Stressors, social support and psychological responses to sport injury in high- and low-performance standard participants

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ABSTRACT

Objective: The purpose of the present study was to examine the main and buffering effect relationships between social support and psychological responses to sport injury with samples of high- and low-performance standard injured participants.

Method: High- (N = 147) and low-performance (N = 114) standard injured participants completed measures of perceived social support, injury-related stressors and psychological responses during physiotherapy clinic visits.

Results: Moderated hierarchical regression analyses revealed the following key findings: a) in the high-performance sample, there were significant (p < .05) main effects for social support in relation to psychological responses; b) in the low-performance sample, there were significant buffering effects for social support in relation to psychological responses. That is, in the low-performance sample, the detrimental relationships between stressors and psychological responses were reduced for those with high social support compared to those with low social support, but level of social support was relatively unimportant at low levels of stressors.

Conclusion: These results highlight that the relationships between social support, stressors, and psychological responses to sport injury may differ, depending upon the performance standard of the athlete. The impact of social support in the injury process may therefore be more complicated than first thought, and this has implications for interventions aimed at increasing social support for injured athletes.

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There is growing recognition in the sport psychology literature that social support plays an important role in the way athletes cope with and rehabilitate from sport injury (e.g., Bianco, 2001; Johnston & Carroll, 1998; Podlog & Eklund, 2006; Tracey, 2003; Udry, 1997). As well as being noted within the most widely accepted conceptual models of the injury process (e.g., Wiese-Bjornstal, Smith, Shaffer, & Morrey’s, 1998, stress-based Integrated Model of Response), empirical evidence demonstrates that social support can enhance the well being of injured athletes by reducing distress (Bianco, Malo, & Orlick, 1999), preventing perceptions of isolation and fears of re-injury (Podlog & Eklund, 2004), and by increasing motivation (Bianco, 2001), rehabilitation adherence (Duda, Smart, & Tappe, 1989; Evans, Hardy, & Fleming, 2000; Fisher, Domm, & Wuest, 1988; Johnston & Carroll, 1998), and self-confidence (Magyar & Duda, 2000). Indeed, injury is a social process whereby exchanges with, as well as the perception of the availability of support from, friends, family members, teammates, coaches and medical staff, in addition to the size and aptness of the network, may affect athletes’ ability to cope. It is therefore unsurprising that social support has been afforded such a central role in injury response and rehabilitation (Gould, Udry, Bridges, & Beck, 1997a; Tracey, 2003; Udry, 1997).

Three key theoretical perspectives have underpinned research on social support (Lakey & Cohen, 2000): the stress and coping perspective, the social constructionist perspective and the relationship perspective. Within each perspective, different types of support and operational mechanisms are emphasised. There is, therefore, no definitive understanding of how social support per se and the different types of support operate. There are, however, two principal models that explain the conditions under which social support is related to outcomes (for reviews, see Bianco & Eklund, 2001; Cohen, Gottlieb, & Underwood, 2000; Cohen & Wills, 1985;
the buffering effect model and the main effect model.

The notion of buffering effects is primarily tied to models of the stress process, appraisal and coping (e.g., Cox, 1978; Lazarus, 1966; Lazarus & Folkman, 1984). Social support may intervene at specific points along the pathway from encountering stressors, through experiencing stress, to subsequent outcomes such as psychological responses to sport injury (Cohen & Wills, 1985). For example, social support may help to reframe the threat posed by a stressor, alter an individual’s perceptions of his/her available resources to cope, or lead an individual to feel more in control, which could all prevent a stressor from being appraised as highly stressful (Cohen et al., 2000; Cohen & Wills, 1985; Schwarzer & Leppin, 1991). Once stress is experienced, however, social support may reduce or alter the affective reaction, physiological response, or behavioral response to the stressful event, decrease the perceived importance of the problem, lead to improved coping, or provide a distraction from, or a solution to, the problem (Cohen et al., 2000; Cohen & Wills, 1985).

In the context of the present study, buffering would imply that the detrimental relationships between stressors and psychological responses would be reduced (buffered) for those with high social support compared to those with low social support. But level of social support would be relatively unimportant at low levels of stressors. In other words, social support moderates the relative relationship between stressors and psychological responses to sport injury. Injured athletes may be faced with a variety of highly stressful demands (stressors) that have the potential to significantly affect their responses to, and rehabilitation from injury (Evans et al., 2000; Podlog & Eklund, 2006, 2007; Tracey, 2003). For example, incapacitation and disruption to normal functioning have been found to exacerbate feelings of depression and frustration (cf. Evans & Hardy, 1995; Johnston & Carroll, 1998). In turn, slowness of progress and rehabilitation setbacks can reduce athletes’ levels of motivation and self-confidence, and as a result, their adherence to rehabilitation programmes. Given that injury can be a stressful and traumatic experience for many athletes (Bianco et al., 1999; Eklund & Bianco, 2004; Tracey, 2003), the potential for social support to buffer the negative relationships between stressors and psychological responses has important implications for the injury process.

In contrast to the buffering effect model, the main effect model would suggest that social support has a beneficial relationship with psychological responses irrespective of levels of stressors (Cohen & Wills, 1985). In other words, the mere perception of one’s relationships as being supportive is enough to lead to favourable outcomes. In the absence of buffering, main effects should therefore be routinely examined. For example, as Wheaton (1985) demonstrated, significant main effects for stressors and social support could be described within an independent distress determinant model. That is, stressors and social support may be associated with separate and opposite effects, with social support counteracting the negative relationships between stressors and psychological responses (Wheaton, 1985).

A main effect would be demonstrated if social support is significantly associated with psychological responses independent of stressors; a buffering effect would be demonstrated if the interaction term of stressors and perceived support is significantly associated with psychological responses. The normal procedure for testing buffering effects is moderated hierarchical regression analysis (Biddle, Markland, Gilbourne, Chatzisarantis, & Sparkes, 2001; Cohen & Wills, 1985; Jaccard, Turrisi, & Wan, 1990), which incorporates tests for main effects of social support and interactions of stressors and social support (buffering). This is the procedure we followed in the present study.

In light of the preceding discussion, the principal aim of the present research was to examine the main and buffering effect relationships between social support and psychological responses to sport injury. A secondary, exploratory, aim was to examine these relationships across different performance standards of participants. Wiese-Bjornstal et al.’s (1998) model highlighted performance standard (level of competition) as one of a number of situational factors that exert an impact throughout the injury process. Although performance standard has received limited attention with regard to the relationships between social support and injury-related outcomes, research suggests that the impact of injury-related stressors may be greatest for athletes who have made a large investment in sport (Johnston & Carroll, 1998), who have developed a strong athletic identity, for whom sport involvement is an important source of self-worth (Green & Weinberg, 2001), and for whom sport provides important sources of attachment (Evans & Hardy, 1995). These findings are consistent with Podlog and Eklund (2007) who recently acknowledged the importance of sporting standard (or level of sports participation) in the social support—diathesis—outcome model and the extent to which social support may moderate observed stress appraisal and buffering effects (see also, Coyle, 2007). That is, stressors and social support may be associated with psychological responses to sport injury. Injured athletes may be faced with a variety of highly stressful demands (stressors) that have the potential to significantly affect their responses to, and rehabilitation from injury (Evans et al., 2000; Podlog & Eklund, 2006, 2007; Tracey, 2003). For example, incapacitation and disruption to normal functioning have been found to exacerbate feelings of depression and frustration (cf. Evans & Hardy, 1995; Johnston & Carroll, 1998). In turn, slowness of progress and rehabilitation setbacks can reduce athletes’ levels of motivation and self-confidence, and as a result, their adherence to rehabilitation programmes. Given that injury can be a stressful and traumatic experience for many athletes (Bianco et al., 1999; Eklund & Bianco, 2004; Tracey, 2003), the potential for social support to buffer the negative relationships between stressors and psychological responses has important implications for the injury process.

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SRMR ¼ Mean ¼ e of the four-factor model using data from the 261 participants in the research. Often observed with Likert-type scaling), we computed Satorra-Bentler classificatory factor analysis (CFA: Jöreskog & Sörbom, 1993). As departures from multivariate normality were observed (a phenomenon often observed with Likert-type scaling), we computed Satorra–Bentler (SB: Satorra & Bentler, 1994) scaled chi-square tests. CFA of the four-factor model using data from the 261 participants in the present study revealed a good model fit (cf. Hu & Bentler, 1999; SB χ²(98) ¼ 163.07, p < .01; RMSEA ¼ .05; RMSEA(p) ¼ .46; SRMR ¼ .05; CFI ¼ .96; NNFI ¼ .95). Cronbach’s alpha internal consistency reliability coefficients for the subscales were as follows: emotional (α = .81), and tangible (α = .84). Correlations between the social support dimensions ranged from moderate (r = .39, p < .001) to high (r = .85, p < .001). Correlations of this magnitude have been noted with other social support measures (see, e.g., Brookings & Bolton, 1988). In light of these correlations, we also ran two further models with the social support data in CFA: A single higher-order factor model revealed a good fit (SB χ²(100) ¼ 174.18, p < .01; RMSEA ¼ .05; RMSEA(p) ¼ .32; SRMR ¼ .05; CFI ¼ .95; NNFI ¼ .94); A model with all items loading on a single scale revealed a poor fit (SB χ²(104) ¼ 527.30, p < .01; RMSEA ¼ .13; RMSEA(p) < .01; SRMR ¼ .10; CFI ¼ .83; NNFI ¼ .80). The correlations between the social support dimensions and the result of the higher-order factor model CFA provided support for the use in subsequent analyses of (a) an aggregate social support score (a mean of the four subscales), and (b) individual social support subscale scores.1

Stressors

Cohen, Kessler, and Underwood-Gordon (1997) highlighted three broad approaches used by researchers to measure stress. Each approach focuses upon different components of the stress process from situational demands to outcomes (e.g., psychological responses to sport injury). The environmental approach focuses upon situational demands; the psychological approach focuses upon subjective stress appraisals; and the biological approach focuses upon stress responses. The present study assessed situational demands (stressors) facing injured athletes. The following two perceived stressors were used to generate single-item measures of potential injury-related stressors and were chosen for their particular relevance to the injury process: “incapacitation,” and “slowness of progress.” These stressors have been acknowledged within previous injury research (e.g., Eklund & Bianco, 2004; Evans et al., 2000; Gould, Udry, Bridges, & Beck, 1997b; Johnston & Carroll, 1998; Podlog & Eklund, 2006, 2007; Tracey, 2003). The measure asked respondents, “To what extent are these an issue for you as an injured athlete?” with response options ranging on a 5-point Likert scale from 1 (not at all) to 5 (a lot). Although these stressor items were chosen to assess different sources of stress, they were averaged to create a total score for stressors. They were not, however, intended to form a single-factor scale. This process served to reduce the number of models to be tested and aided clarity, but should not be interpreted as evidence that the stressors measure the same underlying construct. The correlation between the two stressors was r = .42 (p < .001).

Psychological responses to sport injury

Psychological responses to sport injury were measured using two negatively-worded subscales (devastation, dispirited) and the one positively-worded subscale (reorganisation) from the Psychological Responses to Sport Injury Inventory (PRSII: Evans, Hardy, & Mullen, 1996; Evans, Hardy, Mitchell, & Rees, 2008), a population-specific inventory of athletes’ psychological responses to sport injury. Devastation (four items) reflects feelings of shock and emptiness, which have frequently been reported to characterise athletes’ responses to injury (Brewer, Petitpas, Van Raalte, Sklar, & Ditmar, 1995; McDonald & Hardy, 1996). Dispirited (four items) reflects feelings of apathy, lack of motivation, and frustration. Reorganisation (three items) reflects constructs such as confidence

1 Brookings and Bolton (1988) similarly noted with the Interpersonal Support Evaluation List (Cohen, Merriamstein, Kamarc, & Hobberman, 1985) that a higher-order factor model and a more differentiated 4-factor model of support fitted equally well in CFA. These authors thus suggested that researchers employ a strategy of running subsequent analyses using both an aggregate support score and individual subscale scores, in order to best illustrate how social support operates.
Results

Means, standard deviations, coefficient alphas, and intercorrelations for all scales – high-performance standard participants.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>SD</th>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
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<td>.67</td>
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<td></td>
</tr>
<tr>
<td>2. Social support</td>
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<td>.92</td>
<td>-.01</td>
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<td></td>
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<tr>
<td>3. Devastation</td>
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<td>.82</td>
<td>.70</td>
<td>-.15</td>
<td>-.07</td>
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<tr>
<td>4. Dispirited</td>
<td>2.49</td>
<td>.81</td>
<td>.69</td>
<td>.19</td>
<td>-.23</td>
<td>-.63</td>
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<tr>
<td>5. Reorganisation</td>
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<td>.68</td>
<td>.08</td>
<td>.15</td>
<td>.11</td>
<td>-.02</td>
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</table>

N = 147. Note: *Denotes correlation significant at .05 level (2-tailed). **Denotes correlation significant at .01 level (2-tailed).

Means, standard deviations, coefficient alphas, and intercorrelations for all scales – low-performance standard participants.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>SD</th>
<th>a</th>
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<th>2</th>
<th>3</th>
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<td>1. Stressors</td>
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<td>2. Social support</td>
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<td>.00</td>
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<tr>
<td>3. Devastation</td>
<td>2.24</td>
<td>.81</td>
<td>.70</td>
<td>.25</td>
<td>-.14</td>
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<tr>
<td>4. Dispirited</td>
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<td>.21</td>
<td>-.16</td>
<td>-.68</td>
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<td>5. Reorganisation</td>
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<td>.83</td>
<td>.59</td>
<td>.04</td>
<td>.27</td>
<td>.05</td>
<td>.03</td>
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</table>

N = 114. Note: *Denotes correlation significant at .05 level (2-tailed). **Denotes correlation significant at .01 level (2-tailed).

(Evans et al., 2000; Gordon & Lindgren, 1990). The inventory asked respondents, “Please indicate the extent to which each of the following statements reflects how you presently feel…” with response options ranging on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Sample items included “I am devastated by the injury” (devastated), “I feel dispirited” (dispirited), and “I have much more confidence in myself” (reorganisation). Data from the present study were screened for outliers, missing values, and indices of non-normality, prior to conducting CFA. As departures from multivariate normality were observed, we computed Satorra–Bentler scaled chi-square tests. CFA of the three-factor model using the data from the 261 participants in the present study revealed a reasonable model fit (χ²(41) = 84.14, p < .01; RMSEA = .06; RMSEA(p) = .12; SRMR = .05; CFI = .93; NNFI = .90).

Cronbach’s alpha internal consistency reliability coefficients for the PRSSI subscales in the present study were as follows: devastated (α = .71), dispirited (α = .68), and reorganisation (α = .66). Correlations between the subscales were as follows: devastation and reorganisation (r = .05, p = .38); dispirited and reorganisation (r = .02, p = .70); devastated and dispirited (r = .64, p < .01).

Results from the moderated hierarchical regression analyses2 were shown in Table 3. There were significant main effects for stressors in relation to devastation (R² = .06, b = .20, p < .01) and dispirited (R² = .04, b = .17, p < .01). Over and above the variance accounted for by stressors, there were significant main effects for the aggregate social support score in relation to devastation (ΔR² = .03, b = -.14, p = .04) and dispirited (ΔR² = .05, b = -.18, p = .01). These effects were in the hypothesised directions: Stressors were associated with higher levels of devastation and dispirited; social support was associated with lower levels of devastation and dispirited. There were no significant interactions (see Fig. 1). There was therefore some support within this subsample for Hypotheses 1 and 2, but no support for Hypothesis 3.

High-performance standard participants

Results from the moderated hierarchical regression analyses2 were shown in Table 4. There were significant main effects for stressors in relation to devastation (R² = .07, b = .17, p = .01) and dispirited (R² = .04, b = .12, p = .03). Over and above the variance accounted for by stressors, there was one significant main effect for the aggregate social support score in relation to reorganisation (ΔR² = .07, b = .21, p < .01). These effects were in the hypothesised directions: Stressors were associated with higher levels of devastation and dispirited; social support was associated with higher levels of reorganisation. All three interactions (buffering effects) added significantly (devastation ΔR² = .05, b = -.17, p = .01; dispirited ΔR² = .08, b = -.22, p < .01; reorganisation ΔR² = .05, b = .17, p = .02) to the variance in psychological responses explained by the main effects of stressors and social support. Graphs of the significant interactions demonstrated (see

2 Additional analyses using the four social support subscales revealed no differential relationships between individual subscales and performance, and no difference in the predictive utility of individual subscales in comparison with the aggregate social support score. We have therefore only reported results for the aggregate social support score. These analyses therefore highlight that by combining social support subscales, the essence of this study’s results is captured equally as well as if subscales had been employed. Although researchers argue that, at a conceptual level, social support may still be broken down into dimensional components (Cohen & Wills, 1985; Cutrona & Russell, 1990), this result suggests that in relation to their psychological responses to sport injury, participants may not distinguish among types of social support.
Comparing the relationships between stressors, social support, their product and psychological responses to sport injury for low- and high-performance standard participants simultaneously

In light of the differential pattern of results across the performance standards, we conducted a further set of analyses, the purpose of which was to test the study relationships for both the low- and high-performance standard participants simultaneously. In this set of analyses, three-way interactions of performance standard, stressors and support would provide an additional opportunity to examine the apparent differences between performance standards. We created a dummy-coded variable to represent performance standard, and entered variables into moderated hierarchical regression analysis in a five-step process. First, the dummy-coded performance standard variable was entered. Second, the stressors were entered. Third, social support was entered. Fourth, three two-way interactions were entered: the products of the dummy-coded variable and stressors, and the stressors and social support. Finally, a three-way interaction of the dummy-coded variable, stressors, and social support was entered. As in the previous set of regression analyses, assumptions were conducted and similarly satisfied. The only differences were as follows: There were 13 standardised residuals greater than 1.96 in absolute value in the model with reorganisation as the dependent variable (none of the standardised residuals were greater than 2.58); and the values for the Durban–Watson statistic ranged from 1.79 to 2.03.

Results from the moderated hierarchical regression analyses are shown in Table 5. There were non-significant relationships between the dummy-coded performance variable and psychological responses across all three models. There were significant main effects for stressors in relation to devastation ($R^2 = .06, b = -.18, p < .01$) and dispirited ($R^2 = .04, b = .13, p < .01$). Over and above the variance accounted for by stressors, there were significant main effects for the aggregate social support score in relation to devastation ($\Delta R^2 = .03, b = -.13, p = .01$), dispirited ($\Delta R^2 = .04, b = -.15, p < .01$), and reorganisation ($\Delta R^2 = .04, b = .17, p < .01$). Although the relationships between the set of two-way products and psychological responses were only significant in relation to dispirited ($\Delta R^2 = .03, p = .03$), the interactions of stressors and social support were all significant in the final equation: devastation ($b = -.09, p = .04$), dispirited ($b = -.13, p < .01$), and reorganisation ($b = .12, p = .02$). The key results of interest in this set of analyses were the three-way interactions, all of which were non-significant: devastation ($\Delta R^2 = .01, b = -.14, p = .13$), dispirited ($\Delta R^2 = .01, b = .14, p = .13$), and reorganisation ($\Delta R^2 < .01, b = -.09, p = .43$). Overall, these results suggest that when both performance standards were tested simultaneously, the interactions of stressors and support were significant in relation to psychological responses across all participants.

**Table 3**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>$\Delta R^2$</th>
<th>$\Delta R^2$</th>
<th>$p(\text{DF})$</th>
<th>$b^2$</th>
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<td>.27</td>
<td>.08</td>
<td>.27</td>
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</table>

$N = 147$. Note: All variables standardised except for product. Product was formed from the two preceding (standardised) variables.

- Cumulative $R^2$.
- Stepwise change in $R^2$.
- Probability of $F$ for $\Delta R^2$.
- Unstandardised regression coefficient in final equation.
- Probability of $t$ for $b$.

*Fig. 1.* The non-significant interactions of stressors and social support in relation to devastation, dispirited and reorganisation (high-performance standard participants). The $x$-axis represents values of low (1 SD below the mean), mid (the mean), and high (1 SD above the mean) levels of stressors. The lines represent values of low (1 SD below the mean) and high (1 SD above the mean) social support.

*Fig. 2.* That these were consistent with buffering explanations: The detrimental relationships between stressors and psychological responses were reduced for those with high social support compared to those with low social support, but level of social support was relatively unimportant at low levels of stressors. There was therefore some support within this subsample for all three hypotheses.
Table 4
Relationships between stressors, social support, product and psychological responses — hierarchical regression analyses for low-performance standard participants.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>$\Delta R^2$</th>
<th>$\Delta R^2_{	ext{all}}$</th>
<th>$p(F)$</th>
<th>$b^*$</th>
<th>$p(t)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devastation</td>
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<td>.07</td>
<td>.01</td>
<td>.17</td>
<td>.02</td>
</tr>
<tr>
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<td>.02</td>
<td>.12</td>
<td>.10</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td>Product</td>
<td>.14</td>
<td>.05</td>
<td>.01</td>
<td>.17</td>
<td>.01</td>
</tr>
<tr>
<td>Dispirited</td>
<td>Stressors</td>
<td>.04</td>
<td>.04</td>
<td>.03</td>
<td>.12</td>
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<td></td>
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<td></td>
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<td>.15</td>
<td>.08</td>
<td>.00</td>
<td>.22</td>
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<tr>
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<td>.00</td>
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<td>.07</td>
<td>.35</td>
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<td></td>
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<td>.02</td>
<td>.17</td>
<td>.02</td>
</tr>
</tbody>
</table>

N = 114. Note: All variables standardised except for product. Product was formed from the two preceding (standardised) variables.

* Cumulative $R^2$.
* Stepwise change in $R^2$.
* Probability of $F$ for $\Delta R^2$.
* Unstandardised regression coefficient in final equation.
* Probability of $t$ for $b$.

Discussion

The results of this study suggest that social support is positively related to psychological responses, but its function may differ in high- and low-performance standard participants. For the high-performance standard participants, social support operated as a main effect. Specifically, high levels of social support were associated with lower levels of devastation and dispirited. In contrast, for the low-performance standard participants, social support operated primarily as a buffer effect. That is, the detrimental relationships between stressors and devastation, dispirited, and reorganisation were reduced for those with high social support compared to those with low social support, but level of social support was relatively unimportant at low levels of stressors.

A caveat to the conclusions above is that the additional set of regression analyses revealed non-significant relationships between the three-way interactions (of the dummy-coded performance standard variable, stressors, and social support) and psychological responses. This might imply that one cannot make robust conclusions with regard to the differential pattern of results observed for the buffer effect interactions within each performance standard group. Indeed, one could, on the basis of this set of results, conclude that for both performance standards the interactions of stressors and support were similarly significant in relation to psychological responses. However, we would argue that it would be misleading to report only the last set of analyses (with both performance standards tested simultaneously) in which non-significant effects for the three-way interactions were highlighted, because this effectively ignores important differences within each performance standard. It is also conceivable, given that such analyses are so affected by power and sample size, that the results of the three-way interactions are Type I errors. In such a stringent analysis, the power to detect effects shrinks with each step of the analysis, and the analysis demands an effect over and above variance that is already accounted for. In the following, we therefore discuss the results in relation to each of the performance standards, but we do urge readers to treat our results and conclusions with caution.

Why then was buffering evident with the low-performance sample but not with the high-performance sample? As we noted in the introduction to this paper, the negative impact of injury-related stressors may be most evident in athletes who have made a large investment in sport (Johnston & Carroll, 1998), who have developed a strong athletic identity, and for whom sport involvement provides important sources of self-worth (Green & Weinberg, 2001) and attachment (Evans & Hardy, 1995). One might therefore expect that injury-related stressors such as incapacitation and slowness of progress would be a far greater source of stress for the high-performance standard participants. For example, incapacitation, which inevitably leads to a disruption to normal functioning can result in the loss of important attachments (e.g., self-image, self-esteem). Interruptions to these social and psychological attachments are important to the high-performance standard participants with high levels of investment/identity, not least because these attachments form the basis of many types of self-gratification and social reinforcement (Evans & Hardy, 1995). These participants may therefore, experience greater levels of devastation, dispirited, and lower levels of reorganisation. In turn, for these participants, the social support might be far more important as a buffer for these negative relationships.
In terms of the low-performance standard participants, one might logically expect the opposite: Because investment in sport and the sources of attachment are less, and athletic identity weaker, both the sources of stress and the impact of social support might be less salient. However, the findings do not support this proposition, and therefore further structured research is recommended. To elaborate, although the main effect of social support suggested that for the high-performance standard participants social support aided their psychological responses to sport injury, it is possible that these participants were simply better equipped to cope with injury-related stressors than the low-performance standard participants, and as a result did not need social support to aid their coping with stressors as did their low-performance counterparts. Alternatively, in line with Uchino’s (2009) more recent predictions, the high-performance standard participants’ social support may have led to a more functional psychological response to injury through the mechanism of proactive coping (i.e., efforts undertaken in advance of a potentially stressful event to prevent it or to modify its form before it occurs)” Aspinwall & Taylor, 1997, p. 417), and through making healthy behavioral choices and adhering to medical treatment (DiMatteo, 2004).

Despite this potentially contradictory evidence, the pattern of main effects observed in the high-performance sample may shed further light on the results. There were significant main effects for stressors and social support in relation to psychological responses in two of the three models tested. Entered first, stressors were associated with less positive psychological responses. Over and above the variance in psychological responses explained by stressors, social support was associated with more positive psychological responses. Thus, these beneficial main effects may have off-set the negative impact of the stressors. As Wheaton (1985) noted, in such main effect cases, social support may act as an “independent distress deterrent” by directly counterbalancing any negative relationship between stressors and psychological responses, potentially via its impact upon intermediate mechanisms (see Lakey & Cohen, 2000).

The findings of the present study have important implications for researchers and practitioners alike. The results suggest that social support is beneficially associated with psychological responses, but that the distinction between the performance standard of the injured athlete should be taken into account. The main effects imply that for the high-performance standard athlete, attempts to increase perceptions of social support should be encouraged irrespective of the levels of stressors encountered by the athlete. The buffering effects imply that, for low-performance standard athletes, increasing perceptions of social support would be primarily important for those facing stressors (i.e., incapacitation and slowness of progress). The direct provision of support (received support) may increase perceptions of support over time (Norris & Kaniasty, 1996), so at-risk athletes could be encouraged to be proactive in using the social support that is available to them. At the same time, coaches could be encouraged to employ an open door policy for injured athletes (Richey, Hardy, Rosenfeld, & Callanan, 1989), and support providers in general could be educated to better understand the injured athlete’s requirements (see Bianco & Eklund, 2001).

A strength of this study is that a clear pattern of results was generated for high-performance and low-performance standard participants. The effect sizes for the interactions (5%, 5%, and 8%) were particularly notable. McClelland and Judd (1993) highlighted a number of statistical factors that contribute to the difficulty in finding significant interactions in field studies, compared with experimental studies, and Evans (1985) noted that significant moderator effects are so difficult to detect, that effects as low as 1% should be viewed as important. Against this backdrop, there are some potential limitations. The self-report and correlational nature of this study precludes causal inference. The categorization into high-performance and low-performance standard participants was based upon self-report and does not reflect an objective assessment of performance standard. One further potential concern with the self-report measures of social support, stressors, and psychological responses is that any empirical demonstration of a relationship between two variables could be attributed, at least in part, to shared method variance. Finally, although the age and gender distributions across the performance standards were similar, there were more males than females in this study. Thus, conclusive recommendations across gender cannot be drawn.

In conclusion, the present study has provided an insight into when social support may positively influence psychological responses to sport injury. Despite the recent attention social support has received in a rehabilitation context, additional research is required to explore the support needs of athletes when they experience injury-related stressors and the effect of this support on their psychological responses. Clearly more structured research is recommended, in particular with regard to the impact of social support across different performance standards. Due to the temporal nature of injury-related stressors and psychological responses, future studies might include prospective and/or longitudinal designs, in order to examine how current perceptions of support affect subsequent psychological responses. Lakey and Cohen (2000) have outlined how attention should also be focused on the mechanisms underpinning the effects of social support. In relation to psychological responses, social support may lead to a host of positive affective and cognitive states, such as increased self-confidence (Vealey, 2001) and self-efficacy (Bandura, 1997), that in turn lead to better psychological response, and ultimately help to expedite recovery and return to competitive sport.
References


