

## 運動心理學

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### 一、簡答題 60% (每題十五分)

1. 何謂DK理論 (Degree of knowledge)? 對運動心理學領域的研究有何重要啟示?
2. 過去研究教練領導行為有那二個重要方向? 重要研究成果為何?
3. 試概述覺醒與運動表現相關之理論，並對這些理論加以評論。
4. 試比較成就目標理論和自我決定理論在預測成就行為的機轉上有何不同?

### 二、論文評鑑 40% (每題十分)

請依據所附的期刊論文回答下列問題：

1. 請陳述研究目的及研究假設。
2. 此篇論文所採用的研究方法為何? 相對應的統計分析為何?
3. 簡要陳述研究結果。是否支持研究假設?
4. 本研究的學術及應用價值如何?

## Coping Resources and Athlete Burnout: An Examination of Stress Mediated and Moderation Hypotheses

Thomas D. Raedeke  
East Carolina University

Alan L. Smith  
Purdue University

Although it is widely accepted that coping resources theoretically influence the stress-burnout relationship, it is unclear whether key internal (i.e., coping behaviors) and external (i.e., social support satisfaction) coping resources have stress-mediated or moderating influences on athlete burnout. Therefore we examined whether coping behaviors and social support satisfaction (a) had indirect stress-mediated relationships with burnout or (b) disjunctively (independently) or conjunctively (in combination) moderated the relationship between perceived stress and burnout. Senior level age-group swimmers ( $N = 244$ ; ages 14–19 years) completed a questionnaire assessing burnout, perceived stress, general coping behaviors, and social support satisfaction. The results revealed that perceived stress, general coping behaviors, and social support satisfaction were related to burnout. Structural equation modeling demonstrated that general coping behaviors and social support satisfaction had stress-mediated relationships with overall burnout levels. Hierarchical multiple regression analyses failed to support the disjunctive and conjunctive moderation hypotheses. Results thus support stress-mediated perspectives forwarded in previous research.

Key Words: buffering hypothesis, mediation, social support, swimming, youth

For some athletes the intense physical and psychological demands of sport participation come with a high cost—burnout. Based on a multidimensional definition, it is thought that athletes experiencing burnout feel physically and psychologically exhausted from the demands of training and competing, perceive a reduced sense of accomplishment, and experience sport devaluation in which they stop caring about sport and their performance (Raedeke & Smith, 2001). In the organizational and health psychology literatures, burnout has been associated with an array of negative work related performance and health outcomes (Cordes & Dougherty, 1993; Maslach, Schaufeli, & Leiter, 2001). Extended to athletes, burnout is thought to have a negative influence on the quality of sport experiences, leading to performance decrements and possibly to sport discontinuation. In addition, burnout presumably has a negative impact on athletes' physical and psychological well-being.

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T.D. Raedeke is with the Dept. of Exercise and Sport Science, East Carolina University, FITT Bldg., Greenville, NC 27858; A.L. Smith is with the Dept. of Health and Kinesiology, Purdue University, Lambert Fieldhouse, W. Lafayette, IN 47907.

It is widely accepted that burnout is a consequence of chronic stress (Cordes & Dougherty, 1993; Schaufeli, Maslach, & Marek, 1993; Smith, 1986). Most contemporary perspectives propose that a variety of personal and situational factors influence the stress process (Lazarus, 1990; Smith, 1986). Aligned with this view, researchers have shown that athlete burnout is related to a host of such factors (e.g., Gould, Tuffey, Udry, & Loehr, 1996; Gould, Udry, Tuffey, & Loehr, 1996; Raedeke, Lunney, & Venables, 2002; Vealey, Armstrong, Comar, & Greenleaf, 1998).

The empirical knowledge base on athlete burnout is not extensive. However, a substantial amount of research grounded within stress-strain frameworks has examined the potentially debilitating effects of stress. Strains represent physiological, psychological, and behavioral responses to stress (Cooper, Dewe, & O'Driscoll, 2001) and include a variety of physical (e.g., injury, illness) and mental health (e.g., burnout, depression) outcomes. Specific to sport, Smith (1986), Kelley and Gill (1993), and Andersen and Williams (1988) have developed conceptually similar models to explain the occurrence of burnout and injury. Within these frameworks, burnout and injury are manifestations of stress related strain.

Although burnout is stress related, some individuals are presumably more vulnerable to the negative effects of stress than others (Pines, 1993). Examining why some athletes are more adversely affected by chronic stress than others is an important question that can advance our knowledge of burnout. One avenue of research that may provide insights on this issue is to examine how coping resources influence the stress-burnout relationship.

Coping resources "comprise a wide variety of behaviors and social networks that aid the individual in dealing with the problems, joys, disappointments, and stresses of life" (Williams, 2001, p. 774). Sleep patterns, fitness levels, nutrition, and time management are all examples of general coping behaviors or lifestyle management that reflect *internal resources* that help athletes deal with stress. The perception of receiving strong social support is an *external resource* that can help athletes deal with the demands of sport training and competition. Social support generally consists of the presence of others whom athletes can rely on and whom they know value and care for them (Williams, 2001). It is widely accepted that coping behaviors, social support, stress, and burnout are related (Cooper et al., 2001; Cordes & Dougherty, 1993). However, there is still debate as to how these variables interrelate.

One hypothesis is that coping behaviors and social support influence burnout through their impact on stress. Individuals who perceive relatively strong coping behaviors and/or high social support may find the demands of sport less threatening and thereby perceive less stress. As a result, coping behaviors and social support have an indirect association with burnout through their relationship with stress (Cooper et al., 2001). Within this context, stress is a mediating variable that accounts for the relationship between the predictors (coping behaviors/social support) and the criterion (burnout) (Baron & Kenny, 1986).

An alternative hypothesis is that coping behaviors and social support moderate the relationship between stress and burnout. A moderator is defined as a variable that "affects the direction and/or strength of the relationship between an independent or predictor variable and a dependent or criterion variable" (Baron & Kenny, 1986, p. 1174). According to a moderating or buffering hypothesis, relatively strong coping behaviors and/or social support shield athletes from negative effects of stress by helping them cope effectively with the demands of sport par-

ticipation. Thus the relationship between stress and burnout will differ depending on the level of coping behaviors and social support. Elevated stress will be associated with higher burnout levels; however, that relationship will be stronger for individuals with lower coping behaviors and/or social support. Conversely, stress and burnout will not be as tightly coupled for those reporting higher social support and/or coping behaviors (Cooper et al., 2001; Cordes & Dougherty, 1993; Maslach et al., 2001).

Researchers examining athlete burnout have not examined whether coping resources have stress-mediated or moderating influences on burnout. However, in examining burnout among coaches and athletic directors, Kelley and colleagues (Kelley, 1994; Kelley, Eklund, & Ritter-Taylor, 1999; Kelley & Gill, 1993; Martin, Kelley, & Eklund, 1999) have found that a variety of personal and situational factors (e.g., trait anxiety, hardiness, leadership style, social support) have indirect stress-mediated relationships with burnout. Personal/situational factors predict perceived stress, and perceived stress predicts burnout. In addition to indirect relationships through stress, they also report that personal/situational variables have direct effects on burnout. Applied to athletes, their research suggests that social support and general coping behaviors may have stress-mediated and direct influences on burnout.

In studying another manifestation of stress related strain, sport injury researchers have discussed and examined whether coping resources (e.g., social support and coping behaviors) moderate the stress-injury relationship. Specifically, Andersen and Williams (1988) argue that stronger coping resources both directly reduce the probability of injury and attenuate the negative effects of stress on injury (moderating influence). In accord with Andersen and Williams, some injury research has supported the buffering hypothesis (see Williams, 2001).

Moreover, health and organizational psychology researchers recognize that social support potentially has stress-buffering effects (Cohen & Wills, 1985). There is evidence that social support moderates the stress-illness relationship (e.g., Sarason, Sarason, Potter, & Antoni, 1985). However, research examining stress moderators has not been entirely consistent with predictions (Cooper et al., 2001). Specific to burnout, some studies have shown that social support has a stress-buffering influence whereas other studies have not shown this (e.g., Dignam & West, 1988; Greenglass, Fiksenbaum, & Burke, 1996; Koeske & Koeske, 1989).

In a novel conceptualization of the moderating hypothesis, Smith, Smoll, and Ptacek (1990) argued that one reason why factors such as coping behaviors and social support have not consistently shown stress-buffering influences is because those moderators might function in combination with one another rather than singularly. Based on an interactional approach that considers both internal and external coping resources, Smith et al. (1990) argued that coping and social support may have either disjunctive or conjunctive moderating influences on stress-strain relationships. According to the typically examined disjunctive moderating hypothesis, social support and coping independently moderate the stress-strain relationship. Applied to burnout, athletes with relatively low coping behaviors *or* social support are more likely to experience higher levels of burnout in response to stress.

Conversely, according to the conjunctive moderating hypothesis, coping behaviors and social support in combination moderate the stress-strain relationship. Athletes with both relatively low coping behaviors *and* social support are more likely to experience higher burnout levels in response to stress. The negative



influence of either a lack of coping behaviors or social support on the stress-burnout relationship is offset by the presence of the other. For example, relatively low social support may be associated with a weak, rather than pronounced, stress-burnout relationship if athletes have relatively strong coping behaviors.

In examining stress related strain, Smith et al. (1990) found that coping skills and social support conjunctively, but not disjunctively, moderated the relationship between life stress and injury. The relationship between stress and injury was significant only for athletes who were relatively low in both coping and social support. Extended to burnout, these results suggest that coping behaviors and social support may conjunctively rather than disjunctively moderate the stress-burnout relationship.

Although it is widely accepted that coping behaviors and social support theoretically influence the stress-burnout relationship, it is unclear whether these variables have stress-mediated or stress-moderating associations with athlete burnout. Based on the coach burnout literature, one hypothesis is that coping behaviors and social support have indirect stress-mediated associations with athlete burnout (Kelley et al., 1999; Martin et al., 1999). Alternatively, coping behaviors and social support may disjunctively or conjunctively moderate the stress-burnout relationship (Smith et al., 1990). Consequently, the purpose of this study was to examine these hypotheses in an attempt to better understand the athlete burnout phenomenon. Furthermore, because burnout is conceptualized as a multidimensional construct, for exploratory purposes we evaluated the study hypotheses not only relative to a global burnout index but also relative to individual burnout subscales.

## Method

### *Participants*

A total of 244 senior level swimmers (131 F, 112 M, and 1 whose gender was not disclosed) participated in the study. The swimmers were recruited from USA Swimming affiliated clubs from five states and ranged in age from 14 to 19 years ( $M = 15.8$ ,  $SD = 1.3$ ). Participants were heavily involved in swimming, as evident by a median weekly swimming volume of 50,000 meters ( $SD = 22,200$ ), an average of 19.0 hours per week ( $SD = 4.9$ ) in training related activities, and an average commitment of 10.5 months ( $SD = 1.1$ ) per year to the sport. Swimmers were selected as participants because anecdotal evidence suggests that burnout is an important issue in sports that require intense training on a near year-round basis.

### *Procedure and Measures*

The present study is an analysis of data collected as part of a larger effort designed to develop a sport-specific measure of athlete burnout (see Raedeke & Smith, 2001, Study 2, for additional details). Prior to questionnaire administration, participants were told that the general purpose of the study was to learn about motivation and stress in swimmers. Immediately following a swim practice, volunteers, with parent consent if under age 18, completed a multisection questionnaire containing the measures described below.

*Perceived Stress.* Twelve items from the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) were adapted to assess how often in the previous month respondents felt or thought a certain way *in swimming* (e.g., "In

the last month, how often have you felt that you could not handle all the things you had to do in swimming?”). Response options fell on a 5-point Likert scale of 1 (*never*), 2 (*almost never*), 3 (*sometimes*), 4 (*fairly often*), and 5 (*very often*). Two items from the original PSS were not used because they were less readily adapted to the swim context than the other items (i.e., “In the last month, how often have you been able to control the way you spend your time?” “In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?”). Kelley and colleagues have successfully used the PSS to assess perceived stress (Kelley et al., 1999; Martin et al., 1999). In the present study one of the items (“In the last month, how often have you found yourself thinking about things that you have to accomplish in swimming?”) exhibited a low item-total correlation ( $-.04$ ) and a low squared multiple correlation value ( $.14$ ) compared with the other items (range =  $.25-.56$ ). This item was removed for subsequent analyses. Internal consistency of the 11-item scale was good ( $\alpha = .81$ ).

*General Coping Behaviors.* The coping section of Miller and Smith’s (1982) Stress Audit Questionnaire was used to assess general coping behaviors. This scale has been used to examine coping behaviors in the sport injury realm (Williams, 2001). The response set was modified such that participants indicated the degree to which they engaged in various life habits on a 5-point Likert scale of 1 (*never*), 2 (*some of the time*), 3 (*most of the time*), 4 (*almost always*), and 5 (*always*). Example items include: “I eat at least two full, balanced meals a day”; “I have some fun each day”; “I organize my time effectively”; and “I take quiet time for myself each day.” Five items reflecting social support were removed from the scale to avoid conceptual overlap with the social support measure. The internal consistency reliability of the resulting 15-item measure was marginal ( $\alpha = .66$ ). Three items with negative wording (e.g., “I do not smoke”) were subsequently removed because some participants reported the interface of the items with the response set to be confusing, evident by these items showing low negative correlations with other items in the scale. The final 12-item coping scale used in the present analyses exhibited marginally adequate internal consistency reliability ( $\alpha = .69$ ).

*Social Support Satisfaction.* Satisfaction with social support was assessed using an adapted version of the 6-item short form of the Social Support Questionnaire (Sarason, Sarason, Shearin, & Pierce, 1987). The original version taps number of social support sources and satisfaction with that support. Previous sport related research has used this instrument successfully to assess social support perceived by college coaches and high school athletic directors (Kelley, 1994; Martin et al., 1999). Consistent with this research, the adapted version in the present study was limited to assessing satisfaction with social support received, regardless of the number of social support sources. Participants indicated their extent of satisfaction on a 5-point Likert scale with response anchors of 1 = very dissatisfied and 5 = very satisfied. In the adapted version used in the present study, instructions contextualized the measure to swimming, and the stem “To what extent are you satisfied with the overall support you receive...” preceded items. Example items include “when you feel under stress and need to be distracted from your worries” and “when you need to feel cared about, regardless of what is happening to you.” Internal consistency reliability of the measure was good ( $\alpha = .88$ ).

*Burnout.* Burnout was assessed using a preliminary version of the Athlete Burnout Questionnaire (ABQ; see Raedeke & Smith, 2001). The ABQ taps three

burnout subscales: emotional/physical exhaustion, reduced sense of accomplishment, and sport devaluation. Respondents were asked to indicate how often they felt or thought a certain way during the current season on a 5-point Likert scale of 1 (*almost never*), 2 (*rarely*), 3 (*sometimes*), 4 (*frequently*), and 5 (*almost always*). Example items include “I feel overly tired from my swim participation” (emotional/physical exhaustion); “I am not performing up to my ability in swimming” (reduced sense of accomplishment); and “I’m not into swimming like I used to be” (swimming devaluation). This version of the ABQ contained 15 core and 5 trial items, 14 of which were retained in the final version of the ABQ following an additional validation study (Raedeke & Smith, 2001). One trial item not included in the final version of the ABQ was used in the present study to allow for a 5-item reduced accomplishment subscale. Internal consistency reliability values for the subscales ( $\alpha = .84\text{--}.88$ ) and a global index comprising all items ( $\alpha = .91$ ) were good.

### Data Analysis

Structural equation modeling was used to examine the stress-mediation hypothesis. Data screening was conducted using PRELIS 2.52 and structural models were tested using LISREL 8.52 (Scientific Software International, Chicago). For each burnout dimension and a global burnout index, we examined three models based on the criteria set forth by Baron and Kenny (1986) to establish mediation. In the first model, coping behaviors and social support satisfaction were hypothesized to directly predict stress (corresponding with paths *a* and *b* in Figure 1). In the second, coping behaviors and social support satisfaction were hypothesized to directly predict burnout (paths *d* and *e* in Figure 1). In the third, both direct and stress-mediated associations of coping behaviors and social support satisfaction with burnout were examined simultaneously (all paths in Figure 1).

Assuming good-fitting models, the parameter estimates across the three models are examined to determine the degree of support for stress mediation. To establish mediation, the hypothesized paths for Models 1 and 2 must be significant, as well as the relationship between stress and burnout in the third model (path *c* in Figure 1). If these criteria are met, the paths from coping behaviors and

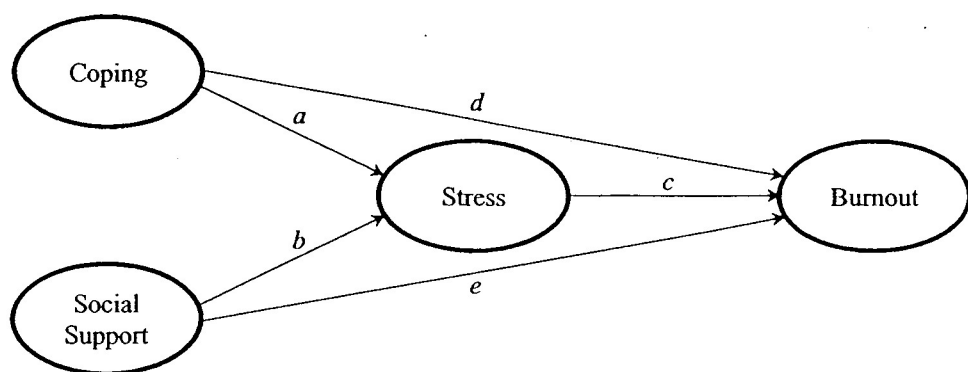


Figure 1 — Elaborated model examined in the present study (path labels correspond with those in Table 2).

social support satisfaction to burnout are examined in the third model relative to the second model (i.e., coping behaviors and social support satisfaction predicting burnout, stress not included in the model). If significant paths from coping behaviors or social support satisfaction to burnout in Model 2 are no longer significant or are significantly reduced in the third model, this shows support for stress mediation.

Aggregates of subscale items were created and used as observed indicators of coping behaviors, social support satisfaction, and stress latent variables. Subscale items used to tap a given latent construct were randomly assigned to three sets. Items within a set were averaged to create the aggregate score. Exhaustion, reduced accomplishment, and devaluation subscale scores were used as indicators of the global burnout latent variable. Item scores served as observed indicators for analyses examining specific burnout dimensions. One factor loading per latent variable was fixed to 1.0 to scale the latent variables to a common metric. As suggested by Hoyle and Panter (1995), multiple indicators were used to judge the fit of the models to the data. Specifically, the  $\chi^2$  statistic, goodness-of-fit index (GFI), nonnormed fit index (NNFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) were used in the present study.

A nonsignificant  $\chi^2$  statistic, fit index values of .90 or over, and RMSEA value of .08 or under are traditionally considered to indicate good model fit. However,  $\chi^2$  statistic values are sensitive to minor departures of the observed variance-covariance matrix from the expected matrix, and often yield significant values that suggest the rejection of models which are in fact adequate. Therefore  $\chi^2$  statistic values are reported for informational purposes but were not used for model acceptance decisions. Following assessment of model fit, we examined parameter estimates to assess the hypothesized relationships (i.e., model paths), with statistical significance of parameters denoted by *t* values of 1.96 or higher.

We used hierarchical multiple regression analyses to examine the disjunctive and conjunctive moderator hypotheses. Predictor variables were centered prior to calculating interaction terms to reduce multicollinearity between main effect and interaction terms (Aiken & West, 1991). We conducted four analyses using the centered predictor variables, one using the global burnout index as the criterion variable and the others targeting the respective burnout dimensions. Each analysis consisted of three steps: First, stress, coping behaviors, and social support satisfaction were entered as predictors of the burnout criterion variable. Second, two-way interactions of predictor variables were added (i.e., stress by coping behaviors, stress by social support satisfaction, coping behaviors by social support satisfaction). The stress-by-coping/social support interactions test the disjunctive moderator hypotheses. Finally, the three-way interaction of stress, coping behaviors, and social support satisfaction was added to assess the conjunctive moderator hypothesis.

Support for the disjunctive moderator hypotheses is indicated by significant stress-by-coping behaviors and/or stress-by-social-support satisfaction interaction terms, significant change in  $R^2$  from Step 1 to Step 2, and interaction patterns consistent with expectations (i.e., stronger stress-burnout relationship when there were either lower coping behaviors or lower social support satisfaction). Support for the conjunctive moderator hypothesis is indicated by a significant three-way interaction term and change in  $R^2$  from Step 2 to Step 3, as well as an interaction pattern consistent with a stronger stress-burnout relationship in the presence of both lower coping behaviors and lower social support satisfaction.

**Table 1** Descriptive Statistics for Stress, Coping, Social Support, and Burnout ( $N = 244$ )

Variable	1	2	3	4	5	6	7
1. Stress	.81						
2. Coping	-.40	.69					
3. Social support	-.32	.39	.88				
4. BO – Global index	.63	-.37	-.34	.91			
5. BO – Exhaustion	.48	-.26	-.31	.78	.88		
6. BO – Reduced accompl.	.64	-.37	-.28	.84	.48	.84	
7. BO – Devaluation	.47	-.29	-.24	.86	.47	.62	.87
<i>M</i>	2.56	3.91	3.78	2.52	3.06	2.30	2.19
<i>SD</i>	.59	.48	.79	.71	.82	.79	.95

Note: Alpha values are on diagonal, correlation values below diagonal. All correlations are significant at  $p < .01$  level (2-tailed).

## Results

Table 1 contains descriptive statistics for the variables examined in this study. Overall, swimmers reported low to moderate stress, perceived strong coping behaviors, and were satisfied with the social support they received. They also reported low to moderate burnout. With regard to the specific burnout dimensions, swimmers reported “sometimes” experiencing exhaustion over the season and “rarely” experiencing reduced sense of accomplishment and swimming devaluation. Correlations were in expected directions, with higher burnout scores associated with higher stress, lower coping, and lower social support.

### Mediation Testing

Skewness (range =  $-.92$  to  $.95$ ) and kurtosis (range =  $-.78$  to  $.86$ ) values were below an absolute value of one for all aggregate (coping, social support, stress), individual burnout item, and burnout subscale scores used as observed variables in the analyses.<sup>1</sup> Although the observed variables demonstrated significant multivariate skewness (normalized Mardia’s coefficient =  $9.17$  to  $13.18$ ) and multivariate kurtosis (normalized Mardia’s coefficient =  $7.16$  to  $8.78$ ),<sup>2</sup> maximum likelihood estimation was used because it is accurate relative to other estimation techniques when data depart from normality (Chou & Bentler, 1995).

All models exhibited a reasonably good fit to the data. GFI, NNFI, CFI, and RMSEA values for all models met traditional criteria for good fit (see Table 2). All parameter estimates representing measurement elements (i.e., factor loadings, uniquenesses, factor variances) were significant for all models. Burnout variance explained in the third model (i.e., all paths) was 67% for the global index, 34% for exhaustion, 59% for reduced accomplishment, and 28% for devaluation.

Examination of parameter estimates representing structural relationships supports stress mediation for general coping behaviors. For the global burnout

Table 2 Fit Statistics and Completely Standardized Path Coefficients for Structural Models Assessing the Relationship of Stress, Coping, Social Support, and Burnout ( $N = 244$ )

Burnout Dimension	$\chi^2$	df	GFI	NNFI	CFI	RMSEA	Completely Standardized Path Coefficient				
							a	b	c	d	e
<i>Global Burnout Index</i>											
M <sub>1</sub>	51.96*	24	.96	.96	.98	.065	-.39*	-.16*	-	-	
M <sub>2</sub>	54.28*	24	.95	.96	.98	.074	-	-	-.39*	-.20*	
M <sub>3</sub>	107.24*	48	.93	.96	.97	.070	-.41*	-.16*	.73*	-.07	
<i>Exhaustion</i>											
M <sub>1</sub>	51.96*	24	.96	.96	.98	.065	-.39*	-.16*	-	-	
M <sub>2</sub>	77.08*	41	.95	.96	.98	.061	-	-	-.18*	-.26*	
M <sub>3</sub>	144.36*	71	.92	.97	.97	.063	-.40*	-.16*	.50*	-.19*	
<i>Reduced Accomplishment</i>											
M <sub>1</sub>	51.96*	24	.96	.96	.98	.065	-.39*	-.16*	-	-	
M <sub>2</sub>	58.25*	41	.96	.99	.99	.036	-	-	-.39*	-.14	
M <sub>3</sub>	114.62*	71	.94	.98	.98	.046	-.40*	-.16*	.70*	-.02	
<i>Devaluation</i>											
M <sub>1</sub>	51.96*	24	.96	.96	.98	.065	-.39*	-.16*	-	-	
M <sub>2</sub>	87.86*	41	.94	.97	.97	.071	-	-	-.29*	-.14	
M <sub>3</sub>	154.43*	71	.92	.96	.97	.068	-.40*	-.16*	.43*	-.07	

*Note:* *M*<sub>1</sub> = coping and social support predicting stress; *M*<sub>2</sub> = coping and social support predicting burnout; *M*<sub>3</sub> = coping and social support predicting stress as well as coping, social support, and stress predicting burnout; Path coefficient descriptors correspond to Figure 1 where *a* = coping predicting stress, *b* = social support predicting stress, *c* = stress predicting burnout, *d* = coping predicting burnout, and *e* = social support predicting burnout. \* $p < .05$

index and all three burnout dimensions, hypothesized paths between coping and stress in Model 1, coping and burnout in Model 2, and stress and burnout in Model 3 were significant. Additionally, the significant coping-burnout path in Model 2 became nonsignificant with the addition of stress as a mediator in Model 3.

The same pattern of findings emerged for social support satisfaction using the global burnout index as the criterion variable. However, stress mediation was not evident for social support satisfaction when examining distinct burnout dimensions. Although social support was related to stress and stress was related to all three burnout dimensions, not all the criteria for establishing mediation were met. For exhaustion there was a significant social support-burnout path for Model 2, but that path was also significant in Model 3 which included stress. This suggests that social support satisfaction has a direct association with exhaustion independent of stress. For both reduced accomplishment and devaluation, the social support-burnout path in Model 2 was nonsignificant, thus failing to meet a precondition of establishing mediation. Also, of note across all models was the relatively small path coefficient between social support satisfaction and stress.

### *Moderation Testing*

Table 3 summarizes the findings for the hierarchical multiple regression analyses used to examine whether coping behaviors and social support satisfaction moderated the relationship between stress and burnout. At Step 1, stress, coping, and social support main effects explained 43% of the variance in global burnout index scores,  $F(3, 240) = 59.86, p < .001$ . Stress ( $b = .66, p < .01$ ) and social support ( $b = -.11, p < .05$ ) were significant predictors of burnout. Higher stress and lower social support were associated with higher burnout. Adding the two- and three-way interaction terms did not result in a significant change in explained variance, thereby indicating that social support and coping did not moderate the relationship between stress and burnout.<sup>3</sup>

The same outcome was observed in the exhaustion analysis. At Step 1, stress, coping, and social support main effects explained 26% of the variance in exhaustion scores,  $F(3, 240) = 28.03, p < .001$ . Stress ( $b = .58, p < .01$ ) was positively and social support ( $b = -.18, p < .01$ ) was negatively associated with exhaustion. Two-way and three-way interaction terms did not add to explained variance, indicating that social support and coping did not moderate the relationship between stress and exhaustion.

The main effects for stress, coping, and social support explained 42% of the reduced sense of accomplishment variance,  $F(3, 240) = 58.98, p < .001$ . However, stress ( $b = .77, p < .01$ ) was the only significant predictor at Step 1. Higher stress was associated with a stronger reduced sense of accomplishment. Adding the two- and three-way interaction terms at Steps 2 and 3 both resulted in small significant ( $p < .05$ ) increases in explained variance. However, the addition of interaction terms only accounted for increases of 2% and 1% of the explained variance, respectively. Given that the interactions did not explain a meaningful proportion of the variance beyond that accounted for at Step 1, the latter models are not interpreted.

At Step 1 the predictor variable main effects explained 24% of the variance in swim devaluation,  $F(3, 240) = 24.65, p < .001$ . Stress was the only significant predictor ( $b = .64, p < .01$ ), with higher stress corresponding to higher devaluation.

Table 3 Hierarchical Regression Analyses With Stress, Coping, and Social Support Predicting Burnout ( $N = 244$ )

Criterion Variable	F	R <sup>2</sup>	ΔR <sup>2</sup>	S	Unstandardized Regression Coefficients					
					C	SS	SxC	SxSS	CxSS	SxCxSS
Global Burnout Index										
Step 1	59.86	.43		.66**	-.14	-.11*				
Step 2	30.67	.44	.01	.65**	-.15	-.13*	-.15	-.02	-.19	
Step 3	26.65	.44	.00	.67**	-.18*	-.14**	-.20	-.04	-.19	-.15
Exhaustion										
Step 1	28.03	.26		.58**	-.04	-.18**				
Step 2	14.37	.27	.01	.56**	-.05	-.19**	-.23	-.02	-.15	
Step 3	12.27	.27	.00	.56**	-.05	-.19**	-.23	-.02	-.15	.00
Reduced Accomplishment										
Step 1	58.98	.42		.77**	-.18	-.06				
Step 2	31.46	.44	.02*	.75**	-.21*	-.08	-.06	-.03	-.31**	
Step 3	28.07	.45	.01*	.80**	-.26**	-.10	-.15	-.07	-.31**	-.26*
Devaluation										
Step 1	24.65	.24		.64**	-.19	-.09				
Step 2	12.39	.24	.00	.63**	-.20	-.10	-.16	-.02	-.13	
Step 3	10.80	.24	.00	.66**	-.24	-.12	-.23	-.04	-.12	-.19

Note: Main effects entered at Step 1. Main effects and two-way interactions entered at Step 2. Main effects, two-way interactions, and three-way interaction entered at Step 3; Degrees of freedom: Step 1 (3, 240), Step 2 (6, 237), Step 3 (7, 236).  $S$  = stress,  $C$  = coping,  $SS$  = social support. All models are significant at  $p < .001$ ; \* $p < .05$ , \*\* $p < .01$ .



No significant change in explained variance was achieved by adding two-way interactions or the three-way interaction. Collectively these findings suggest that coping behaviors and social support satisfaction neither conjunctively nor disjunctively moderate the stress-burnout relationship.

## Discussion

Currently there is little debate that burnout is stress related (Maslach et al., 2001). However, one challenge is to understand why some athletes are more negatively impacted by the demands of sport participation than others and respond by showing signs of burnout (Raedeke, 1997). Coping resources theoretically influence an athlete's ability to effectively deal with the stresses of sport participation. Therefore we examined whether coping behaviors and social support satisfaction had stress-mediated relationships with burnout or whether those variables moderated the stress-burnout relationship.

Overall the results provide stronger evidence for stress mediation than moderation. Similar to past research (e.g., Gould, Tuffey, et al., 1996; Kelley et al., 1999), results revealed a positive relationship between perceived stress and burnout. Athletes reporting higher stress felt more exhausted, valued swimming less, and felt they were accomplishing less in swimming compared to those who reported lower stress. Perceived stress explained much of the variance in burnout, confirming the belief that burnout is stress related. Aligned with Kelley's original stress-mediated burnout model (Kelley, 1994; Kelley & Gill, 1993), athletes reporting higher coping behaviors and social support satisfaction scores perceived lower stress than those reporting lower scores on coping behaviors and social support. Based on Baron and Kenny's (1986) guidelines for testing mediation, coping behaviors and social support were associated with the overall burnout index via their relationship with stress. However, concerning individual burnout subscales, coping behavior had stress-mediated relationships with all three dimensions whereas social support satisfaction did not.

Those who do research on burnout generally attend more to external coping resources such as social support than to internal resources such as lifestyle management and coping skills. Based on this study's results, internal coping behaviors exhibited a stronger relationship with stress and burnout than did social support. This highlights the importance of strong internal coping resources including lifestyle management skills in athletes' responses to the demands of sport participation. Not only do lifestyle management skills relate to psychological stress and burnout, but they are also thought to play a role in overtraining processes and potentially influence athletes' ability to recover from the demands of physical training (Kuipers & Keizer, 1988).

Although social support satisfaction exhibited a stress-mediated relationship with overall burnout, a closer look at the results revealed that using an overall burnout index may mask underlying relationships between social support, stress, and burnout dimensions. While the path coefficients from social support to stress and the burnout dimensions of reduced sense of accomplishment and devaluation were in the hypothesized direction to support mediation, they were nonsignificant or relatively weak. For exhaustion, a different pattern of results emerged. Social support had a direct association with exhaustion independent of its relationship with perceived stress. Future research is needed to examine whether various types

and amounts of social support have differential influences on the individual burnout dimensions.

Social support is a multidimensional dynamic process that involves transactions between individuals in specific social contexts (Vaux, 1992). Support is provided by various individuals (e.g., coaches, parents, and peers) and serves different functions (e.g., informational, emotional, and tangible). The type, amount, and provider of support may influence the extent to which athletes find sport stressful and also their responses to the demands of sport. There may be an optimal matching between the amount, type, and provider of support with specific stressors associated with burnout (Cohen & Wills, 1985; Cutrona, 1990). In addition, though high social support is generally linked to lower burnout scores, not all social support is equally positive (Kaufmann & Beehr, 1986). For example, athletes who perceive high stress and have others, such as teammates and peers outside of sport, reaffirm the aversive nature of sport participation might have more tendency to burn out.

Bianco and Eklund (2001) suggest that examining social support in the context of specific provider-recipient relationships may yield a better understanding of this construct. Applied to burnout, researchers may want to examine how the specific behaviors of important others including coaches, peers, and parents influence the quality of athletes' sport experiences. In interviewing athletes, Udry, Gould, Bridges, and Tuffey (1997) highlight the influential role that significant others have on athletes dealing with stress related issues such as burnout or injury. Other researchers (e.g., Price & Weiss, 2000; Vealey et al., 1998) have shown that perceived coach behaviors such as support, empathy, praise, provision of instruction and training, and democratic coaching style are negatively related to burnout, whereas an autocratic coaching style and emphasis on winning are positively related to burnout. Coach behaviors may impact not only athletes' stress levels but also their responses to the demands of competitive sport. Needed is more research on the role of significant others in the burnout process.

Results revealed that coping behaviors and social support satisfaction did not moderate the relationship between stress and burnout either in a disjunctive or conjunctive fashion. As such, examining those variables did not increase our understanding of why some athletes may be more at risk of experiencing elevated burnout in response to stress than others. However, these findings may have been influenced by the nature of the stress measure and sample characteristics.

The strong relationship between stress and athlete burnout is similar to that found in the research on coach burnout (Kelley et al., 1999; Martin et al., 1999). In the coaching literature, the most prevalent measure of stress is Cohen et al.'s (1983) PSS. Although this scale is often viewed as a stress appraisal assessment (Kelly et al., 1999; Martin et al., 1999), Lazarus (1990) describes the PSS as an output or stress response measure because it treats stress as a reaction to situational demands. Given that both stress and burnout are measured on the response level, the high correlation between stress and burnout is not surprising. Theoretically, stress measures aimed at input processes (e.g., stressors such as training and life demands) should not be as highly correlated with burnout as output measures. The relationship between stress and burnout might be lower if stress were measured at a different level in a stress framework.

The response level assessment of stress may also explain why coping behaviors and social support satisfaction did not moderate the relationship between stress

and burnout. In examining stress-injury relationship moderators, researchers typically quantify stress in terms of life events (Williams, 2001). As such, stress is assessed on the input level. If the stress-injury relationship is similar to the stress-burnout relationship, those findings suggest that coping and social support may be important moderators of the relationship between stress measured at the input level (e.g., life events) and burnout. However, the life-events approach does not measure sport-specific stress and thus may be less useful in helping us understand how the demands of training and competing influence burnout.

As an alternative to a life-events approach to assessing stress at the input level, it may be that coping behaviors and social support satisfaction moderate the relationship between sport-specific stressors (e.g., training demands) and burnout. Future research is warranted that tests such hypotheses using a more transactional process-oriented view of stress (e.g., Lazarus, 1990). Such an approach requires consideration of several interrelated components including situational demands and personal resources, cognitive appraisal, affective and physiological responses, coping, and task related behaviors. Moreover, a process-oriented approach involves examination of the temporal sequencing of demands, stress responses, coping resources, and outcomes such as burnout.

In addition to measuring stress at the response level, the sample's favorable outlook on swimming may have influenced results. Similar to past research examining athlete burnout, swimmers reported low to moderate burnout scores (Price & Weiss, 2000; Raedeke, 1997; Vealey et al., 1998). It is plausible that mediation is more likely to be supported than moderation in the absence of high stress or burnout levels. Based on a buffering hypothesis, athletes most susceptible to burnout include those who experience high stress and report low social support and/or weak coping skills. Given that our study participants had an overall favorable outlook on their swim participation, those most vulnerable to burnout may not have represented a sufficiently large portion of the sample to detect stress-buffering effects. This finding could mean that burnout is not a prevalent issue in age-group swimming or, alternatively, that swimmers who experience high stress and burnout coupled with low coping behaviors and support have already left the sport and thus were not sampled.

Although specialization and year-round training are becoming the norm in many sports, the effects of intensive training on burnout are not yet well known. In examining athlete responses to demanding training environments, researchers may want to consider how sport-specific coping skills (e.g., stress management skills) and coping efforts (e.g., task vs. emotional) directed at specific sources of stress, as well as general coping behaviors, influence the stress-burnout relationship. In addition to coping, researchers may want to examine other individual (e.g., personality characteristics, goal orientations) and situational (e.g., motivational climate) variables that potentially influence stress and athletes' responses to stress.

While the prevalence of athlete burnout in youth sport remains to be quantified, the strong association between stress and burnout perceptions in this study alludes to the importance of teaching individuals stress management skills to help prevent burnout. Yet it would be erroneous to conclude that stress management techniques geared at the individual are the most or the only effective intervention approach. Maslach et al. (2001) argue that situational factors play a larger role in work burnout than individual factors, and that interventions must target environmental modifications to create a more optimal person-environment match. Coakley



(1992) emphasizes that teaching athletes how to cope with stress is analogous to treating burnout with a band-aid rather than addressing the underlying cause of burnout, the social structure of sport. Collectively, these perspectives suggest that preventing burnout calls for changing the social organization of sport to create a better fit between the athlete and the competitive sport environment. To help with such efforts, research is needed on how the social structure of sport may influence athletes' levels of and responses to stress.

In summary, our results corroborate theory and research linking stress and burnout. This is the first study on athlete burnout that has examined disjunctive/conjunctive moderation and mediation hypotheses by looking at the interrelationships between coping behaviors, social support satisfaction, stress, and burnout. Results highlight that coping behaviors and social support satisfaction play an important role in understanding burnout. However, rather than moderating the relationship between stress and burnout, stronger evidence was found for stress-mediated effects, especially for coping behaviors. Future research is needed that assesses the prevalence of burnout in youth sport, why some athletes are more likely to burn out in response to the demands of sport participation, how the social structure of sport influences burnout, and the efficacy of interventions designed to prevent burnout.

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## Notes

<sup>1</sup> Full descriptive statistics for these variables are available from the authors.

<sup>2</sup> Mardia's coefficient values were calculated using the aggregate scores and one set of burnout indicators at a time (i.e., subscale scores only, exhaustion items only, reduced accomplishment items only, devaluation items only).

<sup>3</sup> This conclusion is corroborated via results of correlational analyses we conducted using the strategy adopted by Smith et al. (1990) in their study of adolescent sport injuries. Stress-burnout correlations were examined for those in the upper and lower thirds of the coping and social support distributions, respectively, to assess the disjunctive moderation hypotheses. Correlations were of similar magnitude, ranging from .56 to .67, thus failing to support disjunctive moderation. Low-low, high-low, low-high, and high-high groups on coping and social support were generated from this pool of participants, enabling assessment of the conjunctive moderation hypothesis. Stress-burnout correlations for three of these subgroups were of similar magnitude, .51 to .65, while the other group (low coping, high social support,  $n = 11$ ) had a correlation value of .92. The pattern of correlations does not support conjunctive moderation.

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