

Running title: SOCIAL SUPPORT AND GOLF PERFORMANCE

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Stressors, Social Support and Effects upon Performance in Golf

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Abstract

1
2 In this study we extended the work of Rees and Hardy (2004) by examining the main
3 and stress-buffering effects of social support upon sports performance in a different
4 context, using a different outcome measure and a specific time-frame. A high-level
5 performance sample of 117 male golfers, mean age 24.8, $s=8.3$, completed measures of
6 social support and stressors before competitions. Performance outcome was recorded.
7 Moderated hierarchical regression analyses revealed significant ($p < 0.05$) main effects
8 for stressors upon performance in 8 of the 11 models tested ($R^2 = 0.08 - 0.21$). Over and
9 above the variance accounted for by stressors, there were significant ($p < 0.05$) main
10 effects for social support upon performance in all models tested ($\Delta R^2 = 0.10 - 0.24$). In
11 all models, stressors were associated with worse performance, whereas social support
12 was associated with better performance. There were no significant interactions (stress-
13 buffering effects). Main effects for social support upon performance suggest that social
14 support may have aided performance directly, regardless of the level of stress.
15

Introduction

1
2 Although I. G. Sarason *et al.* (1990) proposed that social support might affect
3 sports performance, there has been no explicit attempt to test this proposal. A small
4 number of researchers have noted social support as an important resource within a
5 performance context (e.g., Gould *et al.*, 1999; Holt and Hogg, 2002; Rees and Hardy,
6 2000), and recently (Rees and Hardy, 2004; Rees *et al.*, 1999), researchers have
7 employed process-related performance measures. Using a high-level (regional to
8 international standard) sample of tennis players, Rees and Hardy (2004) found evidence
9 for main effects of social support and interactive effects of social support and stressors
10 upon processes underlying performance. The main effects implied that social support
11 positively influenced performance, regardless of the level of stress. The interactive
12 effects were explained in terms of stress-buffering (for reviews, see Cohen, 1988;
13 Cohen, Underwood and Gottlieb, 2000; B. R. Sarason *et al.*, 1990a; Veiel and Baumann,
14 1992): higher levels of social support protected tennis players from the harmful effects
15 of stress upon performance, but social support was relatively unimportant for those not
16 experiencing stress. As high-level sport is characterised by a demand to perform well in
17 intense pressure situations (Jones, 1995), studies of high-level performance are
18 particularly notable. The purpose of the present study was to extend the work of Rees
19 and Hardy (2004) by examining the impact of social support upon performance using a
20 sample of high-level golfers. This study also addressed Rees and Hardy's
21 recommendations to conduct studies in different contexts, using different outcome
22 measures and specific time-frames.

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

1 highlighted, because perceived support (often referred to as the perception of available
2 support) and received support (often referred to as enacted support) are considered
3 separate constructs (Dunkel-Schetter and Bennett, 1990; Helgeson, 1993; Wethington
4 and Kessler, 1986). The importance of receiving social support has been implicated in
5 relation to dealing with competitive stress (Crocker, 1992), slumps in performance
6 (Madden *et al.*, 1989), and burn-out (Gould *et al.*, 1996), and the recommendations from
7 the sport psychology literature are that sportspeople should be encouraged to be
8 proactive in harnessing social support from those around them (Gould *et al.*, 1993a;
9 Hardy and Crace, 1991; Richman *et al.*, 1989; Rosenfeld and Richman, 1997).
10 Furthermore, although empirically, it is perceived support that has been most
11 consistently linked with the stress-buffering hypothesis (Cohen, 1988; Cohen, Gottlieb
12 and Underwood, 2000; Cohen and Wills, 1985; Wills and Shinar, 2000), theoretically
13 both perceived and received support should aid stress-buffering (Lakey and Cohen,
14 2000). For example, the perception that support is available if needed might lead to
15 benign appraisal of the stressful event or better coping; the receipt of support might lead
16 to a reduction in the impact of the stressor due to a direct transfer of resources (e.g.,
17 giving financial aid), or encouragement of more effective coping behaviours. These
18 coping behaviours might also influence subsequent reappraisal of the stressor.

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

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

10 Prior to testing main effect and stress-buffering models, Rees and Hardy (2004)
11 constructed and refined their measurement of the key social support variables. The
12 purpose of this was to ensure context-specific and accurate measurement of social
13 support, not to develop and validate a scale. This same strategy was used in the present
14 study, and follows two recommendations from the social support literature: a) social
15 support measures should be relevant to the situational context in which they are being
16 used, and b) social support researchers should write new items to capture specific
17 aspects of the support needs of the target population (Bianco and Eklund, 2001; House
18 and Kahn, 1985; Wills and Shinar, 2000). This is akin to the measurement strategy
19 within self-efficacy research (Bandura, 1997), for which it has been argued a “one-
20 measure-fits-all” approach has only limited explanatory and predictive value.
21 Furthermore, because of problematic issues of construct validity and content relevance
22 in sport of the many existing social support measures (Rees and Hardy, 2000; Rees *et*
23 *al.*, 2000), measurement in the present study was guided by the insights of high-level
24 performers regarding their experiences of social support (Rees and Hardy, 2000).

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

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

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

12 Specification of models was guided by the optimal matching hypothesis,
13 whereby specific types of social support were carefully matched to the potential
14 demands elicited by specific stressors (Cutrona and Russell, 1990; Lakey and Cohen,
15 2000; Wills and Shinar, 2000). In this regard, we employed three strategies. First, we
16 considered the relative controllability or uncontrollability of the stressors (Cutrona and
17 Russell, 1990): uncontrollable events lead to a need for forms of social support that
18 foster emotion-focused forms of coping (emotional and esteem support); controllable
19 events lead to a need for forms of social support that foster problem-focused coping
20 (informational and tangible support). We should note here that some authors have
21 questioned the utility of such a division of coping behaviours (Leventhal *et al.*, 1993). In
22 practice, specific forms of social support do not exclusively foster either emotion- or
23 problem-focused coping, but can foster both (Cutrona and Russell, 1990). Nonetheless,
24 the use of problem-focused forms of coping in the face of uncontrollable stressors and

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

6 *Models and Hypotheses*

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

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

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

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

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

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

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

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

13 Method

14 *Participants*

15 Participants were 117 male British high performance amateur golfers, mean age
16 24.8 years, $s=8.3$, with handicaps ranging from +2 (national/international level) to 6
17 (strong club player). The golf handicap system runs from “+” numbers (the best players)
18 through “0” to “28” (poorer players). The number in each handicap band was as follows:
19 +2 ($n = 3$); +1 ($n = 7$); 0 ($n = 13$); 1 ($n = 16$); 2 ($n = 13$); 3 ($n = 14$); 4 ($n = 17$); 5 ($n =$
20 17); 6 ($n = 17$).

21 *Procedures*

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

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

6 *Measures*

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

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

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

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

16 *Performance.* Performance was assessed by GPI. Initially, golfers' nett
17 competition scores were calculated as number of shots taken minus handicap. Because
18 various competitions were used, on different courses, on different days, and with
19 differing weather conditions, a procedure was also employed to standardise nett scores
20 across these conditions: this was nett scores minus a value for Competition Scratch
21 Score (CSS). The Standard Scratch Score (SSS) is a standard score allotted to an 18-
22 hole golf course, and is the score that a scratch player (zero handicap) would be
23 expected to return in ideal conditions over a measured course; it may differ from the par

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

12 *Analyses*

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

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

16 Moderated hierarchical regression analysis (Biddle *et al.*, 2001; Jaccard *et al.*,
17 1990) was used to examine the effects of social support dimensions and stressors upon
18 GPI. For the hypothesised models, the independent variables were entered hierarchically
19 in a three-step process, corresponding with the testing of the stress-buffering hypothesis
20 (Baron and Kenny, 1986; Cohen and Wills, 1985), and based upon theoretical
21 supposition. First, the stressor was entered. Second, the social support dimension was
22 entered. Third, the product of the stressor and the social support dimension (the
23 interaction term, relating to whether social support has moderated the effect of the

1 stressor on performance) was entered. The significance of increments in explained
2 variance in performance over and above the variance accounted for by those variables
3 already entered into the equation, as well as the sign of the regression coefficients, was
4 then assessed at each step. In line with Jaccard *et al.*'s recommendations, the
5 independent variables were standardised prior to entry. An alpha level of 0.05 was used
6 for all statistical tests.

7 Results

8 *Social Support Measure*

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

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

4 Correlations between the social support dimensions (inter-subscale correlations
5 based upon composite subscale scores using the raw data) ranged from moderate ($r =$
6 $0.35, p < 0.05$) to high ($r = 0.75, p < 0.05$) (see Table 1). Correlations of this magnitude
7 have been noted with other measures (Brookings and Bolton, 1988; Cohen and Wills,
8 1985; B. R. Sarason *et al.*, 1990b). In light of these correlations, we also ran four further
9 models on the social support data in confirmatory factor analysis. First, we tested a
10 single higher order factor model. This produced a very poor fit. Second, we tested a
11 model with all items loading on a single scale. This also produced a very poor fit. Third,
12 we tested a two-factor model that combined emotional and esteem support on the one
13 hand and informational and tangible support on the other (cf. Cutrona and Russell,
14 1990). This fit was markedly better than the previous two models but still well outside
15 the values outlined in Hu and Bentler (1999). Fourth, we tested a two-factor model of
16 tangible support on the one hand and a combined scale including emotional, esteem and
17 informational support on the other. This produced the best of these four models,
18 although fit statistics ($\chi^2 (89) = 156.43, p = 0.00$; RMSEA 0.08, SRMR 0.07, CFI 0.91,
19 NNFI 0.90) were still outside the values outlined in Hu and Bentler (1999) and worse
20 than the original four-factor model. At this point, a chi-square difference test (e.g.,
21 Tabachnick and Fidell, 1996) revealed that the fit of this more parsimonious model was
22 significantly worse ($\chi^2 (5) = 44.74, p < 0.01$) than the four-factor model.

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

9 *Effects of Stressors, Social Support Dimensions and Products on GPI*

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

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

1 game”), models 3 and 4 (involving the stressor “personal problems”), and models 5 and
2 6 (involving the stressor “competition pressure”); b) a model with all stressors and all
3 social support dimensions; and c) a model with a combined score for stressors (labelled
4 “total stress”) and a combined score for support (labelled “total social support”). The
5 results from these models suggest that esteem support may be the key social support
6 dimension predicting GPI. The results also suggest that a combined score for stressors
7 and a combined score for social support capture the essence of this study’s results
8 equally well.

9 Discussion

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

19 Evans (1985) noted that significant moderator effects are notoriously difficult to
20 detect, while McClelland and Judd (1993) highlighted a number of statistical factors that
21 contribute to the difficulty in finding significant interactions in field studies compared
22 with experimental studies. Failure to find stress-buffering (interactive) effects of social
23 support has also been attributed to sample size issues (Wills and Shinar, 2000). In the
24 present study, the sample size of 117 should be sufficient to detect medium effect sizes

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

14 In this study, received social support aided performance, regardless of the level
15 of stress. The additional set of regression analyses highlighted that esteem support may
16 be the principal dimension in this regard. It also highlighted that by combining stressors
17 and social support the essence of this study's results was captured equally well.

18 Although researchers argue that at a conceptual level, social support may still be broken
19 down into dimensional components (Cohen and Wills, 1985; Cutrona and Russell,
20 1990), this result suggests that in relation to their performance golfers may *not*
21 distinguish among types of stressors and types of support.

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

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

14 A particular strength of this study is the proportion of variance in performance
15 explained by the main effects of social support. These main effects ranged from 10% -
16 24% (medium to large effect sizes, cf. Cohen, 1992) for effects on performance,
17 compared with values of 3% - 10% in the Rees and Hardy (2004) study and 12% - 21%
18 in the Rees *et al.* (1999) study. These effect sizes are greater than the fairly modest
19 effect sizes observed in two recent meta-analyses of the relationships of anxiety and
20 self-confidence with performance (Craft *et al.*, 2003; Woodman and Hardy, 2003).
21 Although we acknowledge that there is variability in the performance/outcome measures
22 used across studies, we make this point, because anxiety and self-confidence are
23 considered key variables in sport psychology that have been extensively studied. On the
24 other hand, research on social support in sport is scarce, and has generally been limited

1 to its influence on sport injury (for reviews, see, e.g., Bianco and Eklund, 2001; Brewer,
2 2001; Hardy *et al.*, 1999; Udry, 1996; Williams, 2001). The results of the present study
3 offer a very powerful indication of the impact social support may have in relation to
4 sports performance.

5 In conclusion, in this study we have provided further insight into the potential for
6 social support to positively influence performance. To further develop understanding, in
7 future researchers might include measures of both perceived and received support in
8 order to help elucidate whether perceived support is indeed more likely to lead to stress-
9 buffering than received support (Wills and Shinar, 2000). A key area is to examine the
10 mechanisms via which perceived and received support exert their effects (e.g., see
11 Lakey and Cohen, 2000). For example, effects upon performance outcome might be
12 mediated by self-confidence and self-efficacy, or by performance processes, such as
13 increased positive affect and flow (cf. Cohen, 1988; Rees and Hardy, 2004; Rees *et al.*,
14 1999). Finally, it should be noted that we did not assess stressors and social support
15 experienced during actual competition, so future research might consider such
16 assessment using different methods.

17

References

- 1
- 2 Aldwin, C.M. (1994). *Stress, Coping, and Development: An Integrative Perspective*.
- 3 New York: The Guilford Press.
- 4 Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: Freeman.
- 5 Baron, R.M. and Kenny, D.A. (1986). The moderator-mediator variable distinction in
- 6 social psychological research: Conceptual, strategic, and statistical considerations.
- 7 *Journal of Personality and Social Psychology*, **51**, 1173-1182.
- 8 Barrera, M.J. (1986). Distinctions between social support concepts, measures, and
- 9 models. *American Journal of Community Psychology*, **14**, 413-445.
- 10 Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological*
- 11 *Bulletin*, **103**, 411-423.
- 12 Bianco, T. and Eklund, R.C. (2001). Conceptual considerations for social support
- 13 research in sport and exercise settings: The case of sport injury. *Journal of Sport &*
- 14 *Exercise Psychology*, **23**, 85-107.
- 15 Biddle, S.J.H., Markland, D., Gilbourne, D., Chatzisarantis, N.L.D. and Sparkes, A.
- 16 (2001). Research methods in sport and exercise psychology: Quantitative and qualitative
- 17 issues. *Journal of Sports Sciences*, **19**, 777-809.
- 18 Brewer, B.W. (2001). Psychology of sport injury rehabilitation. In *Handbook of Sport*
- 19 *Psychology* (edited by R.N. Singer, H.A. Hausenblas and C.M. Janelle), 2nd ed, pp.
- 20 787-809. New York: Wiley.

- 1 Brookings, J.B. and Bolton, B. (1988). Confirmatory factor analysis of the Interpersonal
2 Support Evaluation List. *American Journal of Community Psychology*, **16**, 137-147.
- 3 Burleson, B.R. (2003). Emotional support skill. In *Handbook of Communication and*
4 *Social Interaction Skills* (edited by J.O. Greene and B.R. Burleson), pp. 551-594.
5 Mahwah, NJ: Erlbaum.
- 6 Cohen, J. (1992). A power primer. *Psychological Bulletin*, **112**, 155-159.
- 7 Cohen, S. (1988). Psychosocial models of the role of social support in the etiology of
8 physical disease. *Health Psychology*, **7**, 269-297.
- 9 Cohen, S., Gottlieb, B.H. and Underwood, L.G. (2000). Social support and health. In
10 *Social Support Measurement and Intervention: A Guide for Health and Social Scientists*
11 (edited by S. Cohen, L.G. Underwood and B.H. Gottlieb), pp. 3-25. New York: Oxford
12 University Press.
- 13 Cohen, S., Underwood, L.G. and Gottlieb, B.H. (2000). *Social Support Measurement*
14 *and Intervention: A Guide for Health and Social Scientists*. New York: Oxford
15 University Press.
- 16 Cohen, S. and Wills, T.A. (1985). Stress, social support and the buffering hypothesis.
17 *Psychological Bulletin*, **98**, 310-357.
- 18 Craft, L.L., Magyar, T.M., Becker, B.J. and Feltz, D.L. (2003). The relationship
19 between the Competitive State Anxiety Inventory-2 and sport performance: A meta-
20 analysis. *Journal of Sport & Exercise Psychology*, **25**, 44-65.

- 1 Crocker, P.R.E. (1992). Managing stress by competitive athletes: Ways of coping.
2 *International Journal of Sport Psychology*, **23**, 161-175.
- 3 Cutrona, C.E. and Russell, D.W. (1990). Type of social support and specific stress:
4 Toward a theory of optimal matching. In *Social Support: An Interactional View* (edited
5 by B.R. Sarason, I.G. Sarason and G.R. Pierce), pp. 319-366. New York: Wiley.
- 6 Dunkel-Schetter, C. and Bennett, T.L. (1990). Differentiating the cognitive and
7 behavioral aspects of social support. In *Social Support: An Interactional View* (edited by
8 B.R. Sarason, I.G. Sarason and G.R. Pierce), pp. 267-296. New York: Wiley.
- 9 Evans, M.G. (1985). A Monte Carlo study of the effects of correlated method variance
10 in moderated multiple regression analysis. *Organizational Behavior and Human*
11 *Decision Processes*, **36**, 305-323.
- 12 Fornell, C. and Larcker, D.F. (1981). Evaluating structural equation models with
13 unobservable variables and measurement error. *Journal of Marketing Research*, **18**, 39-
14 50.
- 15 Gould, D., Guinan, D., Greenleaf, C., Medbery, R. and Peterson, K. (1999). Factors
16 affecting Olympic performance: Perceptions of athletes and coaches from more and less
17 successful teams. *The Sport Psychologist*, **13**, 371-394.
- 18 Gould, D., Jackson, S.A. and Finch, L.M. (1993a). Life at the top: The experiences of
19 U.S. National Champion figure skaters. *The Sport Psychologist*, **7**, 354-374.
- 20 Gould, D., Jackson, S.A. and Finch, L.M. (1993b). Sources of stress in national
21 champion figure skaters. *Journal of Sport & Exercise Psychology*, **15**, 134-159.

- 1 Gould, D., Petlichkoff, L., Simons, J. and Vevera, M. (1987). Relationship between
2 Competitive State Anxiety Inventory-2 subscale scores and pistol shooting performance.
3 *Journal of Sport Psychology*, **9**, 33-42.
- 4 Gould, D., Tuffey, S., Udry, E. and Loehr, J. (1996). Burnout in competitive junior
5 tennis players: II: Qualitative analysis. *The Sport Psychologist*, **10**, 341-366.
- 6 Hanton, S., Fletcher, D. and Coughlan, G. (2005). Stress in elite sports performers: A
7 comparative study of competitive and organizational stressors. *Journal of Sports*
8 *Sciences*, **23**, 1129-1141.
- 9 Hardy, C.J., Burke, K.L. and Crace, R.K. (1999). Social support and injury: A
10 framework for social support-based interventions with injured athletes. In *Psychological*
11 *bases of sport injuries* (edited by D. Pargman), 2nd ed., pp. 175-198. Morgantown, WV:
12 Fitness Information Technology, Inc.
- 13 Hardy, C.J. and Crace, R.K. (1991). Social support within sport. *Sport Psychology*
14 *Training Bulletin*, **3**, 1-8.
- 15 Helgeson, V.S. (1993). Two important distinctions in social support: Kind of support
16 and perceived versus received. *Journal of Applied Social Psychology*, **23**, 825-845.
- 17 Holt, N.L. and Hogg, J.M. (2002). Perceptions of stress and coping during preparations
18 for the 1999 women's soccer World Cup finals. *The Sport Psychologist*, **16**, 251-271.
- 19 House, J.S. and Kahn, R.L. (1985). Measures and concepts of social support. In *Social*
20 *Support and Health* (edited by S. Cohen and S.L. Syme), pp. 83-108. New York:
21 Academic.

- 1 Hu, L. and Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure
2 analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*,
3 **6**, 1-55.
- 4 Jaccard, J., Turrisi, R. and Wan, C.K. (1990). *Interaction Effects in Multiple Regression*
5 (Quantitative Applications in the Social Sciences No. 72). Newbury Park, CA: Sage.
- 6 Jones, G. (1995). More than just a game: Research developments and issues in
7 competitive anxiety in sport. *British Journal of Psychology*, **86**, 449-478.
- 8 Jöreskog, K.G. (1993). Testing structural equation models. In *Testing Structural*
9 *Equation Models* (edited by K.A. Bollen and J.S. Long), pp. 294-316. Newbury Park,
10 CA: Sage.
- 11 Jöreskog, K.G. and Sörbom, D. (1993). *LISREL 8 User's Reference Guide*. Chicago, IL:
12 Scientific Software International.
- 13 Krause, N. (1995). Assessing stress-buffering effects: A cautionary note. *Psychology*
14 *and Aging*, **10**, 518-526.
- 15 Lakey, B. and Cohen, S. (2000). Social support theory and measurement. In *Social*
16 *Support Measurement and Intervention: A Guide for Health and Social Scientists*
17 (edited by S. Cohen, L.G. Underwood and B.H. Gottlieb), pp. 29-52. New York: Oxford
18 University Press.
- 19 Leventhal, E.A., Suls, J. and Leventhal, H. (1993). Hierarchical analysis of coping:
20 Evidence from *attention and Avoidance*. (edited by H.W. Krohne), pp. 71-99. Seattle,
21 WA: Hogrefe & Huber.

- 1 Madden, C.C., Kirkby, R.J. and McDonald, D. (1989). Coping styles of competitive
2 middle distance runners. *International Journal of Sport Psychology*, **20**, 287-296.
- 3 McCaffrey, N. and Orlick, T. (1989). Mental factors related to excellence among top
4 professional golfers. *International Journal of Sport Psychology*, **20**, 256-278.
- 5 McClelland, G.H. and Judd, C.M. (1993). Statistical difficulties of detecting interactions
6 and moderator effects. *Psychological Bulletin*, **114**, 376-390.
- 7 Rees, T. and Hardy, L. (2000). An investigation of the social support experiences of
8 high-level sports performers. *The Sport Psychologist*, **14**, 327-347.
- 9 Rees, T. and Hardy, L. (2004). Matching social support with stressors: Effects on factors
10 underlying performance in tennis. *Psychology of Sport and Exercise*, **5**, 319-337.
- 11 Rees, T., Hardy, L., Ingledew, D.K. and Evans, L. (2000). Examination of the validity of
12 the social support survey in confirmatory factor analysis. *Research Quarterly for*
13 *Exercise and Sport*, **71**, 322-330.
- 14 Rees, T., Ingledew, D.K. and Hardy, L. (1999). Social support dimensions and
15 components of performance in tennis. *Journal of Sports Sciences*, **17**, 421-429.
- 16 Richman, J.M., Hardy, C.J., Rosenfeld, L.B. and Callanan R.A.E. (1989). Strategies for
17 enhancing social support networks in sport: A brainstorming experience. *Journal of*
18 *Applied Sport Psychology*, **1**, 150-159.

- 1 Rosenfeld, L.B. and Richman, J. M. (1997). Developing effective social support: Team
2 building and the social support process. *Journal of Applied Sport Psychology*, **9**, 133-
3 153.
- 4 Sarason, B.R., Sarason, I.G. and Pierce, G.R. (1990a). *Social Support: An Interactional*
5 *View*. New York: Wiley.
- 6 Sarason, B.R., Sarason, I.G. and Pierce, G.R. (1990b). Traditional views of social
7 support and their impact on assessment. In *Social Support: An Interactional View*
8 (edited by B.R. Sarason, I.G. Sarason and G.R. Pierce), pp. 9-25). New York: Wiley.
- 9 Sarason, I.G., Sarason, B.R. and Pierce, G.R. (1990). Social support, personality and
10 performance. *Journal of Applied Sport Psychology*, **2**, 117-127.
- 11 Scanlan, T.K., Stein, G.L. and Ravizza, K. (1991). An in-depth study of former elite
12 figure skaters: III. Sources of stress. *Journal of Sport & Exercise Psychology*, **13**, 103-
13 120.
- 14 Schutz, R.W. and Gessaroli, M.E. (1993). Use, misuse, and disuse of psychometrics in
15 sport psychology research. In *Handbook of Research on Sport Psychology* (edited by
16 R.N. Singer, M. Murphey and L.K. Tennant), pp. 901-917. New York: Macmillan.
- 17 Shook, C.L., Ketchen, Jr, D.J., Hult, G.T.M and Kacmar, K.M. (2004). An assessment
18 of the use of structural equation modeling in strategic management research. *Strategic*
19 *Management Journal*, **25**, 397-404.
- 20 Steiger, J.H. (1990). Structural model evaluation: An interval estimation approach.
21 *Multivariate Behavioral Research*, **25**, 173-180.

- 1 Tabachnick, B.G. and Fidell, L.S. (1996). *Using Multivariate Statistics*. New York:
2 HarperCollins.
- 3 Tucker, L.R. and Lewis, C. (1973). A reliability coefficient for maximum likelihood
4 factor analysis. *Psychometrika*, **38**, 1-10.
- 5 Udry, E. (1996). Social support: Exploring its role in the context of athletic injuries.
6 *Journal of Sport Rehabilitation*, **5**, 151-163.
- 7 Veiel, H.O.F. (1992). Some cautionary notes on buffer effects. In *The Meaning and*
8 *Measurement of Social Support* (edited by H.O.F. Veiel and U. Baumann), pp. 273-289.
9 New York: Hemisphere.
- 10 Veiel, H.O.F. and Baumann, U. (1992). *The Meaning and Measurement of Social*
11 *Support*. New York: Hemisphere.
- 12 Watson, D. and Pennebaker, J.W. (1989). Health complaints, stress, and distress:
13 Exploring the central role of negative affectivity. *Psychological Review*, **96**, 234-254.
- 14 Weinberg, R. S. (1990). Anxiety and motor performance: Where to go from here?
15 *Anxiety Research*, **2**, 227-242.
- 16 Wethington, E. and Kessler, R. C. (1986). Perceived support, received support and
17 adjustment to stressful life events. *Journal of Health and Social Behavior*, **27**, 78-89.
- 18 Wheaton, B. (1985). Models for the stress-buffering functions of coping resources.
19 *Journal of Health and Social Behavior*, **26**, 352-364.

- 1 Williams, J.M. (2001). In *Handbook of Sport Psychology* (edited by R.N. Singer, H.A.
2 Hausenblas and C.M. Janelle), 2nd ed., pp. 766-786. New York: Wiley.
- 3 Wills, T.A. and Shinar, O. (2000). Measuring perceived and received social support. In
4 *Social Support Measurement and Intervention: A Guide for Health and Social Scientists*
5 (edited by S. Cohen, L.G. Underwood and B.H. Gottlieb), pp. 86-135. New York:
6 Oxford University Press.
- 7 Woodman, T. and Hardy, L. (2003). The relative impact of cognitive anxiety and self-
8 confidence upon sport performance: A meta-analysis. *Journal of Sports Sciences*, **21**,
9 443-457.

Table 1

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

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

^aStepwise change in R^2 . ^bCumulative R^2 . ^cProbability of F for ΔR^2 . ^dUnstandardised regress coefficient in final equation. ^eProbability 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.

^aStepwise change in R^2 . ^bCumulative R^2 . ^cProbability of F for ΔR^2 . ^dUnstandardised regression coefficient in final equation. ^eProbability of t for b .