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The Effects of Perceived and Received Support on Objective Performance Outcome

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## Abstract

This study examined the main and stress-buffering effects of perceived and received support upon objective performance outcome. The sample consisted of 123 male British high performance golfers, mean age 25.3 years ( $SD = 5.4$ ). Participants completed measures of perceived support, stressors, stress, and received support before competitions. After the competitions, performance outcome (number of shots) was recorded. When both types of support were considered separately, there were significant main effects for perceived ( $\Delta R^2 = .08$ ,  $b = -.81$ ,  $p < .01$ ) and received support ( $\Delta R^2 = .05$ ,  $b = -.68$ ,  $p < .01$ ) on performance. There were also significant stress-buffering effects for perceived ( $\Delta R^2 = .03$ ,  $b = -.48$ ,  $p = .02$ ) and received support ( $\Delta R^2 = .06$ ,  $b = -.61$ ,  $p < .01$ ). When both types of support were considered simultaneously, the significant main effect ( $\Delta R^2 = .09$ ,  $p < .01$ ) was primarily attributable to perceived support ( $b = -.63$ ,  $p = .02$ ). The significant stress-buffering effect ( $\Delta R^2 = .06$ ,  $p = .01$ ) was primarily attributable to received support ( $b = -.56$ ,  $p = .04$ ). These results demonstrate the beneficial influence of social support on performance. The findings highlight the need to recognise the distinction between perceived and received support, both in terms of theory and the design of social support interventions with athletes.

### The Effects of Perceived and Received Support on Objective Performance Outcome

Social support is a key construct in relation to mental health (see Kessler & McLeod, 1985, for a review), physical health (see Schwarzer & Leppin, 1991, for a review), and physiological processes (see Uchino, Cacioppo, & Kiecolt-Glaser, 1996, for a review). In sport, athletes have been encouraged to use social support as a useful resource (Richman, Hardy, Rosenfeld, & Callanan, 1989). Research has suggested that social support is beneficial in dealing with competitive stress (Crocker, 1992), slumps in performance (Madden, Kirkby, & McDonald, 1989), burn-out (Gould, Tuffey, Udry, & Loehr, 1996), and injury (Bianco, 2001; Smith, Smoll, & Ptacek, 1990). Recent studies have also demonstrated that social support is positively associated with performance outcome (Rees, Hardy, & Freeman, 2007) and process-related performance variables (Rees & Hardy, 2004; Rees, Ingledew, & Hardy, 1999). Additionally, a small number of qualitative studies have highlighted social support as a positive factor affecting sports performance (e.g., Gould, Guinan, Greenleaf, Medbery, & Peterson, 1999; Greenleaf, Gould, & Dieffenbach, 2001). The purpose of the present study was to further examine the influence of social support on objective performance outcome.

Social support is a complex concept (Bianco & Eklund, 2001), encompassing structural and functional aspects of interpersonal relationships (Cohen & Wills, 1985). Functional aspects refer to the particular functions served by interpersonal relationships (Cohen, 1988). For example, supportive relationships might help individuals develop a positive identity and self-esteem, regulate affect, or provide coping assistance (Heller & Rook, 2001). Functional support may be divided into perceived availability of support (perceived support) or support actually received (received support). Lakey and Drew (1997) noted that in early social support research it was assumed that received support led to beneficial outcomes through promoting effective

coping. Perceived support was assumed to be associated with beneficial effects because it reflected the support received during times of stress. Perceived and received support might therefore be significantly correlated and have the same relationship with outcomes (Lakey & Drew, 1997). Empirical evidence in social psychology, however, has found that perceived support is more consistently related to outcome variables than received support (e.g., Cohen & Hoberman, 1983; Wethington & Kessler, 1986; Helgeson, 1993). Further, perceived and received support may, in fact, be distinct constructs that typically share as little as 20% common variance (e.g., Cohen & Hoberman, 1983; Goodwin, Costa, & Adonu, 2004; Komproe, Rijken, Ros, Winnubst, & Hart, 1997). The present study addresses the recommendation of Bianco and Eklund (2001) to incorporate measures of both perceived and received support in the same study.

There are two principal models that explain how social support affects outcomes (see Cohen, Gottlieb, & Underwood, 2000; Cohen & Wills, 1985, for reviews): the stress-buffering model and the main effect model. These were examined in this study to elucidate how perceived and received support might influence performance. A key difference between the two models is the conditions under which support is suggested to be beneficial. A main effect implies that support is associated with outcomes, irrespective of levels of stress. The stress-buffering model suggests support is primarily associated with outcomes only for individuals under high levels of stress. Stress-buffering is present if support moderates the relationship between variables in the pathway from encountering stressors, through experiencing stress, to subsequent outcomes (Cohen et al., 2000; Cohen & Wills, 1985). As depicted in Figure 1, perceived support may intervene when a stressor is encountered, leading it to be appraised as less stressful (Cohen et al., 2000). Once stress is experienced, however, both perceived and received support may intervene, such that support might reduce or eliminate the negative effect of the stress on outcomes (Cohen

et al., 2000; Cohen & Wills, 1985). These potential moderating effects of perceived and received support were examined in the present study.

In sport, there has been limited research that has explicitly examined the effects of social support on performance. Indeed, only Rees et al. (2007) have tested main and stress-buffering effects on objective performance outcome. A limitation of the Rees et al. (2007) study was that it only assessed received support. No study has examined if perceived support is associated with beneficial effects on objective performance outcome. Rees and Hardy (2004) did, however, find main and stress-buffering effects of perceived support on performance-related variables. The present study incorporates measures of both perceived and received support in the same study. This will help to determine if perceived and received support are associated with different effects on objective performance outcome, and if one type of support exerts a greater influence.

Bianco and Eklund (2001) argued that perceived support is primarily associated with the main effect model and that received support is primarily associated with the stress-buffering model. Bianco and Eklund suggested that individuals with high levels of perceived support will perceive that they have the resources to cope with situations. Individuals will therefore appraise situations as less stressful leading to more favourable outcomes. Once stress is experienced, however, individuals might actually need to receive support to cope with the situation. Although Bianco and Eklund's view is congruent with the views of some researchers in social psychology (e.g., Dunkel-Schetter & Bennett, 1990), empirical evidence that has examined such effects is mixed. For example, stress-buffering effects have been consistently observed with perceived support, and only limited evidence exists for stress-buffering effects of received support (see Cohen & Wills, 1985, for a review). Dunkel-Schetter and Bennett offered two potential explanations for the lack of effects for received support. First, the context of received support has

often been ignored. Second, measures of support, stress, and outcomes have not been similar in their level of specificity. It is unlikely that support measures that assess general, everyday support transactions would find effects in specific contexts and on outcomes such as sports performance in the present study. Measures of support should incorporate specific support behaviours that are relevant for the population and stressful situation under investigation (Dunkel-Schetter & Bennett, 1990). The present study addressed these issues through the use of specific measures of both stressors and support that were relevant for a sport performance context.

An important consideration when testing for main and stress-buffering effects of social support is whether to employ aggregate or more differentiated measures of the key variables. Some researchers favour an approach that examines the effects of specific dimensions of support (e.g., Cohen & McKay, 1984; Cutrona & Russell, 1990; Veiel, 1992). Cutrona and Russell (1990) proposed the optimal matching model, which proposed that specific dimensions of support should be matched to specific stressors. Burlinson and MacGeorge (2002) noted, however, that this matching has received little empirical support due to a number of problems. For example, the same supportive behaviour often serves multiple functions, and different supportive behaviours can achieve similar objectives (Burlinson & MacGeorge, 2002). Indeed, there is often overlap between dimensions of support in naturalistic settings (Cohen & Wills, 1985). An attempt to provide advice and guidance (informational support) may also be interpreted as a sign of caring (emotional support). The above issues may lead to difficulty in identifying unique effects for different dimensions of support on performance. A meta-analysis in the work stress literature by Viswesvaran, Sanchez, and Fisher (1999) found little support for the argument that the matching of specific support and stress dimensions yields stronger results

than using aggregate measures of key variables. In this study, we employed aggregate measures of stressors, stress, perceived support, and received support. This helps to reduce the risk of Type 1 errors, as well as aiding clarity, affording a primary focus upon differences between perceived and received support.

As highlighted in the preceding discussion, there has been limited research focusing on social support and objective performance outcome. The purpose of this study therefore was to examine the main and stress-buffering effects of social support on an objective measure of performance. Four models were tested to examine the potential buffering roles of perceived and received support highlighted in Figure 1. Moderated hierarchical regression analysis allowed for main and stress-buffering effects of support to be examined simultaneously. The first model tested the effect of stressors and perceived support on stress. It was hypothesised that scores for stressors would be positively related to scores for stress (Hypothesis 1a). Scores for perceived support would be negatively related to scores for stress (Hypothesis 1b). An interactive effect would be explained in terms of stress-buffering and would be demonstrated by the following: The positive relationship between stressors and stress would be reduced for those with high perceived support compared to those with low perceived support (Hypothesis 1c).

The second model tested the effect of stress and perceived support on performance. The third model tested the effect of stress and received support on performance. Models 2 and 3 allowed the effects of perceived and received support to be considered separately. Empirical evidence in sport (e.g., Rees & Freeman, 2007; Rees & Hardy, 2004) has found perceived and/or received support are associated with beneficial effects on performance-related variables. Theoretically, both perceived and received might be associated with main and stress-buffering effects on outcomes (Cohen et al., 2000; Cohen & Wills, 1985). For models 2 and 3 it was

hypothesised that scores for stress would be positively related to scores for performance (in the present study, lower scores represent better performance: see Method) (Hypothesis 2). Scores for perceived (Hypothesis 3a) and received support (Hypothesis 3b) would be negatively related to scores for performance. Interactive effects would be explained in terms of stress-buffering and would be demonstrated by the following: The detrimental relationship between stress and performance would be reduced for those with high perceived and received support compared to those with low perceived (Hypothesis 4a) and received (Hypothesis 4b) support. The fourth model tested the effect of stress and both perceived and received support (entered simultaneously), thereby offering the opportunity to examine whether one type of support was of greater influence on performance. Congruent with the suggestions of Bianco and Eklund (2001), it was hypothesised that perceived support would be primarily associated with main effects on performance (Hypothesis 5). Received support was hypothesised to primarily be associated with stress-buffering effects on performance (Hypothesis 6).

## Method

### *Participants*

Participants were a sample of 123 male high performance golfers (96% Caucasian British), mean age 25.3 years (SD = 5.4). Handicaps ranged from +2 (national/international level) to 4 (strong club players). The golf handicap system runs from “+” numbers (the best players) through “0” to “28” (the poorest players). The number of participants possessing each handicap were as follows: +2 ( $n = 4$ ); +1 ( $n = 2$ ); 0 ( $n = 16$ ); 1 ( $n = 24$ ); 2 ( $n = 32$ ); 3 ( $n = 26$ ); 4 ( $n = 19$ ).

### *Measures*

*Perceived support.* Perceived support was assessed using a 16-item self-report questionnaire constructed specifically for this study. This followed two recommendations from the social support literature: a) social support measures should be relevant to the situational context in which they are being used; and b) social support researchers should write new items to capture specific aspects of the support needs of the target population (Bianco & Eklund, 2001; House & Kahn, 1985; Wills & Shinar, 2000). The items were derived from statements made by high-level sportspeople about their social support experiences (Rees & Hardy, 2000), and represented dimensions of emotional, esteem, informational, and tangible support. These four dimensions of support were identified by Rees & Hardy (2000) and are congruent with the common set of dimensions identified by Cutrona & Russell (1990) in a review of multidimensional models of social support<sup>1</sup>. Prior to data collection, both authors scrutinised the items making up each scale. Another two independent researchers correctly assigned 100% of the items to their social support dimensions. All the items (and all other items in this study) were also scrutinized for relevance and representativeness by one golf teaching professional, two national level competitors (handicaps of +2 and +1) and three strong club golfers (handicaps of 1, 1, and 3). The measure asked, “To what extent do you have someone . . . ,” and participants responded on a 5-point Likert scale ranging from 1 (not at all) to 5 (a lot). Sample items included “who helps take your mind off things” (emotional), “who encourages you” (esteem), “who gives you technical advice” (informational), and “who helps with tasks to leave you free to practice” (tangible). Confirmatory factor analysis (Jöreskog & Sörbom, 1993) of the four-factor model using the data in the present study revealed a good model fit (cf. Hu & Bentler, 1999;  $\chi^2(98) = 137.16, p = .01$ ; RMSEA = .05, SRMR = .05, CFI = .96, NNFI = .95), and Cronbach’s alpha internal reliability coefficients for the four subscales ranged from .77 to .86. As we noted in the

introduction, Viswesvaran et al (1999) advocated the use of aggregate measures of key variables to best illustrate how social support functions. We therefore combined the perceived support subscales to create an overall score. The Cronbach's alpha internal reliability coefficient for this scale was .91.

*Stressors.* Three stressors were assessed: competition pressure, technical problems with your game, and personal problems. The measure asked, "Please indicate to what extent you have encountered these situations over the past two weeks . . .," and participants responded on a 5-point Likert scale ranging from 1 (not at all) to 5 (a lot). These stressors were used in a study by Rees et al. (2007). The stressors reflected competition and non-competition sources of stress, and were chosen for their particular relevance to golf, an individual and highly-technical sport. The three items were summed to create a total score. This served to reduce the number of models to be tested and aided clarity.

*Stress.* Although stressors produce stress in many people, individual differences in the degree of reaction are normally evident (Lazarus & Folkman, 1984). Participants were, therefore, asked to indicate the stress they had experienced resulting from each stressor (competition pressure, technical problems with your game, and personal problems). This approach to assessing the stress experienced resulting from each stressor was used in a study by Rees and Freeman (2007) and is congruent with the psychological stress perspective highlighted by Cohen, Kessler, and Underwood-Gordon (1997). That is, this approach focused on whether individuals felt that they had experienced stress and not merely whether participants had encountered stressors. The measure asked "Please indicate how stressed you have felt as a result of the following situations over the past two weeks . . .," and participants responded on a 5-point

Likert scale ranging from 1 (not at all) to 5 (a lot). The three items were summed to create a total score of stress.

*Received support.* Received support was assessed using the same 16 items included in the perceived support measure. To reflect received support, items were reworded to be in the perfect tense, and participants were asked to rate the extent to which they had received those types of support in the past two weeks. The measure asked, “In the past two weeks, to what extent has someone . . . ,” and participants responded on a 5-point Likert scale ranging from 1 (not at all) to 5 (a lot). Confirmatory factor analysis of the received support measure revealed a reasonably good fit to the four-factor model (cf. Hu & Bentler, 1999;  $\chi^2(98) = 152.85, p < .01$ ; RMSEA = .06, SRMR = .07; CFI = .93; NNFI = .91), and Cronbach’s alpha internal reliability coefficients for the four subscales ranged from .70 to .82. As with the perceived support measure, the four scales were combined to create an overall score for received support, which was used for all subsequent analyses. The Cronbach’s alpha internal reliability coefficient for this scale was .88.

*Performance.* Performance was assessed by an objective measure of golf performance, based on the number of shots taken in a competition (hereafter termed Golf Performance Index: GPI). Initially, golfers’ nett scores were calculated as number of shots taken minus handicap. Because various competitions were used, on different courses, on different days, and with differing weather conditions, a procedure was employed to standardise nett scores across these conditions: this was nett score minus a value for Competition Scratch Score. The Standard Scratch Score is a standard score allotted to an 18-hole golf course, and is the score that a scratch player (zero handicap) would be expected to return in ideal conditions over a measured course; it may differ from the par of the course. The Competition Scratch Score is the adjustment that may be necessary to the Standard Scratch Score to take account of weather and course conditions; it is

the Standard Scratch Score after it has been adjusted due to current playing conditions, using scores returned in the competition. GPI was operationalised as nett score minus Competition Scratch Score. Lower GPI represents better performance. To demonstrate the calculation of GPI, let us consider one player as an example. Player A shot 72 in a competition. Player A had a handicap of 1, and therefore his nett score was 71 ( $72 - 1$ ). The Competition Scratch Score for the competition was 69. Player A's GPI would be calculated by subtracting 69 (the Competition Scratch Score) from 71 (nett score), which would give a GPI of +2. As competitors completed between two and four rounds, scores relative to Competition Scratch Score were averaged across the rounds, to give the equivalent of a one-round score.

### *Procedures*

The study was approved by an institutional ethics review committee, and participants provided informed consent. Recruitment of participants was opportunistic (convenience sample) at various golf courses in the South-East of England on the practice day preceding competitions. Participants completed measures of perceived support, stressors, stress, and received support. The presentation of measures was systematically rotated to minimise order effects. After the competition, the participants' scores were recorded. Competitions were held over a maximum of two days, ranging from two to four rounds of golf.

### *Analyses*

The main and stress-buffering effects of social support were tested using moderated hierarchical regression analyses (Baron & Kenny, 1986; Cohen & Wills, 1985; Jaccard, Turrisi, & Wan, 1990). The independent variables were entered in a three step process. The predictor variable (stressors or stress) was entered at step 1, the moderator(s) (perceived and/or received support) was entered at step 2, and the product term(s) (predictor\*moderator) was entered at step

3. The significance of increments in explained variance in the dependent variable over and above the variance accounted for by those variables already entered into the equation, as well as the sign of the regression coefficients, was assessed at each step. In all the models the independent variables were centred, by standardising them, before the product term was created (Jaccard et al., 1990). The unstandardised solution was then examined. Significant interactions were plotted following the guidelines of Aiken and West (1991). Values for social support of -1, 0, and +1 were substituted into the regression equations. The subsequent regression lines were plotted to depict the relationship between stress and performance at low (1 SD below mean), moderate (mean), and high (1 SD above mean) levels of social support.

## Results

Means, standard deviations, and intercorrelations of all variables are displayed in Table 1. Results from the moderated hierarchical regression analyses are shown in Table 2.

### *Moderated Hierarchical Regression Analyses*

*Stressors and perceived support upon stress.* There was a significant main effect for stressors on stress ( $R^2 = .51$ ,  $b = 1.81$ ,  $p < .01$ ), with higher levels of stressors associated with higher levels of stress. Hypothesis 1a was supported. There was a non-significant main effect for perceived support upon stress ( $\Delta R^2 = .01$ ,  $b = -.22$ ,  $p = .21$ ), and a non-significant interaction ( $\Delta R^2 = .00$ ,  $b = -.11$ ,  $p = .49$ ). Hypotheses 1b and 1c were not supported.

*Stress and perceived support upon GPI.* There was a significant main effect for stress upon GPI ( $R^2 = .13$ ,  $b = .82$ ,  $p < .01$ ), with higher stress being associated with poorer performance. Hypothesis 2 was supported. Over and above the effect of stress, there was a significant main effect for perceived support upon GPI ( $\Delta R^2 = .08$ ,  $b = -.81$ ,  $p < .01$ ), with higher perceived support associated with better performance. Hypothesis 3a was supported. There was a

significant interaction of stress and perceived support (stress-buffering effect) upon GPI ( $\Delta R^2 = .03$ ,  $b = -.48$ ,  $p = .02$ ). This interaction is displayed graphically in Figure 2. The detrimental relationship between stress and performance was reduced for those with high levels of perceived support compared to those with low levels of perceived support. Hypothesis 4a was supported.

*Stress and received support upon GPI.* There was a significant main effect for stress upon GPI ( $R^2 = .13$ ,  $b = .88$ ,  $p < .01$ ), with higher stress being associated with poorer performance. Over and above the effect of stress, there was a significant main effect for received support upon GPI ( $\Delta R^2 = .05$ ,  $b = -.68$ ,  $p < .01$ ), with higher received support associated with better performance. Hypothesis 3b was supported. There was a significant interaction of stress and received support (stress-buffering effect) upon GPI ( $\Delta R^2 = .06$ ,  $b = -.61$ ,  $p < .01$ ). This interaction is displayed graphically in Figure 3. The detrimental relationship between stress and performance was reduced for those with high levels of received support compared to those with low levels of received support. Hypothesis 4b was supported.

*Stress and perceived and received support upon GPI.* There was a significant main effect for stress upon GPI ( $R^2 = .13$ ,  $b = .80$ ,  $p < .01$ ), with higher stress being associated poorer performance. Over and above the effect of stress, there was a significant main effect of perceived and received support upon GPI ( $\Delta R^2 = .09$ ,  $p < .01$ ), primarily attributable to perceived support ( $b = -.63$ ,  $p = .02$ ). Hypothesis 5 was supported. There was a significant stress-buffering effect upon GPI ( $\Delta R^2 = .06$ ,  $p = .01$ ), primarily attributable to received support ( $b = -.56$ ,  $p = .04$ ). Following such a result, in which a higher order term is non-significant (the interaction of stress and perceived support), Aiken and West (1991) recommend forming a new model by removing non-significant higher order terms and then testing remaining scale invariant terms separately for significance. Only significant higher order terms, their related lower-order terms, and significant

scale invariant terms should be retained in the final model. In the present data, the final model included stress, perceived support, received support, and the interaction of stress and received support. In this model, there was a significant interaction of stress and received support upon GPI ( $\Delta R^2 = .06$ ,  $b = -.60$ ,  $p = .00$ ). Hypothesis 6 was supported.

To better understand the nature of the interaction of stress and received support in the final model, two techniques were used: plotting the interaction and simple slopes analysis (Aiken & West, 1991). The plot of the stress and received support interaction is displayed in Figure 4. This provides evidence that the interaction was consistent with a stress-buffering explanation: The detrimental relationship between stress and performance was reduced for those with high levels of received support compared to those with low levels of received support. A simple slopes analysis was used to determine at which levels of received support the effect of stress upon GPI significantly differed from zero (Aiken & West, 1991). The relationship between stress and GPI was significantly different from zero at low ( $t = 4.75$ ,  $p < .01$ ) and moderate ( $t = 3.50$ ,  $p < .01$ ) levels of received support. The relationship between stress and GPI was not significantly different from zero at high levels of support ( $t = .67$ ,  $p = .50$ ). The plot of this simple slopes analysis is displayed in Figure 5. The region of significance shows that the relationship between stress and GPI significantly differed from zero at levels of received support less than  $.51SDs$  above the mean.

## Discussion

The purpose of this study was to examine the main and stress-buffering effects of perceived and received support upon objective performance outcome. In line with models in the social support literature (Cohen et al., 2000; Cohen & Wills, 1985), it was hypothesised that perceived support may lead to a stressor being appraised as less stressful, and that both perceived

and received support may intervene to reduce the negative impact of stress upon performance. The results provide evidence for the beneficial effects of perceived and received support upon performance outcome and provide partial support for the buffering effects of perceived and received support depicted in Figure 1.

When perceived and received support were examined separately, both types of support were associated with main and stress-buffering effects upon performance. When both types of support were examined simultaneously, however, different effects were found. This highlights the potential importance of incorporating measures of perceived and received support in the same study to understand their unique effects. Consistent with the suggestion of Bianco and Eklund (2001) in the sport injury literature, the main effect upon performance in the present study was primarily attributable to perceived support and the stress-buffering effect was primarily attributable to received support.

The graph displaying the interaction between stress and received support upon GPI demonstrates that the detrimental relationship between stress and performance was reduced for those with high received support compared to those with low received support (cf. Cohen & Wills, 1985). The simple slopes analysis provides evidence as to when the protective effect of received support becomes salient. The detrimental relationship between stress and performance was primarily apparent at levels of received support less than  $.51SDs$  above the mean. That is, individuals with levels of received support greater than  $.51SDs$  above the mean were protected against the detrimental relationship between stress and performance. High levels of received support may have reduced the negative impact of stress by leading to improved coping, or by providing a distraction from, or a solution to, the stress (Cohen et al., 2000).

The findings of the present study have important applied implications. The results suggest that both perceived and received support are associated with beneficial effects upon performance. Athletes should therefore be encouraged to increase their social support (Richman et al., 1989) and not view using this valuable resource as a sign of weakness (Hardy, Jones, & Gould, 1996). These findings may also lead significant others to actively provide support. Lehman, Ellard and Wortman (1986), however, suggested that unskilled others are often poor providers of support, basing their support attempts solely on intuition. Sport psychologists may therefore need to educate significant others as to what constitutes effective support.

Some potential limitations of the present study should be noted. First, as the measures of perceived and received support were completed at the same time, participants may have found it difficult to distinguish between current evaluations of support availability and retrospective evaluations of support received. Second, the received support measure contained the same items as the perceived support measure, reworded to be in the perfect tense. Both of these limitations may have inflated the relationship between the two types of support. The shared variance between the two types of support in the present study, however, was not substantially greater than the shared variance observed in studies in social psychology that have used distinct measures of perceived and received support (e.g., Cohen & Hoberman, 1983; Goodwin et al., 2004; Komproe et al., 1997). Further, if distinct items had been included in the two measures, any differences in the effects found for the two types of support could have been attributed to the specific content of the measures rather than merely differences between perceived and received support.

In conclusion, the present study found that both perceived and received support were associated with beneficial effects upon objective performance outcome. Congruent with the ideas

of Bianco and Eklund (2001) in the sport injury literature, the main effect in the present study was primarily attributable to perceived support, and the stress-buffering effect was primarily attributable to received support. It may be that perceived support operates through a preventive pathway leading individuals to appraise situations as less stressful, and received support operates through a palliative pathway buffering the negative effect of stress upon performance (Bianco & Eklund, 2001). To further develop understanding, future research could examine if the social support-performance relationship is mediated by psychological states (Cohen et al., 2000). This would help identify the mechanisms via which perceived and received support exert their effects (e.g., see Lakey & Cohen, 2000).

## References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182.
- Bianco, T. (2001). Social support and recovery from sport injury: Elite skiers share their experiences. *Research Quarterly For Exercise and Sport*, *72*, 376-388.
- Bianco, T., & Eklund, R. C. (2001). Conceptual considerations for social support research in sport and exercise settings: The case of sport injury. *Journal of Sport & Exercise Psychology*, *23*, 85-107.
- Burleson, B. R., & MacGeorge, E. L. (2002). Supportive communication. In M. L. Knapp, & J. A. Daly (Eds.), *Handbook of interpersonal communication* (pp. 374-424). Thousand Oaks, CA: Sage Publications.
- Cohen, S. (1988). Psychosocial models of the role of social support in the etiology of physical disease. *Health Psychology*, *7*, 269-297.
- Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. In S. Cohen, L. G. Underwood & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 3-25). New York: Oxford University Press.
- Cohen, S., & Hoberman, H. M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology*, *13*, 99-125.

- Cohen, S., Kessler, R. C., & Underwood-Gordon L. G. (1997). Strategies for measuring stress in studies of psychiatric and physical disorders. In S. Cohen, R. C. Kessler, & L. G. Underwood-Gordon (Eds.), *Measuring stress: A guide for health and social scientists* (pp. 3-26). Oxford: Oxford University Press.
- Cohen, S., & McKay, G. (1984). Social support, stress, and the buffering hypothesis: A theoretical analysis. In A. Baum, S. E. Taylor, & J. E. Singer (Eds.), *Handbook of Psychology and Health* (pp. 253-267). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.
- Crocker, P. R. E. (1992). Managing stress by competitive athletes: Ways of coping. *International Journal of Sport Psychology*, 23, 161-175.
- Cutrona, C. E., & Russell, D. W. (1990). Type of social support and specific stress: Toward a theory of optimal matching. In B. R. Sarason, I. G. Sarason, & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 319-366). New York: Wiley.
- Dunkel-Schetter, C., & Bennett, T. L. (1990). Differentiating the cognitive and behavioral aspects of social support. In B. R. Sarason, I. G. Sarason, & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 267 - 296). New York: Wiley.
- Goodwin, R., Costa, P., & Adonu, J. (2004). Social support and its consequences: 'Positive' and 'deficiency' values and their implications for support and self-esteem. *British Journal of Social Psychology*, 43, 465-474.
- Gould, D., Guinan, D., Greenleaf, C., Medbery, R., & Peterson, K. (1999). Factors affecting Olympic performance: Perceptions of athletes and coaches from more and less successful teams. *The Sport Psychologist*, 13, 371-394.

- Gould, D., Tuffey, S., Udry, E., & Loehr, J. (1996). Burnout in competitive junior tennis players: II: Qualitative analysis. *The Sport Psychologist, 10*, 341-366.
- Greenleaf, C., Gould, D., & Dieffenbach, K. (2001). Factors affecting Olympic performance: Interviews with Atlanta and Nagano US Olympians. *Journal of Applied Sport Psychology, 13*, 154-184.
- Hardy, L., Jones, G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers*. Chichester: Wiley.
- Helgeson, V. S. (1993). Two important distinctions in social support: Kind of support and perceived versus received. *Journal of Applied Social Psychology, 23*, 825-845.
- Heller, K. & Rook, K. S. (2001). Distinguishing the theoretical functions of social ties: Implications for support interventions. In B. Sarason & S. Duck (Eds.), *Personal relationships: Implications for clinical and community psychology* (pp. 119-139). Chichester: John Wiley & Sons.
- House, J. S., & Kahn, R. L. (1985). Measures and concepts of social support. In S. Cohen, & S. L. Syme (Eds.), *Social support and health* (pp. 83-108). New York: Academic.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- Jaccard, J., Turrisi, R., & Wan, C. K. (1990). *Interaction effects in multiple regression*. Newbury Park, CA: Sage.
- Jöreskog, K. G., & Sörbom, D. (Eds.) (1993). *LISREL 8 user's reference guide*. Chicago, IL: Scientific Software International.

- Kessler, R. C., & McLeod, J. D. (1985). Social support and mental health in community samples. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp.219-240). New York: Academic Press.
- Komproe, I. H., Rijken, M., Ros, W. J. G., Winnubst, J. A. M. and Hart, H. (1997). Available support and received support: Different effects under stressful circumstances. *Journal of Social and Personal Relationships*, 14, 59-77.
- Lakey, B., & Cohen, S. (2000). Social support measurement and theory. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 29-52). New York: Oxford University Press.
- Lakey, B., & Drew, J. B. (1997). A social-cognitive perspective of social support. In G. R. Pierce, B. Lakey, I. G. Sarason, & B. R. Sarason (Eds.), *Sourcebook of social support and personality* (pp. 107-140). New York: Springer.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lehman, D. R., Ellard, J. H., & Wortman, C. B. (1986). Social support for the bereaved: Recipients' and providers' perspectives on what is helpful. *Journal of Consulting and Clinical Psychology*, 54, 438-446.
- Madden, C. C., Kirkby, R. J., & McDonald, D. (1989). Coping styles of competitive middle distance runners. *International Journal of Sport Psychology*, 20, 287-296.
- Rees, T., & Freeman, P. (2007). The effects of perceived and received support on self-confidence. *Journal of Sports Sciences*, 25, 1057-1065.
- Rees, T., & Hardy, L. (2000). An investigation of the social support experiences of high-level sport performers. *The Sport Psychologist*, 14, 327-347.

- Rees, T., & Hardy, L. (2004). Matching social support with stressors: Effects on factors underlying performance in tennis. *Psychology of Sport and Exercise, 5*, 319-337.
- Rees, T., Hardy, L., & Freeman, P. (2007). Stressors, social support and effects upon performance in golf. *Journal of Sports Sciences, 25*, 33-42.
- Rees, T., Ingledew, D. K., & Hardy, L. (1999). Social support dimensions and components of performance in tennis. *Journal of Sports Sciences, 17*, 421-429.
- Richman, J. M., Hardy, C. J., Rosenfeld, L. B., & Callanan, R. A. E. (1989). Strategies for enhancing social support networks in sport: A brainstorming experience. *Journal of Applied Sport Psychology, 1*, 150-159.
- Schwarzer, R., & Leppin, A. (1991). Social support and health: A theoretical and empirical overview. *Journal of Social and Personal Relationships, 8*, 99-127.
- Smith, R. E., Smoll, F. E., & Ptacek, J. T. (1990). Conjunctive moderator variables in vulnerability and resiliency research: Life stress, social support, coping skills, and adolescent sport injuries. *Journal of Personality and Social Psychology, 58*, 360-370.
- Uchino, B. N., Cacioppo, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin, 119*, 488-531.
- Veiel, H. O. F. (1992). Some cautionary notes on buffer effects. In H. O. F. Veiel & U. Baumann (Eds.), *The meaning and measurement of social support* (pp. 273-289). New York: Hemisphere.
- Viswesvaran, C., Sanchez, J. I., & Fisher, J. (1999). The role of social support in the process of work stress: A meta-analysis. *Journal of Vocational Behavior, 54*, 314-334.

Wethington, E., & Kessler, R. C. (1986). Perceived support, Received support, and adjustment to stressful life events. *Journal of Health and Social Behavior*, 27, 78-89.

Wills, T. A., & Shinar, O. (2000). Measuring perceived and received social support. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Ed.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 86-135). New York: Oxford University Press.

Footnote

<sup>1</sup> Cutrona and Russell (1990) also identified social integration as a fifth dimension of support, which reflects more structural aspects of support. As the focus of the present study was on functional aspects of support, social integration was not assessed.

Table 1

*Means, SD, and Intercorrelations of Stressors, Stress, Perceived Support, Received Support, and GPI*

	Mean	SD	1	2	3	4
1. Stressors	9.40	2.16				
2. Stress	8.59	2.71	.72*			
3. Perceived Support	3.41	.64	-.21*	-.23*		
4. Received Support	2.96	.60	-.14	-.18	.58*	
5. GPI	1.84	2.84	.31*	.36*	-.36*	-.29*

*Note.* \* denotes correlation significant at .05 level (2-tailed)

Table 2

*Moderated Hierarchical Regression Analyses: Effects of Stressors, Social Support, Stress, and Products upon Stress and GPI*

Dependent Variable	Step	Independent Variable	$R^2$	$\Delta R^{2a}$	$P(F)^b$	$b^c$	$p(t)^d$
Stress	1	Stressors	.51	.51	.00	1.81	.00
	2	Perceived Support	.52	.01	.20	-.22	.21
	3	Product	.52	.00	.49	-.11	.49
GPI	1	Stress	.13	.13	.00	.84	.00
	2	Perceived Support	.21	.08	.00	-.81	.00
	3	Product	.24	.03	.02	-.48	.02
GPI	1	Stress	.13	.13	.00	.88	.00
	2	Received Support	.18	.05	.01	-.68	.00
	3	Product	.25	.06	.00	-.61	.00
GPI	1	Stress	.13	.13	.00	.80	.01
	2	Perceived Support	.22	.09	.00	-.63	.02
		Received Support				-.33	.24
	3	Stress*Perceived	.28	.06	.01	-.07	.82
		Stress*Received				-.56	.04
GPI	1	Stress	.13	.13	.00	.80	.00
	2	Perceived Support	.22	.09	.00	-.63	.02
		Received Support				-.33	.23
	3	Stress*Received	.28	.06	.00	-.60	.00

*Note.*  $n = 123$ . All variables standardised except for Product. Product formed from the two preceding (standardised) variables.

<sup>a</sup>Stepwise change in  $R^2$ . <sup>b</sup>Probability of  $F$  for  $\Delta R^2$ . <sup>c</sup>Unstandardised regression coefficient in final equation. <sup>d</sup>Probability of  $t$  for  $b$ .

## Figure Captions

*Figure 1.* The potential influence of perceived and received support (adapted from Cohen et al., 2000 by permission of Oxford University Press, Inc. Adapted Fig.1.2 p.13 from "Social Support Measurement and Intervention: A Guide for Health and Social Scientists" edited by Cohen, Sheldon et al (2000). Free permission).

*Figure 2.* Interaction of stress and perceived support upon GPI. The relationship between stress and performance at low (1 SD below mean), moderate (mean), and high (1 SD above mean) levels of perceived support.

*Figure 3.* Interaction of stress and received support upon GPI. The relationship between stress and performance at low (1 SD below mean), moderate (mean), and high (1 SD above mean) levels of received support.

*Figure 4.* Interaction of stress and received support upon GPI accounting for the effect of perceived support. The relationship between stress and performance at low (1 SD below mean), moderate (mean), and high (1 SD above mean) levels of received support.

*Figure 5.* A plot of the interaction of stress and received support in predicting GPI: Test of simple slopes. The horizontal line denotes a marginal effect of zero. The dashed vertical line represents the boundary of the region of significance.









