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Stressors, Social Support and Effects upon Performance in Golf

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Abstract

In this study we extended the work of Rees and Hardy (2004) by examining the main and stress-buffering effects of social support upon sports performance in a different context, using a different outcome measure and a specific time-frame. A high-level performance sample of 117 male golfers, mean age 24.8, s=8.3, completed measures of social support and stressors before competitions. Performance outcome was recorded. Moderated hierarchical regression analyses revealed significant ($p < 0.05$) main effects for stressors upon performance in 8 of the 11 models tested ($R^2 = 0.08 - 0.21$). Over and above the variance accounted for by stressors, there were significant ($p < 0.05$) main effects for social support upon performance in all models tested ($\Delta R^2 = 0.10 - 0.24$). In all models, stressors were associated with worse performance, whereas social support was associated with better performance. There were no significant interactions (stress-buffering effects). Main effects for social support upon performance suggest that social support may have aided performance directly, regardless of the level of stress.

Introduction

Although I. G. Sarason *et al.* (1990) proposed that social support might affect sports performance, there has been no explicit attempt to test this proposal. A small number of researchers have noted social support as an important resource within a performance context (e.g., Gould *et al*., 1999; Holt and Hogg, 2002; Rees and Hardy, 2000), and recently (Rees and Hardy, 2004; Rees *et al.*, 1999), researchers have employed process-related performance measures. Using a high-level (regional to international standard) sample of tennis players, Rees and Hardy (2004) found evidence for main effects of social support and interactive effects of social support and stressors upon processes underlying performance. The main effects implied that social support positively influenced performance, regardless of the level of stress. The interactive effects were explained in terms of stress-buffering (for reviews, see Cohen, 1988; Cohen, Underwood and Gottlieb, 2000; B. R. Sarason *et al.*, 1990a; Veiel and Baumann, 1992): higher levels of social support protected tennis players from the harmful effects of stress upon performance, but social support was relatively unimportant for those not experiencing stress. As high-level sport is characterised by a demand to perform well in intense pressure situations (Jones, 1995), studies of high-level performance are particularly notable. The purpose of the present study was to extend the work of Rees and Hardy (2004) by examining the impact of social support upon performance using a sample of high-level golfers. This study also addressed Rees and Hardy's recommendations to conduct studies in different contexts, using different outcome measures and specific time-frames.

Although Rees and Hardy (2004) assessed *perceived* social support, the present study assessed the influence of *received* support upon performance. This distinction is

highlighted, because perceived support (often referred to as the perception of available support) and received support (often referred to as enacted support) are considered separate constructs (Dunkel-Schetter and Bennett, 1990; Helgeson, 1993; Wethington and Kessler, 1986). The importance of receiving social support has been implicated in relation to dealing with competitive stress (Crocker, 1992), slumps in performance (Madden *et al*., 1989), and burn-out (Gould *et al.*, 1996), and the recommendations from the sport psychology literature are that sportspeople should be encouraged to be proactive in harnessing social support from those around them (Gould *et al*., 1993a; Hardy and Crace, 1991; Richman *et al*., 1989; Rosenfeld and Richman, 1997). Furthermore, although empirically, it is perceived support that has been most consistently linked with the stress-buffering hypothesis (Cohen, 1988; Cohen, Gottlieb and Underwood, 2000; Cohen and Wills, 1985; Wills and Shinar, 2000), theoretically both perceived and received support should aid stress-buffering (Lakey and Cohen, 2000). For example, the perception that support is available if needed might lead to benign appraisal of the stressful event or better coping; the receipt of support might lead to a reduction in the impact of the stressor due to a direct transfer of resources (e.g., giving financial aid), or encouragement of more effective coping behaviours. These coping behaviours might also influence subsequent reappraisal of the stressor.

This buffering role of social support should not detract from its equally important role as a main effect (Wheaton, 1985). Main effects imply that social support may play an important role in influencing outcomes, either directly or via intermediate mechanisms (see Lakey and Cohen, 2000). For example, social support might influence performance by providing advice about tactics and game plans, or by increasing positive affect, leading to a greater likelihood of experiencing flow states (cf. Cohen, 1988; Rees

et al., 1999). The normal procedure for testing stress-buffering effects is moderated hierarchical regression analysis (Cohen and Wills, 1985). This incorporates tests for both main effects (of stress and social support) and stress-buffering effects (interaction of stress and social support). In the absence of stress-buffering effects, main effects should be more closely examined. For example, Wheaton (1985) demonstrated that significant main effects for stress and support could be described as an independent distress deterrent model. In this case, stress and social support exert separate and opposite effects on outcomes (e.g., performance), with social support counteracting the negative effect of stress (Wheaton, 1985).

Prior to testing main effect and stress-buffering models, Rees and Hardy (2004) constructed and refined their measurement of the key social support variables. The purpose of this was to ensure context-specific and accurate measurement of social support, not to develop and validate a scale. This same strategy was used in the present study, and follows 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 and Eklund, 2001; House and Kahn, 1985; Wills and Shinar, 2000). This is akin to the measurement strategy within self-efficacy research (Bandura, 1997), for which it has been argued a "one-measure-fits-all" approach has only limited explanatory and predictive value. Furthermore, because of problematic issues of construct validity and content relevance in sport of the many existing social support measures (Rees and Hardy, 2000; Rees *et al.*, 2000), measurement in the present study was guided by the insights of high-level performers regarding their experiences of social support (Rees and Hardy, 2000).

In line with the recommendations of Rees and Hardy (2000), four dimensions of sport-relevant social support were assessed: emotional, esteem, informational and tangible support. Emotional support relates to being "there" for comfort and security, leading to a person feeling loved and cared for. Esteem support relates to bolstering a person's sense of competence or self-esteem. Informational support relates to providing advice or guidance. Tangible support relates to providing concrete instrumental assistance (Cutrona and Russell, 1990). Three stressors were chosen for their particular relevance to golf, an individual and highly technical sport. These stressors were chosen to reflect competition and non-competition sources of stress (e.g., Gould *et al.*,1993b; Hanton *et al*., 2005; Scanlan *et al.*, 1991). They were "technical problems with your game," "personal problems," and "competition pressure." Both technical problems with your game (re-worded to be relevant to golf) and competition pressure had figured prominently in the study by Rees and Hardy (2004). The stressor, personal problems, was included in light of the comments of golf tour professionals in McCaffrey and Orlick (1989), who indicated that their personal life strongly affected how they played. This same observation has been made in psychological consultancy work with golfers by the authors of the present study.

The dependent variable was a competition outcome index of golf performance (an objective performance measure, explained in the Method section, and hereafter termed GPI). Rees and Hardy (2004) used self-report assessments of processes underpinning performance. Their approach to performance assessment followed suggestions from sport psychology to include process measures that may reflect the task complexity of different sports (e.g., Gould *et al.*, 1987). As Weinberg (1990) had noted, focusing solely on performance outcome (e.g., winning versus losing) does not

necessarily reflect how well an individual has performed - a sportsperson may perform well one day, but lose to a better opponent. Conversely, he/she may perform poorly, but win an easy contest. A key concern with the self-report approach, however, is potential confounders (Barrera, 1986). For example, social support might be caused by performance, or results may be prone to third variable issues, such as negative affectivity (Watson and Pennebaker, 1989). These concerns also apply to general (social) psychology, in which the majority of social support studies focus primarily upon subjective judgments of outcome (e.g., self-report measures of mental health, anxiety, and depression). The purpose of the present study was therefore to examine the impact of social support upon objective performance outcome using a sample of high-level golfers in a naturalistic setting.

Specification of models was guided by the optimal matching hypothesis, whereby specific types of social support were carefully matched to the potential demands elicited by specific stressors (Cutrona and Russell, 1990; Lakey and Cohen, 2000; Wills and Shinar, 2000). In this regard, we employed three strategies. First, we considered the relative controllability or uncontrollability of the stressors (Cutrona and Russell, 1990): uncontrollable events lead to a need for forms of social support that foster emotion-focused forms of coping (emotional and esteem support); controllable events lead to a need for forms of social support that foster problem-focused coping (informational and tangible support). We should note here that some authors have questioned the utility of such a division of coping behaviours (Leventhal *et al.*, 1993). In practice, specific forms of social support do not exclusively foster either emotion- or problem-focused coping, but can foster both (Cutrona and Russell, 1990). Nonetheless, the use of problem-focused forms of coping in the face of uncontrollable stressors and

the use of emotion-focused forms of coping in the face of controllable stressors can increase psychological distress (cf. Aldwin, 1994). Second, the content of the items on the support scales was carefully matched to the stressors. Third, as recommended by Wills and Shinar (2000), we made use of the authors' knowledge of golfers derived from previous psychological consultancy work.

Models and Hypotheses

The stressor, technical problems with your game, was considered relatively controllable: technical problems with your game might be solved. For dealing with this stressor, problem-focused forms of coping were therefore hypothesised to be most appropriate. These include both informational support (such as someone to help put things in perspective) and tangible support (such as someone helping to set up sessions in practice). The stressor, personal problems, was considered a relatively uncontrollable environmental stressor: emotion-focused forms of coping were therefore hypothesised to be most appropriate. These include both emotional support (such as someone to take the golfer's mind off things) and esteem support (such as encouragement). Competition pressure was considered a relatively uncontrollable environmental stressor, for which emotion-focused forms of coping were hypothesised to be most appropriate. Each of these stressor-support combinations was specified in a model in relation to GPI. Through this process, six models were specified:

Model 1: the interaction of technical problems with your game and informational support upon GPI.

Model 2: the interaction of technical problems with your game and tangible support upon GPI.

Model 3: the interaction of personal problems and emotional support upon GPI.

Model 4: the interaction of personal problems and esteem support upon GPI.

Model 5: the interaction of competition pressure and emotional support upon GPI.

Model 6: the interaction of competition pressure and esteem support upon GPI.

It was hypothesised that main effects for stressors upon performance would be associated with increases in GPI (for GPI, lower scores represent better performance; higher scores represent poorer performance). It was also hypothesised that main effects for social support upon performance would be associated with decreases in GPI. Interactive effects would be explained in terms of stress-buffering and would be demonstrated by the following: the detrimental effects of increases in stressors upon performance would be reduced for those with high social support compared to those with low social support.

Method

Participants

Participants were 117 male British high performance amateur golfers, mean age 24.8 years, *s*=8.3, with handicaps ranging from +2 (national/international level) to 6 (strong club player). The golf handicap system runs from "+" numbers (the best players) through "0" to "28" (poorer players). The number in each handicap band was as follows: +2 (*n* = 3); +1 (*n* = 7); 0 (*n* = 13); 1 (*n* = 16); 2 (*n* = 13); 3 (*n* = 14); 4 (*n* = 17); 5 (*n* = 17); 6 (*n* = 17).

Procedures

The study was approved by the ethics committee of the School of Sport and Health Sciences, University of Exeter, and participants provided informed consent. Recruitment of participants was opportunistic (convenience sample) but spread across

various golf courses in the South-East region of England on the practice days preceding major competitions. Participants completed measures of social support and stressors in the two days preceding major competitions; after competitions, participants' competition scores were recorded. Competitions were held over a maximum of two days, ranging from one to four rounds of golf.

Measures

Stressors. The three perceived stressors, technical problems with your game, personal problems, and competition pressure were used to generate single-item measures of potential stressors. The measure asked respondents, "Bearing the upcoming competition in mind, please indicate to what extent you have experienced these stressors over the past week . . . ," with response options ranging on a 5-point scale from 1 (not at all) to 5 (a lot).

Social support. Social support was assessed using a 21-item self-report questionnaire designed for this study. The items were derived from statements made by high-level sportspeople about their social support experiences (Rees and Hardy, 2000). The measure asked respondents, "In the past week, to what extent has someone . . . ," with response options ranging on a 5-point scale from 1 (not at all) to 5 (a lot). The 21 items represented the four primary dimensions (emotional, esteem, informational and tangible support) identified by Rees and Hardy. The questionnaire contained six emotional items, six esteem items, five informational items and four tangible items. Evidence that the four dimensions underpin the items has previously been demonstrated through confirmatory factor analysis. Rees and Hardy (2004) reported adequate fit

statistics (χ^2 (98) = 152.37, p = 0.00, RMSEA 0.06, SRMR 0.07, CFI 0.94) and reliability coefficients (0.73 to 0.89) for the four-factor model.

In the present study, not every item that could have been derived from the Rees and Hardy (2000) study was used. The 21 items were chosen for their relevance to golfers and their potential to be matched with the stressors. The criteria for inclusion of items were as follows: a) the stressors were first chosen for their relevance to golfers and their potential influence on performance, and b) social support items were then selected for their potential to be matched with those stressors. Prior to data collection, all three authors scrutinised the items making up each scale. Another two independent researchers within the School of Sport and Health Sciences at the University of Exeter (one psychologist and one sociologist) correctly assigned 100% of the items to their social support dimensions. All the items (and all other items in this study) were also scrutinised for relevance and representativeness by one golf teaching professional, two England squad members (with +3 handicaps), one national level competitor (+1 handicap), and two strong club golfers (3 handicap).

Performance. Performance was assessed by GPI. Initially, golfers' nett competition 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 also employed to standardise nett scores across these conditions: this was nett scores minus a value for Competition Scratch Score (CSS). The Standard Scratch Score (SSS) 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 CSS is the adjustment that may be necessary to the SSS to take account of weather and course conditions; it is the SSS after it has been adjusted due to current playing conditions, using scores returned in the competition. GPI is nett scores minus CSS. For this study, lower scores for GPI represent fewer shots taken; lower scores for GPI therefore represent better performance. To demonstrate the calculation of GPI, let us consider one player as an example. Player A shot 76 in a competition. Player A had a handicap of 3, and therefore his nett score was 73 (76 – 3). The CSS for the competition was 72. Player A's GPI would be calculated by subtracting 72 (the CSS) from 73 (nett score), which would give a GPI of +1. As competitors completed between one and four rounds of golf, scores relative to CSS were averaged across rounds, to give the equivalent of a one-round score.

Analyses

The initial phase of analysis involved refinement of the measure of social support using confirmatory factor analysis with maximum likelihood estimation (Biddle *et al.*, 2001; Jöreskog and Sörbom, 1993; Schutz and Gessaroli, 1993). The sequential model testing approach recommended by Jöreskog (1993, p. 313) and outlined in Biddle *et al.* (2001, p. 785) was employed. This involved three stages. First, tests of separate single-factor models corresponding to individual subscales were performed. The purpose of this was to assess the convergent validity of the items making up each subscale. Second, tests of each pair of subscales were performed, combining them in two-factor models. The purpose of this was to identify any ambiguous items. Based upon the diagnostic information from the single-factor and the two-factor stages, items were deleted from each subscale. Finally, all factors were included in full models.

For all models, the following diagnostic information was used to aid the process of scale refinement, item deletion and further model testing: the goodness of fit of the models, the completely standardised factor loadings, the standardised residuals, and the modification indices for the covariances of the measurement errors (e.g., Jöreskog and Sörbom, 1993). The goodness of fit of the models was tested using the chi-square likelihood ratio statistic (χ^2), Root Mean Square Error of Approximation (RMSEA: Steiger, 1990) and its associated *p*-value (for RMSEA < 0.05), Standardised Root Mean Square Residual (SRMR), Comparative Fit Index (CFI: Bentler, 1990), and Non-Normed Fit Index (NNFI: Tucker and Lewis, 1973). The χ^2 statistic is generally regarded as an initial indicator of model fit, such that a small χ^2 corresponds to a good fit, and a large χ^2 corresponds to a poor fit (Jöreskog and Sörbom, 1993). Although there is no accepted criterion, the χ^2/df ratio may also provide a further standard by which to judge the size of the χ^2 statistic. Hu and Bentler's (1999) recommendations for fit were used: namely, that SRMR values close to 0.08, RMSEA values close to 0.06, and CFI and NNFI values close to 0.95 represented a good fit.

Moderated hierarchical regression analysis (Biddle *et al.*, 2001; Jaccard *et al.*, 1990) was used to examine the effects of social support dimensions and stressors upon GPI. For the hypothesised models, the independent variables were entered hierarchically in a three-step process, corresponding with the testing of the stress-buffering hypothesis (Baron and Kenny, 1986; Cohen and Wills, 1985), and based upon theoretical supposition. First, the stressor was entered. Second, the social support dimension was entered. Third, the product of the stressor and the social support dimension (the interaction term, relating to whether social support has moderated the effect of the

stressor on performance) was entered. The significance of increments in explained variance in performance 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 then assessed at each step. In line with Jaccard *et al*.'s recommendations, the independent variables were standardised prior to entry. An alpha level of 0.05 was used for all statistical tests.

Results

Social Support Measure

At the single-factor stage, and based upon the diagnostic information outlined in the Method, the emotional, esteem and informational support dimensions were reduced to four-item subscales, and the tangible support dimension was reduced to a three-item subscale. For all single- and two-factor models, χ^2 values relative to degrees of freedom were less than two and non-significant, and all other values met the criteria for fit of Hu and Bentler (1999). For the full model, the χ^2 statistic (χ^2 (84) = 111.69, p = 0.02) relative to degrees of freedom was less than two, the RMSEA was low enough (0.05), with a non-significant test for close fit (p = 0.45), the SRMR was low enough (0.05), and the CFI (0.96) and NNFI (0.96) were high enough. These values suggested that the full four-factor model could fit the data well. Factor loadings (directional relationships from the social support dimensions to their corresponding items) for all models ranged from 0.49 to 0.90. Composite reliability, which draws upon the standardised loadings and measurement error for each item (Fornell and Larcker, 1981; Shook *et al.*, 2004), was acceptable (> 0.70) for the four subscales: emotional 0.77, esteem 0.86, informational 0.73, and tangible 0.83 (Cronbach's alpha internal reliability coefficients

for the four subscales were: emotional 0.77, esteem 0.85, informational 0.72, and tangible 0.83). Means and standard deviations for the four social support subscales (and all other scales used in this study) are in Table 1.

Correlations between the social support dimensions (inter-subscale correlations based upon composite subscale scores using the raw data) ranged from moderate (r = 0.35, $p < 0.05$) to high ($r = 0.75$, $p < 0.05$) (see Table 1). Correlations of this magnitude have been noted with other measures (Brookings and Bolton, 1988; Cohen and Wills, 1985; B. R. Sarason *et al*., 1990b). In light of these correlations, we also ran four further models on the social support data in confirmatory factor analysis. First, we tested a single higher order factor model. This produced a very poor fit. Second, we tested a model with all items loading on a single scale. This also produced a very poor fit. Third, we tested a two-factor model that combined emotional and esteem support on the one hand and informational and tangible support on the other (cf. Cutrona and Russell, 1990). This fit was markedly better than the previous two models but still well outside the values outlined in Hu and Bentler (1999). Fourth, we tested a two-factor model of tangible support on the one hand and a combined scale including emotional, esteem and informational support on the other. This produced the best of these four models, although fit statistics (χ^2 (89) = 156.43, $p = 0.00$; RMSEA 0.08, SRMR 0.07, CFI 0.91, NNFI 0.90) were still outside the values outlined in Hu and Bentler (1999) and worse than the original four-factor model. At this point, a chi-square difference test (e.g., Tabachnick and Fidell, 1996) revealed that the fit of this more parsimonious model was significantly worse (χ^2 (5) = 44.74, $p < 0.01$) than the four-factor model.

The items on the emotional support subscale were: cheered you up; helped you to relax when you felt under pressure; helped take your mind off things; given you moral support when you felt down. The items on the esteem support subscale were: told you, you can do it; encouraged you; believed in you; reassured you. The items on the informational support subscale were: helped put things into perspective; given you advice about coping; given you constructive criticism; helped you prepare mentally. The items on the tangible support subscale were: helped to set up sessions in practice; helped plan your practice to deal with problems; helped organise practice and competitions.

Effects of Stressors, Social Support Dimensions and Products on GPI

Results from the moderated hierarchical regression analyses are shown in Table 2. There were significant main effects for stressors upon GPI in four of the six models tested. Over and above the variance accounted for by stressors, there were significant main effects for social support upon GPI in all six models tested. All these results were in the hypothesised direction, with stressors associated with worse performance and social support associated with better performance. None of the interactions (stress-buffering effects) added significantly to the variance of GPI explained by the main effects of the stressors and social support.

At this point, we ran an additional set of regression analyses (Table 3). There were two reasons for this. First, the correlations between the social support dimensions were relatively high (see Table 1), and the results from the confirmatory factor analyses demonstrated reasonable fit statistics for alternatives to the four-factor support model. Second, the pattern of results suggested that the support dimensions were not associated with differential effects upon GPI. The following additional models were specified: a) a combination of models 1 and 2 (involving the stressor “technical problems with your

game"), models 3 and 4 (involving the stressor "personal problems"), and models 5 and 6 (involving the stressor "competition pressure"); b) a model with all stressors and all social support dimensions; and c) a model with a combined score for stressors (labelled "total stress") and a combined score for support (labelled "total social support"). The results from these models suggest that esteem support may be the key social support dimension predicting GPI. The results also suggest that a combined score for stressors and a combined score for social support capture the essence of this study's results equally well.

Discussion

The results of this study suggest that the influence of received social support upon performance is positive, but that in this study, the support functioned as a main effect, not a stress-buffer. Unlike the Rees and Hardy (2004) study, then, the matching of specific support dimensions with specific stressors did not lead to stress-buffering in the present study. Although the optimal matching hypothesis offers an eloquent explication of when buffering is likely to occur, its empirical support base is still mixed (Burleson, 2003). It may be that detection of stress-buffering effects is more likely with process-related assessments of performance, rather than performance outcome (Rees and Hardy, 2004).

Evans (1985) noted that significant moderator effects are notoriously difficult to detect, while 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. Failure to find stress-buffering (interactive) effects of social support has also been attributed to sample size issues (Wills and Shinar, 2000). In the present study, the sample size of 117 should be sufficient to detect medium effect sizes

(cf. Cohen, 1992), but it is still relatively small, a natural function of the lack of high calibre golfers. If one were to use a lower standard of golfer, then one could more easily increase sample size, but well-designed studies of high-level performers are relatively rare. It is also unlikely that social support would have such a strong effect on the performance of recreational golfers. Krause (1995) suggested that failure to find buffering effects may be due to a misspecified relationship between social support and stress - social support may only be beneficial up to a point, beyond which it may exacerbate the effects of stress. Following the procedures outlined by Krause, we also tested for nonlinear interactions with the present data, but again none were significant. Finally, it may simply be that this set of results supports the empirical literature (if not the theory): perceived support (and not received support) is most consistently linked with stress-buffering (Cohen, 1988; Cohen, Gottlieb, and Underwood, 2000; Cohen and Wills, 1985; Wills and Shinar, 2000).

In this study, received social support aided performance, regardless of the level of stress. The additional set of regression analyses highlighted that esteem support may be the principal dimension in this regard. It also highlighted that by combining stressors and social support the essence of this study's results was captured equally well. Although researchers argue that at a conceptual level, social support may still be broken down into dimensional components (Cohen and Wills, 1985; Cutrona and Russell, 1990), this result suggests that in relation to their performance golfers may *not* distinguish among types of stressors and types of support.

A further speculative explanation for this pattern of results may be offered. There were significant main effects for social support upon performance and significant main effects for stressors. Entered first, the effect of the stressors upon performance was

in a negative direction. Over and above the variance in performance explained by the stressors, social support explained a further (and generally greater) amount of variance in a positive direction. Thus, the receipt of social support may have off-set the negative impact of the stressors. Veiel (1992) implied that buffering is present when social support is beneficial in some proportion to exposure to stress and Wheaton (1985) described these "borderline" (p. 359) stress-buffering cases as independent distress deterrent models. According to Wheaton, whilst social support "can be seen as directly counterbalancing the impact of stress" (p. 359), counterbalancing is not buffering. He nonetheless added that this should not detract from the relevance of social support in impacting upon outcomes. On the contrary, he wrote, "in fact, resources in an independent distress deterrent role may ultimately have more to do with the reduction of illness or distress than resources *only* in a stress-buffering role" (p. 360). In a sense, main effects are more important, because they always offer benefit.

A particular strength of this study is the proportion of variance in performance explained by the main effects of social support. These main effects ranged from 10% - 24% (medium to large effect sizes, cf. Cohen, 1992) for effects on performance, compared with values of 3% - 10% in the Rees and Hardy (2004) study and 12% - 21% in the Rees *et al.* (1999) study. These effect sizes are greater than the fairly modest effect sizes observed in two recent meta-analyses of the relationships of anxiety and self-confidence with performance (Craft *et al.*, 2003*;* Woodman and Hardy, 2003). Although we acknowledge that there is variability in the performance/outcome measures used across studies, we make this point, because anxiety and self-confidence are considered key variables in sport psychology that have been extensively studied. On the other hand, research on social support in sport is scarce, and has generally been limited

to its influence on sport injury (for reviews, see, e.g., Bianco and Eklund, 2001; Brewer, 2001; Hardy *et al*., 1999; Udry, 1996; Williams, 2001). The results of the present study offer a very powerful indication of the impact social support may have in relation to sports performance.

In conclusion, in this study we have provided further insight into the potential for social support to positively influence performance. To further develop understanding, in future researchers might include measures of both perceived and received support in order to help elucidate whether perceived support is indeed more likely to lead to stress-buffering than received support (Wills and Shinar, 2000). A key area is to examine the mechanisms via which perceived and received support exert their effects (e.g., see Lakey and Cohen, 2000). For example, effects upon performance outcome might be mediated by self-confidence and self-efficacy, or by performance processes, such as increased positive affect and flow (cf. Cohen, 1988; Rees and Hardy, 2004; Rees *et al.*, 1999). Finally, it should be noted that we did not assess stressors and social support experienced during actual competition, so future research might consider such assessment using different methods.

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Table 1

Means, s, and Intercorrelations of Social Support, Stressors, and GPI

	means ± *s*	1	2	3	4	5	6	7	8	9
1. Emotional support	2.87 ± .70									
2. Esteem support	3.09 ± .84	.75*								
3. Informational support	2.57 ± .74	.60*	.67*							
4. Tangible support	2.26 ± .92	.35*	.42*	.61*						
5. Technical problems	2.69 ± 1.07	-.21*	-.19*	-.04	.02					
6. Competition Pressure	2.54 ± .90	.18*	.14	.22*	.29*	.26*				
7. Personal problems	2.32 ± 1.14	.01	.00	.03	-.00	.21*	-.05			
8. Total social support	2.70 ± .65	.80*	.86*	.87*	.75*	-.12	.26*	.01		
9. Total stressors	2.52 ± .68	-.03	-.03	.09	.13	.76*	.55*	.65*	.06	
10. GPI	.70 ± 3.08	-.41*	-.47*	-.39*	-.30*	.37*	-.09	.28*	-.48*	.31*

Note. * denotes correlation significant at 0.05 level (2-tailed)

Table 2

Moderated Hierarchical Regression Analyses: Effects of Stressors, Social Support and Pro upon GPI

Dependent Variable	Independent Variable	ΔR^{2a}	ΣR^{2b}	$P(F)^c$	b^d
GPI	Technical problems with your game	.13	.13	.00	1.09
	Informational support	.14	.27	.00	-1.15
	Product	.00	.27	.71	.10
GPI	Technical problems with your game	.13	.13	.00	1.14
	Tangible support	.10	.23	.00	-.96
	Product	.00	.23	.94	.02
GPI	Personal problems	.08	.08	.00	.86
	Emotional support	.17	.25	.00	-1.25
	Product	.01	.26	.23	-.28
GPI	Personal problems	.08	.08	.00	.86
	Esteem support	.22	.30	.00	-1.46
	Product	.00	.30	.86	.04
GPI	Competition pressure	.01	.01	.35	-.04
	Emotional Support	.16	.17	.00	-1.26
	Product	.00	.17	.65	.13
GPI	Competition pressure	.01	.01	.35	-.06
	Esteem support	.22	.23	.00	-1.45
	Product	.00	.23	.94	-.02

Note. $N = 117$. All variables standardised except for Product. Product formed from the two preceding (standardised) variables.

[a]Stepwise change in R^2. [b]Cumulative R^2. [c]Probability of F for ΔR^2. [d]Unstandardised regress coefficient in final equation. [e]Probability of t for b.

Table 3

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

Dependent Variable	Independent Variable	ΔR^{2a}	ΣR^{2b}	$P(F)^c$	b^d	$p(t)^e$
GPI	Technical problems with your game	.13	.13	.00	1.09	.00
	Informational support	.15	.28	.00	-.91	.00
	Tangible support				-.40	.20
GPI	Personal problems	.08	.08	.00	.86	.00
	Emotional support	.23	.31	.00	-.36	.32
	Esteem support				-1.18	.00
GPI	Competition pressure	.01	.01	.35	-.04	.88
	Emotional Support	.22	.23	.00	-.36	.36
	Esteem support				-1.18	.00
GPI	Technical problems with your game	.21	.21	.00	.84	.00
	Personal problems				.70	.00
	Competition pressure				-.15	.56
	Informational support	.18	.39	.00	-.34	.36
	Tangible support				-.32	.30
	Emotional support				-.11	.77
	Esteem support				-.84	.03
GPI	Total stressors	.10	.10	.00	1.04	.00
	Total social support	.24	.34	.00	-1.53	.00

Note. $N = 117$. All variables standardised.

[a]Stepwise change in R^2. [b]Cumulative R^2. [c]Probability of F for ΔR^2. [d]Unstandardised regression coefficient in final equation. [e]Probability of t for b.