologist, 14*, 391-409.

Raedeke, T. D. (1997). Is athlete burnout more than just stress? A sport commitment perspective. *Journal of Sport & Exercise Psychology, 19*, 396-417.

Raedeke, T. D., & Smith, A. L. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of Sport & Exercise Psychology, 23*, 281-306.

Raedeke, T. D., & Smith, A. L. (2004). Coping resources and athlete burnout: An examination of stress mediated and moderation hypotheses. *Journal of Sport & Exercise Psychology, 26*, 525-541.

Reinboth, M., & Duda J. L. (2006). Perceived motivational climate, need satisfaction and indices of well-being in team sports: A longitudinal perspective. *Psychology of Sport and Exercise, 7*, 269-286.

Reinboth, M., Duda, J. L., & Ntoumanis, N. (2004). Dimensions of coaching behavior, need satisfaction, and the psychological and physical welfare of young athletes. *Motivation and Emotion, 28*, 297-313.

Richer, S., & Vallerand, R. J. (1998). Construction et validation de l'Échelle du sentiment d'appartenance sociale [Construction and validation of the Relatedness Feeling Scale]. *Revue Européenne de Psychologie Appliquée, 48*, 129-137.

Ryan, R. M., & Deci, E. L. (2002). An overview of self-determination theory: An organismic dialectic perspective. In E. L. Deci, & R. Ryan (Eds.), *Handbook of self-determination research* (pp. 3-37). Rochester, NY: University of Rochester Press.

Sarason, I. G., Sarason, B. R., Shearin, E. N., & Pierce, G. R. (1987). A brief measure of social support: Practical and theoretical implications. *Journal of Social & Personal Relationships, 4*, 497-510.

Scanlan, T. K., Carpenter, P. J., Schmidt, G. W., Simons, J. P., & Keeler, B. (1993). An introduction to the sport commitment model. *Journal of Sport & Exercise Psychology, 15*, 1-15.

Sheldon, K. M., & Niemiec, C. (2006). It's not just the amount that counts: Balanced need satisfaction also affects well-being. *Journal of Personality and Social Psychology, 91*, 331-341.

Smith, R. E. (1986). Toward a cognitive-affective model of athletic burnout. *Journal of Sport Psychology, 8*, 36-50.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (pp. 271-360). New York: Academic Press.

Vealey, R. S., Armstrong, L., Comar, W., & Greenleaf, C. A. (1998). Influence of perceived coaching behaviors on burnout and competitive anxiety in female college athletes. *Journal of Applied Sport Psychology, 10*, 297-318.

Manuscript submitted September 2006. Accepted for publication July 2007.

Athlete engagemer
I. A qualitative inv

CHRIS LONSDALE*, KEN

**The Chinese University of*
***University of Otago, New*
****East Carolina University,U*

Organizatic
ment may be an e
dedication, effica
(Maslach, Schaufe
engagement (AE,
whether or not el
AE dimensions. I
was defined as a p
terized by confide
ability to attain a
was defined as 'a
as important'. Vig
liness'. Results in
the findings of thi
environments.

KEY WORDS: Conf

Chris Lonsdale, Departm
University of Hong Kong. Ker
New Zealand. Thomas D. Raed
University, USA.

This study was funded, in
pleted while the first author wa
of Otago. The authors wish to a
Heriot-Watt University and Pat
sion of this report.

For correspondence: Chris
Chinese University of Hong Ko
(E-mail: clonsdale@cuhk.edu.hk