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Psychosocial determinants of dimensions of performance

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PSYCHOSOCIAL DETERMINANTS OF DIMENSIONS

OF PERFORMANCE



Thesis submitted to the University of Wales in fulfilment of the requirements for the degree of Doctor of Philosophy at the School of Sport

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Summary

This thesis examined some of the psychosocial determinants of performance. It is presented as a series of four interrelated research papers, which constitute the four main studies undertaken. These are preceded by a general introduction and succeeded by a general discussion. Study one concerned the issue of multidimensional performance assessment in sport. Specifically, it reported confirmatory factor analyses of a measurement instrument for tennis performance, first reported in Rees, Ingledew and Hardy (1999). Generally, the results provided support for the seven-factor structure of the instrument. Study two concerned the assessment of social support in sport. Specifically, it reported confirmatory factor analyses of the Social Support Survey (SSS) (Richman, Rosenfeld, & Hardy, 1993), which has been increasingly used in sport. The results of a multitrait-multimethod analysis suggested that the structure of the SSS could be modelled. However, criticisms were levelled at the rationale behind the design. content and construction of the SSS. It was concluded that caution should be exercised in using this instrument in research and applied settings. Study three reported qualitative analyses of in-depth interviews with high-level athletes regarding their social support experiences. Grounded Theory Analysis indicated a four-dimensional model of social support, with specific quotes informing the construction of a questionnaire for study four. Study four represented the culmination of the preceding three studies. It examined the effects of stressors and social support upon performance. The refined performance measure and a measure of social support derived from study three were used, as well as sport-specific stressors. Stressors and social support dimensions were matched in order to examine the main and stress-buffering effects of social support upon performance. Moderated hierarchical regression analyses revealed significant main and stressbuffering effects of social support upon performance. Implications for future research and applied practice are derived from the four studies.

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Chapter 1: Introduction

The importance of social aspects in sport psychology should not be underestimated, not least because almost all sporting activity is social activity (Gill, 1986). In essence, the orientation of social psychology is where psychology ends and sociology begins. It covers a number of areas, of which two of the most widely cited are group cohesion and leadership. Another area of social psychology which could be very important, but which has been studied in sport only to a limited extent is that of social support. Hardy & Jones (1994) and I. G. Sarason, Sarason, & Pierce (1990) have argued for the need to conduct more research into the influence of social support in many aspects of sport psychology, including that of performance, the link with the former until recently (Rees, Ingledew, & Hardy, 1999) having had almost no empirical base.

The goal of this thesis is primarily to create a better understanding of the influence that social support might exert upon sports performance. The thesis achieves this goal by the following means: it examines the experiences of high-level sportspeople through interviews; it deals with issues of measurement of social support and performance, both of which have been highlighted as areas in need of structured research; and it examines the main and stress-buffering effects of social support upon performance, with a view to these giving a greater insight into the mechanisms of influence of social support.

Social Support in Sport

Research in sport has generally regarded social support as a good thing. Unfortunately, anecdotal evidence suggests that those involved in elite-level sport do

not necessarily hold the same view, and sometimes denigrate the use of social support. The prevailing attitude is that athletes often feel they must "go it alone" (Hardy, Jones & Gould, 1996, p. 234) in their pursuit of success and not seek out social support in times of need. Based on current knowledge, researchers have, nonetheless, suggested that athletes should be encouraged to be proactive in their use of social support (e.g. Richman, Hardy, Rosenfeld & Callanan, 1989) and not consider such action a sign of weakness (Hardy et al., 1996). From the viewpoint that social support could have a critical influence on sports performance, specific suggestions have been directed at those involved in sport to actively enhance their network of supportive others (Hardy & Crace, 1991). Furthermore, Rosenfeld and Richman (1997) have proposed specific strategies, based upon their eightdimensional model of social support (see Richman, Rosenfeld & Hardy, 1993), for developing social support within team settings.

Despite the recommendations for research into social support in sport (e.g. Hardy & Jones, 1994; I. G. Sarason et al., 1990), and despite the wealth of evidence pertaining to the beneficial effects of social support from mainstream social psychology (for reviews, see, for example, Cohen, 1988; Heitzmann & Kaplan, 1988; B. R. Sarason, Sarason & Pierce, 1990b; Veiel & Baumann, 1992c), there has been comparatively little research on social support in sport. The following examples give an insight into social support research in sport to date.

Social support has been empirically linked to group cohesion. Westre and Weiss (1991) found that players who considered their coaches to provide high levels of social support also perceived their teams to have higher levels of task cohesion. The concept "seeking social support" has been considered a coping strategy for dealing with competitive stress (Crocker, 1992) and slumps in performance

(Madden, Kirkby & McDonald, 1989). Social support has also figured prominently in the burn-out literature. Gould, Tuffey, Udry & Loehr (1996) found that as the competitive nature of tennis increased, players' support diminished, leading to a decreased ability to combat stress. Social support has also been suggested to play a role in both the aetiology of, and recovery from, injury (e.g. Hardy, Richman & Rosenfeld, 1991; Udry, 1996), and in vulnerability to injury (Smith, Smoll & Ptacek, 1990). In studies of leadership styles (for a review, see Chelladurai, 1993) players' perceptions of the socially supportive nature of their coach have been found to have an effect on players' satisfaction with the coach's leadership. Players' perceptions of, and preferences for, more socially supportive leadership from the coach have also been affected by players' age and ability.

I. G. Sarason et al. (1990) convincingly argued that social support might directly affect sports performance. For example, they suggested that a performer might pull out of a batting slump simply due to the knowledge that a coach would be available to provide technical support. There is at present little empirical evidence to support such a link, although Weiss and Friedrichs (1986) did find that the social support dimension of the Leadership Scale for Sports (Chelladurai & Saleh, 1978, 1980) was negatively associated with win/loss percentage. Rees et al., (1999) speculated a link between social support and performance in tennis using the Interpersonal Support Evaluation List (ISEL) (Cohen, Mermelstein, Kamarck, & Hoberman, 1985), and they found main effects for specific functional dimensions of support on certain dimensions of performance.

Although there is at present only a limited number of studies examining the influence of social support in sport, there appears to be a general consensus that being supported can be very beneficial. Conversely, the effects of being isolated from

support are potentially negative. However, it is also possible to view social support as being potentially detrimental. For example, a junior sportsperson could view the receipt of certain types of social support from parents as pressure; overly supported sportspeople might find that they do not fully develop their own coping strategies; a sportsperson who seeks emotional support to deal with a setback, but who instead receives critical instructional advice may be irritated by the support. In mainstream social psychology, Krause (1995) found that, in dealing with the effect of financial concerns on depressive symptoms, a certain amount of emotional support was beneficial up to a point, but higher levels of emotional support led to increases in depressive symptoms. In this case, it may be reasonable to assume that a certain amount of emotional support would be welcomed by the person undergoing financial strain. However, the reality is that what this person really needs is tangible financial help. Further increases in emotional support do not match this person's specific, current needs and may eventually become a source of irritation.

In view of the lack of research in sport, and in particular the area of performance, there is an urgent need for more research in this area. To obtain a greater understanding, researchers would do well to draw upon the large research base on social support in mainstream social psychology, which may transfer to the sporting setting.

Social Support in Mainstream Social Psychology

Social support has been noted alongside stress and coping as one of the three most important constructs in mental health research (Veiel & Baumann, 1992b), and has been the most frequently studied psychosocial resource (Thoits, 1995). The potential beneficial influence of social support has been implicated in the aetiology of physical disease and mortality, and psychological distress and mental disorder (for

reviews, see, for example, Cohen, 1988; Heitzmann & Kaplan, 1988; B. R. Sarason et al., 1990b; Veiel & Baumann, 1992c). However, despite an ever-increasing literature base, research into social support in mainstream social psychology has been largely atheoretical, stemming from what almost appears a "conceptual agnosticism" (Veiel & Baumann, 1992a, p. 317). As a result, it suffers serious limitations, which also have implications for social support research in sport.

Firstly, there is an urgent need to tackle the issue of measurement of social support (House & Kahn, 1985); and secondly, there is a need to generate a greater understanding of how this social support might exert its influence (Thoits, 1995). If research in sport and mainstream social psychology is to further the understanding of the influence of social support and maximise its potential in applied contexts, it is imperative that it addresses these major limitations in the area.

Measurement of Social Support

In summarising the state of social support research at that time, House and Kahn (1985) wrote, "measurement in this area is still in a fairly primitive state" (p.102). The picture does not appear to be much clearer today. Vaux (1992) noted, among other points, concerns regarding the psychometric properties of social support measures and the plethora of different measures, which have made synthesis of findings difficult. Underpinning these points is the difficulty of measuring a construct, which has no clear definition. As Veiel and Baumann (1992b) noted, "if asked, almost every researcher in the field will present a more or less precise definition of support, but, more than likely, it will be different from that of his or her colleagues" (p.3). The proliferation of research into the area of social psychology that could be said to come under the rubric of social support has meant that studies assessing social support have used various terms to describe the construct (or aspects

of the construct), including: network size, social integration, quantity and quality of relationships, social resources, availability and satisfaction of support, received versus perceived support, and structural versus functional components of support (for reviews, see Cohen, 1988; Heitzmann & Kaplan, 1988; B. R. Sarason et al., 1990b; Veiel & Baumann, 1992c). Such diversity has not helped in creating a clear consensus as to what constitutes social support, how to measure it, and what to measure.

A major issue has surrounded the functional dimensionality of social support. There is no absolute consensus as to whether social support should be conceptualised as a multidimensional or a unidimensional construct (Heitzmann & Kaplan, 1988). Whilst there is probably wider agreement that social support be viewed as a multidimensional construct, argument exists over how many dimensions might comprise social support (Cutrona & Russell, 1990). Furthermore, those still dissatisfied with current conceptualisations of the functional dimensionality of social support (e.g. B. R. Sarason, Sarason, & Pierce, 1990c; Sarason, Shearin, Pierce, & Sarason, 1987) do not necessarily accept that it is more useful to conceptualise social support as a multidimensional as opposed to a unidimensional construct. It has been argued that the essence of support is best reflected in terms of "knowing that others love us and would willingly do for us what they can" (Sarason et al., 1987, p. 830). In essence, this implies a unidimensional or overall sense of being supported, and criticism (e.g. B. R. Sarason et al., 1990c; Sarason et al., 1987) levelled against the theory underpinning multidimensional measures of support largely concerns the belief that social support is really all about some general sense of being loved and cared for. This line of reasoning is bolstered by concerns regarding the psychometric properties of the majority of functional measures, which frequently contain overly

high correlations between dimensions (B. R. Sarason et al., 1990c), suggesting an undifferentiated structure. However, it has been demonstrated in confirmatory factor analysis with the Interpersonal Support Evaluation List (ISEL) (Cohen, Mermelstein, Kamarck & Hoberman, 1985) that such correlations can be accounted for by the introduction of a higher order factor (e.g. Brookings & Bolton, 1988). At a conceptual level, there is still evidence that support should be broken down into dimensional components. For example, Cohen, (1992) noted that "having someone who would loan you money may be useful in the face of a temporary job loss, but useless in the face of the death of a friend" (p. 112), and in sport, Rees et al. (1999) found differential relationships between different support dimensions and specific performance components.

Despite these encouraging results, Rees et al. (1999) raised concerns regarding the content validity of the measure they had used for the measurement of social support. They tempered the findings of their study by questioning the applied relevance to sport of the measure. Rees et al. used the ISEL (Cohen et al., 1985), a measure of perceived functional social support, with a confirmed factor structure (Brookings & Bolton, 1988). However, the questions posed by the ISEL are concerned with general everyday support issues, and do not account for the specific support issues which might be relevant to high-level sportspeople. Whilst it is necessary for a measure of social support to have structural validity, taking a measure directly from mainstream psychology may not help us to understand the specific support experiences of sportspeople. Rather, in sport, there is a need to look at the specific support transactions a sportsperson might experience with coaches, other players, sport psychologists and trainers alongside friends and family in dealing with the stresses and strains of high-level sport.

Measurement of social support is a primary issue for sport and mainstream social psychology alike. In tackling this issue, researchers will need to consider issues such as the psychometric properties of measures, the dimensionality of social support, context specificity, and ultimately what sort of social support it is that they are trying to measure. Beyond the issue of measurement, these is at present little understanding of the processes by which support might exert its influence.

The Processes of Social Support Influences

Thoits (1995) noted that the processes and intervening mechanisms of social support influences are a fundamentally important area for social support research, but that they have so far received little attention. This may be partly due to the fact that there is also little consensus as to a precise definition of what constitutes social support.

The lack of understanding of how social support exerts its influence is in all probability due to the way that initial research has proceeded in this area, and the way the field has grown. Awareness of the social support construct became more explicit in the research of the 1970s. However, since that time, whilst empirical associations between social support and health outcomes have been observed, the field has remained largely atheoretical. Veiel and Baumann (1992b) have argued that this may be because social support has been regarded as a general and directly beneficial quality of social relationships, its philosophical roots being found in postulates about basic human requirements. Aetiological models of social support on health outcomes have therefore not needed to refer to elaborate theories to explain empirical associations. It is possible that this has led to the proliferation of simplistic research, which has not been required to deal with intricate mechanisms or processes,

as well as to enthusiastic acceptance of such simple research paradigms. The legacy of such a position is summed up by Veiel and Baumann:

As tends to happen when ideas and concepts turn into scientific paradigms, the support paradigm has ceased to be seen as needing justification, and support measures are now routinely included in assessment batteries for no other reason than to "cover" it (pp. 1-2).

Cohen (1988) had also noted that despite encouraging links between social support and health, the process of how social support exerts its influence was largely unknown. He attempted to address this issue by outlining psychosocial process models of the link between social support and health outcomes. Rees et al. (1999) used Cohen's models in speculating hypotheses about the effects of social support on performance in tennis, and did find simple associations between social support and performance. For example, following Cohen's models and the comparisons of support measures given by Cutrona and Russell (1990), it was concluded that appraisal support, which referred to support in the form of advice and discussion, might have functioned to provide advice which directly influenced performance. This advice might have consisted of information about the opponent or information regarding certain tactics and game plans. Appraisal might have also helped the player to stay positive in the face of stressful tension. Belonging support, which referred to support in the form of identification with a social network, might have led to less despondency and anxiety, and to increased positive affect, thereby preventing the player from feeling flat. The positive thought patterns associated with belonging support might have also increased the likelihood of the player experiencing elements of flow. Following the guidelines for social psychology research suggested by Carron (1988) and Zanna and Fazio (1982), Rees et al. suggested that future research might go beyond looking for a simple relationship between social support and performance

to examining possible moderating effects and mediating processes that might explain social support effects.

Cohen (1988) suggested that social support might serve two primary functions: firstly, to influence health directly, in a main effects model; and secondly, to moderate the effect of stress on symptomatology. This is referred to as the stressbuffering hypothesis, by which it is meant that "support 'buffers' (protects) persons from the potentially pathogenic influence of stressful events" (Cohen, p. 278). Given the extensive literature on stress and performance in sport, it would seem reasonable to examine whether support buffers the effect of stress upon performance. It would also seem reasonable to examine whether support exerts an effect on performance, independent of stressors.

To provide an appropriate test of the stress-buffering hypothesis one would need a multidimensional measure of functional support, which taps supportive elements that might match the needs elicited by the specific stressor under consideration (Cohen & Wills, 1985). The concept of optimal matching (Cutrona & Russell, 1990) highlights the need to move away from the use of aggregate measures of stress and support to carefully matching specific stressors with specific functional social support. By discovering optimal stress and support combinations, it might be possible to understand more clearly how stress can be harmful and how support can protect people from this harm (Cutrona & Russell). It makes intuitive sense that the specific stressors faced by athletes may require specific types of support to buffer them, and this concept of matching stressors with support (Cutrona & Russell) potentially applies to all areas of life. For example, the person coping with the immediate effects of bereavement probably requires emotional support to aid the coping process, rather than the tangible gift of money. However, such intuition needs to be supported by rigorous research employing sound measurement procedures.

It is imperative that future research into social support includes a greater search for theory behind effects on outcomes. Specifically, it might attempt to examine the mechanisms of influence, main and stress-buffering effects, and the concept of optimal matching of stress and support functions.

Rees et al. (1999) also highlighted the fact that effects of social support on performance would not have been observed had they used a measure of performance that only accounted for winning and losing. Whilst the performance dimensions did themselves distinguish winners from losers, significant associations were found only for the social support dimensions with some of the dimensions of their differentiated performance measure, but not with a win/loss dependent variable. They concluded: "This exploratory research, therefore, has identified effects of the social support dimensions...upon performance that are only apparent when attention is paid to the components of performance" (Rees et al., p. 428).

Measuring Performance

The need for more reliable and valid measurement of performance has been identified as an important future research issue for sport psychology (Gould & Krane, 1992; Hardy & Jones, 1990; Jones, 1995). In performance assessment, studies have often focused on outcome measures, such as winning versus losing. For example, in Gould, Petlichkoff, and Weinberg (1984), performance in wrestling bouts was measured solely in terms of winning and losing. Gould, Petlichkoff, Simons, and Vevera (1987) argued that such performance measurement is not standardised, because the standard of the opponent differs from bout to bout, making valid comparisons across bouts tenuous. In tennis, this is also true: one may play well one day, but lose to a higher-ranked opponent; conversely, one may play poorly, but win an easy match. As Weinberg (1990) noted, focusing solely on the outcome may mask the quality of the performance, and so does not necessarily reflect how well an individual has performed.

An alternative approach is to use multidimensional process rather than outcome measures, as process measures may better reflect the task complexity of different sports. Attention to such processes has paid dividends in research into the effects of anxiety on performance (Parfitt, Jones, & Hardy, 1990). By using such multidimensional process measures of performance, as opposed to outcome measures, one might be able to further speculate as to the potential processes or mechanisms underlying social support effects. Furthermore, by using sport-specific measures of stressors and social support, by carefully matching stressors with support functions, and by testing for both main effects and stress-buffering relationships, one might be able to speculate on how the different aspects of social support exert their effects on performance.

Research Methods

The present thesis employed both quantitative and qualitative methods in the design and analysis of the studies. Specifically, studies 1, 2 and 4 used quantitative methods with numerical data, based upon large sample sizes, affording the opportunity to model statistical relationships between the variables of interest. Study 3 used a qualitative method with non-numerical data, affording the opportunity to analyse in greater depth the experiences and insights of just 10 high-level performers. The findings of this qualitative study were used to inform the construction of a questionnaire for use in further quantitative analyses in study 4.

The debate concerning the use of quantitative and qualitative methods in sport psychology has been well documented (see, for example, Locke, 1989; Martens, 1987; Schutz, 1989; Siedentop, 1989). In this thesis, the merits and demerits of each method were noted before employment, and some of those issues will be highlighted in the following, related discussion of nomothetic and ideographic designs (see, for example, Vanden Auweele, De Cuyper, Van Mele, & Rzewnicki, 1993). The use of nomothetic designs in sport psychology research allows the researcher to become familiar with certain consistencies across groups of people. These consistencies give such methods the strength to confer on the generalisability of the results and the applied implications thereof. In the present thesis, the use of such nomothetic methods was entirely reasonable and proper, and in fact was in all probability the best way to address the research question of primary interest. For example, throughout this thesis the issue of measurement is highlighted, both of social support and of performance. Issues of measurement are important both to researchers and to applied practitioners. In sport psychology, we need better measurement if we are to be more confident in our interpretations of the results of research and the needs of performers. According to classical psychometric theory, in order to best refine such measurement, one should use a broad sample from the population of interest and analyse the responses of that sample. Trends and consistencies found in that data then afford us greater confidence in informing future research, measurement and application. Quantitative data also allow us to create statistical models of relationships between the phenomena of interest, based upon probability, for example in statistically modelling the stress-buffering interaction of social support and stressors in study 4.

There are, of course, limitations to such an approach that should be noted, of which the primary concerns are reductionism and a reliance on inter-individual designs. By creating research designs to pinpoint specific elements of phenomena, such as that of social support buffering stress, there is a danger that the phenomena of interest is so reduced, that its meaning is isolated from the context of the person as a whole. As Martens (1987) noted, "we will not come to understand... [phenomena] ...by reducing them to their simplest components" (p. 43). Any generalisation, based upon the results of nomothetic research could then be regarded as lacking contextual meaning. Thus, this might suggest we are missing the whole picture, and should consider more holistic approaches.

In study 3, a qualitative design was used to examine the experiences of social support of high-level performers. This study involved a detailed analysis of in-depth interviews that unearthed a very rich source of non-numerical data. In a sense, this involved an in-depth study of individuals. However, it cannot be argued to be strictly ideographic or intraindividual in approach. Whilst the uniqueness within the individual and his/her experiences was sought, consistencies across all ten performers interviewed in this study were also sought. Furthermore, the results informed generalisation to other high-level performers regarding the applied implications of the study. Such a search for consistencies (or laws) across individuals (the study of a group) constitutes nomothetic research. Whilst this information is interesting, the problem in adopting this approach is that, across all four studies, unique, valuable information may have been lost or "washed out," that might have been highlighted using more ideographic, intraindividual approaches.

The argument for the use of more ideographic intraindividual research in sport psychology is inspired by the view that, since the population of high-level

(elite) performers is relatively small, the use of ideographic designs is more pertinent than the employment of nomothetic designs (Vanden Auweele et al., 1993). This mirrors Martens' (1987) view: "practising sport psychology is characterised by its concern with helping athletes and coaches, and with the need to focus on the whole person in order to do so" (p. 31).

Criticism of the ideographic approach largely focuses on its lack of generalisability - one cannot generalise from one unique performer to any other performers. Unique effects are unique, and as such cannot be used to generalise externally. Of course, proponents of ideographic research hold the view that such research does still have external validity, just that this is more a function of the reader than the methodology itself. Locke (1989) noted, "most readers have little difficulty recognising situations that are parallel to their own" (p. 12). It is still questionable, however, how much such information would be useful to applied practitioners within sport psychology to speculate from ideographic research on one performer to a different performer. On the other hand, ideographic designs used solely for one performer, such as in performance profiling (Butler & Hardy, 1992) would still be a useful applied tool. Indeed, it would appear that ideographic approaches tend to be advocated by sport psychologists who have a more applied than theoretical focus to their work. The main point that should be stressed is that a reliance or insistence on the sole use of either a nomothetic or ideographic approach to research would probably present an incomplete picture.

Summary

This introduction was designed to give an insight into the state of social support research in sport and mainstream social psychology to date. Whilst it was recognised that researchers in this area have generally regarded social support as a good thing, the introduction also highlighted a number of issues and limitations of research in the area, which are reiterated in the following lines. In sport, there is an urgent need for more research, especially in the area of performance. The lack of quality measurement of social support is an important issue for sport and mainstream social psychology alike, with a need to focus upon the psychometric quality of measures, the issue of dimensionality in measures and context-specificity of measures. The still rather atheoretical nature of social support research to date highlights an urgent need to focus on generating an understanding how social support exerts its influence. This may involve examining social support processes, the main and stress-buffering effects of social support, and the concept of optimal matching of specific stressors with specific functional support. Finally, the development of more sensitive, multidimensional performance measures is needed, and this may aid understanding of the processes by which social support exerts its influence.

Structure of The Thesis

This thesis was written as a series of interrelated research papers, each presented as a separate chapter, which constitute the four main studies undertaken. Consequently, there is a degree of overlap in the content of different chapters. Chapter one is an introduction to the thesis. It gives an overview of the subject areas, provides an understanding of the major issues and limitations of the areas, and provides a rationale for the direction of the research in the thesis. Chapter two deals with the issue of performance assessment in sport. Specifically, it reports confirmatory factor analyses of an instrument for measuring tennis performance, first reported in Rees, Ingledew and Hardy (1999). Chapter three deals with the issue of social support assessment in sport. Specifically, it reports confirmatory factor analyses of the Social Support Survey (Richman, Rosenfeld, & Hardy, 1993), using a multitraitmultimethod model. Chapter four examines the actual social support experiences of sportspeople. Specifically, it reports qualitative analyses of in-depth interviews with high-level athletes regarding their social support experiences, using Grounded Theory Analysis. Chapter five represents the culmination of the preceding three studies. It reports a study which examines the effects of different stressors and social support upon performance. It uses the refined performance measure examined in chapter two and a measure of social support derived from study three. It also uses sport-specific stressors. It reports the matching of stressors and social support with both main and stress-buffering effects for social support upon performance. Chapter six contains an overall discussion of the thesis. It draws the findings of the previous chapters together, and discusses the limitations and implications for future research and applied practice of these findings.

¹Chapter 2: Performance Assessment in Sport: Formulation, Justification, and Confirmatory Factor Analysis of a Measurement Instrument for Tennis Performance

Abstract

The present study reports the refinement and confirmatory factor analysis of a performance assessment instrument designed for tennis, first reported in Rees, Ingledew, and Hardy (1999). Background and justification for this study are reported, together with a detailed description of the sequential model-testing approach (Jöreskog, 1993) adopted. The factor structure of the instrument was tested using a sample of 155 fulltime tennis players. Analyses revealed good fit for the proposed model to the new data sample, and provided confirmation for the seven performance factors: Execution of (Flexible) Plan; Loss of Composure; Feeling Flat; Determination; Worry; Flow; and Effective Tactics. Performance factors discriminated between winners and losers. Performers should look at the various factors comprising overall performance - in a sense, the processes by which they come to achieve their successes.

¹This chapter has been submitted for publication, and is currently in press.

Rees, T., Hardy, L., & Ingledew, D. K. (in press). Performance assessment in sport: Formulation, justification, and confirmatory factor analysis of a measurement instrument for tennis performance. Journal of Applied Sport Psychology.

Introduction

The need for more reliable and valid measurement of performance has been identified as an important future research issue for sport psychology (Gould & Krane, 1992; Hardy & Jones, 1990; Jones, 1995). In performance assessment, studies have often focused on outcome measures, such as winning versus losing. For example, in Gould, Petlichkoff, and Weinberg (1984) performance in wrestling bouts was measured solely in terms of winning and losing. Gould, Petlichkoff, Simons, and Vevera (1987) argued that such performance measurement is not standardised, because the standard of the opponent differs from bout to bout, making valid comparisons across bouts tenuous. In tennis, this is also true: one may play well one day, but lose to a higher-ranked opponent; conversely, one may play poorly, but win an easy match. As Weinberg (1990) noted, focusing solely on the outcome may mask the quality of the performance, and so does not necessarily reflect how well an individual has performed.

An alternative approach to performance measurement is to use process rather than outcome measures, as process measures may better reflect the task complexity of different sports. In creating a better understanding of how stressors might affect performance, Hockey and Hamilton (1983) suggested that stressors influence performance via various subcomponents or processes. Attention to such subcomponents or processes has paid dividends in research into the effects of anxiety on performance (Parfitt, Jones, & Hardy, 1990). More recently, Vealey (1992, 1994) has also called for more process-oriented measurement in sport psychology.

Tennis has provided some examples of alternative forms of performance assessment. Daw and Burton (1994) constructed tennis performance assessment instruments to reflect a player's self-reported general observation on how well he or she <u>tends</u> to play, and to assess perceptions of performance regarding mental skills only. The United Kingdom Lawn Tennis Association's unpublished Tactical-Technical Evaluation Sheet assesses aspects of tactics and technique. Mahoney, Gabriel, and Perkins (1987) assessed the psychological skills underlying exceptional athletic performance. All these examples provide more information regarding the range of factors that might underlie tennis performance, compared to outcome measures. In the present study, a refined version of a post-match measurement tool, first reported in Rees, Ingledew, and Hardy (1999), was used to examine the factors of tennis performance. Its structural validity was assessed using confirmatory factor analysis.

The issue of performance assessment was addressed by Rees et al. (1999) in studying the effects of social support on tennis performance. Rees et al. piloted a postmatch measure of perceived performance with tournament tennis players. Principal components analysis of this measure yielded eight factors, labelled: (1) Execution of (Flexible) Plan; (2) Loss of Composure; (3) Feeling Flat; (4) Positive Tension; (5) Worry; (6) Flow; (7) Effective Tactics; and (8) Double Faults. Execution of (Flexible) Plan represented having a plan of action which was sufficiently flexible to adapt to changing circumstances. Loss of Composure represented feelings of anger and frustration. Feeling Flat represented feeling sluggish, flat, and mentally tired. Positive Tension represented combined feelings of nervousness, determination and motivation. Worry represented feelings of hesitancy and worry regarding shots. Flow represented combined feelings of playing well and feeling good. Effective Tactics represented playing tactically well. Double Faults had just one item. A sub-set of the players in the Rees et al. (1999) study had also completed the Interpersonal Support Evaluation List (Cohen, Mermelstein, Kamarck, & Hoberman, 1985), a multidimensional self-report measure of perceived functional social support, before their matches. Results demonstrated differential effects of the support dimensions on the performance factors. However, logistic regression analyses revealed no significant effects of the social support dimensions upon a winning versus losing outcome measure. Rees et al., therefore, concluded that their exploratory research had identified effects of social support upon performance that were only apparent when attention was paid to the factors which might underlie performance.

Present Study

The purpose of the present study was to refine Rees et al.'s (1999) tennis performance assessment instrument, and to test its structural validity using confirmatory factor analysis and a new sample. Similarly to Rees et al. (1999), it was also considered appropriate to examine whether players who won and players who lost differed on the confirmed factors.

Method

Scale Refinement

Initial scale refinement was based on the final principal components analysis reported by Rees et al. (1999). An item was selected for the present study if, in the Rees et al. study, it was a clear and unambiguous indicator of a factor. The following criteria were used: it had to have an absolute loading of at least .40 on one factor, and have absolute loadings at least .15 less on all other factors. In addition, as the factor Double Faults had only one item, it was removed, as such single-item factors are not generally considered good factors. This left Loss of Composure with five items, Execution of (Flexible) Plan and Flow with four items, Feeling Flat and Effective Tactics with three items, and Positive Tension and Worry with two items. Further new items were then theoretically derived and hypothesised to load on specific factors, so that each scale contained five items.

The revised instrument (Appendix I) was a 35-item checklist, reflecting the various criteria by which performance might be appraised. The instrument asked: "During this match, to what extent did you ...". Response options ranged on a 4-point scale from 0 to 3: from <u>not at all</u>; through <u>a little</u>; and <u>somewhat</u>; to <u>a lot</u>. The instrument was given to participants immediately following their matches.

Participants

Participants were 155 full-time tennis players (147 males, 8 females; mean age 22.03, <u>SD</u> 7.94 years). The players (mostly British) ranged from players in the world top 200 to players with Lawn Tennis Association ratings not less than 3.1 (regional standard). They were recruited at various Lawn Tennis Association tournaments. They completed and returned the instrument on site.

The reason for choosing such high-level performers was that at this level a minor change in performance processes can be the difference between winning and losing. With lower standard performers, for whom skill level differs so much, the various processes tapped by this study's measurement instrument may make little difference to an overall result compared to skill level and may indeed not be of particular salience. Of the 155 sets of data, two were lost, due to listwise deletion for missing values.

Confirmatory Factor Analysis

The factorial validity of the performance instrument was tested by analyses of covariance structures, using LISREL 8 (Jöreskog & Sörbom, 1993). As the instrument was refined somewhat, it would be plausible and reasonable to re-use exploratory factor analysis (EFA) on this measure. However, following initial EFA in Rees et al. (1999), the process of refinement involved theoretically deriving new items in terms of content and the pattern of item-factor loadings. To test these hypotheses, the most effective method is to use confirmatory factor analysis (CFA) (Schutz & Gessaroli, 1993), as with EFA one cannot specify specific items to load on specific factors. Jöreskog and Sörbom (1993) argued that a hypothesis that has been largely derived through exploratory procedures should be confirmed using more rigorous procedures. They also argued that most studies are to an extent both exploratory and confirmatory, and CFA procedures can be used as a model generating tool, as opposed to being simply a strict confirmatory procedure (Jöreskog, 1993; Jöreskog & Sörbom, 1993).

The sequential model testing approach recommended by Jöreskog (1993) was adopted. Maximum likelihood estimation was employed.

The overall goodness of fit of the models was tested using the chi-square likelihood ratio statistic (χ^2), Root Mean Square Error of Approximation (RMSEA), Standardised Root Mean Square Residual (SRMR), Goodness of Fit Index (GFI), and Comparative Fit Index (CFI) (see Jaccard & Wan, 1996; Jöreskog & Sörbom, 1993). The criteria for evaluation of fit proposed by Jaccard and Wan (1996) were that the CFI and GFI should exceed 0.90, SRMR should be less than 0.05, and the RMSEA should be not greater than 0.05 with a related nonsignificant <u>p</u> value for close fit. RMSEA values of .05 or less generally indicate a close fit, values up to .08 indicate a reasonable error of approximation, and one would not want to use models with values greater than .10 (Browne and Cudeck, 1993).

Single-factor models. This first stage involved testing seven separate singlefactor models corresponding to the seven performance scales. The purpose of this stage was to assess the convergent validity of the five items making up each scale. As well as examining the overall goodness of fit of the models, we examined the standardised residuals, the completely standardised factor loadings, and the modification indices for the covariances of the measurement errors. For example, a large positive standardised residual between two items would suggest that these items share more in common than the model allows; a large negative standardised residual between two items would suggest that these items share less in common than the model suggests. Similar diagnostic information is provided by the modification indices for the covariances between measurement errors.

<u>Two-factor models.</u> In the second stage of the analysis, each of the seven performance factors was paired with every other performance factor in two-factor models (a total of 21 pairings). Factors were allowed to correlate. The first purpose of this stage was to identify any ambiguous items. Therefore, as well as the overall goodness of fit of the models, the completely standardised factor loadings, the standardised residuals, and the modification indices for the covariances between measurement errors, we also examined the modification indices for the factor loadings. Large modification indices suggest that improvements in fit can be expected if items are allowed to cross-load on another factor. The second purpose was to investigate the discriminant validity of the factors. This was achieved by examining the 95% confidence interval (\pm 1.96 standard errors) around each correlation between factors. A confidence interval including 1.0 would suggest that the factors could be perfectly correlated and therefore lack discriminant validity (Anderson & Gerbing, 1988).

Based upon the diagnostic information from the single-factor and the two-factor stages, one item was deleted from each scale, and the single-factor and two-factor stages repeated with four items per scale. As a result of the process of item deletion, Positive Tension lost the item, "Feel nervous," and was renamed Determination.

<u>Full model.</u> Finally, all seven performance factors, each represented by four items, were included in a full model. This model was assessed as in the second stage.

Multivariate analysis of variance was used to test whether players who won and players who lost differed on the confirmed factors.

Results

Single-Factor Models

Factor loadings and fit statistics for the final four-item single-factor models are shown in Table 1. Factor loadings were generally high, with the exception of two that were moderately low. These were "Adapt to changing circumstances" [loaded .32 on Execution of (Flexible) Plan] and "Become aggressive" (loaded .28 on Loss of Composure). Fits for the four-item models were excellent. The weakest was Flow. Whilst the RMSEA value for Flow was fairly high (<0.10), its associated p-value was nonsignificant, suggesting the error of approximation was not significant. Apart from this, all other criteria for good fit were met for Flow. Fit statistics for the original fiveitem models are also shown.

Two-Factor Models

Fit statistics and correlations between factors for the final two-factor models are shown in Table 2. Fits were generally fairly good. The two weakest models involved the Feeling Flat factor (Feeling Flat with Determination, and Feeling Flat with Flow). For three of the correlations [Execution of (Flexible) Plan with Effective Tactics; Determination with Flow; Flow with Effective Tactics] the 95% confidence interval for the intercorrelation included figures close to 1.0, suggesting the possibility that those factors ought not to be separated. For one other correlation [Execution of (Flexible) Plan and Flow] the 95% confidence interval did indeed include 1.0. In all four of these cases, eight-item single-factor scales were tested, but provided poor fit. As a consequence of this and the fact that the items for these scales did appear to be measuring qualitatively different constructs, it was felt justifiable to maintain the distinction between these constructs.

Table 1Fits and factor loadings for single-factor models

Factor/	Loading	γ^2	d.f.	$p(\gamma^2)$	RMSEA	p value	GFI	SRMR	CFI
Items	0.000	λ		P(V)		(for	011	Sittint	UI1
						RMSEA			
						< 0.05)			
						1			
Execution of (Flexible) Plan/		1.15	2	.56	0.00	.67	1.00	0.02	1.00
Keep to a routine	.65								
Plan each point	.63								
Adapt to changing circumstances	.32								
Use breaks in play to prepare for the next point or game	.61								
(new)									
Original model with "Solve problems as they occurred"		11.52	5	.04	0.11	.10	.96	0.06	.92
Loss of Composure/		1.82	2	.40	0.00	.53	.99	0.02	1.00
Get wound up	.80								
Get angry	.88								
Let errors bother you	.64								
Become aggressive	.28								
Original model with "Fret about mistakes"		21.18	5	.00	0.17	.00	.92	0.05	.92
Feeling Flat/		0.09	2	.96	0.00	.97	1.00	0.00	1.00
Feel sluggish	.89						0.000		
Feel mentally tired	.51								
Feel lively	74								
Feel slow (new)	.68								
Original model with "Feel sharp" (new)		18.94	5	.00	0.16	.01	.93	0.06	.94
					19924321940	2142601630		(4.1.1	·· · ·

(table continues)

Factor/ Items	Loading	χ^2	d.f.	<u>p</u> (χ ²)	RMSEA	p value (i.e. RMSEA <0.05)	GFI	SRMR	CFI
Determination/		1.69	2	43	0.00	55	99	0.02	1.00
Work hard on each point	.76	1.05	-	.15	0.00	.55	.))	0.02	1.00
Feel determined (new)	.82								
Run down every ball (new)	.82								
Give up on some points (new)	49								
Original model with "Feel nervous"		2.83	5	.73	0.00	.82	.99	0.02	1.00
Worry/		0.02	2	99	0.00	99	1.00	0.00	1.00
Worry about your shots	.58	0.02	4	.))	0.00	.))	1.00	0.00	1.00
Become hesitant	.67								
Feel tense (new)	.72								
Not always think positively (new)	.65								
Original model with "Play very cautiously" (new)		4.41	5	.49	0.00	.64	.98	0.03	1.00
Flow/		4 87	2	09	0.10	17	90	0.03	90
Keep a consistent standard	.66	1.07	4	.07	0.10	.17	.90	0.05	.90
Feel good	.70								
Keep your mind on the present	.68								
Stay focused but relaxed (new)	.69								
Original model with "Enjoy yourself"		11.73	5	.04	0.11	.10	.96	0.05	.96
								(table con	tinues)
Factor/ Items	Loading	χ^2	d.f.	<u></u>	RMSEA	p value (i.e. RMSEA	GFI	SRMR	CFI
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						< 0.05)			
Effective Tactics/		1.71	2	43	0.00	55	00	0.01	1.00
Use effective strategies	.88		-		0.00	.55	.))	0.01	1.00
Employ good tactics	.92								
Keep up the pressure on your opponent	.77								
Play tactically well (new)	.91								
Original model with "Control the match" (new)	800 (S	14.57	5	.01	0.13	.04	.95	0.03	.98
Note N = 152 DMSEA = Deat Moon Course Emeral	· · · · ·	FI C	1	CD' I	1 00100		-	and the second s	

<u>Note.</u> $\underline{N} = 153$. RMSEA = Root Mean Square Error of Approximation. GFI = Goodness of Fit Index. SRMR = Standardised Root Mean Square Residual. CFI = Comparative Fit Index.

.

Table 2Fit measures for two-factor models and full seven-factor model

Scale	χ^2	d.f.	$p(\chi^2)$	RMSEA	p value	GFI	SRMR	CFI	Correlations
					(for				between factors
					RMSEA				(standard error)
					< 0.05)				
Execution of (Flexible) Plan and Loss of Composure	27.94	19	.09	0.06	.38	.96	0.06	.97	39(.09)
Execution of (Flexible) Plan and Feeling Flat	23.22	19	.23	0.04	.61	.96	0.05	.99	52(.09)
Execution of (Flexible) Plan and Determination	19.42	19	.43	0.01	.79	.97	0.04	1.00	.77(.06)
Execution of (Flexible) Plan and Worry	20.02	19	.39	0.02	.76	.97	0.05	1.00	37(.10)
Execution of (Flexible) Plan and Flow	21.80	19	.29	0.03	.68	.97	0.04	.99	.89(.06)
Execution of (Flexible) Plan and Effective Tactics	32.59	19	.03	0.07	.21	.95	0.04	.98	.88(.05)
Loss of Composure and Feeling Flat	37.84	19	.01	0.08	.09	.95	0.07	.95	.37(.08)
Loss of Composure and Determination	26.65	19	.11	0.05	.44	.96	0.06	.98	39(.08)
Loss of Composure and Worry	24.04	19	.19	0.04	.57	.96	0.05	.99	.70(.06)
Loss of Composure and Flow	37.26	19	.01	0.08	.10	.94	0.07	.95	64(.07)
Loss of Composure and Effective Tactics	32.59	19	.03	0.07	.21	.95	0.07	.98	45(.07)
Feeling Flat and Determination	44.65	19	.00	0.09	.02	.93	0.06	.95	57(.07)
Feeling Flat and Worry	19.41	19	.43	0.01	.79	.97	0.05	1.00	.42(.09)
Feeling Flat and Flow	46.15	19	.00	0.10	.02	.93	0.06	.93	62(.07)
Feeling Flat and Effective Tactics	21.41	19	.31	0.03	.70	.97	0.04	1.00	32(.07)
Determination and Worry	29.95	19	.05	0.06	.30	.96	0.06	.97	31(.09)
Determination and Flow	28.74	19	.07	0.06	.35	.96	0.04	.98	.80(.05)
Determination and Effective Tactics	19.33	19	.44	0.01	.79	.97	0.03	1.00	.28(.05)
Worry and Flow	26.34	19	.12	0.05	.45	.96	0.05	.98	58(.08)
Worry and Effective Tactics	14.52	19	.75	0.00	.95	.98	0.03	1.00	48(.08)
Flow and Effective Tactics	41.82	19	.00	0.09	.04	.94	0.04	.97	.85(.04)
								1000	
Full seven-factor model	486.70	329	.00	0.05	.55	.83	0.07	.92	
Note $N = 152$									

<u>Note</u>. $\underline{N} = 153$

Full Seven-Factor Model

Fit statistics for the full seven-factor model are also shown in Table 2. The ratio of χ^2 to degrees of freedom was less than two, and the RMSEA was low enough and the CFI was high enough to feel reasonably confident about the fit of the model to the data. However, the GFI was fairly low (0.83) and SRMR marginally too high (0.07), leading to some caution in accepting the model. Completely standardised factor loadings and factor-factor correlations for the full seven-factor model are shown in Table 3.

Winners versus Losers

Multivariate analysis of variance was conducted to see whether those who won and those who lost differed on the new scales. Results (see Table 4) showed that winners and losers did differ on the scales, Hotelling's $\underline{T}^2 = .45$, $\underline{F}(7, 118) = 7.68$, $\underline{p} < .001$. Follow-up discriminant function analysis revealed that all scales were salient in this regard (i.e., standardised structure coefficients greater than 0.30 in absolute value, which Pedhazur, 1982, regards as meaningful). However, Effective Tactics, Flow, and Loss of Composure were more salient than the others. On all scales, winners had more favourable scores than losers (i.e., scored higher for scales with positive connotations, scored lower for scales with negative connotations).

Table 3

Completely standardised solution for the full seven-factor model

	Factor							
	1	2	3	4	5	6	7	
Items			Item-	factor l	oadings	5		
1. Keep to a routine	.66							
9. Plan each point	.57							
15. Adapt to changing circumstances	.42							
29. Use breaks in play to prepare for the next point or game	.57							
2. Get wound up		.79						
8. Get angry		.87						
23. Let errors bother you		.68						
30. Become aggressive		.27						
3. Feel sluggish			.82					
10. Feel mentally tired			.51					
17. Feel lively			81					
31. Feel slow			.68					
4. Work hard on each point				.75				
18. Feel determined				.86				
25. Run down every ball				.79				
32. Give up on some points				47				
					(tabl	e contin	ues)	

	Factor										
	1	2	3	4	5	6	7				
Items	Item-factor loadings										
5. Worry about your shots					.63						
14. Become hesitant					.67						
20. Feel tense					.68						
34. Not always think positively					.64						
6. Keep a consistent standard						.58					
13. Feel good						.72					
27. Keep your mind on the present						.61					
33. Stay focused but relaxed						.78					
7. Use effective strategies							.89				
12. Employ good tactics							.91				
21. Keep up the pressure on your opponent							.78				
28. Play tactically well							.91				
Factor		F	actor-fa	actor co	rrelatio	ns					
1. Execution of (Flexible) Plan	1.00										
2. Loss of Composure	39	1.00									
3. Feeling Flat	55	.38	1.00								
4. Determination	.78	40	57	1.00							
5. Worry	38	.69	.43	30	1.00						
6. Flow	.90	65	62	.79	59	1.00					
7. Effective Tactics	.88	45	49	.64	49	.85	1.00				

Table 4

Multivariate analysis comparing winners and losers on performance scales

			Standardised
	<u>M</u> (<u>S</u>	structure	
Scale	Winners	Losers	coefficient
Execution of (Flexible) Plan	7.13 (2.01)	5.92 (2.52)	.40
Loss of Composure	4.36 (2.70)	6.29 (2.87)	52
Feeling Flat	3.43 (2.81)	4.83 (3.24)	35
Determination	10.40 (2.26)	9.10 (2.62)	.40
Worry	4.09 (2.53)	5.53 (2.58)	42
Flow	8.15 (2.48)	6.12 (2.83)	.57
Effective Tactics	8.67 (2.63)	5.29 (2.87)	.92

<u>Note.</u> <u>N</u> = 126. Hotelling's \underline{T}^2 = .46, <u>F</u>(7, 118) = 7.68, <u>p</u> < .001

Discussion

The first aim of this research was to refine the original performance assessment instrument of Rees et al. (1999). This involved removal of low loading and ambiguous items, and the removal of one factor, Double Faults, which had only one item indicator. Twelve new items were then theoretically derived and hypothesised to load on specific factors, so that each scale contained five items. The revised instrument was a 35-item checklist, reflecting the various criteria by which performance might be assessed.

The second aim of this research was to test the structural validity of this refined instrument using confirmatory factor analytic procedures. The factor structure was essentially confirmed, using the sequential model testing approach. At the same time, each scale was reduced from five to the best four items. Although the test of the full model did reveal a reasonable fit to the data, the SRMR was marginally too high and the GFI was fairly low. The low GFI was probably a result of the relatively small sample size, as, whilst the GFI calculation does not explicitly use N in its calculation, it has been shown to be adversely affected by small sample sizes (Marsh, Balla, & McDonald, 1988). The relatively small sample size in this study is a natural function of a lack of tennis players of this calibre. If one were to use a lower standard, then one could more easily increase the numbers of participants. Despite this reservation, the present series of analyses demonstrate that much information about the factorial validity of an instrument can be gained using the sequential approach to model testing. Indeed, such attention to detail at the single- and two-factor stages may be more effective in helping to diagnose problems in structure than simply testing the full seven-factor structure, with its multitudinous degrees of freedom.

The third aim was to test the discriminant validity of the measurement instrument across winners and losers. As in Rees et al. (1999), the performance scales did distinguish winners from losers. In the present study, all seven performance scales were salient in this regard, although Effective Tactics, Flow, and Loss of Composure were the most salient, with winners having overall more favourable scores than losers. In light of these findings, it is interesting to speculate on the problem of disentangling cause and effect. Did players win or lose as a result of executing certain performance processes well or poorly? Or, were the answers on the measurement instruments more a reflection of the players' frame of mind (positive or negative) following a win or a loss. This is a problem for all retrospective measures, and further research is needed to confirm the current measure's predictive validity in this respect. One way to test such predictive validity might be to examine the effects upon performance of process oriented goal setting, which was based on scale scores. Certainly, were this measure to be used in an applied setting, one might argue that one should not give the player the measurement instrument immediately following a match, but wait until the player has had time to come to terms with the win or loss. Vallerand's (1987) intuitive-reflective appraisal model would suggest that, given time, the player would be able to reflect on the win or loss in a less emotional way. This may, of course, lead to problems of recall, although there is evidence that athletes can accurately recall anxiety feelings two days following a competition (Harger & Raglin, 1994).

This research and the original study by Rees et al. (1999) further point to the need for performers to look at the various factors comprising overall performance - in a sense, the processes by which they come to achieve their successes. It is potentially

problematic when a performer concentrates solely on the outcome of an event at the expense of the process by which he or she arrives at the outcome (Hardy, Jones, & Gould, 1996). After the event, a focus on outcomes, such as winning versus losing, may mask the quality of the performance (Weinberg, 1990), so that it is difficult to pinpoint areas which need improving. On the other hand, focusing on process-oriented goals has been found to lead to better concentration, increased self-efficacy, and more control over negative experiences (Kingston & Hardy, 1997). Such influences as these are thought to lead to improvements in performance and ultimately to more successful outcomes. In actuality, to reach a high level in sport, performers probably need to have a strong desire to beat the opposition and so do set outcome goals (Hardy, 1997; Hardy et al., 1996). However, process goals may help to keep the performer focused on the task at hand and in the here and now (see, for example, Hardy et al., 1996).

In light of the numerous calls for improved performance measurement in the sport psychology literature and encouraging use of multi-component performance assessment (see Introduction), future research should continue to adopt a more process-oriented and differentiated approach to performance assessment. Despite some reservations in terms of the fit of the full model, the performance measure highlighted in this study should be seen as a refinement of the measure in Rees et al. (1999). It addresses one of the concerns regarding outcome performance measurement, namely differentiation of performance factors/processes. Future research might examine the sensitivity of the measure; for example, to the use of different process oriented goals. Once validated, multidimensional performance assessment instruments such as the

present one should aid in pinpointing areas of strength and weakness, and may better explain the effects of predictor variables, such as stress and social support.

¹Chapter 3: Examination of the Validity of the Social Support Survey in Confirmatory Factor Analysis

Abstract

The Social Support Survey (SSS), validated by Richman, Rosenfeld, and Hardy (1993), is a multidimensional self-report measure of social support, tested with student athletes. The SSS contains eight dimensions of support. For each dimension of support four identical questions are posed. The SSS could therefore essentially be scored in two ways: one, to derive a score for the dimensions of support; two, to derive a score for the questions posed across all eight dimensions of support. Confirmatory factor analyses of the SSS on 416 university athletes revealed poor fits to models for the eight dimensions of support, and for the four questions across all eight dimensions of support. This problem was clarified by employing a multitrait-multimethod (MTMM) model, which led to improved model fit, but which revealed that most of the SSS items were inherently ambiguous. Caution should, therefore, be exercised in the use of the SSS as a measure of multidimensional social support.

¹ This chapter has been submitted for publication, and is currently in press.

Rees, T., Hardy, L., Ingledew, D. K., & Evans, L. (in press). Examination of the validity of the social support survey in confirmatory factor analysis. <u>Research Quarterly for Exercise and Sport.</u>

Introduction

The potential benefits for athletes of having good social support has led to active encouragement for athletes to harness this resource (e.g., Gould, Jackson, & Finch, 1993; Hardy & Crace, 1991; Richman, Hardy, Rosenfeld, & Callanan, 1989). Increasing interest in the concept of social support in sport has led to links being made with group cohesion (Westre & Weiss, 1991), coping with competitive stress (Crocker, 1992), slumps in performance (Madden, Kirkby, & McDonald, 1989), burnout (Gould, Tuffey, Udry, & Loehr, 1996), the aetiology of and recovery from injury (e.g., Hardy, Richman, & Rosenfeld, 1991; Udry, 1996), leadership styles (for a review, see Chelladurai, 1993), and performance (Rees, Ingledew, & Hardy, 1999). In this research, the definition and measurement of social support has been very varied. This same comment could also be made of social support research in mainstream psychology, and many doubts have been raised regarding the plethora of measures with psychometric limitations (e.g., Vaux, 1992). Despite the encouraging link with tennis performance found by Rees et al. (1999), the findings of their study were tempered by questions regarding the applied relevance to sport of the instrument used for the measurement of social support.

Rees et al. (1999) used the Interpersonal Support Evaluation List (ISEL) (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). The ISEL is a generic measure of perceived functional social support, which has a confirmed factor structure (Brookings & Bolton, 1988), with support dimensions relating to appraisal, belonging, self-esteem and tangible support. However, in spite of its appealing multidimensional nature and structural validity, the questions posed by the ISEL only concern general everyday support issues, and do not account for the specific support issues which might be relevant to tennis players. Whilst it is necessary for a measure of social support to have structural validity, taking a measure directly from mainstream psychology may not help us to understand the specific support experiences of sportspeople.

Another measure of multidimensional support that has been used in research in sport is The Social Support Survey (SSS). Richman, Rosenfeld, and Hardy (1993) developed this measure from a conceptualisation of support in relation to burnout (Pines, Aronson, & Kafry, 1981), based upon a model of support derived from mainstream psychology. The SSS purports to measure eight separate dimensions or forms of support (hereafter named content factors): listening support; task appreciation; task challenge; emotional support; emotional challenge; reality confirmation; tangible assistance; and personal assistance. For each content factor the following four identical questions are posed: number of providers of that support; satisfaction with that support; difficulty of obtaining more of that support; and importance to one's overall well-being of that support. (Hereafter, these will be named appraisal factors and labelled: number; satisfaction; difficulty; and importance). Earlier work with hospice personnel (Richman & Rosenfeld, 1987) and, later, with college athletes (Rosenfeld, Richman, & Hardy, 1989) provided some evidence for the concept of separating support in terms of the model of the SSS.

Richman et al. (1993) suggest that the SSS and the model it is based upon "possess high clinical utility for practitioners" (p. 304). Indeed, the SSS is a very flexible instrument, which can clearly be used in mainstream and sport psychology settings. Based on the following content and structural validity evidence Richman et al. (1993) offer some support for the eight content factors and four appraisal factors of the SSS. Content validity was provided by concluding that the SSS sufficiently covered the multiple conceptualisations of dimensional support constructs to be found in the literature. Structural validity was provided by analysis of twelve correlation matrices - eight matrices for the content factors and four matrices for the appraisal factors. These suggest that, except for number of providers, the eight content factors were fairly well distinguished, and the four appraisal questions appeared to be measuring distinct aspects of support. Richman et al. (1993) note the ability of the SSS to be used to simultaneously measure different aspects of support and do not enforce any concrete scoring format for the SSS. Nonetheless, the SSS could arguably be scored in two ways, deriving scores for the eight content factors and for the four appraisal factors. However, despite Richman et al.'s (1993) validation work, the structure of the SSS does not appear to have been tested using confirmatory factor analysis procedures.

The main issue to consider in checking the factor structure of the SSS is whether support be conceptualised as a multidimensional or unidimensional construct. For example, the essence of support has been suggested to be simply "knowing that others love us and would willingly do for us what they can" (e.g., Sarason, Shearin, Pierce, & Sarason, 1987, p. 830), and criticism (e.g., Sarason et al., 1987) has been levelled at multidimensional measures of support, both at the conceptual level, and also because many multidimensional measures contain overly high correlations between dimensions. It has been demonstrated in confirmatory factor analysis with the ISEL that such correlations can be accounted for by the introduction of a higher order factor (e.g., Brookings & Bolton, 1988). However, at a conceptual level, there is increasing evidence that support should be broken down into dimensional components. For example, Rees et al. (1999) demonstrated differential relationships between different support dimensions and specific performance components. It makes intuitive sense that specific stressors faced by athletes may require specific types of support to buffer them. This concept of matching stressors with support (Cutrona & Russell, 1990) potentially applies to all areas of life. For example, a person coping with the immediate effects of a recent bereavement may require emotional support to aid the coping process, rather than the tangible gift of money. However, such intuition needs to be supported by rigorous research employing sound measurement procedures.

The purpose of the present study was, therefore, to examine the structure of the SSS using confirmatory factor analysis. The structures to be examined were the eight-factor content structure, the four-factor appraisal structure, and a multitrait-multimethod (MTMM) structure, which combines both the two previous structures.

Method

Participants

Participants in this study were 416 college athletes, enrolled on sports science courses at two constituent colleges of the University of Wales. These athletes ranged in ability from college level to International level athletes. Due to listwise deletion for missing values, the effective sample size was reduced to 316.

The Social Support Survey (SSS)

In the present study, the questions on the SSS were slightly modified, in order to stimulate participants into giving responses that concerned their sport as well as their everyday lives. An exemplar of the modified SSS is shown in the Appendix II. Each content factor is identically assessed by providing a definition of the type of social support being assessed, followed by the same four questions relating to: number of providers of that support; satisfaction with current level of that support; difficulty of obtaining more of that support; and importance to one's overall well-being of that support. The first question asks respondents to list the initials of providers of that type of support. The last three questions are answered on a five-point scale.

<u>Analyses</u>

The factorial validity of the SSS was tested by analyses of covariance structures, using LISREL 8 (Jöreskog & Sörbom, 1993). The sequential approach to model-testing recommended by Jöreskog (1993) was adopted. Maximum likelihood estimation was employed.

Initially, the appraisal question relating to number of providers of that support was skewed for each content factor (skewness ranged from 1.160 to 3.956). This skewness was due to the answering format enforcing no upper limit on participants' responses, such that scores on this item ranged from 0 to 27, with frequencies tailing off at about 8. (This item may also have contributed to the loss of much data in listwise deletion, with respondents often leaving this item blank, instead of writing "no-one," as requested to do). To correct for skewness this item was scaled to the 5-point format of the other items, such that responses of 0 or 1 were rated 1, responses of 2 or 3 were rated 2, responses of 4 or 5 were rated 3, responses of 6 or 7 were rated 4, and responses of 8 and above were rated 5. Thereafter, only two items had skewness greater than 1. These were satisfaction with emotional support (-1.155) and importance to one's overall wellbeing of emotional support (-1.248).

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The overall goodness of fit of the models was tested using the chi-square likelihood ratio statistic (χ^2), Root Mean Square Error of Approximation (RMSEA), Standardised Root Mean Square Residual (SRMR), Goodness of Fit Index (GFI), and Comparative Fit Index (CFI) (see Jaccard & Wan, 1996; Jöreskog & Sörbom, 1993). The criteria for evaluation of fit proposed by Jaccard and Wan (1996) were that the CFI and GFI should exceed 0.90, SRMR should be less than 0.05, RMSEA should be not greater than 0.05 with a related non-significant <u>p</u> value for close fit. RMSEA values of .05 or less generally indicate a close fit, values up to .08 indicate a reasonable error of approximation, and one would not want to use models with values greater than .10 (Browne and Cudeck, 1993). The completely standardised factor loadings were also checked, to identify any low-loading items.

Single-factor models. This first stage involved testing eight separate single factor models corresponding to the eight content factors of support and four separate single factor models corresponding to the four appraisal factors of support. The purpose of this stage was to assess the convergent validity of the items making up each scale. As well as examining the overall goodness of fit of the models and the completely standardised factor loadings, this stage included examination of the standardised residuals and the modification indices for the covariances of the measurement errors. For example, a large positive standardised residual between two items would suggest that these items share more in common than the model allows; a large negative standardised residual between two items would suggest that these items share less in common than the model suggests. Similar diagnostic information is provided by the modification indices for the covariances between measurement errors.

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Paired models. In the second stage of the analysis, each of the eight content factors was paired with all the other content factors (a total of 28 pairings). Similarly, each of the four appraisal factors was paired with all the other appraisal factors (a total of 6 pairings). Factors were allowed to correlate. The first purpose of this stage was to identify any ambiguous items. Therefore, as well as the overall goodness of fit of the models, the completely standardised factor loadings, the standardised residuals, and the modification indices for the covariances between measurement errors, we also examined the modification indices for the factor loadings. Large modification indices suggest that improvements in fit can be expected if items are allowed to cross-load on another factor. The second purpose was to investigate the discriminant validity of the factors. This was achieved by examining the 95% confidence interval (⁴1.96 standard errors) around each correlation between factors. A confidence interval including 1.0 would suggest that the factors are effectively perfectly correlated and therefore lack discriminant validity (Anderson & Gerbing, 1988).

<u>Full models.</u> Full models were tested for the eight-factor structure and the fourfactor structure. We assessed the models as in the second stage.

<u>MTMM models.</u> Campbell and Fiske (1959) suggested testing the validity of models such as the one underlying the SSS using a MTMM approach. The MTMM design is almost certainly the best known procedure for detection of systematic measurement error in subjective measures in the social sciences. In MTMM designs multiple substantive traits are measured by multiple methods. The MTMM design was used in the present study, following initial analyses of the eight- and four-factor models, to account for the proposed structure of the SSS, which has the same four appraisal questions across all eight content factors. In these analyses the content factors (listening support, task appreciation, task challenge, emotional support, emotional challenge, reality confirmation, tangible assistance, and personal assistance) were considered traits, and the appraisal factors (number, satisfaction, difficulty, and importance) were considered methods; that is to say, the same four measurement methods across the eight content factors. In the LISREL MTMM model, paths were specified which related eight sets of four appraisal questions to their underlying content factors (traits). Paths were also specified which related four sets of eight identical appraisal questions to their underlying appraisal factors (methods). MTMM models are notoriously difficult to run, often providing improper solutions (Marsh & Grayson, 1995). In this study's analyses the MTMM model was initially run with correlated traits and correlated methods. However, this provided an improper solution, evidenced by excessively high factor loadings and factor intercorrelations. A proper solution was provided by running the MTMM model with uncorrelated methods (Marsh & Grayson, 1995).

Results

Single-factor Models

Fits for the single-factor models for the eight content factors of support were fairly good for most of the factors. They were not so good for listening support and task challenge. The standardised residuals, and the modification indices for the covariances between measurement errors, suggested that each of these two factors could have been split into two sub-factors comprising the items referring to number and importance, and the items referring to satisfaction and difficulty. However, the worst fit was found for reality confirmation. There was no clear indication of how this model might be improved.

Fits for the single-factor models for the four appraisal factors were also reasonable, but not good. Standardised residuals, and modification indices for covariances between measurement errors, consistently suggested that personal assistance and tangible assistance items were closely related. The fit for importance was the worst. <u>Paired Models</u>

Fits for paired models were generally very poor. For the content factors a pattern emerged whereby the standardised residuals, and modification indices for covariances between measurement errors, suggested that appraisal items wanted to link up across content factors. For example, the items to do with number of providers of that support wanted to link up with each other. For the appraisal factors fits were also poor. The worst were for those involving the satisfaction appraisal factor. This time, the standardised residuals and modification indices for covariances between measurement errors suggested that content items wanted to link up across the appraisal factors. For example, pairs of items to do with task challenge wanted to link up with each other. Full Models

Results for the eight-factor content model (see Table 1) suggested a poor fit to the data. This is evidenced by a large chi-square value relative to the degrees of freedom, and by very low CFI and GFI. There was no suggestion of ambiguity of items, that is, of items wanting to load on different factors. The standardised residuals, and the modification indices for covariances between measurement errors, suggested a systematic desire for the appraisal items to link with each other: number items with other

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number items; satisfaction items with other satisfaction items; difficulty items with other difficulty items; and importance of support items with each other.

Results for the four-factor appraisal model (see Table 1) suggested a better fit to the data than the eight-factor content model. However, the fit was still poor. The standardised residuals, and the modification indices for covariances between measurement errors, this time suggested a systematic desire for the content items to link with each other. Table 1

Goodness of fit statistics for full models and MTMM model

Model	χ^2	d.f.	<u>p</u> (χ ²)	Root Mean Square Error of Approximation	p value (i.e RMSEA <0.05)	Goodness of Fit Index	Standardised Root Mean Residual	Comparative Fit Index
Eight-factor (content) model	1856.77	436	.00	(RMSEA) 0.10	.00	.65	0.10	.54
Four-factor (appraisal) model	1640.38	458	.00	0.09	.00	.73	0.08	.62
MTMM model	704.28	404	.00	0.05	.65	.88	0.06	.90

MTMM Model

At this point, it appeared that both the eight-factor and four-factor models were unstable, each showing a tendency to revert to the other. This problem was clarified by employing the MTMM design for analysis of these models. Results for the MTMM model (see Table 1) suggested a much better fit to the data. However, the GFI was still less than 0.90, and the SRMR was still too high. Whilst further improvements could have been made to this model, only one modification would have made a significant change to the fit of the model in terms of a change in the χ^2 value. This modification index was for the path linking the measurement errors of the importance items for personal assistance and tangible assistance (modification index 50.30), adding further credence to the statement made earlier that these two items were closely related.

The MTMM model (see Figure 1) provided evidence of systematic measurement error, in terms of method effects. Figure 1 shows support content factors at the top (traits) and support appraisal factors below (methods). In structures such as the one underlying the SSS, wherein similar methods are used to measure multiple substantive traits, one would expect such a phenomenon. However, it would be desirable for the method effects to be sufficiently small to provide support for the discriminant validity of the traits. The MTMM model in the present study showed that the factor loadings for the content factors and the appraisal factors were very similar (see Table 2), leading to a conclusion that all items were somewhat ambiguous. Each item was equally influenced by both a content factor and an appraisal factor.



Completely standardised solution for the MTMM model

	174	Factor											
		1	2	3	4	5	6	7	8	9	10	11	12
Items	Measurement Error Variances					It	em-facto	or loading	gs				
1. Listening Support Number	.53	.47								.49			
2. Listening Support Satisfaction	.45	.68									.30		
3. Listening Support Difficulty	.51	.41										.57	
4. Listening Support Importance	.66	.38											.43
5. Task Appreciation Number	.51		.46							.53			
6. Task Appreciation Satisfaction	.27		.79								.33		
7. Task Appreciation Difficulty	.54		.55									.40	
8. Task Appreciation Importance	.65		.25										.54
9. Task Challenge Number	.48			.51						.52			
10.Task Challenge Satisfaction	.33			.78							.24		
11. Task Challenge Difficulty	.47			.66								.31	
12. Task Challenge Importance	.60			.37									.51
13. Emotional Support Number	.36				.57					.56			
14. Emotional Support Satisfaction	.48				.58						.43		
15. Emotional Support Difficulty	.55				.39							.55	
16. Emotional Support Importance	.49				.52								.50
17. Emotional Challenge Number	.45					.58				.47			
18. Emotional Challenge Satisfaction	.35					.75					.31		
19. Emotional Challenge Difficulty	.52					.45						.52	
20. Emotional Challenge Importance	.56					.45							.49
											(t	able con	tinues)

Table 2

							Fac	ctor					
		1	2	3	4	5	6	7	8	9	10	11	12
Items	Measurement Error Variances					It	em-facto	r loadin	gs				
21. Reality Confirmation Number	.39						.53			.57			
22. Reality Confirmation Satisfaction	.32						.66				.50		
23. Reality Confirmation Difficulty	.54						.48					.50	
24. Reality Confirmation Importance	.56						.51						.42
25. Tangible Assistance Number	.55							.44		.51			
26. Tangible Assistance Satisfaction	.39							.74			.24		
27. Tangible Assistance Difficulty	.55							.57				.35	
28. Tangible Assistance Importance	.86							.15					.34
29. Personal Assistance Number	.49								.51	.50			
30. Personal Assistance Satisfaction	.37								.73		.30		
31. Personal Assistance Difficulty	.49								.50			.51	
32. Personal Assistance Importance	.70								.41				.38
Factor						Fact	or-factor	correlat	tions				
1. Listening Support		1.00											
2. Task Appreciation		.47	1.00										
3. Task Challenge		.31	.52	1.00									
4. Emotional Support		.48	.36	.06	1.00								
5. Emotional Challenge		.34	.22	.36	.44	1.00							
6. Reality Confirmation		.28	.25	.26	.44	.38	1.00						
7. Tangible Assistance		.26	.34	.20	.42	.21	.17	1.00					
8. Personal Assistance		.24	.47	.17	.33	.22	.18	.60	1.00				
9. Number										1.00			
10. Satisfaction											1.00		
11. Difficulty												1.00	
12. Importance													1.00

<u>Note.</u> $\underline{N} = 316$.

Discussion

Tests of the models proposed by Richman et al. (1993) suggested poor fits to the data for the eight-factor content structure of support and the four-factor appraisal structure. The LISREL outputs indicated that the eight-factor model wanted to become a four-factor model and the four-factor model wanted to become an eight-factor model. This problem was clarified using an MTMM model, which fitted markedly better than the first two models. What the MTMM model demonstrated was that most of the SSS items were influenced more or less equally by both a content factor and an appraisal factor. Therefore, most items were inherently ambiguous. It would therefore be inappropriate to add up items to represent content factors because the items would be contaminated by appraisal factors. Similarly, it would be inappropriate to add up items to represent appraisal factors because the items would be content factors. This has implications for use in research and in applied practice.

In research, the poor fits for the eight-factor content model and the four-factor appraisal model imply that one cannot separate these two in analysis. Using just the eight-factor content model runs the risk of false interpretations being made, due to the influence of the appraisal factors. Using just the four-factor appraisal model runs the risk of false interpretations being made, due to the influence of the content factors. Some researchers may consider that the loadings of the appraisal factors (as methods in the MTMM analysis) are too high to feel safe about using the eight content factors as factors with genuine discriminant validity.

Richman et al. (1993) assume that it is meaningful and appropriate to consider the SSS comprising eight separate content factors based upon content or face validity and an amalgamation of previous conceptualisations of the social support construct. However, as previous conceptualisations of support have regarded the construct as being unidimensional or comprising just three or four dimensions (for reviews see Vaux, 1992; Heitzmann & Kaplan, 1988), such as the ISEL with four dimensions, further evidence is required to support the notion that the eight factors are necessary or sufficient to cover all aspects of support. It may be that, by encompassing so many of the support aspects previously noted in the literature, the SSS contains too many factors. Indeed, Richman et al. (1993) note that the eight content factors are sub-dimensions of three principal support factors: tangible; informational; and emotional support.

Given the results of the present study, can one argue that the SSS does possess high clinical utility for practitioners? On the one hand, the SSS appears to cover many interesting areas of support. However, the preceding arguments regarding issues of structural and content validity of the SSS suggest that inferences and implications for best practice based upon the model of the SSS (e.g., Hardy & Crace, 1991; Richman et al. 1989; Rosenfeld & Richman, 1997) may be mis-placed. For example, based upon the model of the SSS, Rosenfeld & Richman make suggestions for enhancing each of the eight content factors of support in sports teams to aid team-building, and Hardy and Crace describe the types of support sportspeople need. The present study suggests it may be difficult to pin-point any factor without ambiguity. If one were to take each of the 32 original items in the SSS on its own merit, it is difficult to interpret whether the score on each item is specifically due to the content factor or the appraisal factor. Consequently, the claim by Richman et al. (1993), that the SSS allows people to "view strengths and deficits in their network and begin to plan for adding, deleting, or accepting support" (p. 293) may not be fully justified.

A final problem with the current form of the SSS relates to content validity. In normal factor analysis the content of the items defines each factor. In the SSS this is not the case. In the SSS, each content factor is defined by a single sentence (see Appendix II). The four appraisal questions (number of providers of that support, satisfaction with that support, difficulty of obtaining more of that support and importance to one's overall well-being of that support) are then related to this one defining sentence. These four appraisal questions are not, however, indicators of any empirical support for the theoretical definition of the support content factor.

In summary, the present study used a MTMM approach to test the factor structure of the SSS. The results demonstrate the flexibility one has in testing the validity of a measurement instrument using confirmatory factor analysis. Tests of the models proposed by Richman et al. (1993) suggested the structure of the SSS is not sound. Caution should, therefore, be taken in using the SSS in future research and applied practice.

¹Chapter 4: An Investigation of the Social Support Experiences of High-Level Sports Performers

Abstract

Lack of consensus regarding the nature and conceptual definition of the social support construct has led to a plethora of different forms of measurement of this psychosocial variable, many with psychometric limitations. Beyond the psychometric limitations of some measures, in sport there is also a need for measures to be relevant to the specific experiences of sports performers. In order to gain a greater understanding of the social support experiences of sportspeople, 10 high-level sports performers were interviewed regarding their experiences of social support. A Grounded Theory approach was adopted for analysis of their responses and insights. Four dimensions of support emerged, within each of which were comments relating to sport-specific support and comments relating to support not directly concerning the sport itself. The dimensions were labelled: Emotional; Esteem; Informational; and Tangible. Example quotes are given to highlight each dimension of support, and implications for intervention are derived.

¹ This paper has been submitted for publication, and has been accepted.

Rees, T, & Hardy, L. (accepted). An investigation of the social support experiences of high-level sports performers. <u>The Sport Psychologist.</u>

Introduction

In summarising the state of social support research at that time, House and Kahn (1985) wrote, "measurement in this area is still in a fairly primitive state" (p.102). The picture does not appear to be much clearer today. Vaux (1992) noted, among other points, concerns regarding the psychometric properties of social support measures and the plethora of different measures, both of which have made synthesis of findings difficult. Furthermore, there is an inherent difficulty in measuring social support, because it has no clear definition. As Veiel and Baumann (1992b) noted, "if asked, almost every researcher in the field will present a more or less precise definition of support, but, more than likely, it will be different from that of his or her colleagues" (p.3). Studies assessing social support have used various terms to describe the construct (or aspects of the construct), including: network size; social integration; quantity and quality of relationships; social resources; availability of and satisfaction with support (for reviews, see Cohen, 1988; Heitzmann & Kaplan, 1988; B. R. Sarason, Sarason & Pierce, 1990a; Vaux, 1992; Veiel & Baumann, 1992c). Social support has also been conceptualised as a multidimensional and a unidimensional construct (Heitzmann & Kaplan, 1988). Despite all of these concerns, social support has been the most frequently studied psychosocial resource (Thoits, 1995), and has been noted alongside stress and coping as one of the three most important constructs in mental health research (Veiel & Baumann, 1992).

The potentially beneficial influence of social support in sport has led to active encouragement for sportspeople to harness this resource (e.g., Gould, Jackson & Finch, 1993; Hardy & Crace, 1991; Richman, Hardy, Rosenfeld & Callanan, 1989). Despite such comments and despite recommendations for research into social support in sport (e.g., Hardy & Jones, 1994; I. G. Sarason, Sarason & Pierce, 1990), empirical evidence for the beneficial effects of social support in sport has been relatively scarce. Social support has, however, been linked with group cohesion (Westre and Weiss, 1991), coping with competitive stress (Crocker, 1992), slumps in performance (Madden, Kirkby & McDonald, 1989), burn-out (Gould, Tuffey, Udry & Loehr, 1996), vulnerability to injury (Smith, Smoll & Ptacek, 1990) the aetiology of and recovery from injury (e.g., Hardy, Richman & Rosenfeld, 1991; Udry, 1996), leadership styles (for a review, see Chelladurai, 1993), and performance (Rees, Ingledew & Hardy, 1999).

Like health research, measurement of social support in the sporting domain has also been varied. Despite the association with tennis performance found by Rees et al. (1999), the findings of their study were tempered by questions regarding the applied relevance to sport of the instrument they used to measure social support. Rees et al. used the Interpersonal Support Evaluation List (ISEL) (Cohen, Mermelstein, Kamarck & Hoberman, 1985), a measure of perceived functional social support with a confirmed factor structure (Brookings & Bolton, 1988). The basic concern in using the ISEL in a sporting setting is one of content validity; the questions posed by the ISEL relate to general everyday support issues, and do not account for the specific support issues that might be relevant to high-level sportspeople. Whilst it is undoubtedly necessary for a measure of social support to have structural validity, taking a measure directly from mainstream psychology may not help us to understand the specific support experiences of sportspeople.

The present study sought to address this issue of content validity by examining more closely the social support experiences of high-level sportspeople. It has been

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claimed that social support can be simply stated in the following terms: "Knowing that one is loved and cared for may be the essence of social support" (I. G. Sarason et al., 1990, p. 119). However, in sport there is a need to look at the specific support transactions a sportsperson might experience with coaches, other players, psychologists, trainers, and friends and family in dealing with the stresses and strains of high-level sport. The structure of one multidimensional measure of social support, the Social Support Survey (SSS) (Richman, Rosenfeld & Hardy, 1993), can be used to generate this sort of information. However, despite some validation work with college athletes, the SSS contains problematic content and structural validity issues (see Chapter 3). For example, Richman et al.'s (1993) assumption that it is meaningful and appropriate to consider the SSS as comprising eight separate content factors is questioned, in view of the fact that previous conceptualisations have regarded the construct as unidimensional or comprising just three or four dimensions (for reviews see Vaux, 1992; Heitzmann & Kaplan, 1988). Confirmatory factor analyses of the SSS in Chapter 3 also revealed that the items on the scales were ambiguous indicators of the latent constructs, leading to difficulties in pin-pointing the factors in the SSS without ambiguity.

It was in light of such criticisms as the content validity, structural validity, and applied relevance to sport of many social support measures that in the present study the authors conducted in-depth interviews with high-level sportspeople. In so doing, the study sought to examine the social support resources of high-level sportspeople and the functions served by those resources. This functional aspect of support is highlighted in the concept of optimal matching between stressors and support (e.g., Cutrona & Russell, 1990), whereby specific types of social support are hypothesised to be resourced to deal with specific problems and stressors. Cohen et al. (1985) based their measure (the ISEL) on this concept of support. The present study sought to examine the experiences of highlevel sportspeople by adopting a Grounded Theory approach to analysis of the interview transcripts, and thereby developing an understanding of the dimensional structure of support for sportspeople and the precise behaviours performed.

Method

Participants

The participants in this study were ten high-level sports performers (five male, five female). For both men and women, performers from individual and team sports were chosen. For men, the sports were rugby, tennis, sprinting, hockey and gymnastics. For women, the sports were badminton, hockey, netball, field athletics/basketball and judo/powerlifting/rugby. All performers were aged between 18 and 27 and all were competing at International level.

Procedure

All performers were contacted by telephone and consented to participate in live interviews, which lasted from 27 to 50 minutes. The majority of interviews were conducted in the performers' homes. Each participant was guided through the same series of standardised open-ended questions, which were outlined in an interview guide (Appendix III). A series of standardised prompts was also used, when necessary. The interviews were recorded using a Dictaphone and were later transcribed verbatim into 115 pages of A4 single-spaced text.

Interview Guide. The interview guide contained the following six major questions, which were posed in order to elicit information regarding support across a

broad spectrum of the sports performers' experience: 1) Can you tell me about any help you get in dealing with the pressures of high-level sport? 2) Can you tell me about any help you get in dealing with how you feel about your sport at different times? 3) Can you tell me about any help you get in dealing with injuries and periods of rehabilitation? 4) Can you tell me about any help you get in dealing with practical matters? 5) Can you tell me about any help you get in dealing with personal issues about your life and future? 6) Can you tell me about any help you get in dealing with relationship issues? There was also a final question, which asked for any further information not already requested, but which might have been of relevance and importance to the sports performer. Following each major question was a list of secondary questions and elaboration probes, which were used, where appropriate to encourage the performers to expand on their answers and to gain a fuller understanding of their responses.

<u>Pilot Study.</u> The study was piloted on three individuals (2 males, 1 female), also of International standard in the sports of rugby league, karate and hockey. The purpose of these pilot interviews was to 'try out' the interview guide, and to elucidate further on topics not covered in the questions. Following the interviews performers were asked to reflect on the content and style of questions and prompts; they were also asked to offer feedback on the interviewer's style and the congeniality of atmosphere created during the interview. These interviews were video-taped and observed by the interviewer (the first author), the second author, and one further colleague. This process generated feedback regarding the style, mannerisms and body language of the interviewer, as well as feedback regarding the content and flow of the interview. Interviews. Despite remaining neutral to the content of each interview, the interviewer showed signs of care and appreciation for the openness and willingness of the interviewees to share their experiences. This was achieved through body signs of verbal tracking (Côté, Salmela & Russell, 1995), such as nodding, and with words of thanks, praise and support. The purpose of this was to build a situation wherein the interviewee felt at ease and motivated to disclose personal experiences that were considered valuable by the interviewer.

Grounded Theory As A Qualitative Approach To Data Analysis. Analysis of the transcripts was based upon a grounded theory approach (Glaser and Strauss, 1967). Grounded theory primarily involves the generation of theory by induction. However, in view of the researchers' prior knowledge of the social support phenomenon, preconceived ideas, personal experiences and values must have had an influence on the researchers as the analysis proceeded (Charmaz, 1990; Henwood & Pidgeon, 1992; Pidgeon & Henwood, 1997; Pidgeon, Turner, & Blockley, 1991). Such prior knowledge would also have influenced the original make-up of the interview guide. This prior knowledge is actually considered an advantage in grounded theory, wherein an emphasis is placed upon the creativity and subjectivity of the researchers in building and testing new theories that emerge from the data. In the present study, prior knowledge of the subject gave the researchers the necessary framework to aid in the interpretation of the data.

<u>Analysis.</u> The present study followed clear guidelines for good practice in grounded theory (Henwood & Pidgeon, 1992; Pidgeon & Henwood, 1997; Pidgeon et al., 1991). Prior to detailed analysis of the data, all ten transcripts were read numerous
times in order for the interviewer to familiarise himself thoroughly with the data. The ten transcripts were then entered into QSR NUD*IST 4 (Nonnumerical Unstructured Data Indexing Searching and Theorising) (1997), a computer package designed for handling qualitative data. QSR NUD*IST 4 does not analyse the data. It is in essence a more efficient form of the original card-sorting strategy. Data can be categorised, moved and 'shuffled' in a matter of seconds, as opposed to the lengthy re-writing and sorting of cards. Data from transcripts is coded and stored in 'nodes'. Each node can be named and re-named. An explanation of the content of the node can be given, and memos can be written regarding the node.

Initial analysis in the present study proceeded by coding relevant sections of the text from each interview into various nodes. At this stage of analysis the primary objective was to ensure that the node titles did fit the data well. This is akin to Pidgeon and Henwood's (1997) "flip-flop" (p. 261) approach, whereby terms were changed and adjusted until fit was improved. Each node then contained one or multiple items that, together, reflected the node title. Emergence and clarification of nodes then occurred by employing the constant comparative method of analysis (Strauss & Corbin, 1990), whereby similarities and differences in the data were compared and contrasted, so that the richness of the data was fully explored.

The core analysis involved refining the node system, integrating categories and writing memos (Glaser & Strauss, 1967). In the present study a "free" node was created, entitled, "Project Thoughts," solely for the purpose of writing memos documenting all procedures undertaken. This memo contained information regarding, amongst other things: ideas regarding the focus and changing focus of the research; a trail of node

emergence, integration, sub-division and separation; reminders of interesting and important quotes for later use in a write-up; and a flag for problematic and ambiguous concepts. This information provided a ready documentation for scrutiny and observation by immediate colleagues.

Repeated integration and sub-division of categories then continued until coding of additional data no longer contributed further to the clarification of concepts and ideas. At this point one could say that theoretical saturation (Glaser & Strauss, 1967) had been reached. Concepts were then further refined and re-labelled, until optimum fit was reached. Finally, having explored links and differences across all node categories, node trees were drawn up to represent the analysis.

Results

Four primary dimensions of social support emerged: Emotional; Esteem; Informational; and Tangible. Within the primary dimensions were elements that dealt with sporting issues and elements that dealt with issues that were not directly related to the sport itself. The analysis was arranged so that note was made of the specific behaviours performed by supportive others and the functions these behaviours served. The term "functions" was taken to mean the purpose served by the supportive behaviour. This may have involved the buffering of a stressor or a general helping support. It may also have elucidated a potential mechanism by which the supportive behaviour was operating.

The process borne out of the analysis is shown in the following figures (please see figures 1-4), each of which is arranged in order as social support dimensions, subdimensions (sport, non-sport), functions (and mechanisms) and supportive behaviours and processes. Validation criteria were met through frequent discussions between the two authors. A third researcher, well trained in qualitative methods, chose a 20% random selection of the raw quotes (30 from 153) and categorised them into raw themes (behaviours) and first-order themes (functions). 83% (25 from 30) of the quotes were correctly assigned to the raw themes (behaviours), and 87% (26 from 30) were correctly assigned to the first-order themes (functions). Finally, the researcher categorised all raw and first-order themes in a combined fashion into the correct support dimensions. 98% (93 from 95) were correctly assigned. Figure 1 represents Emotional support. Figure 2 represents Esteem support. Figure 3 represents Informational support. Figure 4 represents Tangible support.

Similar functions and behaviours often occur in more than one of the figures. This demonstrates how different types of support are often used to achieve the same endpoint. For example, in dealing with injuries, sportspeople receive tangible help in terms of physiotherapy treatment, emotional help in terms of sympathy from others, and esteem support in terms of encouragement and reassurance. All these aspects aid the coping and recovery process and are vital aspects of the person's supportive network during rehabilitation.

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Social Support Dimension	Sub- Dimension	Functions (and mechanisms)	Supportive Behaviours and Processes
		help dealing with technical problems in training help dealing with being	-I go and talk to him -Talk through things -Moral support
		down about your sport help dealing with issues re. training and competitions	-mentoring and perspective
Г	sport	help dealing with on-site pressure	-team-mates help you feel relaxed -you can always turn to him -gives me a hug
		help dealing with being dropped	-someone to complain to -bounce ideas off -show me I'm still loved
		help dealing with worries and problems about sport	-talk through things -I can turn to him -I can always turn to them -cheer me up
		help dealing with fitness concerns	-counselling
emotional support		help with issues re. selection and whether to play	-discuss things
	-	help with general pressure	-mickey-taking -talk through things
		help with injuries	-others' concern -take my mind off it -sympathy from peers -people care
		help with being away	-help you keep in touch
	non-	general help	-someone to listen to you -they're always there for me
		help with life direction issues regarding future	-bounce ideas off them
	sport	help dealing with down times	-deal with my bad moods
		help with relationship issues	-someone to talk to -shared moan -I can talk to them -help me out

Figure 1. Flow-chart, representing support dimensions, sub-dimensions, functions (and mechanisms) and supportive behaviours for Emotional support.

Social Support Dimension	Sub- Dimension	Functions (and mechanisms)	Supportive Behaviours and Processes				
	-	help dealing with loss of confidence help making a breakthrough	-encouragement -tell you you can do it -encouragement				
	-	help with injuries	-directive encouragement -encouragement -others' belief in me -reassurance				
	-	help dealing with pressure of important matches	-boosts confidence				
	-	help at competitions	-confidence boost from team-mates -psyches me up				
esteem support	sport	help dealing with not starting	-encouragement -build and maintain confidence and esteem				
		help dealing with pre- competition nerves and doubts	 -reinforcement of positives re. current form -reassurance re. current form -psyches me up -inspires me to mentally focus -motivates and psyches me up -encourage and motivate 				
	_	help to pull out of slumps	-encouragement -inspire me to get practising -pick me up -lift morale				
	_	help dealing with fitness concerns	-motivation				
		help coping with on-going pressures of commitment to sport	-general encouragement				

Figure 2. Flow-chart, representing support dimensions, sub-dimensions, functions (and mechanisms) and supportive behaviours for Esteem support.



Figure 3. Flow-chart, representing support dimensions, sub-dimensions, functions (and mechanisms) and supportive behaviours for Informational support.



Figure 4. Flow-chart, representing support dimensions, sub-dimensions, functions (and mechanisms) and supportive behaviours for Tangible support.

There were similarities between the dimensions which emerged in this study and those suggested by Cutrona and Russell (1990) to cover all aspects of social support. Cutrona and Russell (1990) highlighted five primary dimensions from previous conceptualisations of multidimensional support. One of those dimensions, social integration or network support, did not appear in the present study.

As well as providing traditional criteria for validity (see, for example, Lincoln & Guba, 1985; Patton, 1990) and diagrammatic representations of the node trees, the present study takes heed of the advocation of Sparkes (1998) to go beyond traditional criteria for validity. Thus, the present study highlights extensive quotes from the athlete interviews, so that readers can judge for themselves, in terms also of authenticity, fidelity and believability the conclusions drawn by this study's authors.

Using Cutrona and Russell's (1990) definitions of support, Emotional support represented "the ability to turn to others for comfort and security during times of stress, leading the person to feel that he or she is cared for by others" (Cutrona and Russell, 1990, p. 322). Exemplar quotes from the athlete interviews are shown in Table 1 to highlight this aspect of support. Esteem support represented "the bolstering of a person's sense of competence or self-esteem by other people. Giving an individual positive feedback on his or her skills and abilities or expressing a belief that the person is capable of coping with a stressful event are examples of this type of support" (Cutrona and Russell, 1990, p.322). Exemplar quotes from the athlete interviews are shown in Table 2 to highlight this aspect of support. Informational support represented "providing the individual with advice or guidance concerning possible solutions to a problem" (Cutrona and Russell, 1990, p. 322). Exemplar quotes from the athlete interviews are shown in Table 3 to highlight this aspect of support. Tangible support represented "concrete instrumental assistance, in which a person in a stressful situation is given the necessary resources (e.g., financial assistance, physical help with tasks) to cope with the stressful event" (Cutrona and Russell, 1990, p. 322). Exemplar quotes from the athlete interviews are shown in Table 4 to highlight this aspect of support.

Table 1

Node titles and athlete quotes demonstrating emotional support

sport/help with injuries/take my mind off it

close friends and stuff, people, friends at university. Yeah, they really helped. Um, they took my mind off it, really. I completely forgot about track and field for a while.

sport/help with injuries/others' concern

[person's name] is the big boss of the elite [squad]. And, whenever I see him, he says, how's everything going, blah, blah. I say, oh I'm injured or whatever. He'll say, have you been to the physio? Have you done this? And then when you see him, it's, how's your legs. Well, they're all interested. I suppose because they're throwing the money into it, they want you to be 100%.

sport/general pressure/talk through things

if there's anything we need, like, we always talk to each other, talk through things. I'd say that's especially since being in college, because we lived together, as well. You get so much chance to talk and get each other through things.

sport/being dropped/show me I'm still loved

I'd say that's what I need when I phone from somewhere away. You know, I don't want to have to explain what's going on. I just want to say, look, I'm having a bad time and for her (her mother) just to give me a bit of support and say, just show me that I'm still loved, even outside of sport, which I need.

non-sport/general help/they're always there for me

It's just sort of a security, knowing that they're your parents and they'll always, if you need anything, they'll always try and help. They're always there if you need to talk to them.

It's good just knowing they're there for you to be honest. They don't often know what to say, but um, it's just knowing they're around.

non-sport/life direction issues re. future/bounce ideas off them I think my training partners I talk to a lot. Um, [athlete's name] because...he's in the twilight of his career, he's established a career for himself. So, bouncing ideas off him is really good. He tells me kind of things I should be doing.

non-sport/general help/someone to listen to you I think it makes me feel better if I talk to people about stuff anyway, even whether they give me advice back or not.

Table 2

Node titles and athlete quotes demonstrating esteem support

sport/fitness concerns/motivation

his role again is just planning and um, because I think we're not in direct contact, he's more of a motivator as well. He'll try and motivate me.

sport/pull out of slumps/pick you up

They usually get a feel for when I'm feeling up or feeling down. And, um, when I'm feeling up, obviously they'll keep encouraging me, but when I feel down, they'll do whatever they can to try and help me and to pick me up and to get me going again.

sport/pre-comp nerves and doubts/encourage and motivate

She'd always been at competitions, well most of the time. When she was there, I liked having her there, because she'd say, come on, you know you're better than her, you can batter her, she's ****, or whatever, you know. And, I'd love, I really liked having her there.

sport/pre-comp nerves and doubts/motivates and psyches me up

I know I've got to centre and focus, and you know he always reiterates that before you know as I'm going to warm up out on to the track. You know, this is your time, um, it's a war situation, you've got to stay in control. There's no point panicking, because you won't run to the best of your capabilities. So, hearing things like that, that's really good.

sport/pre-comp nerves and doubts/reinforcement of positives re. current form He'll reinstate the kind of form you're in, even though, he'll just reinforce the positive for you. And it comes from a much more practical point of view. He's like, if you have any doubt he'll say, well look last week you did such and such, that shows you're in good form.

sport/help with injuries/reassurance

He was working on me before the world championships, and I had an injury going into them, um, I wasn't able to run for two weeks prior to that. And, um, he was brilliant. He was working with me virtually every day. And he kept reassuring me that it was going to be okay. Um, and before my warm-up, before going into the heats and stuff, he was there, and he'd work on me, and he'd say stuff like, you know, your muscles are in the best shape they've ever been. And, you know, that probably wasn't true. But, you know, it's just kid psychology, if you hear it enough times, you're going to believe it.

Table 3

Node titles and athlete quotes demonstrating informational support

sport/help with performance concerns/technical and tactical feedback and coaching because she's (team-mate) in the same situation, you know, or I could come off and say, oh, I didn't play well then. What do I need to do to improve next time, she could tell me specifically, well, you weren't driving forward for the ball, or whatever. You know, it's a lot more specific.

sport/help with fitness concerns/advice about how to build patiently he'll try and round it up by saying, right, build yourself up slowly and stuff like this. You know, make a training plan, to help keep yourself motivated and stuff like this.

sport/dealing with a loss of confidence/constructive criticism if I use this other friend who doesn't play...she can give more constructive criticism, a you know, saying what I should, she'll always say the things I should be thinking about, but I

sport/help with performance catastrophes/advice

haven't picked up myself.

I probably had a few experiences when I was younger, that I, er, totally froze in a big match or something, and you get advice from people that have been there before, and they try and help you...people like that, who've had experience, they try and help with different situations, and because it comes from them, you sort of extra listen to them.

non-sport/help with interpersonal problems/puts things into perspective for me [My boyfriend is] brilliant. Like, he's the one I talk to about everything, really. And he always puts things into perspective, you know. If I'm upset about things, he says, don't get upset...he puts it in black and white, and says it's not that bad...If I'm upset from phoning my parents, [he] will say to me, don't listen to them, don't get upset, and it's all right again then.

non-sport/life direction/helps me consider my options regarding my future I've been having so many problems trying to decide what to do next year now with college, and like before coming out tonight I sat and talked to my mum for a while about it. You know, considering going away to England to do physio. And so I think I'd always talk to her, just because I know she'd always tell me the truth, and she'll be really open and say, these are the pros and the cons of both sides of whatever argument it is. And like I said, I prefer that. sport/help with injuries/injury treatment

We're attached to a health scheme through BUPA, and one of the physios attached to the club works for BUPA. So, if any of the boys need any operations or whatever, it's done straight-away. There's no waiting, nothing to be paid for.

I broke [my wrist] just playing a match, and then I went, the [National Governing Body] paid for me to go to Harley Street and get an X-ray and see a hand specialist...He said it was broken, and gave me this thing, and then I went back a month later, and he told me to take it off, it should be fine, but, yeah, the [National Governing Body] organised that.

sport/help with injuries /planning rehabilitation

It was niggling me and getting worse. I had to go up to Coventry to have a cortisone injection in my wrist. And, um, I found him to be very good in terms of planning the rehabilitation of the injury, sort of thing, because he was a gymnast himself.

sport/alleviate pressure and leave me free to concentrate/does everything for me at comps It took the complete pressure off me, worrying about my knee-wraps, worrying about what weight I was going to lift. Like, after every lift you do you have to put a card in saying your next lift. Like, I couldn't even think what my next lift was. But he was doing it all for me, and he took so much pressure off me, that all I concentrated on was my lift. And to be honest...I don't think I would have won it if he hadn't been there, because I would have been panicking about what to do next. And, but I was so calm, and I was thinking, all I have to do is lift this, and just go through the technique, and he was going through the technique with me, and it was brilliant, and I think to be honest that's why I won it.

non-sport/reduce worries about practical matters/funding transport I get a car. So, that allows me to train, well, go to all the tournaments in this country. The petrol and everything I have to pay for myself, but then I get with the elite [squad], the grant, I get all the mileage and everything.

non-sport/reduce worries about practical matters/gets me to comps Without them it would be quite hard. Because, obviously they started me up, they paid for everything at the start, and drove me everywhere and stuff. So, without them, I wouldn't have started.

non-sport/reduce worries about practical matters/pay for training I've been helped by a gentleman called [person's name] for, well, the whole of my athletics career. He's, um, helped pay for various warm weather training trips. Um, for example, last year I went to California for three months, and he paid for the hire car for the whole duration. So, stuff like that has been invaluable.

non-sport/reduce worries about practical matters/equipment and clothing deals [my agents] deal with...racket deals that I have, or clothes deals, or, for instance, at Wimbledon I wore a patch on my shirt - they organised that. So, they try and make life easy, so I don't have to worry about those sorts of things. I can just play tennis.

Discussion

As the analysis proceeded, four main dimensions of social support emerged from the data. This showed similarities and contrasts to previous conceptualisations of social support. Cutrona and Russell's (1990) synthesis of previous measures suggested five dimensions. These five included the four mentioned in this study: Emotional; Esteem; Informational; and Tangible. A fifth dimension, Social Integration or Network Support did not emerge explicitly in the present study. Social Integration is taken to represent a person "feeling part of a group whose members have common interests" (p. 322). Whilst some issues did arise in our study which would intuitively deal with Social Integration or Belonging, to use Cohen et al.'s (1985) terminology, this dimension is taken to reflect more casual friendships. In our study, comments that appeared to involve issues of belonging or being socially integrated, for example "they're always there for me," were subsumed under the Emotional dimension.

The support dimensions that emerged in this study also showed some similarities with Richman et al.'s (1993) three primary dimensions in the SSS. These are emotional, informational, and tangible support. However, there was insufficient evidence to suggest that the four dimensions in the present study should be further broken down as in the SSS to eight dimensions. In this study, issues concerning the SSS dimensions of listening support, emotional support, emotional challenge, and reality confirmation were subsumed under the Emotional support dimension. Issues concerning SSS task appreciation were subsumed under the Esteem support dimension. Issues concerning dimensions. Finally, issues concerning SSS personal and tangible assistance were subsumed under the Tangible dimension.

The importance of having good social support was highlighted in the present study. For example, the closing comments from one subject, an International tennis player, included the following quote:

I think for me, if I were never to make a breakthrough, it wouldn't be through [a lack of] support....I've had a lot. I think, when you've done something good, and people tell you you've done something good, it gives you a lift and gives you a little kick and makes you want to do something good again. I think it would be difficult if you were just totally on your own and never had anyone really helping you out and giving you support, basically. I think it's a big difference....I can't see how you can totally do it on your own... You do need encouragement and advice, and, good times, bad times, you need people to help you out. I think it's pretty hard to do it without them.

The importance of support in keeping the sportsperson focused and preventing

doubts is shown in the following quote:

But, I think I always respect my mum's decision more than anyone else's. Like, if I didn't have my mum's support on something, I'd always doubt what I was doing, always. I've always found that. I can't rest, unless I know she's behind what I'm doing.

There were also comments highlighting the sense of security provided by the

knowledge that supportive others were there, if needed. The following quote expands on

this concept, highlighting the sense of security provided by the knowledge that these

supportive others are there, as always, at the competition site, providing a familiar

situation for this sprinter:

A lot of sports psychologists say that you should do things that are familiar to you, um, prior to a big competition, so that you feel relaxed and at ease with yourself. And, you know, that <u>is</u> [italics added] a build up of a familiar routine. You know, having those kind of people there, that <u>is</u> [italics added] a familiar routine to me. So, just knowing that they are there, you know, you think that everything is under control. Everything is the way it should be.

The importance of social support is often most clearly demonstrated in the inverse of support, namely isolation. Isolation has been noted as possibly exerting a greater negative effect on depression than does social support exert a positive effect (see Cohen, 1988). Isolation from social support may also lead to a greater susceptibility to injury and to non-adherence to rehabilitation programs (see, for example, Udry, 1996). In the present study, isolation from all four dimensions of social support was considered negative. In dealing with injury, one netball player stated:

I did feel quite isolated during that. Because it was out of season, as well, I wasn't in contact with people like the team manager or um or...the physio, who I'd normally talk to, if I had something like that....I couldn't understand it. That was one of the hard things.... Because she's always been so caring, I couldn't understand why she was like that then....And, you know, it just put a lot of pressure on me, then, starting college, as well, knowing that I wasn't fit. Like, I sat out of my first few practical lectures, and I just felt, like I said, that I wasn't getting any support to get me better, until the coach discovered that I was still injured.

The potentially deleterious effects of isolation on performance are shown in the following quote from a badminton player, who cannot afford to have her coach travel with her full-time. Often she links up with another National squad, whose coach will help her, providing she's not playing one of his players. When the latter occurs, she experiences problems, such as the following:

Um, well I go with the [other National team], and I know all them. So, it's not, I'm not totally on my own. I'm with, half with the team. But, I'm really outside of that. Um, I suppose I feel fine. It's just, when it comes to, if the coach doesn't speak to me before I'm playing somebody he's coached, or, then, that's when I feel, oh my God, I'm on my own. And that's when I start, all negative thoughts come into my head. That's really when it's, you know, I don't like that.

Whilst the results of this study suggest a positive role for social support, it cannot

be said that all references to social support were positive. Some quotes reflected a

negative aspect of social support. For example, one hockey player sometimes experienced problems at matches, stating: "My parents obviously help, they support, they come and watch me, which sometimes can be a hindrance, because it can be offputting."

Furthermore, whilst some espouse the benefits of a varied social support network, some feel distinctly protective of expressing their feelings openly, when this can be seen as a weakness. One hockey player stated:

The only people I felt really happy about talking to was my parents. You talk to coaches, you talk to other players. I just felt that people have an ulterior motive as to what you're saying. I mean, my parents were very good, in so far as they gave me a lot of room to sort of be myself. It's, but at the end of the day, they're the only people you can turn to. I mean, as I said earlier, coaches are okay. But, you always say, if you have a problem, and you go to the coach, you always feel that you're, um, giving something away. You've got a weakness somewhere.

The present study highlights social support as a multidimensional construct as opposed to a unidimensional one. Different types of support were received for helping to deal with different problems and stressors. Different types of supportive help were also sometimes used, in dealing with the same problem, and similar types of support were used for helping to deal with different problems. Sometimes the supportive behaviour served a specific functional purpose. Whilst the quotes in the paper do not necessarily make it clear, this supportive behaviour was sometimes received from various people and sometimes received from the same person or organisation. In replying to a question about the nature of the different support received, one netball player replied, "Depends what the problem was." This is consistent with Cutrona & Russell's (1990) notion of matching stressors with the correct support. In light of the findings of the present study, future research will involve the construction of a measurement device based on the raw quotes of the performers. This could then be used to elucidate the mechanisms by which the support might be working. These mechanisms have been highlighted as a fundamentally important area for social support research, but have so far received little attention (see, for example, Thoits, 1995).

The present study has important implications for sports performers and all those involved with sports performers. It needs to be recognised that important others can play a crucial role in the life of the performer, and that the consequences of performers being isolated from support are damaging. Therefore, the oft-hailed toughness ideal that sportspeople should feel they must "go it alone" in their pursuit of success and not seek out social support in times of need is out-moded and potentially very limiting. Performers should, in fact, be encouraged to be proactive in their use of social support (e.g., Richman et al., 1989) and be helped to understand that such action is not a sign of weakness (Hardy, Jones & Gould, 1996).

The results of the present study might lead important others to the conclusion that they should actively give support. Herein lies a problematic issue, in that un-skilled others are often poor providers of support, basing their understanding of what the individual needs solely on intuition. For example, Lehman, Ellard, and Wortman (1986) note that others can provide unhelpful support by trying, among other things, to minimise the importance of an event, avoid open communication about the event, criticise attempts at coping, encourage quicker coping, and give inappropriate advice. Interventions might, therefore, focus upon providers to improve the quality and aptness of the support they provide. However, in view of the comment that it is often great "knowing they're there for you," interventions might also focus upon helping performers to fully understand how they can maximise the support that is available in their network of supportive others, and learn the skills necessary to be proactive in using this resource. The concept of matching stressors with support (Cutrona & Russell, 1990) implies that performers might also be taught to recognise their needs and seek out appropriate supportive exchanges to help deal with those needs (Richman et al., 1989).

The present study sought to examine sport-specific social support by adopting a grounded theory approach to analyse athlete interviews. This analysis revealed four primary dimensions of support: Emotional; Esteem; Informational; and Tangible. Linked to these were specific behaviours performed by others, and the functions served by these behaviours. As well as documenting support for issues not directly related to sport, this study has provided an insight into supportive experiences that are directly relevant to the performance of sport.

Chapter 5: Matching Stressors with Social Support: Effects on Tennis Performance

Abstract

This study: (a) examined the factor structure of a proposed 4-dimensional measure of social support, designed for this study; (b) matched stressors with social support dimensions in examining the main and stress-buffering effects of social support upon tennis performance. 130 high-level tennis players completed measures of social support, stressors, and performance. Analysis of the assessment instrument largely provided support for the 4-dimensional structure of support. Moderated hierarchical regression analyses revealed significant main and stress-buffering effects of the social support dimensions upon performance. The results point to the beneficial role social support has to play, both in impacting directly upon performance and in combating the deleterious effect of stressors upon performance. Results also illustrate the importance of matching specific types of support with the needs elicited by the stressor under consideration.

Introduction

The potential benefits for athletes of having good social support have led to active encouragement for athletes to harness this resource (e.g., Gould, Jackson, & Finch, 1993; Hardy & Crace, 1991; Richman, Hardy, Rosenfeld, & Callanan, 1989). Research examining these potential benefits has identified links with group cohesion (Westre & Weiss, 1991), coping with competitive stress (Crocker, 1992), slumps in performance (Madden, Kirkby, & McDonald, 1989), burnout (Gould, Tuffey, Udry, & Loehr, 1996), the aetiology of and recovery from injury (e.g., Hardy, Richman, & Rosenfeld, 1991; Udry, 1996), vulnerability to injury (Smith, Smoll, & Ptacek, 1990), leadership styles (for a review, see Chelladurai, 1993), and performance (Rees, Ingledew, & Hardy, 1999).

Despite these encouraging links, there is at present little understanding of the process by which social support works. This same comment can also be levelled at social support research in mainstream social psychology. Thoits (1995) noted that the processes by which support works and the intervening mechanisms are a fundamentally important area for social support research, but that they have so far received little attention. There is even little consensus as to a precise definition of what constitutes social support. As Veiel and Baumann (1992b) noted, "if asked, almost every researcher in the field will present a more or less precise definition of support, but, more than likely, it will be different from that of his or her colleagues" (p.3).

Despite these issues, social support has been the most frequently studied psychosocial resource (Thoits, 1995), and has been noted alongside stress and coping as one of the three most important constructs in mental health research (Veiel & Baumann, 1992b). Increased awareness of the potential benefits of social support in sport demands greater efforts to better understand the nature of any such benefits. The present study chose to follow the guidelines for social psychology research of Carron (1988) and Zanna and Fazio (1982) and go beyond simple associations to examine possible moderating effects of the social support-performance relationship and mediating processes that might explain the social support effects. Research from health psychology (see, for example, Cohen, 1988) suggests that social support might work in two ways: firstly, directly, in a main effects model; and secondly, by moderating the effect of stress on symptomatology. This is referred to as the stress-buffering hypothesis, by which it is meant that "support 'buffers' (protects) persons from the potentially pathogenic influence of stressful events" (Cohen, p. 278). Given the extensive literature on stress and performance in sport, it would seem reasonable to examine whether support buffers the effect of stress upon performance. It would also seem reasonable to examine whether support exerts an effect on performance, independent of stressors.

To provide an appropriate test of the stress-buffering hypothesis one needs a multidimensional measure of functional support, which can tap supportive elements that might match the specific needs elicited by the stressor under consideration (Cohen & Wills, 1985). It is unfortunate that the measurement of support is also a contentious area, with a plethora of different measures to choose from, many with psychometric limitations (Vaux, 1992). Indeed, despite the association with tennis performance found by Rees et al. (1999), the findings of their study were tempered by questions regarding the content validity of the social support measure they used. This was because Rees and associates used the Interpersonal Support Evaluation List (ISEL) (Cohen, Mermelstein,

Kamarck & Hoberman, 1985), a measure of perceived functional social support with a confirmed factor structure (Brookings & Bolton, 1988), but which relates to general everyday support issues, and does not account for the support issues that might be of specific relevance to high-level sportspeople.

The concept of optimal matching (Cutrona & Russell, 1990) highlights another measurement issue: the need to move away from aggregate measures of stress and support to carefully matching specific stressors with specific functional social support. By discovering optimal stress and support combinations, it might be possible to understand more clearly how stress can be harmful and how support can protect people from this harm (Cutrona & Russell, 1990). To address this issue, the present study drew upon previous research into potential stressors in sport. It also drew upon the information gleaned from in-depth interviews with high-level athletes regarding their support experiences (Chapter 4), the results of which informed the construction of a measurement instrument for the present study. Further information on both of these issues is given in the Method section. The reasons for constructing a measure of social support for this study were based on the following: the lack of context-specificity of items on social support measures (e.g., the ISEL, mentioned previously); problematic issues of content and construct validity of other measures, such as the Social Support Survey (Richman, Rosenfeld, & Hardy, 1993; please see Chapter 3); and the insights of high-level performers regarding their experiences of social support (Chapter 4). These issues have been addressed in greater depth (see Chapters 3 & 4). By using such sportspecific measures, carefully matching stressors with support functions, and testing for stress-buffering relationships, it was intended that one might be able to speculate on how social support exerts an influence on performance. It was also intended that the use of a multidimensional performance measure (Rees et al., 1999; Chapter 2), as opposed to an outcome measure, would further facilitate speculation regarding the potential processes or mechanisms underpinning performance effects.

The Present Study

The present study sought to (a) examine the factor structure of a proposed 4dimensional measure of social support, designed for this study; (b) match stressors with social support dimensions in examining the main and stress-buffering effects of social support upon tennis performance. Although the stressors were chosen because of their potential for moderation by the four dimensions of social support identified in Chapter 4, specific hypotheses were formulated, only after preliminary analyses of the social support measure had been conducted, and are mentioned later.

Method

Participants

Participants were 130 high-level tennis players (100 males, 30 females), mean age 18.35, SD 3.94. Sampling was opportunistic, with players recruited at LTA British Tour events, National junior events and National squads. Players ranged from those in the British top-10 (world ranked 300) to those with LTA ratings not less than 3.2. As the measures in this study were dispositional, players were given the choice to complete the measures at the tournament site or be sent them at a later date.

Measures

Social Support. Social support was measured using a 41-item questionnaire, designed for this study, the items of which were derived from in-depth interviews with

high-level athletes regarding their social support experiences (Chapter 4). The 41 items were chosen for their potential to be matched with specific stressors, and represented four dimensions: Tangible; Informational; Esteem; and Emotional support. Tangible support contained 7 items, Informational support contained 10 items, Esteem support contained 12 items, and Emotional support contained 13 items. Not every item from the study in Chapter 4 was used. The criteria for inclusion of items were as follows: stressors were chosen for their applicability to high-level tennis players and their potential influence on the performance factors; social support items were then selected for their potential to be matched with those stressors. For example, it was hypothesised that technical problems in training might affect performance, by stopping players from achieving "flow." It was also hypothesised that specific tangible support might buffer this effect. That is to say, this potentially negative influence of technical problems in training might be reduced by having someone who helps plan, organise and set sessions in training to deal with those problems. Items were then selected from the study in Chapter 4 that would therefore best reflect this aspect of tangible support and would best match the stressor. On the other hand, despite their potential applicability to tennis players, items from tangible support concerning help with financial and transport matters were not included. The reason for this was that no stressor regarding financial or transport problems was chosen for consideration in the present study. Tangible items concerning financial and transport matters would therefore have been redundant.

Stressors. Five items were used as single-item measures of potential stressors. These items were drawn from previous research into stressors in sport (Gould, Horn & Spreeman, 1983; Gould, Jackson & Finch, 1993; Scanlan, Stein & Ravizza, 1991). As mentioned earlier, these five items were chosen for their applicability to tennis players and the influence upon them that social support might exert in terms of stress-buffering effects. They were: performance and confidence slumps; technical problems in training; competition pressure; personal problems; and doubts about form.

<u>Performance.</u> Performance was assessed using the 28-item measurement instrument, first reported in Rees et al., (1999) and subsequently validated in Chapter 2. The 28 items yield seven performance factors, labelled: Execution of (Flexible) Plan; Loss of Composure; Feeling Flat; Determination; Worry; Flow; and Effective Tactics. The measure asked respondents, "During your matches, to what extent do you ...," with response options ranging on a 4-point scale, 0 to 3, from <u>not at all</u>, through <u>a little</u>, and <u>somewhat</u>, to <u>a lot</u>.

Analyses

The factorial validity of the social support measure was tested by analyses of covariance structures, using LISREL 8 (Jöreskog & Sörbom, 1993). The sequential model testing approach recommended by Jöreskog (1993) was adopted. Maximum likelihood estimation was employed.

Briefly, the sequential model testing approach involved three stages: firstly, tests of separate single-factor models corresponding to the social support scales, the purpose of which was to assess the convergent validity of the items making up each scale; secondly, each of the social support factors was paired with every other social support factor in two-factor models, the purpose of which 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 scale, and the single-factor and two-factor stages repeated with however many items were left in each scale. Finally, all social support factors were included in a full model. For a more detailed explication of this process, the reader is referred to Chapter 2 and Chapter 3.

The overall goodness of fit of the models was tested using the chi-square likelihood ratio statistic (χ^2), Root Mean Square Error of Approximation (RMSEA), Standardised Root Mean Square Residual (SRMR), Goodness of Fit Index (GFI), and Comparative Fit Index (CFI) (see Jaccard & Wan, 1996; Jöreskog & Sörbom, 1993). The criteria for evaluation of fit proposed by Jaccard and Wan were that the CFI and GFI should exceed 0.90, SRMR should be less than 0.05, RMSEA should be not greater than 0.05 with a related non-significant <u>p</u> value for close fit. RMSEA values of .05 or less generally indicate a close fit, values up to .08 indicate a reasonable error of approximation, and one would not want to use models with values greater than .10 (Browne and Cudeck, 1993). The completely standardised factor loadings were also checked, to identify any low-loading items.

For the examination of the effects of stressors and social support factors upon performance, the principal analytical technique was regression analysis. There were to be tests for main and moderating effects (Jaccard, Turrisi, & Wan, 1990). While considering whether stressors affected performance, or whether social support affected performance over and above the effect of stressors, it was also possible to examine whether social support moderated the effect of stressors on performance. This was achieved by checking whether the product of stressors and social support had an effect upon performance beyond the main effects of stressors and social support. Jaccard et al. emphasise that the independent variables should be centred prior to the formation of product terms. In this study's analyses all the independent variables were standardised, thereby centring them, before any product terms were computed, and the unstandardised solution was examined. An alpha level of .05 was used for all statistical tests. An inherent risk of the present study's use of multiple separate regression analyses was an increased likelihood of committing Type I errors. Canonical correlation would have addressed this problem, but such an analysis could not have tested for interactions. The authors could have tested models using LISREL. However, the sample size precluded the use of structural models, and performing analyses on our models with observed variables would have led to perfect fits, because these models would have had 0 degrees of freedom. In light of these problems, regression analysis was deemed the most appropriate analysis for the present study, and the authors limited the analyses to those that were theoretically most plausible, stating directional hypotheses a priori. This counters the likelihood of committing Type I errors, by minimising the opportunity to capitalise on chance findings.

Results

Social support measure

Single-factor models. Factor loadings and fit statistics for the single-factor models are shown in Table 1. For Tangible support, items were deleted until a 4-item solution yielded an acceptable and good fit. For Informational support, the standardised residuals suggested that this factor could be split into two sub-factors, one with three general items, and one with four items about dealing with technical aspects of training and play. These were named General Advice and Technical Advice respectively. A good fit was found for Esteem support with 7 items. However, this factor could also have been substantively split into two sub-factors, one with four items and one with three items. This two-factor model fitted only marginally better. However, it was evident that one factor (with four items) contained items that were of a general nature, which we named General Esteem. The other factor contained three items with specific qualifiers regarding doubts about form, dealing with pressure and helping when one feels down, and was named Specific Esteem. For Emotional support a good fit was found for a 7item model. However, one item loaded low and two shared common error variance. Reducing this scale to four items yielded an excellent fit. Factor loadings for all models were high.

Table 1Fits and factor loadings for single-factor models

Factor/ Items	Loading	χ^2	d.f.	<u>p</u> (χ ²)	RMSEA	<u>p</u> value (for RMSEA	GFI	SRMR	CFI
						< 0.05)			
Tangible/		0.47	2	.79	0.00	.84	1.00	0.01	1.00
who helps setting sessions in training	.58								
who helps plan your training to deal with problems	.74								
who helps with tasks that build your confidence	.53								
who helps organising training and competitions	.70								
Informational/		13.62	13	.40	0.02	.67	.97	0.04	1.00
(General Advice)									
whom you turn to for critical advice	.67								
who helps you put things in perspective	.52								
with who you talk things through	.70								
(Technical Advice)									
who gives you technical advice	.88								
who helps solve problems in training and	.65								
competitions									
who helps you regarding technique	.88								
whom you go and talk to regarding technical	.90								
problems									

(table continues)

Factor/ Items	Loading	χ^2	d.f.	<u>p</u> (χ ²)	RMSEA	p value (i.e. RMSEA <0.05)	GFI	SRMR	CFI
Esteem/		14.20	13	.36	0.03	.63	.97	0.03	1.00
(General Esteem)									
who reassures you	.70								
who boosts your confidence	.82								
who tells you, you can do it	.62								
who motivates you	.65								
(Specific Esteem)									
who reinforces the positives when you have doubts	.74								
about your current form									
who instils in you the confidence to deal with pressures	.61								
who lifts your morale when it's down	.60								
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Emotional/		0.25	2	.88	0.00	.91	1.00	0.01	1.00
who gives you moral support when you are feeling	.71								
down									
who cheers you up	.60								
who is always there for you	.65								
who listens to your concerns	.64								

<u>Note.</u> $\underline{N} = 124$. RMSEA = Root Mean Square Error of Approximation. GFI = Goodness of Fit Index. SRMR = Standardised Root Mean Square Residual. CFI = Comparative Fit Index.

<u>Two-factor models</u>. Fit statistics for the two-factor models are shown in Table 2. Fits were generally fairly good. The two weakest models involved the Tangible model (Tangible support with General Esteem and Tangible support with Specific Esteem). In both cases these models could have been markedly improved had the item, "who helps with tasks that build your confidence" from Tangible support been free to load on General Esteem and Specific Esteem. This makes sense substantively, as this item contains information that could be about boosting esteem. However, the item was not dropped for two reasons. Firstly, the item was generated from an interview with a highlevel sportsperson who related a time when he had been injured. His father helped him with tasks (a tangible act) that helped him regain confidence whilst rehabilitating. Secondly, running a single-factor model in LISREL with only three items and 0 degrees of freedom would have generated a perfect fit.

For four of the factor intercorrelations, the 95% confidence interval around the correlation included values close to 1. These were for Tangible support and Technical Advice, General Esteem and Specific Esteem, General Esteem and Emotional support, and Specific Esteem and Emotional support. In all four of these cases the two factors were combined, and single-factor scales were tested. These models fitted well, suggesting that perhaps these factors ought not be separated. At this stage note was made of this, but, as the items for these scales did appear to be measuring qualitatively different constructs, it was felt justifiable to maintain the distinction between these constructs.

<u>Full model</u>. Fit statistics for the full model are also shown in Table 2. The ratio of χ^2 to degrees of freedom was less than two, and the RMSEA was low enough and

the CFI was high enough to feel reasonably confident about the fit of the model to the data. However, the GFI was fairly low (0.84) and SRMR marginally too high (0.07), leading to some caution in accepting the model.

At this point, simple correlations were also conducted between the social support factors, revealing that all correlations were significant, ranging from $\underline{r} = .31$ to $\underline{r} = .76$. This phenomenon has been observed in other social support measures (see, for example, Heitzmann & Kaplan, 1988; Vaux, 1992), and is the reason for criticism by those who question the theory behind differentiated multidimensional social support measures (see, for example, B. R. Sarason, Sarason, & Pierce, 1990b; Sarason, Shearin, Pierce and Sarason, 1987).

In view of these results and the four highly correlated two-factor models mentioned previously, it was deemed appropriate to test a full model with a higher order factor, despite insufficient sample size. This revealed a poor fit to the data (Table 2).

Table 2Fit measures for two-factor models, full model and higher order factor model

Scale	χ^2	d.f.	<u></u>	RMSEA	p value	GFI	SRMR	CFI	Correlations
					RMSEA				factors
					< 0.05)				(standard
					,				error)
Tangible and General Advice	15.71	13	.27	0.04	.53	.97	0.06	.98	.58(.10)
Tangible and Technical Advice	22.90	19	.24	0.04	.56	.96	0.03	.99	.91(.04)
Tangible and General Esteem	44.15	19	.00	0.10	.02	.92	0.08	.91	.57(.09)
Tangible and Specific Esteem	44.70	13	.00	0.14	.00	.91	0.09	.85	.61(.09)
Tangible and Emotional	26.67	19	.11	0.06	.37	.95	0.06	.97	.50(.10)
General Advice and Technical Advice	13.62	13	.40	0.02	.67	.97	0.04	1.00	.60(.08)
General Advice and General Esteem	4.57	13	.98	0.00	1.00	.99	0.02	1.00	.80(.07)
General Advice and Specific Esteem	3.10	8	.93	0.00	.97	.99	0.02	1.00	.80(.08)
General Advice and Emotional	17.69	13	.17	0.05	.41	.96	0.04	.98	.83(.08)
Technical Advice and General Esteem	13.97	19	.79	0.00	.94	.97	0.03	1.00	.44(.09)
Technical Advice and Specific Esteem	8.51	13	.81	0.00	.93	.98	0.04	1.00	.53(.09)
Technical Advice and Emotional	15.83	19	.67	0.00	.89	.97	0.03	1.00	.41(.09)
General Esteem and Specific Esteem	14.20	13	.36	0.03	.63	.97	0.03	1.00	.94(.05)
General Esteem and Emotional	29.20	19	.06	0.06	.27	.95	0.05	.97	.92(.05)
Specific Esteem and Emotional	16.57	13	.22	0.05	.48	.97	0.04	.99	.97(.06)
Full model	282.53	194	.00	0.06	.55	.84	0.07	.93	
Higher order factor model	359.98	203	.00	0.07	.00	.80	0.10	.87	

<u>Note.</u> <u>N</u> = 124

Hypotheses

It was hypothesised that performance and confidence slumps might adversely affect performance by leading players to worry. It was also hypothesised that General Advice might buffer this effect. That is, the potentially negative influence of performance and confidence slumps might be reduced by having someone to turn to for critical advice, who helps put things in perspective, and with whom the player talks things through. As noted earlier, it was hypothesised that technical problems in training might affect performance by stopping players from achieving flow, and that Tangible support might buffer this effect. It was also hypothesised that Technical Advice might buffer this effect. That is, the potentially negative influence of technical problems in training might be reduced by having someone to go and talk to about technical problems, who helps, solves problems, and gives technical advice. It was hypothesised that personal problems might affect performance by leading players to lose composure. It was also hypothesised that Emotional support might buffer this effect. That is, the potentially negative influence of personal problems might be reduced by having someone there for the player, who listens, cheers the player up, and gives moral support. It was hypothesised that doubts about form would lead the players to worry. It was also hypothesised that Specific Esteem would buffer this effect. That is, the potentially negative influence of doubts about form might be reduced by having someone who reinforces the positives, instils confidence in the player and lifts morale.

Of the other hypotheses, it was predicted that performance and confidence slumps might affect performance by leading the players to feel flat, worry, and by stopping them achieving flow. It was also hypothesised that these effects might be buffered by Emotional support, General Advice, and Specific Esteem. It was hypothesised that technical problems in training might affect performance by stopping the players from achieving flow and by leading them to worry. It was hypothesised that these effects might be buffered by Tangible support and Technical Advice. It was hypothesised that competition pressure might affect performance by leading the players to feel flat and by stopping them from achieving flow. It was hypothesised that these effects might be buffered by Specific Esteem and Emotional support. It was hypothesised that personal problems might lead to players losing composure. It was hypothesised that this effect might be buffered by Emotional support and General Advice. It was hypothesised that doubts about form might affect performance by leading the players to worry, and by stopping them achieving flow. It was also hypothesised that these effects might be buffered by Emotional support and General Advice. It was hypothesised that doubts about form might affect performance by leading the players to worry, and by stopping them achieving flow. It was also hypothesised that these effects might be buffered by Emotional support and Specific Esteem. In total, then, 23 directional hypotheses were formulated and tested in the present study.

Effects of stressors, social support factors and products on dimensions of performance

The results from the regression analyses are shown in Tables 3 to 7. The increment in explained variance $(\Delta \underline{R}^2)$ was taken to indicate the effect of an independent variable on the dependent variable (over and above the effect of any independent variables already in the equation). The significance of that increment (\underline{p} of \underline{F} for $\Delta \underline{R}^2$) is shown in the next column. The sign of the regression coefficient in the final equation (\underline{b}) is taken to indicate the direction of the association between independent and dependent variable (with other independent variables present).
Hierarchical Regression Analyses: Effects of Performance and Confidence Slumps, Social Support Factors and Products on Performance

Dependent Variable	Independent Variable	$\Delta \underline{R}^{2a}$	$p(\underline{F})^{b}$	<u>b</u> ^c	$p(\underline{t})^d$
Feeling Flat	Performance and Confidence Slumps	.05	.02	.10	.03
	Emotional Support	.02	.13	07	.10
	Product	.02	.16	06	.16
Flow	Performance and Confidence Slumps	.08	.00	13	.00
	Emotional Support	.05	.01	.13	.01
	Product	.01	.28	.04	.28
Worry	Performance and Confidence Slumps	.13	.00	.20	.00
	Emotional Support	.00	.44	04	.45
	Product	.00	.84	.01	.84
Feeling Flat	Performance and Confidence Slumps	.05	.02	.11	.01
	General Advice	.00	.45	04	.44
	Product	.00	.67	.02	.67
Flow	Performance and Confidence Slumps	.08	.00	16	.00
	General Advice	.03	.05	.09	.05
	Product	.01	.28	04	.28
Worry	Performance and Confidence Slumps	.13	.00	.22	.00
	General Advice	.01	.39	04	.35
	Product	.03	.03	.09	.03
Feeling Flat	Performance and Confidence Slumps	.05	.02	.11	.02
	Specific Esteem	.01	.34	04	.37
	Product	.00	.58	02	.58
Flow	Performance and Confidence Slumps	.08	.00	13	.00
	Specific Esteem	.05	.01	.11	.01
	Product	.01	.19	.05	.19
Worry	Performance and Confidence Slumps	.13	.00	.19	.00
	Specific Esteem	.03	.04	09	<.05
	Product	.00	.64	02	.64

<u>Note.</u> $\underline{N} = 124$. All variables standardised except for Product. Product formed from the two preceding (standardised) variables.

^aStepwise change in \underline{R}^2 . ^bProbability of <u>F</u> for \underline{R}^2 . ^cUnstandardised regression coefficient in final equation. ^dProbability of <u>t</u> for <u>b</u>.

<u>Hierarchical Regression Analyses: Effects of Technical problems in training, Social</u> <u>Support Factors and Products on Performance</u>

Dependent Variable	Independent Variable	$\Delta \underline{R}^{2a}$	p(F) ^b	<u>b</u> ^c	<u>p(t</u>) ^d
Flow	Technical problems in training	.00	.73	.04	.33
	Tangible support	.10	.00	.17	.00
	Product	.04	.02	.09	.02
Worry	Technical problems in training	.06	.00	.14	.01
	Tangible support	.02	.09	08	.09
	Product	.00	.77	01	.77
Flow	Technical problems in training	.00	.73	.03	.50
	Technical Advice	.02	.10	.09	.07
	Product	.02	.10	.07	.10
Worry	Technical problems in training	.06	.00	.13	.01
	Technical Advice	.00	.73	.02	.76
	Product	.00	.74	01	.74

<u>Note.</u> $\underline{N} = 124$. All variables standardised except for Product. Product formed from the two preceding (standardised) variables.

^aStepwise change in $\underline{\mathbb{R}}^2$. ^bProbability of <u>F</u> for $\underline{\mathbb{R}}^2$. ^cUnstandardised regression coefficient in final equation. ^dProbability of <u>t</u> for <u>b</u>.

<u>Hierarchical Regression Analyses: Effects of Competition pressure, Social Support</u> Factors and Products on Performance

Dependent Variable	Independent Variable	$\Delta \underline{R}^{2a}$	<u>p(F</u>) ^b	<u>b</u> ^c	$\underline{p}(\underline{t})^{d}$
Feeling Flat	Competition pressure	.06	.01	.14	.00
	Specific Esteem	.02	.10	05	.30
	Product	.03	.03	09	.03
Flow	Competition pressure	.02	.13	09	.04
	Specific Esteem	.07	.00	.11	.02
	Product	.04	.02	.09	.02
Feeling Flat	Competition pressure	.06	.01	.13	.00
	Emotional support	.03	.05	08	.09
	Product	.03	.05	08	.05
Flow	Competition pressure	.02	.13	08	.06
	Emotional support	.07	.00	.13	.01
	Product	.03	.04	.09	.04

<u>Note.</u> $\underline{N} = 124$. All variables standardised except for Product. Product formed from the two preceding (standardised) variables.

^aStepwise change in \underline{R}^2 . ^bProbability of <u>F</u> for \underline{R}^2 . ^cUnstandardised regression coefficient in final equation. ^dProbability of <u>t</u> for <u>b</u>.

Hierarchical Regression Analyses: Effects of Personal problems, Social Support Factors and Products on Performance

Dependent Variable	Independent Variable	$\Delta \underline{R}^{2a}$	$p(\underline{F})^{b}$	<u>b</u> ^c	$p(\underline{t})^d$
Loss of Composure	Personal problems	.02	.12	.09	.09
	Emotional support	.00	.86	.03	.53
	Product	.05	.01	13	.01
Loss of Composure	Personal problems	.02	.12	.07	.19
	General Advice	.00	.59	02	.74
	Product	.01	.18	06	.18

<u>Note.</u> $\underline{N} = 124$. All variables standardised except for Product. Product formed from the two preceding (standardised) variables.

^aStepwise change in $\underline{\mathbb{R}}^2$. ^bProbability of <u>F</u> for $\underline{\mathbb{R}}^2$. ^cUnstandardised regression coefficient in final equation. ^dProbability of <u>t</u> for <u>b</u>.

Hierarchical Regression Analyses: Effects of Doubts about form, Social Support Factors and Products on Performance

Dependent Variable	Independent Variable	$\Delta \underline{R}^{2a}$	p(F) ^b	<u>b</u> ^c	<u>p(t</u>) ^d
Flow	Doubts about form	.10	.00	17	.00
	Emotional support	.07	.00	.14	.00
	Product	.01	.31	.04	.31
Worry	Doubts about form	.16	.00	.23	.00
	Emotional support	.01	.23	06	.23
	Product	.01	.36	04	.36
Flow	Doubts about form	.10	.00	18	.00
	Specific Esteem	.06	.00	.13	.00
	Product	.03	.04	.08	.04
Worry	Doubts about form	.16	.00	.24	.00
	Specific Esteem	.04	.02	11	.02
	Product	.03	<.05	08	<.05

<u>Note.</u> $\underline{N} = 124$. All variables standardised except for Product. Product formed from the two preceding (standardised) variables.

^aStepwise change in \underline{R}^2 . ^bProbability of <u>F</u> for \underline{R}^2 . ^cUnstandardised regression coefficient in final equation. ^dProbability of <u>t</u> for <u>b</u>.

There were eight moderating or interactive effects of stressors and social support dimensions on the performance dimensions. Seven of these could be related to the stress-buffering hypothesis. That is to say, for seven of the interactive effects, under high stress conditions, those with high support had higher scores than those with low support on performance factors with positive connotations (e.g., Flow) and lower scores for performance factors with negative connotations (e.g., Feeling Flat, Worry, and Loss of Composure). For example, for those with low emotional support (i.e., with Emotional support 1 SD below its mean), a one unit increase in personal problems led to an increase in Loss of Composure of .22 units. For those with high emotional support (i.e., with Emotional support 1 SD above its mean), a one unit increase in personal problems led to a decrease in Loss of Composure of .04 units. The effect of personal problems (PB) and Emotional support (ES) on Loss of Composure (LC) can be represented by the following formula (please see Jaccard et al., 1990):

LC = 1.819 + .092(PB) + .034(ES) - .130(PB*ES)

Hence, when ES = -1 (one SD below its mean)

LC = 1.785 + .222(PB)

When ES = +1 (one SD above its mean)

LC = 1.853 - .038(PB)

These equations are represented graphically in Figure 1, from which it is apparent that the potentially negative effect of personal problems on Loss of Composure was "buffered" for those with high emotional support. Figures 2-8 represent all the other examples of interactive effects observed in this study.



Figure 1: Interactive Effect of Personal Problems and Emotional Support on Loss of Composure



Figure 2: Interactive Effect of Competition Pressure and Specific Esteem on Feeling Flat



Figure 3: Interactive Effect of Competition Pressure and Specific Esteem on Flow



Figure 4: Interactive Effect of Competition Pressure and Emotional support on Flow



Figure 5: Interactive Effect of Doubts About Form and Specific Esteem on Flow



Figure 6: Interactive Effect of Doubts About Form and Specific Esteem on Worry



Figure 7: Interactive Effect of Technical Problems in Training and Tangible support on Flow



Figure 8: Interactive Effect of Performance and Confidence Slumps and General Advice on Worry

One slight anomaly is represented in Figure 8, from which it is apparent that Worry was highest when both performance and confidence slumps and General Advice were high (i.e., the interaction was not in the predicted direction). This anomaly will be discussed later.

There were also a number of main effects for stressors and social support factors on the performance factors. Where these occurred in combination with an interactive effect, they should be interpreted in light of the interactive effect. However, independent main effects for social support on performance factors suggest that social support may also aid performance in a general way (i.e., it has an overall influence on performance factors), regardless of the level of stress. There were four instances, where main effects were found for both the stressor and the social support factor, but no significant interactive effect was observed. These were for the effects of performance and confidence slumps and Emotional support on Flow, performance and confidence slumps and Specific Esteem on Flow and Worry, and doubts about form and Emotional support on Flow. For all these, effects of social support dimensions on Flow were in a positive direction (i.e., enhanced Flow), and the effect on Worry was negative (i.e., reduced Worry).

Discussion

The first aim of this research was to examine the structural validity of the social support measure constructed for the present study. Using analyses of covariance structures and the sequential model testing approach, the structure was largely confirmed. Items were deleted from each scale until good fits were found. At the two-factor stage, four models which had revealed high factor intercorrelations were tested as single-factor scales, revealing good fits. These were for Tangible support and Technical Advice, General Esteem and Specific Esteem, General Esteem

and Emotional support, and Specific Esteem and Emotional support. This suggests that perhaps these factors ought not to be separated. Whilst the items on these scales could be said to have contained qualitatively different aspects of support, this finding lends support to the suggestions that support might be broken down solely into emotional and tangible aspects (see, for example, Cutrona & Russell, 1990; House & Kahn, 1985). Nonetheless, Cutrona & Russell argued that these two factors should be further distinguished by aspects of emotional and esteem support on the one hand, and tangible and informational support on the other. One reason for this is the differential association of these more specific factors with specific outcomes. It was, nonetheless deemed appropriate to test a full model with the inclusion of a higher order factor. In view of the lack of subject numbers for such a model with many additional parameters, such a test should be treated with caution, and did, in fact, yield a poor fit.

Although the test of the full model did reveal a reasonable fit to the data, the SRMR was marginally too high and the GFI was fairly low. The low GFI was probably a result of the relatively small sample size as the GFI has been shown to be adversely affected by small sample sizes (Marsh, Balla, & McDonald, 1988). The relatively small sample size in this study is a natural function of a lack of tennis players of high calibre. If one were to use a lower standard, then one could more easily increase the numbers of participants. However, well-designed studies of high-level performers are relatively rare, and for players at much lower ranking levels, where skill levels differ so much, subtle changes in levels of stressors and social support may be less salient and play less of a role in determining performance factors.

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The present study also examined the main and stress-buffering effects of social support upon performance. For the sake of clarity we do refer to effects of stressors and social support on performance. However, it is important to note that no causal link can be inferred from this study. Drawing upon the literature from mainstream social psychology, in our study, stress-buffers were taken to mean one of two things: Firstly, the social support might have partially reduced the deleterious impact of stressors on performance; or, social support might have totally ameliorated the effect of stressors on performance (Cohen & Wills, 1985). In such a way, the following is a description of the results, highlighting the process by which the support exerted an influence. Comparisons are made with previous observations of stress-buffers with specific functional social support measures in mainstream social psychology. The influence of technical problems in training on Flow was buffered by Tangible support, this support totally ameliorating any negative impact of the stressor. That is to say, players experiencing technical problems in training were not stopped from achieving flow, when they were helped by having someone to help plan, organise and set sessions in training. This is similar to the result of research by Paykel, Emms, Fletcher, and Rassaby (1980) on the depressive symptoms of postpartum mothers. In their study, concrete instrumental help (similar to our conceptualisation of tangible support) with household chores and shopping buffered the negative impact of stress on depressive symptoms. The influence of competition pressure on Flow and Feeling Flat was buffered by Specific Esteem, this support totally ameliorating any negative impact of the stressor. That is to say, players experiencing competition pressure were not stopped from achieving flow and did not feel flat, when they were helped by having someone to reinforce the positives, instil the players with confidence to deal with the pressure, and lift morale. Similar results

were observed by Cohen & Hoberman (1983), who found that the influence of stress on depressive symptomatology was buffered by esteem support. The influence of competition pressure on Flow was also buffered by Emotional support, this support totally ameliorating any negative impact of the stressor, and implying that players experiencing competition pressure were not stopped from achieving flow, when they were helped by having someone there for them, to listen, and give them moral support. The influence of personal problems on Loss of Composure was buffered by Emotional support, this support totally ameliorating any negative impact of the stressor. That is to say, players experiencing personal problems did not lose composure, when they were helped by having someone there for them, to listen, and give them moral support. In the Cohen and Hoberman study, buffering effects were also found for belonging and appraisal support, both of which contain items similar to those on our scale for emotional support. The influence of doubts about form on Flow and Worry was buffered by Specific Esteem, in this case the support partially buffering the negative impact of the stressor. That is to say, players experiencing doubts about form were helped by having someone to reinforce the positives, instil the players with confidence to deal with the pressure, and to lift morale. Compared to players with less of this type of support, players with higher levels of Specific Esteem maintained higher levels of flow and worried less.

Significant main effects were found for Emotional support and Tangible support on Flow. Main effects were also found for Specific Esteem on Flow and Worry. Where these occurred in conjunction with a significant interaction they should be interpreted in light of this effect. Similar to the results of Rees et al. (1999), such results suggest that support also exerted a beneficial direct effect upon performance, and not just in the presence of the stressors.

The results of this study also highlight other interesting aspects. For example, the nonsignificant buffering effect of Technical Advice on technical problems in training suggests that players experiencing such a stressor were not helped by the receipt of direct technical advice. Rather, they were helped by having someone to plan, organise and set sessions in training to help sort out the problem. Equally, players experiencing personal problems were not helped by the receipt of General Advice, but were helped by having someone to just be there, listen, cheer them up, and give moral support. Players experiencing doubts about form were helped by the receipt of Specific Esteem. Perhaps they were helped by having someone to lift their morale, reinforce the positives, and instil them with confidence. However, for this stressor Emotional support did not help. Perhaps, the receipt of Emotional support simply serves to confirm the problem, without helping to sort the problem out. Players experiencing performance and confidence slumps were not helped by Emotional support or by Specific Esteem. Furthermore the result of the interaction between performance and confidence slumps and General Advice on Worry suggests that such support might have exacerbated the detrimental aspect of this stressor. That is, in this one unexpected finding, when performance and confidence slumps were high, those with high General Advice support had higher scores on Worry than did those with lower General Advice. In other words, effects of the stressor on performance appeared to be "buffered" for those people with low support. Despite this apparent anomaly, one could conceivably interpret this finding in two other ways: Those people experiencing a performance and confidence slump, and who scored high on the Worry performance factor, sought out General Advice support to help them cope. Thus, the causal direction of the effect was different to that which was hypothesised. Alternatively, it might be that this specific type of support is only

useful up to a point, but actually exacerbates the situation at high levels of performance and confidence slump. In other words, it did the players more harm than good to have excessive General Advice support, because such advice simply reinforced the fact that they did have a problem. Krause (1995) has argued that social support is indeed only useful up to a point. The contradictory findings for stressbuffering effects of social support in the mainstream psychology literature might therefore simply be due to the fact that researchers have misspecified the relationship between stress and support.

The finding of significant stress-buffering effects arose from detailed attention to the measurement instruments chosen for the constructs under study. The measures of stressors needed to be matched in as specific a way as possible with the measure of social support (Cohen & Wills, 1985; Cutrona & Russell, 1990; Veiel, 1992). The measures were context-specific (i.e., of specific relevance to sportspeople), and the social support measure was multidimensional, tapping functional elements. Whilst some researchers have questioned the theory and psychometric properties of such measures as opposed to conceptualising social support as a unidimensional construct (B. R. Sarason et al., 1990b; Sarason et al., 1987), it is unlikely that stress-buffering would have been observed with more general measures (Cohen & Wills, 1985; Cutrona & Russell, 1990; Veiel, 1992). In an earlier study by Rees, Ingledew & Hardy (1996) in sport, only main effects were found using aggregate measure of stress and social support, but no interactive effects.

Detection of effects on performance may have been further enhanced by the use of a differentiated performance measure, as opposed to an outcome measure. Whilst the influence of stress on performance has been well documented (see, for example, Jones & Hardy, 1990), measures of performance that are multidimensional would appear to give a greater insight into the possible mechanisms of influence of predictor variables, such as stress and social support. Indeed, it has been noted that anxiety effects of statistical significance are unlikely to be detected when outcome performance measures are used (Parfitt, Jones & Hardy, 1990).

Two other points are also of note here. For four of the significant stressbuffering effects of social support on performance, the main effect of stress on performance was not significant. This might imply that, despite the apparent stressbuffer, the stress did not actually play a large part in influencing performance. Cohen and Wills (1985) have, nonetheless, made the point that a statistically significant main effect for stress is not a pre-requisite for a test of the stress x support interaction.

In four cases there were significant main effects of both stressors and social support, but no significant stress-buffering effects. Such results do not necessarily imply a lack of a stress-buffer (Veiel, 1992). Often, this implies a lack of specificity of the measures. However, in the present study that explanation may be difficult to substantiate, given the carefully detailed matching process.

The finding that high General Advice was associated with more worry for players experiencing performance and confidence slumps also highlights the fact that "supportive" others are sometimes poor providers of support. Generally, the results of the present study suggest that social support is a good thing, in terms of its direct influence on performance and its ability to combat stress. Such results might lead important others to the conclusion that they should actively give support. Herein lies a problematic issue, in that unskilled others are often poor providers of support, basing their understanding of what the individual needs solely on intuition. For example, Lehman, Ellard, and Wortman (1986) noted that others can provide

unhelpful support by trying, among other things, to minimise the importance of an event, avoid open communication about the event, criticise attempts at coping, encourage quicker coping, and give inappropriate advice. The findings of the present study may be particularly salient in this regard. For example, given that, when approached regarding technical problems, coaches might naturally offer technical advice, the results of this study imply that this might not be the best form of support to give. It might be better to help plan, organise and set sessions in training to deal with the problem. For personal problems, players might not want to be told what to do, but rather just have someone there for them, to listen. If players have doubts about form, they might want to be lifted, and not just be given emotional support. Interventions might, therefore, focus upon providers to improve the quality and aptness of the support they provide, and to help them recognise that specific problems and stressors require specific types of support to deal with them. Such careful matching could have an impact upon a player's performance. Interventions might also focus upon helping performers to fully understand how they can maximise the support that is available in their network of supportive others, and learn the skills necessary to be proactive in using this resource. The concept of matching stressors with support (Cutrona & Russell, 1990) implies that performers might also be taught to recognise their needs and seek out appropriate supportive exchanges to help deal with those needs (Richman et al., 1989).

The present study has important implications for sports performers and all those involved with them. The finding of both significant main and stress-buffering effects of social support points to the need for performers to recognise that important others can play a crucial role in aiding performance and protecting them from the detrimental effects of stressors. Those, who were more isolated from support did not perform so well. Therefore, the oft-hailed "toughness" ideal that sportspeople should feel they must "go it alone" in their pursuit of success and not seek out social support in times of need is out-moded and potentially very limiting. Performers should, in fact, be encouraged to be selectively proactive in their use of social support (e.g., Richman et al., 1989) and be helped to understand that such action is not a sign of weakness (Hardy, Jones & Gould, 1996).

Chapter 6: General Discussion

Discussion of Results

This thesis has examined some psychosocial determinants of dimensions of performance. The thesis contains four studies. The first concerned the issue of performance assessment in sport, and reported confirmatory factor analyses of an instrument for tennis performance, first reported in Rees, Ingledew and Hardy (1999). The second concerned the issue of assessment of social support in sport, and reported confirmatory factor analyses of the Social Support Survey (SSS) (Richman, Rosenfeld, & Hardy, 1993). The third concerned the social support experiences of sportspeople, and reported qualitative analyses of in-depth interviews with high-level athletes. The fourth concerned how social support might exert an influence upon performance, reporting confirmatory factor analyses of the social support instrument used, and analyses of main and stress-buffering effects of social support upon performance.

In the first study, Rees et al.'s (1999) assessment instrument for tennis performance was refined and its factor structure was tested using a new sample of 155 full-time tennis players. Confirmatory factor analyses revealed a good fit for the proposed model to the new data sample, and provided confirmation for the seven performance factors: Execution of (Flexible) Plan; Loss of Composure; Feeling Flat; Determination; Worry; Flow; and Effective Tactics. The performance factors also discriminated between winners and losers. It was concluded that, as well as providing support for the model of the performance instrument, this study and the original study by Rees et al. (1999) pointed to the need for performers to look at the various factors comprising overall performance - in a sense, the processes by which they come to achieve their successes. It was also concluded that, in light of the results and the numerous calls for improved performance measurement in the sport psychology literature, future research should continue to adopt a more processoriented and differentiated approach to performance assessment.

In the second study, the Social Support Survey (SSS) (Richman, Hardy, & Rosenfeld, 1993) was tested using confirmatory factor analyses. Analyses revealed poor fits to models for a structure for the SSS involving eight forms of support, and for a structure for the SSS involving the four questions across all eight forms of support. The fit of the model to the data was generally good when a multitraitmultimethod (MTMM) approach was utilised. Despite the structure of the SSS being essentially confirmed using the MTMM approach, reservations were expressed regarding the appropriateness of the dimensional structure of the SSS, and implications were derived, which included a call for caution to be exercised when using this instrument in research and applied settings.

In the third study, the social support experiences of sportspeople were examined through qualitative analyses of in-depth interviews with 10 high-level sports performers. Grounded Theory Analysis indicated a four-dimensional model of social support, with dimensions labelled: Emotional; Esteem; Informational; and Tangible support. Within each dimension performers made comments relating to sport-specific support and comments relating to support not directly concerning the sport itself. The quotes of the performers attested to the potentially beneficial influence of social support in sport. Indeed, the study suggested important implications for sports performers and all those involved with them. For example, it was proposed that people within sport recognise that important others can play a crucial role in the life of the performer, and that the consequences of performers being isolated from support are damaging. The specific quotes from this study informed the construction of a questionnaire for study four.

In the fourth study, stressors and social support dimensions were matched in order to examine the main and stress-buffering effects of social support upon performance. The refined performance measure was used, together with a measure of social support derived from study three, and sport-specific stressors. Moderated hierarchical regression analyses revealed seven examples of stress-buffering effects of social support on performance, and one other interaction, which could not be labelled a stress-buffer. These results suggested that players were protected from the harmful effects of the stressors when they had access to specific types of matched support. There were a number of significant main effects of social support upon performance, suggesting that social support also exerted an overall beneficial effect upon performance, regardless of the presence of the stressors. Implications for research and applied practice were made, including the suggestion that the results of the process of matching stressors with support (Cutrona & Russell, 1990) implies that performers might be taught to recognise their needs and seek out appropriate supportive exchanges to help deal with those needs (Richman, Hardy, Rosenfeld, & Callanan, 1989).

Theoretical Implications

As noted previously, despite recommendations for research into social support in sport (e.g., Hardy & Jones, 1994; I. G. Sarason, Sarason, & Pierce, 1990), and despite the wealth of evidence pertaining to the positive effects of social support in mainstream social psychology (for reviews, see, for example, Cohen, 1988; Heitzmann & Kaplan, 1988; B. R. Sarason, Sarason & Pierce, 1990a; Veiel & Baumann, 1992c), there has been comparatively little research on social support in sport. What research there has been has largely noted social support as one of many aspects that might be of importance to high-level performers, without any attempt to investigate this phenomenon further. In mainstream social psychology, however, social support has been the most frequently studied psychosocial resource (Thoits, 1995) and, despite an enduring lack of understanding of how it exerts a beneficial influence, social support has been noted alongside stress and coping as one of the three most important constructs in mental health research (Veiel & Baumann, 1992b). The findings that arise from this thesis suggest that social support is also an important psychosocial resource for sport psychology, and is deserving of further structured research.

A number of implications for social support research in sport were highlighted. Firstly, the results of study three demonstrated that social support is considered beneficial by sportspeople, and there appear to be a number of different types of supportive functions that can be served by the support. Study two suggested that one should not necessarily accept that established measures of social support adequately reflect the social support experiences of performers. There are a number of reasons for this statement: social support measures often lack context-specificity; whilst they may be based on a theoretical rationale, the construction of measures has not always been based on sound principles of factor analysis; and there is a lack of consensus as to what dimensional structure these measures should take. The fourth study also addressed these concerns, but provided a more theoretical explanation of how social support functions for sportspeople. In terms of effects on sports performance, study four suggests that social support may function by exerting an overall beneficial influence on performance, and it may also act as a buffer against the potentially deleterious effects of different stressors on performance. In terms of mechanisms underpinning effects on performance, it may be that the social support helps by stopping the players from experiencing worry, losing composure, and feeling flat, and may also help players to maintain flow. All these factors were found to discriminate winners from losers in study one.

The finding of significant stress-buffering effects in the fourth study arose from detailed attention to the measurement instruments chosen for the constructs under study. Specifically, this highlighted the need for measures of stressors and social support to be matched in as specific a way as possible (Cohen & Wills, 1985; Cutrona & Russell, 1990; Veiel, 1992); it is possible that the lack of consistent findings of stress-buffering effects in mainstream psychology is due to this lack of specific matching. The measures were context-specific (i.e., of specific relevance to sportspeople), and the social support measure was multidimensional, tapping functional elements. Whilst some researchers have questioned the theory behind and psychometric properties of such measures (e.g., B. R. Sarason, Sarason, & Pierce, 1990b; Sarason, Shearin, Pierce & Sarason, 1987), it is unlikely that stress-buffering would have been observed with more general measures (Cohen & Wills, 1985; Cutrona & Russell, 1990; Veiel, 1992). Indeed, in an earlier study by Rees, Ingledew & Hardy (1996) in sport, only main effects were found using aggregate measures of stress and social support, but no interactive effects.

In examining the stress-buffering properties of social support, Cutrona & Russell (1990) stressed the need to move away from using aggregate measures of stress and support to carefully matching specific stressors with specific functional social support. By employing specific measures of stressors and specific functional social support measures to examine optimal stress and support combinations, one

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should be in a more informed position to comment on how stress can be harmful and how social support can protect people from this harm (Cutrona & Russell, 1990). It is interesting that, when stress-buffering effects have been reported using aggregate measures, explanations have rarely been given as to the psychological or psychosocial processes underlying these interaction effects (Veiel, 1992).

Despite some reservations in terms of the fit of the full model, the performance measure highlighted in study one and four should be seen as a refinement of the measure in Rees et al. (1999). It addresses some of the concerns regarding outcome performance measurement, such as lack of sensitivity and differentiation of performance factors. Such multidimensional process oriented performance assessment instruments should aid in pinpointing areas of strength and weakness, and help to explain the effects of predictor variables, such as stress and social support.

Applied Implications

The conclusions derived from the studies in this thesis have important implications for sports performers and all those involved with them. Indeed, even the issues of problematic measurement of social support have implications for applied practice. For example, the Social Support Survey (SSS) has been said to "possess high clinical utility for practitioners" (Richman, Rosenfeld, & Hardy, 1993, p. 304), and implications for best practice have been derived, based upon the conceptual model underpinning the SSS (e.g. Richman et al. 1989, Hardy & Crace, 1991, Rosenfeld & Richman, 1997). Based upon this model, Rosenfeld & Richman (1997) made suggestions for enhancing each of the eight content factors of support in sports teams to aid team-building, and Hardy and Crace (1991) describe the types of support sportspeople need. However, the conclusions from study two suggest that the structure of the SSS and the rationale on which it is based may not be a good model of social support for sport. The conclusions from study three suggested that social support may involve just four and not eight distinct content factors, as in the SSS. Consequently, the claim by Richman et al. (1993), that the SSS allows people to "view strengths and deficits in their network and begin to plan for adding, deleting, or accepting support" (p. 293) may not be fully justified.

Despite active encouragement for athletes to harness their social support resources (e.g. Gould, Jackson, & Finch, 1993; Hardy & Crace, 1991; Richman, Hardy, Rosenfeld, & Callanan, 1989), such encouragement appears to be based upon largely anecdotal and indirect evidence for the beneficial effects of social support in sport, and certainly not on any empirical evidence for beneficial effects upon performance. The finding of significant main and stress-buffering effects in study four of this thesis provides this evidence, and points to the need for performers (and supportive others) to recognise that important others can play a crucial role in aiding performance and protecting performers from the detrimental effects of stressors. Quotes from the athlete interviews in study three attested to the beneficial influence of social support and to the damaging effects of being isolated. In study four, those players who were more isolated from support did not perform so well. These findings suggest that the oft-hailed "toughness" ideal of going it alone is out-moded and potentially very limiting. As noted previously, performers should be made aware of the detrimental influence upon performance of being isolated, then be encouraged to be proactive in their use of social support (e.g., Richman et al., 1989) and be helped to understand that such action is not a sign of weakness (Hardy, Jones & Gould, 1996), and may in fact actually improve performance.

The findings from study three suggested that performers receive different types of support to help deal with different problems and stressors. Indeed, in replying to a question about the nature of the different support received, one netball player replied, "Depends what the problem was." These findings again highlight Cutrona & Russell's (1990) notion of matching stressors with the correct support. In study four, specific stressors were buffered by specific types of social support, but not by others. For example, the influence of Technical problems in training on Flow was buffered by Tangible support, but not by Technical Advice. This result could have important implications for performers and their supportive others, because, when approached regarding technical problems, coaches might naturally tend to offer technical advice. The aforementioned result suggests that, compared to Tangible support, this might not be the best form of support to give. In another example, the influence of Personal problems on Loss of Composure was buffered by Emotional support, but not by General Advice. So, perhaps, it needs to be understood that players experiencing personal problems might not want to be told what to do, but rather just have someone there for them, to listen, and give them moral support.

The finding in study four that high General Advice was associated with more worry for players experiencing performance and confidence slumps also highlights the fact that "supportive" others are sometimes poor providers of support. Based upon results highlighting the beneficial influence of social support, in terms of its direct effect upon performance and in terms of its ability to combat stress, important others might conclude that they should actively give support. This can lead to problems, because unskilled others are often poor providers of support, basing their understanding of what the individual needs solely on intuition. Lehman, Ellard, and Wortman (1986) noted this, and pointed out that others can provide unhelpful support by trying, among other things, to minimise the importance of an event, avoid open communication about an event, criticise attempts at coping, encourage quicker coping, or give inappropriate advice. The findings of study four may be particularly salient in this regard, and some examples of the need to carefully match stressors with support have already been given.

Focusing solely on encouraging performers to seek out social support may therefore not always be the best intervention, especially if what is received is inappropriate. Interventions might, therefore, also involve a focus upon providers to improve the quality and aptness of the support they provide. Interventions should help them to recognise that specific problems and stressors require specific types of support to deal with them, and that this process requires careful, detailed thought, and could have an important impact upon a player's performance. Interventions should nonetheless still focus upon helping performers to fully understand how they can maximise the support that is available in their network of supportive others, and learn the skills necessary to be proactive in using this resource. The concept of matching stressors with support (Cutrona & Russell, 1990) implies that performers might also be taught to recognise their needs and seek out appropriate supportive exchanges to help deal with those needs (Richman et al., 1989).

It certainly makes intuitive sense that the specific stressors faced by athletes may require specific types of support to buffer them. For example, the player experiencing personal problems probably needs emotional support more than tangible financial aid. Conversely, the player experiencing technical problems in training probably needs tangible help to plan training more than emotional support. Furthermore, this concept of matching stressors with support (Cutrona & Russell, 1990) potentially applies to all areas of life. For example, a person coping with a recent bereavement may initially require emotional support to aid the coping process, rather than the tangible gift of money.

Interestingly, it might be important to find out whether those with low levels of social support are simply unlucky, or whether they drive people away. If poor social skills have led to low levels of social support, interventions might include training strategies to alter people's patterns of social interaction. (Sarason & Sarason, 1986; I. G. Sarason, Sarason & Pierce, 1990). All such issues involve problematic ethical considerations, in that interventions might be viewed as an attempt to force friends on people. Certainly, intervention work in social support is different from most other types of applied practice, in that the beneficial effects of social support per se are not received from direct contact with a practitioner; the beneficial effects are realised through the performer's subsequent interaction with his or her social environment (Gottlieb, 1992).

Coupled with the original study by Rees et al. (1999), studies one and four further point to the need for performers and coaches to look at the various factors comprising overall performance, and not just at the outcome. This is particularly pertinent, as the performance factors did discriminate winners from losers. Certainly, it can be problematic when a performer concentrates solely on the outcome of an event at the expense of the process by which he or she arrives at the outcome (Hardy, Jones, & Gould, 1996). Indeed, after the event, a focus on outcomes, such as winning versus losing, may mask the quality of the performance (Weinberg, 1990), so that it is difficult to pinpoint areas which need improving.

Methodological Limitations

One major limitation of this research could be the lack of subject numbers for the types of analyses used in studies one, two and four. For example, in confirmatory factor analysis, it is often recommended that one use figures of 10 subjects per each estimated parameter in the model. None of the studies had such sufficient data to test full models with confidence, apart from study two. This was generally shown up in the low values for the Goodness of Fit Index in each study. The Goodness of Fit Index has been found to be adversely affected by small sample sizes (Marsh, Balla, & McDonald, 1988). To overcome this problem, analyses were conducted using the sequential model testing procedure recommended by Jöreskog (1993). This allows one to conduct analyses on sections of the full model, thus optimising the subject numbers for each section's analysis.

Use of comparatively small subject numbers can be justified in terms of the quality of those subjects. In study two, student athletes from all sports were used, so it was relatively easy to generate large subject numbers. However, in studies one and four, touring high-level tennis players (including world ranked players) were recruited, mostly at the tournament sites themselves, because such high quality data are necessary if applied sport psychologists are to use the results to inform their interventions with high-level sportspeople. Numbers could have been increased by the addition of much lower ranked players, and players who do not regularly play tournaments. However, as noted in chapter five, well-designed studies of high-level performers are relatively rare, and for players at much lower ranking levels, where skill levels differ so much, subtle changes in levels of stressors and social support may be less salient and play less of a role in determining performance factors.

In study four, the multiple use of regression analyses could have meant that this study capitalised on chance findings. In total, 23 separate moderated hierarchical regression analyses were conducted, within each of which were tests for two main effects and one interaction. To counter the problem of Type I errors, all hypotheses

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were stated a priori. In fact, it is quite possible that, given the differential predictions of various performance factors in Rees et al., (1999), that further significant findings could have been observed in study four, had more analyses been conducted. Canonical correlation could have been used to address the problem of multiple analyses, but such an analysis could not have tested for interactions. The models could also have been tested using LISREL. However, the sample size precluded the use of structural models, and performing analyses on our models with observed variables would have led to perfect fits, because these models would have had 0 degrees of freedom.

There may have been gender confounds in this thesis. In study four gender differences could have led to false conclusions of significant associations with the performance factors using linear regression analysis. There were also more males than females in studies one and four, which is due to a lack of female players playing on the British tennis circuit.

Finally, for the sake of clarity, study four tended to refer to effects of stressors and social support on performance components. However, it is important to recognise that no causal link can be inferred from this study. Generally, it seems most unlikely that social support could have been caused by performance, although it was suggested that the one anomaly in study four could be interpreted in this exact fashion. On the other hand, poor performance could conceivably have led to the stressors, performance and confidence slumps and doubts about form. The issue of causality is further addressed in the following section.

At this point it would also be pertinent to revisit the debate concerning nomothetic and ideographic research that was highlighted in the introduction to this thesis. Some of the merits and demerits of these two approaches were addressed there. The need to revisit these issues is important, since a proponent of either approach would tend to bring a specific focus to bear upon the interpretation of results (essentially a methodological issue) and subsequent research (essentially a future research issue).

Throughout this thesis implications for psychological intervention, based upon results of the four studies, were highlighted. These implications were borne of consistencies across groups of participants (a nomothetic approach to research). In terms of the results from study 4, specific types of social support buffered the negative effects of specific stressors on performance. From these, it was concluded that social support could have an important role to play in the performer's life and should be regarded as an important construct for applied practitioners to be aware of. However, some of the hypotheses in this study did not unearth significant results, leading to a conclusion that certain types of social support may not be beneficial in dealing with certain stressors. These "somewhat" mixed results could suggest another interpretation; that the research methods employed had some limitations. The sound use of measurement instruments meant that a trend in results emerged that has been lacking in previous research – a positive element of this research. However, it is possible that an ideographic approach might have suggested further relationships. Indeed, by reducing the phenomena in this thesis to a degree whereby they could be well-measured and studied in statistical analyses, some of the important elements of social support that are embedded more holistically in the individual may have been missed.

The implication from the stance of the proponent of ideographic research is that subsequent research focusing on the individual might aid further understanding in this area. For example, it might enable one to find out more about who gives what type of social support, and to what degree (cf. Vanden Auweele et al., 1993). In defence of the methods in this thesis, one might argue that a problem with such an approach is that ideographic research tends to be largely descriptive, and, as such, it does not generally allow one to test specific hypotheses. Used longitudinally, on the other hand, it might be possible to employ an ideographic approach to test hypotheses, and this may be a useful way to extend the findings in this thesis. For example, one might look at who gives what types of social support at different time points, and observe fluctuations in stressors and performance at those times.

Clearly, both nomothetic and ideographic approaches have inherent strengths and limitations. As noted in the introduction to this thesis, the important point is to be aware of those strengths and limitations and not to rely or insist on either a nomothetic or ideographic approach, as this runs the risk of building an incomplete picture of the phenomena of interest.

Future Research

This thesis addressed some of the limitations of social support research and the issues of primary importance facing researchers examining the influence of social support on performance in sport. These were: the issue of measurement of social support, with consideration of the psychometric quality, dimensionality, and contextspecificity of measures is an issue for sport and mainstream social psychology alike. the issue of how social support exerts its influence, with consideration of social support processes, main and stress-buffering effects of social support, and optimal matching of specific stressors with specific functional support; and the issue of performance assessment, with consideration of the processes underlying performance. All these issues still require further examination.

In study four, the measure of social support was constructed and tested using sound validation techniques, was multidimensional, and context-specific. However, further analyses of the measure still need to be conducted with new samples. Future research into the stress-buffering effects of social support might also involve the use of different social support items generated from the third study. In such a fashion, one might choose new stressors and match them to specific support by choosing specific items. For example, in the fourth study the criteria for inclusion of items were as follows: stressors were chosen for their applicability to high-level tennis players and their potential influence on the processes that might underpin performance; social support items were then selected for their potential to be matched with those stressors. For example, it was hypothesised that technical problems in training might affect performance, by stopping players from achieving "flow." It was also hypothesised that specific tangible support might buffer this effect. Items were then selected from study three that would best reflect this aspect of tangible support and would best match the stressor. In future research, one might want to examine the extent to which stressors and problems over financial and transport matters might affect performance. Specific tangible support items about dealing with financial and transport matters could then be selected from the pool of items for tangible support as the best matches for the stressor in question.

Future research might also include a more detailed examination of the mediating processes underpinning effects of social support. In the fourth study mediating processes were highlighted by using the performance factors as dependent variables and then speculating on their effects in terms of processes. This is a reasonable assumption, given that in study one performance factors were found to discriminate between winners and losers. Nonetheless, it may be possible in future to statistically model such mediating effects, in order to learn still more about the nature of the way social support exerts effects upon performance.

In light of the numerous calls for improved performance measurement in the sport psychology literature, and the encouraging use of multi-component performance assessments in studies one and four, future research should continue to adopt a more process-oriented and differentiated or multidimensional approach to performance assessment. The performance measure highlighted in study one addresses one of the concerns regarding outcome performance measurement, namely differentiation of performance factors/processes.

In study one, the performance scales did distinguish winners from losers, with Effective Tactics, Flow, and Loss of Composure being the most salient in this regard, with winners having overall more favourable scores than losers. In light of these findings, it would be interesting to speculate on the problem of disentangling cause and effect. Did players win or lose as a result of executing certain performance processes well or poorly? Or, were the answers on the measurement instruments more a reflection of the players' frame of mind (positive or negative) following a win or a loss - further research is needed to confirm the current measure's predictive validity in this respect. One way to test such predictive validity might be to examine the effects upon performance of process oriented goal setting, based on scale scores obtained from previous matches.

Krause (1995) argued that the traditional way that the stress-social support relationship is hypothesised in terms of stress-buffering effects may not be a true reflection of reality. He examined whether the effect of financial concerns on depressive symptoms was buffered by emotional support, and found that a certain amount of emotional support was beneficial up to a point, but higher levels of emotional support led to increases in depressive symptoms. This relationship was demonstrated using a quadratic term in regression analyses, instead of a simple product term. Krause employed this method, arguing that the lack of consistent findings for stress-buffering effects could be attributed to testing the stress-support relationship inappropriately. In future studies one might, therefore, consider using quadratic terms, particularly in light of the one anomaly in the fourth paper, in which the interaction between Performance and confidence slumps and General Advice on Worry suggested that such support might have exacerbated the detrimental aspect of this stressor. However, as was pointed out in study four, this apparent anomaly could also be interpreted in another way: those people experiencing a Performance and Confidence Slump, and who scored high on the Worry performance factor, sought out General Advice support to help them cope.

Having made this point, the fourth study did still find stress-buffering effects using linear product terms; this was in all probability due to the careful matching of stressors with social support dimensions. The stressor in Krause's study (financial concerns) may not have been so well matched with the support (emotional). It is reasonable to assume that a certain amount of emotional support might be welcomed by the person undergoing financial strain. However, perhaps what this person really needs is tangible financial help. Further increases in emotional support are clearly not matched to the needs elicited by the financial strain and may eventually become a source of irritation.

An interesting point was noted by Krause (1995), who pointed to the fact that social support may reduce the personal coping efforts of people. This may be true in some circumstances if one tends to rely on the support without developing one's own coping strategies. However, in the fourth study, social support did not appear to

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directly take away the personal coping efforts of the players, because the study measured perceptions of available support, and not actual exchanges. In other words, the support was there, should the players have decided to resource it. As I. G. Sarason, Sarason and Pierce (1990) noted, by simply knowing that specific support is there if needed, the player may perform better, despite the presence of a stressor. Nonetheless, it may be important to examine this hypothesis in more detail in future, perhaps by including a measure of coping functions.

Whilst the fourth study unearthed interesting effects of social support on performance, the study was dispositional in nature. A next step might be to modify the measures to make them situational and collect measures of social support and stress pre-match and measures of performance post-match. This might facilitate an understanding of exactly how main and stress-buffering effects of social support could influence situationally-specific performance.

Consideration should also be give to conducting prospective analyses in order to overcome the issue of cause and effect. The description of Cohen and Wills (1985) for how one might use longitudinal data highlights such a process: for two-wave data one might use Time 2 performance as the criterion, with Time 1 sport-specific stressors and social support as the predictors, and Time 1 performance as a control. One could then focus on changes in performance that occur as a function of Time 1 stressors and support. This should be a reasonable test, assuming that social support does indeed remain stable over time. Generally, social support is considered a stable, somewhat trait-like resource. However, in the case of specific functional support, resources could be severely hampered for the performer competing abroad, away from his or her resource network. A potentially fruitful study might involve an experimental design; a carefully designed experimental study would allow genuine inferences on the issue of causality. It is not clear how the intensity of such a real-world situation as a tennis match can be transferred to an experimental condition. However, a facilitative effect for manipulated social support on performance for subjects with low levels of measured social support was found in a mainstream social psychology experiment by Sarason and Sarason (1986).

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Appendix I

NAME		DATE		
AGE	SEX	RATING		

YOUR PERFORMANCE

Below are various ways in which you might judge how well you performed in a
match. Please read each one and rate the extent to which it applies to the match you
have just played.
0 = not at all
1 = a little
2 = somewhat
3 = a lot

During this match, to what extent did you ...

			not at all		a lot
1.	keep to a routine	0	1	2	3
2.	get wound up	0	1	2	3
3.	feel sluggish	0	1	2	3
4.	work hard on each point	0	1	2	3
5.	worry about your shots	0	1	2	3
6.	keep a consistent standard	0	1	2	3
7.	use effective strategies	0	1	2	3
8.	get angry	0	1	2	3
9.	plan each point	0	1	2	3
10.	feel mentally tired	0	1	2	3
11.	feel nervous	0	1	2	3
12.	employ good tactics	0	1	2	3

Please turn over

0	1	2	3
0	1	2	3
0	1	2	3
0	1	2	3
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Appendix II

Modified Social Support Survey

This survey is intended to examine social support among sportspeople. The following questions focus on individuals in your environment who provide you with help and/or support. Read the definition of the type of support being considered and respond to the questions that follow it. Please answer all the questions as best you can- there are no right or wrong answers. All your responses are strictly confidential.

LISTENING SUPPORT: People who listen to you without giving advice or being judgmental.

1. Write the initials of all the individuals who provide you with listening support. If no-one provides you with this support, please indicate "no-one." After each person, indicate the relationship you have with her or him (for example, friend within your sport, friend not within your sport, coach, assistant coach, fitness trainer, team/squad manager, sport psychologist/counselor, spouse/partner, parent, grandparent, brother/sister, other [please specify]).

2. In general, how satisfied are	you with	the overa	ll quality	of listeni	ng suppo	ort you receive?				
very dissatisfied	1	2	3	4	5	very satisfied				
3. How difficult would it be for you to obtain more listening support?										
very difficult	1	2	3	4	5	very easy				
4. How important for your overall well-being is it to have one or more persons provide you with listening support?										
very unimportant	1	2	3	4	5	very important				

[Questions 1 through 4, adapted for each of the following social support types, are repeated after the definitions]

TASK APPRECIATION: <u>People who acknowledge your efforts and express appreciation for the</u> work/sporting activity you do.

TASK CHALLENGE: <u>People who challenge your way of thinking about your work/sporting activity</u> in order to stretch you, motivate you, and lead you to greater creativity, excitement, and involvement in your work or sporting activity.

EMOTIONAL SUPPORT: People who comfort you and indicate to you that they are on your side and care for you.

EMOTIONAL CHALLENGE: <u>People who challenge you to evaluate your attitudes</u>, values and <u>feelings</u>.

REALITY CONFIRMATION: <u>People who are similar to you - see things the way you do - who help you confirm your perceptions and perspectives of the world and help you keep things in focus.</u>

TANGIBLE ASSISTANCE: People who provide you with either financial assistance, products and/or gifts.

PERSONAL ASSISTANCE: <u>People who provide you with services or help, such as running an errand</u> for you or driving you somewhere.

Appendix III

Introduction

The purpose of this interview is to try to find out about the help and support you receive as a sportsperson in dealing with the stresses and hassles inside and outside your sport.

The research literature suggests that such support may take many forms. I'll just go through a few examples, so that you have a clear picture as to what I'm trying to get from you.

You could get support from a coach in helping you deal with some aspect of your performance. You could get help and support from family in dealing with times when you feel a bit down. You could get help from a friend or intimate partner who gives you encouragement. You could also get financial help from someone. These are the kinds of things I'd like you to tell me about. I'm totally interested in anything about the help and support you get. Nothing is too trivial.

I'm going to ask you various questions in order to try to get you talking about the support you have, and I shall be trying to prompt you further as and when appropriate.

What you say during this interview is and will remain totally confidential, and your name will not be used in any way following this interview. The only reason I'm using a tape-recorder is so that I can accurately recall what you say.

If there are any questions that you don't want to answer, just say so, and we'll move on to another question. Please feel free to ask questions of me if there is anything you want clarifying or that you're not sure about. Finally, you are free to end this interview at any time, if you so wish.

Did you understand what I meant by support? Would you like me to go over that again for you?

- 1) Can you tell me about any help you get in dealing with the pressures of high-level sport?
- For instance negative aspects of competition dealing with competitive anxiety general anxiety doubts or concerns about failure pressure from yourself/parents/coaches conflicts with coaches or other players pressure to perform to your expected potential under pressure to perform pressure of selection in trials physical and mental demands social evaluation/being judged the game's more important than normal other

Do you ever feel under this pressure?

Is there anyone you turn to for help and support to deal with these things?

Can you just make that issue clear for me, please? Who helps you? How do(es) he/she/these people help you? And how does that work/help? Do(es) he/she/they help you in any other way to deal with the pressures of

high- level sport?

Does anyone else help you deal with these pressures? Are there any other pressures which you get help for? Are there any other ways that the support differs between these people? Can you give me some "for instances" of that? Is this different to the kind of support you get for...? 2) Can you tell me about any help you get in dealing with how you feel about your sport at different times?

For instance if you're a bit down if you're a bit frustrated about things if things are going badly if you're not performing well if you're struggling to achieve (your goals) Lack of motivation if you're having no fun problems with tiredness if you're overtraining if you don't get enough practice time in training and at tournaments performance slumps lack of motivation bad luck other

Do you ever feel like this?

Is there anyone you turn to for help and support for these things?

Can you just make that issue clear for me, please? Who helps you? How do(es) he/she/these people help you? And how does that work/help? Do(es) he/she/they help you in other ways? Does anyone else help you deal with these periods of time? Are there any other areas like this which you get help for? Are there any other ways that the support differs between these people? Can you give me some "for instances" of that? Is this different to the kind of support you get for...?

3) Can you tell me about any help you get in dealing with injuries and periods of rehabilitation?

Prompts	Have you ever been seriously injured?
	Can you tell me about the last time you had an injury, which caused
	you to miss a month or more of training and competition?
	Have you had any other injuries, when you did miss a period of the
season?	
	Did the injury bother you?
	When you're injured, do you get moral support?

Is there anyone you turn to for help and support with this?

Can you just make that issue clear for me, please? Who helps you? How do(es) he/she/these people help you? And how does that work/help? Do(es) he/she/they help you in other ways? Does anyone else help you deal with these periods of time? Are there any other areas like this which you get help for? Are there any other ways that the support differs between these people? Can you give me some "for instances" of that? Is this different to the kind of support you get for...?

4) Can you tell me about any help you get in dealing with practical matters?

For instance finances and living costs transport and transport to competitions sorting out practice (and practice partners/opposition) sorting out accommodation day to day hassles (losing things, being late, disturbances, noise)

Is there anyone you turn to for help and support for these things?

Can you just make that issue clear for me, please? Who helps you? How do(es) he/she/these people help you? And how does that work/help? Do(es) he/she/they help you in other ways? Does anyone else help you deal with these practical matters? Are there any other practical matters which you get help for? Are there any other ways that the support differs between these people? Can you give me some "for instances" of that? Is this different to the kind of support you get for...?

- 5) Can you tell me about any help you get in dealing with personal issues about your life and future?
- For instance personal struggles life direction issues dissatisfaction with social life not being able to pursue other interests dissatisfaction with others involved in your sport

Is there anyone you turn to for help and support for these things?

Can you just make that issue clear for me, please? Who helps you? How do(es) he/she/these people help you? And how does that work/help? Do(es) he/she/they help you in other ways? Does anyone else help you with personal issues? Are there any other personal issues which you get help for? Are there any other ways that the support differs between these people? Can you give me some "for instances" of that? Is this different to the kind of support you get for...?

- 6) Can you tell me about any help you get in dealing with relationship issues?
- For instance problems with family and friends close relationships (perhaps w/ a partner or intimate friend) conflicts with a coach or other players interpersonal things

Is there anyone you turn to for help and support for this?

Can you just make that issue clear for me, please? Who helps you? How do(es) he/she/these people help you? And how does that work/help? Do(es) he/she/they help you in other ways? Does anyone else help you deal with these relationship issues? Are there any other relationship issues which you get help for? Are there any other ways that the support differs between these people? Can you give me some "for instances" of that? Is this different to the kind of support you get for...?

7) This last question is a rather general last question. Can you tell me about any other areas in which you get help from anyone? Things that you have not mentioned so far, or that I may have missed out on. Something unique to you, perhaps.

<u>If all else fails</u>: That's interesting. I've never met anyone like that. So, tell me, what is it about you that makes you like that? How do you manage to be like that?

Appendix IV

This study focuses on a number of different topics: some questions about the help and support you get as a player; some stressors you may face; and your performance.

Please answer all the questions in this booklet. If you are unsure about something, put what you think is as reasonable an answer as you can, given the question. There are no right or wrong answers. I am interested in all responses. Please circle your responses.

Firstly, please fill out the demographic information below.

Name:

Sex:

Age:

Rating:

Date:

WHEN YOU HAVE FINISHED PLEASE CHECK YOU HAVE COMPLETED ALL THE QUESTIONS, AND THEN PUT YOUR COMPLETED BOOKLET IN THE STAMPED ADDRESSED ENVELOPE PROVIDED AND POST IT BACK TO ME.

Below are a list of items referring to the types of help and support you as a tennis player might get from others. Please indicate to what extent these relate to you.

1 = not at all 2 = 3 = somewhat 4 = 5 = a lot.

To what extent do you have someone...

	Not at a	.11	somewha	at	a lot
1. who gives you a gentle massage if you feel ter	nse? 1	2	3	4	5
2. whom you turn to for critical advice?	1	2	3	4	5
3. who encourages you?	1	2	3	4	5
4. who gives you moral support when you are features and the support when you are features and the support of t	eling dov 1	vn? 2	3	4	5
5. who sorts practical things out for you?	1	2	3	4	5
6. who helps you put things in perspective?	1	2	3	4	5
7. who believes in you?	1	2	3	4	5
8. who helps you relax when you feel under pressure?				5	
	1	2	3	4	2
9. who helps setting sessions in training?	1	2	3	4	5
10. who gives you technical advice?	1	2	3	4	5
11. who reassures you?	1	2	3	4	5
12. with whom you talk through things?	1	2	3	4	5
13. who gives you a motivating pat on the back t	to help yo 1	ou dea 2	al with pro 3	essure 4	? 5
14. who helps in dealing with emotional issues?	1	2	3	4	5

To what extent do you have someone...

	Not at a	.11	somewha	ıt	a lot
15. who gives you a hug if you feel under pressu	re? 1	2	3	4	5
16. who reinforces the positives when you have a	doubts al 1	oout yo 2	our curren 3	nt form 4	n? 5
17. who helps plan your training to deal with pro	blems? 1	2	3	4	5
18. who instils in you the confidence to deal with	n pressur 1	es? 2	3	4	5
19. whom you can turn to regarding sport-related	l worries 1	and p 2	roblems? 3	4	5
20. who helps solve problems in training and cor	npetitior 1	ıs? 2	3	4	5
21. who helps with tasks that build your confider	nce?1	2	3	4	5
22. who helps you regarding technique?	1	2	3	4	5
23. who boosts your confidence?	1	2	3	4	5
24. who cheers you up?	1	2	3	4	5
25. who helps organising training and competitio	ons 1	2	3	4	5
26. who helps you mentally prepare?	1	2	3	4	5
27. who tells you you can do it?	1	2	3	4	5
28. who is always there for you?	1	2	3	4	5
29. whom you go and talk to regarding technical	problem 1	s? 2	3	4	5
30. who motivates you?	1	2	3	4	5
31. who helps take your mind off things?	1	2	3	4	5
32. with whom you talk things through?	1	2	3	4	5

To what extent do you have someone...

	Not at a	.11	somewha	ıt	a lot			
33. who picks you up?	1	2	3	4	5			
34. who listens to your concerns?	1	2	3	4	5			
35. who can give you straight advice regarding relationship issues?								
	1	2	3	4	5			
36. who lifts your morale when it's down?	1	2	3	4	5			
37. to whom you can talk?	1	2	3	4	5			
38. who inspires you to get practising?	1	2	3	4	5			
39. who cares about you?	1	2	3	4	5			
40. who inspires you to get mentally focused?	1	2	3	4	5			
41. who is concerned about your welfare?	1	2	3	4	5			

Below are a list of potential stressors. Please indicate to what extent you experience these sources of stress.

1 = not at all 2 = 3 = somewhat 4 = 5 = a lot

	Not at all		somewhat		a lot	
1. performance and confidence slumps	1	2	3	4	5	
2. technical problems in training	1	2	3	4	5	
3. competition pressure	1	2	3	4	5	
4. personal problems	1	2	3	4	5	
5. doubts about form	1	2	3	4	5	

Below are various ways in which you might judge how well you perform in matches. Please read each one and rate the extent to which it applies to the matches you have played recently.

0 = not at all 1 = a little 2 = somewhat3 = a lot

During matches, to what extent do you ...

		not at all			a lot
1.	keep to a routine	0	1	2	3
2.	get wound up	0	1	2	3
3.	feel sluggish	0	1	2	3
4.	work hard on each point	0	1	2	3
5.	worry about your shots	0	1	2	3
6.	keep a consistent standard	0	1	2	3
7.	use effective strategies	0	1	2	3
8.	get angry	0	1	2	3
9.	plan each point	0	1	2	3
10.	feel mentally tired	0	1	2	3
11.	employ good tactics	0	1	2	3
12.	feel good	0	1	2	3

Please turn over

During matches, to what extent do you ...

		not	at		a lot	
13.	become hesitant	0	1	2	3	
14.	adapt to changing circumstances	0	1	2	3	
15.	feel lively	0	1	2	3	
16.	feel determined	0	1	2	3	
17.	feel tense	0	1	2	3	
18.	keep up the pressure on your opponent	0	1	2	3	
19.	let errors bother you	0	1	2	3	
20.	run down every ball	0	1	2	3	
21.	keep your mind on the present	0	1	2	3	
22.	play tactically well	0	1	2	3	
23.	use breaks in play to prepare for the next point or game	0	1	2	3	
24.	become aggressive	0	1	2	3	
25.	feel slow	0	1	2	3	
26.	give up on some points	0	1	2	3	
27.	stay focused but relaxed	0	1	2	3	
28.	not always think positively	0	1	2	3	

THANK YOU FOR YOUR TIME