V. PSYCHOLOGY

A comparison of academic and non-academic distinctions between emotion and mood

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There is considerable variation in academic opinion as to distinctions between emotion and mood. A review of 70 published papers revealed that theoretical distinctions have been made using eight criteria: intensity, duration, physiology, causation, awareness of causation, consequences, function and relatedness or intentionalität. Significantly, none of the papers argued that ‘emotion’ and ‘mood’ were two words for the same construct, despite the fact that even a cursory review of the psychology literature reveals that the two are often used interchangeably. Such semantic confusion may preclude the reliable investigation of emotion and mood and of their potentially different effects on sports performance; that is, if, as many of the published theories suggest, an emotion such as anxiety has different causes and consequences to an anxious mood, when measuring ‘anxiety’ researchers must investigate whether it is an emotion or a mood.

However, consensual conceptual clarity is currently unlikely to be achieved as no data have been published to clarify emotion/mood distinctions. The present study represents the first empirical work in the area and assesses: (1) the extent to which the non-academic population (that is, those not involved in academic research) see emotion and mood as distinct; (2) the degree of consensus among this population; and (3) the congruence between non-academic and academic theories.

The research used a qualitative methodology. Altogether, 106 participants (55 males, 51 females) aged 29.9 ± 9.5 years (mean ± s) and including several Olympic medallists were canvassed via the internet for their perspectives. Participants were asked to respond to the question: ‘What do you believe is the difference between an emotion and a mood?’ All participants made at least one conceptual distinction between emotion and mood (responses ranged from 7 to 827 words in length). Initial deductive content analysis was achieved by frequency counts of references to the above eight criteria in participants’ responses. Subsequent inductive analysis revealed that participants also made distinctions using a further eight criteria. Among non-academics, the most frequently cited criteria were cause (65% of respondents), duration (40%) and degree of control (25%), while among the 70 published works from the literature, duration (62% of authors), intentionality (41%) and cause (31%) were the most frequently proposed criteria.

The results revealed a degree of consensus among academics and non-academics in relation to distinctions between emotion and mood. This lends support to recent research showing that emotion and mood could be discriminated empirically in line with theoretical proposals (Beedie et al., 2001: Journal of Sports Sciences, 19, 69–70). It is hoped that the present research will (1) encourage psychologists to be more precise in their use of language when describing affective states, and (2) stimulate empirical research into distinctions between emotion and mood to augment the theoretical speculation which constitutes the current literature.

Changing existing preferences of movement execution by imagery

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Imagery as a mental practice technique has been widely used for acquisition or enhancement of motor skills. It is generally accepted that the efficacy of imagery in mental practice is less than the efficacy of physical practice but larger than no practice, while a combination of physical practice with imagery practice is most effective. However, Boschker et al. (2000: Journal of Sports Sciences, 18, 593–603) showed that for retroactive interference, the efficacy of imagery and physical practice is similar. In addition, Boschker et al. (in press: Quarterly Journal of Experimental Psychology) demonstrated that imagining non-preferential responses (contralateral touching movements) resulted in an enhanced incidence of those responses during subsequent performance, while physically practising such responses did not affect subsequent motor behaviour. They discussed these effects of imagery practice on (motor) behaviour from the perspective of ecological psychology and concluded that the absence of action-evoked information (information that is created by executing an action and about the consequences of an action) during imagery permitted the modification of response preferences. As an elaboration of Boschker et al. (in press), the current study examines whether the described effect of imagery practice would sink in; that is, will the effects of imagery practice remain during subsequent performance or will physical performance diminish the effect?
Thirty right-handed students (16 males, 14 females) volunteered to participate in the experiment (age 23.5 ± 3.50 years; mean ± s) The participants were randomly assigned to one of three groups: a high imagery group (participants with a score of 5.7 or higher on the Revised Movement Imagery Questionnaire; Hall and Martin, 1997: Journal of Mental Imagery, 21, 143–154), a low imagery group (participants with MIQ-R scores of 4.8 or lower) and a no-practice control group. On a flat tabletop, 17 red light-emitting diodes were used as stimulus/target positions and positioned at a curved line within maximum reaching distance of the participants. The experiment consisted of five phases: a pre-test, a practice phase and three post-tests starting at 0, 30 and 60 min after the practice phases. During the pre- and post-tests, each target position was presented five times in randomized order; during the practice phase, each target position was presented four times in randomized order. During the pre- and post-tests, all participants were instructed to touch the targets as quickly and accurately as possible with their left or right hand, as they preferred. During the practice phase, participants in the imagery groups received instructions to imagine touching all targets as quickly and accurately as possible with only their right hand.

An analysis of variance on the percentage of right hand responses (as a percentage of responses with both hands) revealed significant interactions for group × phase (F6,81 = 2.32, P < 0.05) and group × phase × target position (F96,1296 = 1.88, P < 0.001). The interaction between group and phase indicated that the main effect for phase was due to the imagery groups (see Fig. 1). Post-hoc analysis revealed significant differences between the imagery groups and the control group for post-test 1 and post-test 2. Furthermore, this analysis revealed a significant difference in dominant hand response for both imagery groups between the pre-test and post-test 1; between the pre-test and post-test 2 a trend was found (P= 0.077). Obviously, the observed increase in right hand responses for the two imagery groups during the first and second post-tests was due to an increased incidence of contralateral responses. This was sustained by the three-way interaction of group × phase × target position. For the pre-test and post-test 3, no differences were found between the imagery groups and the control group on any target position and only on one target position (at post-test 2) was a significant difference found between the high-imagery and the low-imagery group.

In agreement with the findings of Boschker et al. (in press), the current study observed that imagining non-preferential responses resulted in an increased incidence of those responses during subsequent performance at post-test 1. This effect of imagery practice was reduced at the next post-test. At post-test 3, the incidence of the practised responses was back at the level of the pre-test. The decline in the effect of imagery practice on behaviour is believed to be due to the occurrence of action-evoked information during actual performance. During the post-tests, the participants performed contralateral touching movements and received action-evoked information about the disadvantages of this type of movement, which counteracted the initial imagery effect. However, during the second post-test, participants still demonstrated an increased incidence of the practised responses. This prolonged effect of imagery practice indicates that the imagery effect is rather strong. Therefore, imagery might be most effective in changing existing preferences of movement execution.

Towards an understanding of elite athlete quality of life: a phenomenological study

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Throughout their careers in sport, elite athletes experience unique pressures, challenges and rewards. While considerable attention has been paid to identifying the characteristics of successful athletes, little or no attention has been paid to understanding the experience of being an elite athlete (Jackson, 1995: In Sport Psychology: Theory, Applications and Issues, edited by T. Morris and J. Summers, pp. 575–591. Brisbane: Wiley). In an investigation into high-performance athletes’ quality of life, Wrisberg (1996: Quest, 48, 392–408) concluded that the quality of life was clearly not very high for many athletes. Of particular concern was the lack of penetrating inquiry into the effects of high-performance sport on the well-being and quality of life of its participants.

If those who provide support for elite performers are to maximize their effectiveness, there is a need to bridge...
such knowledge lacunae by developing an understanding of the elite athlete experience in more holistic terms. To acquire such information, research methodologies are needed that value the knowledge of athletes by allowing them to describe their experience. Phenomenology is one such approach. Phenomenological inquiry focuses on subjective experience – that is, how people understand their experience and construct meaning from it (Patton, 1990: The Sport Psychologist, 1, 29–55). In line with the tenets of phenomenological inquiry, this research asked the question: ‘What is the essence of quality of life for international athletes?’

Purposive sampling was used to access the 11 participants, five of whom were male and six were female. Participants were track or field athletes based at the same performance centre in England, and all had competed at significant international events such as European and World Championships. Athletes were interviewed using a semi-structured format. Interviews lasted between 60 and 90 min. Verbatim transcripts were analysed according to phenomenological precepts with the software package QSR NUD*IST*4. Analysis occurred first at the individual level, where significant statements were coded, linked to form meaning units and themes, and finally a composite account. Divergent perspectives (Moustakas, 1994: Phenomenological Research Methods. Thousand Oaks, CA: Sage) were then sought through considering how different athletes experienced the themes. This allowed group level themes to be refined, from which emerged a description of the essence of quality of life in elite athletes.

Five key themes emerged from the analysis. These were: ‘self-interest’, represented by having a strong drive to fulfill one’s own needs, ‘it might sound selfish, but you have to be able to put yourself first, always’; ‘sacrifice’, represented by recognition of going without things that others had, ‘Yeah, it would be nice to do that (afford food of choice), but I can make do without it’; ‘success’ refers to the impact of performance success on other areas of life, ‘if I am performing well then everything in life is good’; ‘support’ refers to the importance of others who provide valued assistance, ‘my coach is the one other person who knows exactly what I want to achieve’; and ‘autonomy’ represented by being highly independent and self-managing, ‘you’re on your own . . . you have to learn to cope with things by yourself’. The findings provide initial direction towards understanding the quality of life concepts that are meaningful to elite athletes.

Despite reporting frequent and diverse challenges, sacrifices and lifestyle demands that in objective terms might indicate a low quality of life and could support Wrisberg’s (1996) conclusions, in this research subjective interpretation showed that athletes thought their quality of life was good and in some cases close to ideal. The potential for misinterpretation reflects the importance of understanding subjective experience of quality of life, since those ‘outside’ of this population could interpret another’s experience quite differently. In the light of these findings, objective analysis of athletes’ quality of life may well be ‘missing the point’ because it reflects the judgement of the researcher rather than the population investigated.

Beliefs about self and healthy behaviours

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Inadequate exercise and an unhealthy diet point to a high risk for future lifestyle disorders (Wang, 2001: International Journal of Epidemiology, 30, 1129–1136). Self-beliefs (e.g. self-efficacy, self-esteem, locus of control) have been shown to be closely related to adoption/adherence to physical activities and healthy eating behaviours (e.g. Trew et al., 1999: European Physical Education Review, 5, 55–73; Trembley et al., 2000: Pediatric Exercise Science, 12, 312–323). The current study investigates such relationships within an Asian sample, as well as providing an opportunity to compare two cultures.

Altogether, 140 female and 153 male Bruneian and 188 female and 186 male Australian undergraduates (mean age = 20.3 years) provided data on their current sporting/exercise and eating behaviours, and completed scales for health locus of control (Wallston et al., 1978: Health Education Monographs, 6, 160–170, adapted), self-esteem (Rosenberg, 1965: Society and the Adolescent Self Image. Princeton, NJ: Princeton University Press) and specific self-efficacy for eating and exercise, which focused on perceived ability to overcome barriers to adopt a healthy lifestyle (Sallis et al., 1988: Health Education Research, 3, 283–292, adapted). Given the strict traditional Malay Islamic culture in Brunei, it was expected that both males and females would display more externality and lower self-efficacy, while barriers to engaging in activity/exercise would be higher for females.

All samples demonstrated significant positive relationships (all exceeded P < 0.01) between different forms of self-belief and both exercise level and healthy eating. Self-efficacy level was significantly greater for healthy dietary behaviour in females than in males (P < 0.001 Brunei and P < 0.01 Australia), whereas self-efficacy scores for engaging in physical activity were significantly greater for males than females in both cultures (P < 0.01 both Brunei and Australia). Socializing with peers and lack of support from peers and family were the highest ranked perceived barriers in both health-related behaviours for both cultures, while barriers of stress and willpower were ranked signifi-
cantly higher by females than males overall. Australians reported more positive health behaviours and had a significantly higher internal locus of control ($P < 0.01$) than the more authoritarian and traditional Bruneian sample. Stepwise regressions revealed that locus of control and efficacy measures combine significantly to predict specific health behaviours (Brunei males $R^2 = 63\%$, Brunei females $R^2 = 58\%$, Australian males $R^2 = 65\%$, Australian females $R^2 = 55\%$ for regular exercise engagement). For healthy eating behaviour, similar results were produced (Brunei males $R^2 = 62\%$, Brunei females $R^2 = 68\%$, Australian males $R^2 = 61\%$, Australian females $R^2 = 64\%$). Healthy eating behaviour produced a higher $R^2$ ($64\%$) than healthy exercise ($59\%$) for cultural samples combined. General self-esteem did not add to the prediction.

The study has highlighted some psycho-social variables associated with health-related behaviours with identified perceived barriers that can be addressed in proposed intervention strategies. Identified differences between the sexes necessitate sex-specific strategies to improve healthy behaviours. Support from family and friends must be major foci in strategies to overcome perceived barriers. Bruneians need more focus on developing greater internality. Enhancing specific exercise- and health-related self-beliefs rather than general self-esteem would appear more effective for all groups. Support from family and friends must be major foci in strategies to overcome perceived barriers. Bruneians need more focus on developing greater internality. Enhancing specific exercise- and health-related self-beliefs rather than general self-esteem would appear more effective for all groups.

Motivational climate and goal orientations, trait anxiety and perfectionism in dance students: the link between contextual climate and motivational traits

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Goal orientations, trait anxiety and perfectionism have been regarded as important motivational traits in terms of regulating achievement cognition, affective patterns and learning experiences. It is, therefore, important to identify potential antecedents of such motivational dispositions. Related to this, achievement motivation models (e.g. Nicholls, 1984: Psychological Review, 91, 328–346) have recognized the role of the contextual motivational climate in shaping specific motivational traits. The aim of the present study was to extend such research by examining the link between the contextual motivational climate perceived by dance students with goal orientations for dance, trait anxiety and perfectionism.

Altogether, 168 full-time dance students (age $18.5 \pm 2.1$ years; experience $11.6 \pm 2.3$ years; mean $\pm s$) took part in an exploratory correlational investigation. During a 3 week period, dancers completed self-report surveys assessing their perceptions of the following: (a) the contextual motivational climate within their dance school [a modified dance-specific version of the Perceived Motivational Climate in Sport Questionnaire-2 (Newton and Duda, 1993: Journal of Sport and Exercise Psychology, 15[ suppl.], S59); (b) goal orientations for dance [a modified dance-specific version of the Task and Ego Orientation in Sport Questionnaire (Duda, 1993: In Handbook of Research in Sport Psychology, edited by R.N. Singer, M. Murphey and L.K. Tennant, pp. 421–436. New York: Macmillan)]; (c) multidimensional trait anxiety [Competitive State Anxiety Inventory-2 (Martens et al., 1990; Competitive Anxiety in Sport. Champaign, IL: Human Kinetics)]; and (d) multidimensional perfectionism (Frost et al., 1990: Cognitive Therapy and Research, 14, 559–572).

A series of standard multiple regression analyses were conducted with the perceived motivational climate variables (i.e. perceptions of: inter-student rivalry, emphasis on effort and learning, punishment for mistakes, emphasis on cooperative learning, unequal recognition of students and emphasis on an important role for all students) entered as a single block of predictors and the motivational trait constructs as the dependent variables. For goal orientations, the climate variables accounted for 16\% of the variance in students’ task orientation for dance ($F = 6.8$, $P < 0.01$) and 32\% of the variance in ego orientation for dance ($F = 15.3$, $P < 0.01$). Specifically, students’ perceptions of an emphasis on effort and learning in dance schools ($\beta = 0.36$) accounted for the largest proportion of the explained variance in task orientation, and their perceptions of promotion of inter-student rivalry ($\beta = 0.50$) and punishment of mistakes ($\beta = 0.24$) explained the largest proportion of variance in ego orientation. For trait anxiety, the climate variables accounted for 14\% of the variance in students’ tendency to worry about performances ($F = 5.8$, $P < 0.01$) and 11\% of the variance in their tendency to experience concentration-disrupting cognition ($F = 4.7$, $P < 0.01$). Specifically, students’ perceptions of an emphasis on effort and learning in dance schools ($\beta = 0.32$) and of punishment for mistakes ($\beta = 0.22$) accounted for the largest proportion of the explained variance in worrying cognition. Perceptions of punishment of mistakes in dance schools ($\beta = 0.33$) explained the largest proportion of variance in students’ concentration-disrupting cognition. Somatic anxiety was not significantly predicted by the independent variables. For perfectionism, the climate variables accounted for 21\% of the variance in students’ tendency to experience
Differences in motivation and attitudes towards exercise in GCSE physical education students and non-GCSE physical education students: a multi-method approach

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Despite the fact that children are the fittest and most active group in the population, there is a large drop-out from exercise both during and after leaving school, especially in females. Based on the assumption that children who regularly exercise at school will be more likely to carry this behaviour into later life, examination of their attitudes and motivation regarding exercise may provide insight into methods of best practice for schools, local education authorities and the community in general when promoting exercise participation.

This study examined differences in exercise motivation between male (n = 10, mean age 15.5 years) and female (n = 10, mean age 15.4 years) adolescents who had demonstrated an interest in physical activity by taking GCSE physical education, with male (n = 10, mean age 15.6 years) and female (n = 10, mean age 15.4 years) students who had not chosen this option. All participants were given a modified (22 items) Motivation for Physical Activity Measure (MPAM; Frederick and Ryan, 1993: International Journal of Sports Behaviour, 16, 124–146) measuring three aspects of exercise motivation: body-related factors, competence factors and intrinsic factors. Such traditional approaches to the study of psychological correlates of behaviour have often been inadequate. Recently, Johnston et al. (1999: In Adherence Issues in Sport and Exercise, edited by S. Bull. Chichester: Wiley) have promoted a multi-method approach to the investigation of exercise behaviour. Thus, in addition, a more qualitative approach was taken to investigate exercise beliefs. This involved the use of a card sort procedure, in which participants were asked to sort a set of 39 cards containing exercise-related words into similar piles (up to a maximum of six) and to label these piles.

The responses of the four different groups on each of the three MPAM subscales were compared using a mixed-model ANOVA with the three subscales as the within-subject measure. This analysis suggested that a significant difference in overall motivation existed between the four groups (F(3,36) = 3.90, \( P = 0.02 \)). Further post-hoc analysis (\( P < 0.05 \)) revealed that males and females taking GCSE PE were more highly motivated to exercise than females not taking this option, but were no different from each other. However, only the females taking the PE option demonstrated higher exercise motivation when compared with the non-exercising males. That is, there was no difference between the two groups of males. The analysis also suggested an overall difference in the means of the MPAM subscales (\( F(2,72) = 48.1, P < 0.01 \)). Further post-hoc analysis, using Bonferroni-corrected t-tests, demonstrated that intrinsic factors were more important than competence factors and both of these were more important than body-related factors (\( P < 0.05 \)).

Data from the card sort were subjected to a non-metric multidimensional scaling (MDS) analysis using the INDSCAL procedure. Inspection of the results from this procedure suggested a two-dimensional model as the most appropriate with an overall stress value of 0.17. The two dimensions were interpreted as physical–psychosocial aspects of a good lifestyle and physical–psychosocial aspects of a bad lifestyle. This interpretation was based upon a neighbourhood interpretation approach in combination with the labels participants gave the individual piles. A plot of the subject space for the two-dimensional solution suggested that differences in attitudes towards exercise existed between the female PE group and the two non-PE groups. Furthermore, the female PE group viewed...
exercise as a good lifestyle, whereas the two non-PE groups viewed exercise as part of a bad lifestyle.

The results from the MPAM responses are consistent with previous research that intrinsic motivation appears to be the primary motivation to exercise in children. However, both the results from this analysis and the MDS suggest that females who choose to exercise at school differ significantly from groups who do not, which is not the case for the males who choose to exercise. More specifically, this female PE group appear highly motivated to exercise and view it as part of a healthy lifestyle. Alarming results from the MDS imply that both the non-PE groups view exercise as a negative behaviour and part of a bad lifestyle. Why this is the case cannot be answered by the present study and more research is needed, although these results do suggest that educationalists may want to consider changes to how physical activity is promoted in schools to those most at risk of exercise drop-out.

Investigation of differences in coping styles of professional and amateur rugby players

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It is often reported that injury in sport is one of the most emotionally and psychologically traumatic things that can happen to an athlete (Heil, 1993: Psychology of Sport Injury. Champaign, IL: Human Kinetics). Thus examination of how athletes cope with injury and the coping mechanisms athletes use would provide a useful source of information for injury rehabilitation practitioners. Moreover, given the greater physical and psychological demands placed upon professional athletes than non-professional athletes, coping mechanisms between these two groups may be different; thus rehabilitation programmes for different standards of athlete should be tailored accordingly. Also, some athletes appear prone to injury and, as a consequence, may require special attention during the rehabilitation process.

The current research investigated the coping styles of 60 male rugby union players from three different competitive standards. Twenty participants were players from the Zurich Premiership, 20 participants from the semi-professional national divisions and 20 from the national university competition. All participants were instructed to fill in an adapted version of the Ways of Coping with Sport Scale (WOCS; Madden et al., 1990: International Journal of Sport Psychology, 21, 21–35). The scale contained 31 items describing both cognitive and behavioural strategies that could be used to cope with injury. The inventory consisted of five subscales reflecting the different types of coping strategies athletes often use. These were: social support, denial/avoidance, wishful thinking, effort/resolve and control emotions. Additionally, participants were also required to complete a questionnaire indicating how many injuries they had sustained which had prevented them from playing/training for more than 4 weeks to examine the relationship between coping mechanisms and frequency of injury.

Analysis of the three groups’ responses to the WOCS using a 3 × 5 mixed-model ANOVA with the five subscales acting as within-subject variables revealed no differences between the three standards of participation and coping mechanisms. That is, there was no main effect or interaction involving the between-group variable. There was, however, a main within-subject effect (F_{1,228} = 35.9, P < 0.01), suggesting that there were differences between the types of coping mechanisms used by players in general. Indeed, further post-hoc analysis using Bonferroni-corrected t-tests (P < 0.02) revealed that players scored significantly higher on the social support scale when compared to the other scales, and that the mean for the denial/avoidance scale was significantly less than for all other scales. Correlational analysis between the frequency of injury and the five coping scales revealed a significant correlation between frequency of injury and the effort/resolve scale of the WOCS (r = 0.30, P = 0.02).

These results confirm empirical findings and anecdotal reports that social support appears to be a popular coping mechanism for injured athletes. Furthermore, this appears to be regardless of standard of participation. What is encouraging is that the denial/avoidance mechanism is the least favoured coping resource among all participants, which would appear to be a negative coping mechanism. That is, one would assume that denial of the injury would be detrimental to the recovery process. However, just because coping mechanisms are popular among athletes, it does not necessarily follow that these are effective in aiding rehabilitation. Indeed, some research on injury has suggested that some aspects of social support may be detrimental to recovery (Udry et al., 1997: Journal of Sport and Exercise Psychology, 19, 368–395). Based on the present results, for example, it would appear that individuals who are frequently injured are more likely to score highly on the effort/resolve scale, which itself was a relatively popular coping resource. It is difficult to say because of the correlational nature of the current design whether this particular mechanism is the ‘cause or the cure’ for re-injury, although one could argue that ‘trying harder’ during the recovery process could indeed increase the probability of re-injury. It is these issues that warrant further investigation by injury researchers.
Physical activity is important for the health and well-being of all people. Recent trends indicate that children are becoming less physically active. The health benefits of physical activity are well documented and lower levels of physical activity in children are a cause for great concern. Childhood is seen as a critical time in the development of attitudes and values associated with long-term participation in physical activity. Therefore, it is critical that children are given the opportunity to be physically active and to be physically educated. The aim of this study was to investigate attitudes and behaviours of pre-adolescent New Zealand children and their parents to physical activity, along with their understanding and perceptions of physical activity.

A child’s questionnaire, based on the Physical Activity Questionnaire for Children (PAQ-C) (Crocker et al., 1997: Medicine and Science in Sports and Exercise, 29, 1344–1349), and a battery of parallel questions adapted from the Australian Council of Health, Physical Education and Recreation (ACHPER) (Wright et al., 1999: The Australian Council for Health, Physical Education and Recreation Healthy Lifestyles Journal, 46, 11–17) was administered to 170 children (41% boys, 59% girls) between the ages of 8 and 11 years. A further questionnaire developed by ACHPER was completed by 124 parents/caregivers (81% mothers, 15% fathers) with a return rate of 72.9%. The parents’ and children’s questionnaires were analysed by tallying question responses. Results are reported as percentages.

The majority of children (81%) perceived themselves to be moderately active (at least 3–4 times per week) or very active (7 plus times per week). Parents perceived that their children were ‘active enough’ at this age and thought that boys were more active than girls, a trend that was also evident from the results of the children’s questionnaire. The main reasons given by the children for their initial participation in physical activity was their enthusiasm to be involved in the activity or ‘wanting to have a go’ and to be with their friends. However, children indicated that enjoyment was the major factor for continued involvement in physical activity. The major limiting factor to children’s participation in physical activity from the parents’ perspective was the cost of the physical activity, whereas children indicated that ‘not having the time’ was their major barrier to continued physical activity.

School played a significant part in children’s involvement in physical activity and 93% of parents valued the physical education programmes in their child’s school. Furthermore, most parents (93%) considered physical activity to be of moderate importance for their family, with health and social benefits of physical activity reported as the most valued aspect. To increase and maintain children’s involvement in physical activity, we need to maximize what children enjoy about being physically active and minimize any perceived or real barriers to physical activity. Parents’ attitudes and values are also important, as they have a significant influence on physical activity opportunities for children.

A psychological perspective on the relationship between physical activity and mental health

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Participation in sport is characterized by extreme emotions and experiences. However, despite the calls for alternative methodological approaches (Krane et al., 1997: Journal of Sport and Exercise Psychology, 19, 213–218; Gilbourne, 1999: In Adherence Issues in Sport and Exercise, edited by S.J. Bull. Chichester: Wiley), sport and exercise science, with its traditions in positivism, is dominated by traditional research methodologies more concerned with causal relationships in sport performance than real life experiences. However, recent methodological developments in exercise science have embraced alternative methodologies and, as such, are discovering the meaning of lived emotions and experiences for participants involved in exercise.

This study adopted a constructionist perspective (Crotty, 1998: The Foundations of Social Research: Meaning and Perspective in the Research Process. London: Sage) and used a grounded theory methodology (Strauss and Corbin, 1998: Basics of Qualitative Research, 2nd edn. London: Sage) to investigate the experiences of participants on exercise referral schemes in the UK. Through adopting this perspective, it aimed to understand participants’ meanings of their experience, in relation to the physical activity and mental health relationship (the phenomenon). This study demonstrates the value of complementary methodologies and challenges the positivist traditions embedded within sport and exercise science.

Three studies were undertaken in two types of exercise referral scheme classified by Biddle et al. (1994: Physical Activity Promotion in Primary Health Care in England. London: Health Education Authority). In studies 1 and 2, four focus groups (total participants = 10) were undertaken pre- and post-intervention
of the scheme, with two participants selected through purposive sampling (Erlandson et al., 1993: *Doing Naturalistic Inquiry: A Guide to Methods*. London: Sage) for four individual interviews to investigate further their experiences regarding the phenomenon. In study 3, three interviews were conducted with participants (total participants = 5) to investigate their experiences regarding the phenomenon, post-intervention, on a referral scheme that involved hiking in the countryside. The taped discussions were fully transcribed and subsequently analysed using Strauss and Corbin’s (1998) grounded theory method, which resulted in the development of a conceptual framework explaining, from a psychosocial perspective, the phenomenon. The QSR NUD*IST 4 computer program was used to search, store, explore and organize the qualitative material.

The framework explains the themes, their properties and dimensions and the links that exist between them. Participants’ understood mental health, in the context of their experiences, as ‘self-acceptance’. This core category was associated with participants’ acceptance of themselves, their health and social status, and life situation, which provided them with self-assurance or confidence. Participants’ self-acceptance was affected by the environmental context in which the scheme operated. This context included the themes of social support, social network, the environment and culture. Themes impacting on the context related to coping and playing a role, with the consequences of a sense of purpose and belonging, and physical health resulting from the core category. The framework is presented as a conceptual analysis of the lived experiences and social worlds of the participants within these studies, and demonstrates the context-bound nature of experiences for mental health. Our results challenge the positivist approaches commonly undertaken within sport and exercise science. We conclude that the mechanisms regarding the phenomenon are limited in their understanding and that, by adopting an alternative approach, an interrelated psychosocial model has been provided that attempts to explain the phenomenon for participants on exercise referral schemes. Complementary methodologies and methods, therefore, have the potential to further understand the complexities of participants’ experiences within both exercise and sport.

The aim of this study was to establish whether emotion control training (Roger and Masters, 1997: *Legal and Criminal Psychology*, 2, 51–64), which has been shown to reduce maladaptive coping strategies such as rehearsal in some populations, increases self-esteem in elite rugby players. Rehearsal is the tendency to ruminate on emotionally upsetting events and, in conjunction with emotional inhibition, has been shown to play a significant role in delayed physiological recovery following stress. Forty-seven elite rugby players aged 18–21 years were tested using the York Self Esteem Questionnaire (NSEQ; Roger, 1996: *Communication to the 8th European Conference on Personality*), the Emotion Control Questionnaire (ECQ: Roger and Najarian, 1989: *Personality and Individual Differences*, 10, 845–853) and the Coping Strategies Questionnaire (CSQ: Roger et al., 1993: *Personality and Individual Differences*, 15, 619–626). Subsequent research has shown that ECQ rehearsal and the maladaptive (emotional) coping style from the CSQ both predict poor health and social adjustment over periods of adaptation.

A control group and waiting list design were employed, with the control group being tested at the start and end of the season, while the intervention group were tested at the beginning of the season, before the intervention and at the end of the season. The basis of the training programme has been described in detail elsewhere (see Roger and Hudson, 1995: *International Journal of Stress Management*, 2, 119–132; Roger and Masters, 1997) and was adopted for use in the present context with rugby-specific examples used to highlight certain key points. The main features included a definition of stress relevant to the demands faced by elite rugby players, preoccupation with emotional upset, discussion of identified stressors highlighting controllable versus non-controllable factors and emotional versus problem-focused solutions to hypothetical scenarios.

A repeated-measures analysis of variance indicated that there was no significant increase in self-esteem, or decrease in rehearsal, pre- and post-test. These was no evidence of a significant increase or decrease in any of the other factors. The results did not support the hypothesis that an emotion control training programme will influence maladaptive coping strategies and thereby increase self-esteem. In conclusion, this research suggests that it is not possible to influence coping styles, in rugby players at least, through emotion control training. More research is needed into coping strategies used on a daily or weekly basis, however. More research is needed to examine the interaction between individual differences and situational uniqueness in the coping process – that is, the transactional model (Yoo, 2001: *International Journal of Sport Psychology*, 32, 290–303).

The relationship between coping styles and self-esteem in elite rugby players

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Moderating effects of exercise experience on motives for participation and motivational outcomes: a self-determination theory perspective

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The benefits of exercise to develop fitness and maintain health are widely recognized. Despite the many known benefits, there is a very high reported dropout rate (Biddle and Nigg, 2000: International Journal of Sport Psychology, 31, 290–304). It has been argued that extrinsic motives are most salient when people initiate an exercise programme and the subsequent high dropout rates are due, in part, to a lack of intrinsic motivation (Ryan et al., 1997: International Journal of Sport Psychology, 28, 335–354; Li, 1999: Journal of Applied Sport Psychology, 11, 97–115). The period up to 6 months has been identified as the most critical with regard to withdrawal from exercise programmes (Biddle and Nigg, 2000). The rationale underlying the present study is centred upon a need to further our understanding of the motivational dynamics underlying exercise participation.

The aim of the present study was to examine the moderating effects of exercise experience on participation motives and motivational outcomes through the perspective of Self-Determination Theory (Deci and Ryan, 1985: Intrinsic Motivation and Self-determination in Human Behaviour. New York: Plenum Press). The study was set at the contextual level of motivation (cf. Vallerand, 1997: In Advances in Experimental Social Psychology, edited by M.P. Zanna, pp. 271–360. San Diego, CA: Academic Press). It was hypothesized that exercise experience would moderate participation motives and motivational outcomes. Specifically, it was proposed that experienced exercise participants would report higher self-determined motivation and more positive motivational outcomes compared with those who had initiated exercise within 6 months.

Volunteer participants comprised 169 males (age = 33.3 ± 14.5 years; mean ± s) and 272 females (age = 31.9 ± 12.1 years) from four health clubs in North West London. To assess participation motives, they completed the Behavioural Regulation in Exercise Questionnaire (Mullan et al., 1997: Personality and Individual Differences, 23, 745–752) before an exercise session. Four weeks later, they completed a questionnaire that assessed concentration on the task at hand (from the Trait Flow Scale; Jackson et al., 1998: Journal of Sport and Exercise Psychology, 20, 358–378), interest and enjoyment (from the Intrinsic Motivation Inventory; McAuley et al., 1989: Research Quarterly for Exercise and Sport, 60, 48–58), behavioural intent and attitudes towards exercise. These represented cognitive, affective and behavioural motivational outcomes (cf. Vallerand, 1997). A Mahalanobis’ distance test revealed 12 multivariate outliers that were subsequently removed from the data set. The data generally satisfied the assumptions underlying independent-samples multivariate analysis of variance (MANOVA) other than sphericity. MANOVA was used to pre-test for any differences in sex and ethnicity and, as none were found (sex: Hotelling’s Trace$_{1,380} = 0.02$, $P > 0.05$; ethnicity: Pillai’s Trace$_{3,376} = 0.11$, $P > 0.05$), a single-factor independent-samples MANOVA was used to examine differences between four levels of exercise experience (0–6 months, 7 months to 4 years, 5–9 years, > 10 years).

Results indicated a significant effect for exercise experience (Pillai’s Trace$_{3,377} = 0.18$, $P < 0.001$, $\eta^2 = 0.06$) and follow-up univariate tests showed differences to be in the hypothesized direction. That is, scores for extrinsic motives were generally higher in the 0–6 month group, while scores for intrinsic motivation and motivational outcomes were generally higher in the other three exercise experience groups. The effect sizes for all differences were relatively small ($\eta^2 = 0.4–0.8$). The present results show that, to a certain extent, exercise experience moderated participation motives and motivational outcomes as predicted. The main implication for practitioners is that when people embark upon an exercise programme, it is imperative to satisfy the psychological needs underlying intrinsic motivation: self-determination, relatedness and competence (Ryan and Deci, 2000: American Psychologist, 55, 68–78). Researchers might consider the use of motivational profiling in an exercise context to assess the patterns of motives that result in the most positive motivational outcomes.

An investigation of the relationship between exercise dependence and self-esteem among sports studies degree students

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It is generally considered that increased participation in exercise is able to increase self-esteem (Scully et al., 1998: British Journal of Sports Medicine, 32, 111–120). However, few studies have considered whether a desire to increase self-esteem through exercise participation can influence the development of exercise dependence. The work of Smith et al. (1998: Journal of Sports Medicine and Physical Fitness, 38, 66–74) is one of the
few studies to consider whether a desire to increase self-esteem can result in such dependence. The aims of the present study were to develop our understanding of any relationship between exercise dependence and self-esteem and to establish whether individuals who use physical activity as a means of increasing self-esteem are likely to become dependent on exercise as a result.

A mixed-method approach was used in this study, with first-year sports studies students at three institutions of higher education within the UK making up the sample. Students at Birmingham University (n = 105), the University of Wolverhampton (n = 105) and the University of Wales College, Newport (n = 28) completed the Exercise Dependence Questionnaire (Ogden et al., 1997: Addiction Research, 5, 343–356) and the Rosenberg Self-Esteem Scale (Rosenberg, 1965: Society and the Adolescent Image. Princeton, NJ: Princeton University Press). Following the collection of the questionnaire data, four individuals from each institution agreed to participate in an in-depth interview during which exercise levels and self-esteem concerns were discussed.

Overall results indicated that, within a sports studies environment, there is a link between self-esteem and exercise dependence (r = −0.145; P < 0.05). Furthermore, trends evident within the interviews indicated that individuals had increased exercise commitment since starting their degree courses because of concerns about self-esteem and, in particular, body image. However, results were able to indicate that there are a number of factors likely to impact upon the strength of this relationship. For example, questionnaire and interview data revealed trends implying that differences in the nature of university life experienced at different institutions would impact on self-esteem and, therefore, affect the levels of exercise dependence that are evident within the different institutions (F2,235 = 9.91; P < 0.001). The sex of the participants also appeared to affect the relationship between exercise dependence and self-esteem concerns within a sports studies environment. Results indicated that females enjoyed significantly (t236 = 3.25; P = 0.0013) lower self-esteem than males and the interview data revealed that this is, in part, due to body image concerns. Indeed, females were found to be significantly (t236 = −3.63; P < 0.001) more likely to exercise for the purpose of weight control than males. Finally, interview data indicated that student self-esteem concerns were often based around concerns about popularity and the need to develop new friendships within the university environment. The interview trends revealed that, within the sports studies environment, students appeared to view an increase in popularity as a consequence of increased exercise participation and would increase exercise levels accordingly.

This study provides evidence to show that a relationship between exercise dependence and self-esteem does exist, suggesting that those who exercise to increase self-esteem might be prone to becoming dependent upon exercise. However, the results also indicate that, within a sports studies environment, the nature of university life experienced, sex and popularity are likely to have an impact on the strength of this association.

Achievement goals in sport: working towards an alternative model

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Progress in our understanding of achievement behaviour in sport has been substantial over the past 15 years. Our advancements in knowledge are largely due to the seminal work conducted on achievement goal theory in educational settings (Nicholls, 1989: The Competitive Ethos and Democratic Education. Cambridge, MA: Harvard University Press). The translation of this theory to sport has culminated in a plethora of studies into the determinants and consequences of task and ego goal orientations. However, recent publications (e.g. Harwood et al., 2000: Journal of Sport and Exercise Psychology, 22, 235–255) have questioned some of the conceptual premises of achievement goal theory as it applies to sport in an attempt to ‘advance our understanding of achievement goals and individual performers within the competitive sport domain’ (Harwood et al., 2000, p. 235). Where conceptual issues arise, measurement issues naturally follow to a point where alternative assessment methods become important to explore. One of the major conceptual points made by Harwood et al. (2000) reflected the need to measure self-referenced and norm-referenced conceptions of achievement, and to do so with items that were valid and meaningful to a particular context (e.g. competition). A further conceptual issue among achievement goal theorists relates to the role of social achievement goals that have been somewhat neglected in traditional research. In an attempt to bridge this gap in the literature, Harwood and Swain (in press: The Sport Psychologist) have developed a Profile of Goal Involvement Questionnaire (PGIQ) that demonstrates how performers may pursue task and ego goals, not only for self-directed or internalized reasons, but also to achieve more externally regulated social approval. The aim of this study was to further operationalize these conceptual points and work towards the development of an alternative competitive sport-oriented measure of achievement goal orientations.
Seven hundred and twenty athletes participated in the study (308 males, 412 females); they were aged 17–45 years (17.6 ± 3.5; mean ± s). Participants took part in a variety of competitive sports (e.g. athletics, badminton, basketball, football, hockey, lacrosse, netball, rugby, swimming and volleyball). A pool of 18 items, to add to the existing 12 items of the PGIQ, were devised by the first author and vetted by three experts within achievement goal research. The 30-item pool represented four latent goal orientation factors: self-directed task orientation (e.g. to perform to a standard that reflects personal progress); social approval task orientation (e.g. to show other people how well I can execute my skills); self-directed ego orientation (e.g. to prove to myself that I am better than the opposition); and social approval ego orientation (e.g. to prove to others that I am superior to the opposition). For each item, participants responded to the stem, ‘For sport in general, to feel successful and satisfied, it is important for me to . . .’. Response options ranged on a 7-point Likert scale from 1 (not at all important) to 7 (extremely important). To investigate concurrent validity, the participants also completed the Task and Ego Orientation in Sport Questionnaire (TEOSQ) and the Perceptions of Success Questionnaire (POSQ) as traditional measures of achievement goal orientations.

Using confirmatory factor analysis as a model-generating tool, single-factor, two-factor and four-factor models were examined. Goodness-of-fit statistics confirmed a four-factor model ($\chi^2$/d.f. = 2.99; RMSEA = 0.05; GFI = 0.95; SRMR = 0.03; CFI = 0.97) incorporating 16 items (four items per factor). While the $\chi^2$ to degrees of freedom ratio (2.99) was somewhat high, the fit statistics were generally excellent. Interestingly, Pearson’s correlations revealed that only the self-directed task orientation factor displayed a low but significant correlation with both the task and ego subscales of the TEOSQ and POSQ. These results are discussed with particular reference to future psychometric work and to the benefits of embracing such a model when investigating the nature of task and ego goals adopted by performers within the realm of competitive sport.

Evaluating the effectiveness of sport physiology consultants working in the UK

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As sports science support in the UK continues to grow, the responsibilities of the sports physiology consultant have increased. There is a need to accept and respond to new levels of accountability that come with these professional responsibilities. Evaluation of professional effectiveness is, therefore, of primary importance, providing fund holders, coaches and athletes with an opportunity to obtain a holistic picture of intervention effectiveness and, additionally, providing pertinent feedback for the consultant striving to enhance his or her own practice (Anderson and Miles, 1998: Proceedings of the British Psychological Society, 6, 101). The field of consultant evaluation has yet to be fully embraced by the sports science disciplines. The Consultant Evaluation Form (Partington and Orlick, 1987: The Sport Psychologist, 1, 309–317) was developed as an evaluation inventory designed to help sports psychologists assess and improve the field services they provided; it is currently the only instrument that allows credible, reliable and uniform evaluation throughout this discipline. The evaluation of the effectiveness of sports physiology provision has, however, received little attention. The aims of this study were to evaluate the effectiveness of sports physiology consultants providing services to elite British athletes and to identify the characteristics and activities pertinent to effective practice.

Evaluation was undertaken through semi-structured interviews with 10 British athletes aged 18–28 years (24.5 ± 3.5 years; mean ± s), who had been receiving physiological support from a BASES accredited sports physiology consultant for a minimum of 2 years. The interview focused on the athletes’ experiences of sports physiology support.

Inductive content analysis was used to analyse the interview data (Scanlan et al., 1989: Journal of Sport and Exercise Psychology, 11, 65–83). The focus of analysis revolved around three core areas established within the semi-structured interview guide: desirable characteristics of the sports physiologist; what activities the sports physiologist did with the athletes and how they are carried out; and qualitative comments regarding the sports physiologist and the services provided.

The analysis revealed two major fifth-order themes: effective characteristics of sports physiology consultants and activities provided that are pertinent to effective practice. Seven key characteristics were found to be important. Specifically, the effective consultant would be personable, have good communication skills, have knowledge and experience in sport and sports physiology, be a motivator, have a good relationship with the athlete’s coach, be honest and trustworthy and be the provider of a professional practical service. Findings relating to the activities of a sports physiologist identified three fourth-order themes: fitness testing and training (third-order themes: field and laboratory; group and individual; sport-specific); activities other than fitness testing or training (third-order themes:
teaching and education; awareness and consideration of injury); and service delivery issues (third-order themes: regular and supervised sessions; provision of feedback; setting of goals; attendance at competitions). Analysis of qualitative comments indicated that all the athletes interviewed recognized the beneficial value of sports physiology and would continue to both use and recommend such support.

The findings demonstrate that effective practice is dependent on consultants possessing desirable characteristics and providing appropriate activities and services, which will, in turn, elicit positive perceptions of sports physiology support. The study has also provided a basis upon which to build a greater body of literature concerning evaluation of applied sports physiology services, and perhaps a starting point for the development of a measurement tool for such evaluation.

The changing relationship between actual and perceived competence: implications for physical education from a longitudinal study

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Although young people’s involvement in physical activity and sport has received much attention in recent years, there is still a lack of understanding as to why physical activity declines throughout the adolescent and adult years (Health Education Authority, 1997: Young People and Physical Activity: A Literature Review. London: HEA). To assist the physical education profession in its quest to address this problem, there is a need for longitudinal research projects that track the influence of important modifiable variables over time. Findings from these projects will have a considerable impact on future physical education curricula in schools. Consequently, this on-going school-based longitudinal project is built on the increasingly supported hypothesis that, without an appropriate level of actual movement competence, young people, as they get older, will probably develop low perceptions of their movement competence and will be more likely to drop out of physical activity and sport. Here, we report on the interim findings from a sample of 226 pupils (120 boys, 106 girls) and focus on the impact of the changing relationship between pupils’ actual competence, perceived competence and participation in organized physical activity as they progress from year 7 to year 8.

Three important findings were identified. First, participation in organized physical activity dropped slightly from year 7 to year 8, mostly due to an increase in the number of pupils no longer taking part in school extra-curricular activities (32–42%). However, closer scrutiny reveals that PE Group 1 (the more physically able pupils) increased their total participation in organized physical activity inside and outside school from 2.4 to 2.7 days per week, whereas PE Groups 2 and 3 dropped from 2.7 to 1.7 days and from 1.7 to 1.2 days, respectively. Surprisingly, this drop was greater in boys than in girls. Second, data from the Children and Youth Self-Perception Profile (CY-PSPP; Whitehead, 1995: Pediatric Exercise Science, 7, 132–151) suggested that perceptions in years 7 and 8 were reasonably high, with scores between 2.7 and 3.0 (maximum = 4.0) on all six CY-PSPPP factors. Boys’ perceptions were consistently higher, although the body appearance scores of boys in PE Group 3 were very low in both years (i.e. 2.3). Multivariate analysis of variance and post-hoc Tukey test analysis of perception scores revealed significant differences in all CY-PSPP factors between PE Group 1 and the other PE groups. Initial analysis would suggest that this trend continues into year 9. Finally, although year 7 perception scores did not influence participation, year 8 scores revealed that pupils with higher perceptions took part in considerably more organized physical activity than those with lower perceptions. On average, these differences amounted to at least one extra day per week. In fact, 40% of pupils with the lowest perceptions took part in no organized physical activity in year 8, as opposed to 16% in year 7.

These interim findings suggest that, at the start of secondary schooling, the relationship between pupils’ actual and perceived competence is evolving and may have a significant role to play in young people’s participation in organized physical activity. Initial analysis of year 9 data would seem to support these findings.

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Use of anticipatory cues during a soccer dribble by skilled and novice players

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Essential anticipatory information has consistently been shown to be contained in ball flight information and within an opponent’s actions, most recently by Féry and Crogner (2001: Research Quarterly for Exercise and Sport, 72, 143–149) in tennis. The aim of the present investigation was to assess whether skilled and novice soccer players could extract such information when
viewing highly skilled soccer players dribbling the ball and performing a specific skill designed to beat an opponent.

Two JVC GR-DVF10 Mini DV digital video cameras were used to film seven skilled soccer players (from the League of Wales) dribbling the ball directly towards the experimenter filming the action (representing a static defender). The dribble culminated in the player using one of two skilled movements to initiate a final change of direction to the left or right of the experimenter [foot over the ball (FO) or body swerve (BS), with the FO skill being the more complex]. The image obtained from the camera angle was closely related to the typical viewpoint of the defender and, therefore, was deemed to have high ecological validity. In addition, a second camera was used to film concurrently from a side-on position to represent a typical viewpoint of a player on the pitch, but not directly taking part in the action. Video clips were edited on a PC system using a non-linear editing system (Fast DV Master 2000) to construct a compilation video of 80 clips interspersed with 5 s of blank tape. Video clips, therefore, contained either left- or right-footed attackers undertaking one of the two skills, moving to the left or right of the experimenter. Each of the eight different scenarios were repeated for both camera angles and occluded at 0, 200, 400, 600 and 800 ms before the final ball contact that initiated the change of ball direction. Five skilled (League of Wales) and five novice soccer players aged 21–30 years (24.2 ± 2.1 years; mean ± s) then viewed the compilation video and were asked to anticipate which direction the attacker was going to select (left or right) during the 5 s period between clips.

A mixed-model analysis of variance was used with associated simple main effects and post-hoc analyses. The results showed a large effect size for skill level (74.5%), with the highly skilled players performing significantly better in anticipating the direction selected than novices at occlusion points 0 ms (P < 0.05), 200 ms (P < 0.01), 400 ms (P < 0.001) and 600 ms (P < 0.01). No significant difference in performance was observed at 800 ms. Players’ ability to use the anticipatory cues was not affected by the different camera viewpoints (P = 0.524), suggesting that this ability is learnt during the game while watching other players from different viewpoints in addition to being involved in the skill itself. The complexity of the skill used by the players on the video showed a small effect size (15.9%), with further analysis suggesting that highly skilled players, but not novices, were able to detect cues from both skills equally well. The novices found the more complex skill (FO) significantly more difficult (P < 0.01) than the less complex one (BS). One explanation for this finding is that the novices were unable to anticipate this skill as effectively as the BS skill. This suggestion supports Renshaw and Fairweather’s (2000: Journal of Sports Sciences, 18, 951–957) findings in cricket that linked experts’ greater perceptual discrimination to previous exposure of the bowling deliveries.

This study provides further support for the consistent findings related to perceptual differences in sports performers of different standards. However, it would seem that such perceptual differences are not solely a byproduct of performing the skills during practice and competition, but also a consequence of watching skilled performances. Observation of soccer matches, including watching on television, may be beneficial to the player. Further examination of the role of video in the development of perceptual skills is therefore required with respect to anticipatory cues.

Mood state responses during intense cycling

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Research evidence shows that intense exercise is associated with a post-competition negative mood profile typified by increased fatigue, depression and reduced vigour (Morgan et al., 1987: British Journal of Sports Medicine, 21, 107–114).

Training theory proposes that exercise should be specific and involve overload; thus, increased fatigue is an expected response to training. Recent research suggests that depressed mood was the most influential mood dimension (Lane and Terry, 2000: Journal of Applied Sport Psychology, 12, 16–33) and that individuals reporting depressed mood tend also to report increased fatigue, confusion, anger and tension and reduced vigour. The aim of the present study was to examine the interaction between changes in depression and other mood dimensions during intense endurance exercise. Specifically, we were interested in detecting mood responses to exercise that lead to depressed mood and, once induced, whether depressed mood was associated with increased negative mood and reduced vigour as suggested by Lane and Terry (2000).

Ten highly trained cyclists (age 18–35 years, weekly training 14.2 ± 1.2 h; mean ± s) completed a 100-mile cycle performance in laboratory conditions. Mood was assessed using the Profile of Mood States-A (POMS-A; Terry et al., 1999: Journal of Sports Sciences, 17, 861–872). The participants completed the POMS-A before performance, at hourly intervals and immediately post-performance.
The results showed participants reported low anger, confusion, depression, fatigue and tension and high vigour before exercise. Consistent with theoretical predictions (Lane and Terry, 2000), participants reported zero for depressed mood before each test. Results show that fatigue increased in response to exercise. When examined collectively, multivariate analysis of variance indicated mood change significantly over time (Wilks’ lambda = 0.441, P < 0.001, \(\eta^2 = 0.15\)). Univariate results indicated significant increases in depression (\(F = 2.34, P < 0.05, \eta^2 = 0.11\)) and fatigue (\(F = 10.5, P < 0.01, \eta^2 = 0.39\)). Fatigue increased significantly at the end of the second hour and showed a further marked increase after the third hour (effect size = 2.1). Results indicated that depressed mood increased following the exponential increase in fatigue, rather than the other way around.

The findings from the present study show that a sharp increase in fatigue can lead to depressed mood. We suggest that individuals feel depressed as a consequence of a perceived inability to cope with the demands of the task. Once depressed mood is activated, it is associated with a negative mood profile, as suggested by Lane and Terry (2000). We suggest that future research should examine the interplay between mood changes and the type of coping strategies used during intense exercise.

**Validity of the Eating Attitude Test among exercisers**

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The desire to lose weight is one of the most commonly cited reasons for exercising. Increased attention to exercise and diet should lead to improved health and fitness. However, participation in sports that emphasize leanness have been associated with disordered eating attitudes (Hausenblaus and Carron, 1999: *Journal of Sport and Exercise Psychology*, 2, 230–258). Thus, there is a need to examine eating attitudes among samples of exercise participants. The inextricable link between theory testing and validity means that researchers are obliged to investigate the validity of their measures. To date, no published research has looked at the factorial validity of existing eating attitude inventories for use with an exercise population. The Eating Attitude Test (EAT; Garner et al., 1982: *Psychological Medicine*, 12, 871–878) is a 26-item measure that yields a single index of disordered eating attitudes. It is also proposed to assess three interrelated factors: dieting behaviour (13 items), oral control (7 items) and bulimia nervosa and food preoccupation (6 items). The aim of this study was to examine the factorial validity of the EAT among a sample of exercise participants.

Altogether, 598 exercisers (273 males, 325 females) aged 29.4 ± 10.2 years (mean ± s) completed the EAT before taking part in exercise at a health and fitness centre. Confirmatory factor analysis was used to test the single-factor and three-factor model of the EAT. A good fitting model should show a robust comparative fit index (RCFI) above at least 0.90 and a root mean square error of approximation (RMSEA) below 0.08 (Hu and Bentler, 1999: *Structural Equation Modeling*, 6, 1–55). Confirmatory factor analysis of the single-factor model (RCFI = 0.66, RMSEA = 0.10) and three-factor model (RCFI = 0.74, RMSEA = 0.09) showed poor model fit.

A revised four-factor model that separated bulimia and preoccupation with food was tested after removal of items ‘I cut my food into small pieces’, ‘I take longer than others to eat my meals’, ‘I particularly avoid foods with a high carbohydrate content’ and ‘I enjoy trying new rich foods’, as they demonstrated weak factor loadings. The results of confirmatory factor analysis showed acceptable fit indices: RCFI = 0.92, RMSEA = 0.06. An examination of inter-correlations between factors indicated low correlations other than dieting and food preoccupation (\(r = 0.78, P < 0.01\)), which showed a moderate correlation.

Findings suggest that a 22-item four-factor model shows promising validity coefficients among exercise participants. Theoretically, it is important to distinguish bulimia from food preoccupation, as individuals who exercise might score relatively high on food preoccupation but show no symptoms of bulimia. Research is needed to cross-validate the findings of the present study to a new sample.

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**Motor performance as a function of audience affability and metaknowledge**

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Consistent with the findings of home advantage research, it is assumed that the presence of overtly supporting spectators should facilitate performance of
well-learned motor skills. Butler and Baumeister (1998: *Journal of Personality and Social Psychology*, 75, 1213–1230), however, showed that on a difficult skill-based task, performance decrement occurred in the presence of a supportive audience only. A discrepancy between measures of self-perceived and actual performance, similar to Chan’s (1992: unpublished doctoral dissertation, University of Oxford) ‘zero correlation’ characteristic of implicit processes, suggested that the task exhibited implicit features (e.g. low metaknowledge), which insures it from disruption from hostile or neutral audiences but not supportive audiences. As motor skills very low in metaknowledge have been shown to remain intact under stress (Masters, 1992: *British Journal of Psychology*, 83, 343–358), it was proposed that an implicitly acquired skill, which has little or no metaknowledge, would remain robust regardless of audience type.

To test this hypothesis, 28 (n = 14 males, n = 14 females) undergraduate students (age 20.4 ± 1.0 years; mean ± s) learned a table tennis shot either explicitly (with metaknowledge) or implicitly (without metaknowledge). Manipulation checks indicating the presence of characteristics associated with implicit or explicit motor processes provided confirmatory evidence for the efficacy of the conditions. Performance was subsequently assessed in the presence of neutral, supportive and adversarial audiences. A learning group × audience condition (2 × 3) analysis of variance, with Huynh-Feldt epsilon-adjusted probabilities and repeated measures on the latter factor, showed a main effect of audience condition modified by an interaction (F1,78,40.99 = 3.41, P < 0.05), but no effect of learning group (F1,23 = 0.015, P > 0.05). Analysis of simple main effects was used to examine each learning condition separately. A significant effect was evident in the explicit condition (F2,24 = 4.58, P < 0.03), but not in the analogy condition (F2,24 = 0.170, P > 0.05). Tukey’s HSD tests were used to further explore the differences between audience conditions in the explicit learning group, demonstrating a performance decrement in the supportive audience condition but not in the neutral or the adversarial audience condition (P < 0.05).

It is argued that supportive audiences engender greater internally focused attention (potentially due to the increased salience of self-presentational concerns under these conditions) than neutral or adversarial audiences. Internally directed attention can result in disrupted performance when the performer focuses on the mechanics of the movements. This has been described as reinvestment (Masters et al., 1993: *Journal of Personality and Individual Differences*, 14, 655–666) and is more likely to occur in explicit skills, which have a high degree of metaknowledge pertaining to the mechanics of the movement, than implicit skills, which have a low level of metaknowledge.

**Goal orientations, sport enjoyment and patterns of involvement in sport and recreational physical activity**

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This study examined the relationships among achievement goal orientations, enjoyment of sport and level of participation in sport among youths in Botswana. Studies on achievement goal orientations have established a link between goal orientations and patterns of involvement in sport as well as level of enjoyment of sport and physical activity (Duda, 1989: *International Journal of Sport Psychology*, 20, 42–56; Duda, 1989: *Journal of Sport and Exercise Psychology*, 11, 318–335). However, psychological factors that impinge upon various aspects of participation in sport in Botswana are not known. An increasing value placed on participation in sport and physical activity among youths in Botswana creates a need to develop a better understanding of the psychological factors that could be influencing patterns of involvement and enjoyment of sport and physical activities among youths.

This study sought to find out if task and ego goal orientations of Botswana youths are related to their patterns of involvement in sport and level of enjoyment of sport. It was hypothesized that Botswana youths who participate in competitive and recreational sports have higher task and ego goal orientations than non-participants in sport and recreational physical activities. It was further hypothesized that task goal orientation of Botswana youths would be positively correlated with enjoyment of organized sports and recreational physical activities, while the correlation between ego goal orientation and enjoyment of organized sports and recreational physical activities would be lower than with task goal orientation. To test these hypotheses, 903 junior and senior secondary school youths (411 males, 492 females) aged 13–18 years were requested to complete a background information questionnaire, the Task and Ego Orientation in Sport Questionnaire, and items on sport enjoyment. The youths were participants in different competitive sports and leisure physical activities and non-participants in sport and physical activity.

Preliminary multivariate analyses of variance (MANOVA) were run on the task and ego subscales to test for the effects of form level, region and sex. Only significant
form level differences were found. So form level was included in an examination of task and ego differences between levels of participation in sport (sport category). To test for the first hypothesis, a $3 \times 2$ (sport category by form level) MANOVA was conducted on the task and ego subscales. There were significant main effects for sport category ($\text{Pillai's Trace} = 0.04$, $F_{4,777} = 68$, $P < 0.0001$) and form level ($\text{Pillai's Trace} = 0.02$, $F_{4,777} = 9.68$, $P < 0.0001$). These results partially supported the first hypothesis. Competitive sport participants ($4.27 \pm 0.51$; mean $\pm s$) had significantly higher task orientation than the recreational ($4.15 \pm 0.59$) and non-participant groups ($3.98 \pm 0.80$). The difference between the recreational group and the non-participant group approached significance. Post-hoc tests for form level showed that senior forms ($4.28 \pm 0.60$) had significantly higher mean scores for task goal orientations than participants from junior forms ($4.12 \pm 0.59$). However, the effect sizes were very small ($0.13$).

Pearson’s correlation coefficients were calculated to test for the second hypothesis. This hypothesis was also partially supported. The highest significant correlation was between task orientation and enjoyment of organized sport ($r = 0.36$, $P < 0.01$). The correlation between task and enjoyment of recreational sport ($r = 0.10$, $P < 0.001$) was significant but very low. These findings show that task goal orientation differentiates between competitive sport participation on the one hand and recreational and non-participation on the other. In accordance with findings from previous studies, task orientation was significantly correlated with enjoyment of organized sport. The low correlation between task orientation and recreational sports could be a reflection of the organizational aspect and value attached to recreational youth sports in Botswana schools.

The relationship among different modes of physical activity and non-clinical depression
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Current evidence suggests that physical activity may prevent depression and can be used as an adjunctive treatment for depression (Mutrie, 2000: In Physical Activity and Psychological Well-being, edited by S. Biddle, K. Fox and S. Bouchter, pp. 46–62. London: Routledge). In cross-sectional studies, a negative relationship has often been found between depression and levels of exercise, but when physical activity is defined more broadly, the relationship between physical activity and depression is ambiguous. The aim of this study was to describe the relationship between different modes of physical activity and self-reported levels of depression using cross-sectional data obtained from a longitudinal study of health in three age cohorts living in the West of Scotland. The data were obtained from home interviews in 1995–96 when the cohorts were aged 24, 44 and 64 years, respectively. Depression was measured by the Hospital Anxiety and Depression Scales (HADS-D, range of scores 0–21). Participants reported on physical activity at work, at home and during leisure. For each mode of activity, we estimated weekly occasions of either moderate activity lasting at least 30 min or vigorous activity lasting at least 20 min. To analyse the associations of physical activity and the HADS-D score, we constructed generalized linear models for men ($n = 790$) and women ($n = 952$) separately adjusting for age, employment status, social class and smoking status. The HADS-D score was transformed (using square root) because of a positively skewed distribution.

There was no significant relationship between work activity and HADS-D score. There was an inverse linear relationship between vigorous leisure activity and the (transformed) HADS-D score for both sexes (males, $P < 0.005$; females, $P < 0.002$). Men additionally showed a non-linear (U-shaped) relationship for moderate leisure activity ($P < 0.001$). For women, there was a significant positive relationship between vigorous home activity and (transformed) HADS-D score ($P = 0.024$).

It should be noted that these scores do not reflect clinical levels of depression (only five participants showed severe depression with a HADS score above 14). These results suggest that future investigation into the relationship between physical activity and depression must take the mode of activity into account. The often reported negative linear relationship occurred only for vigorous activity and for women a positive linear relationship was reported with home activity. The relationship between moderate activity and HADS-D (transformed) was non-linear and requires further investigation. These results could explain the differences which have been noted between exercise and general physical activity in relation to self-reported depression.

Individual differences, perceived control and competitive trait anxiety
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Based on limitations in the measurement of competitive anxiety, several authors have advocated the need to assess additional dimensions to the stress response. ‘Directional perceptions’ refer to how individuals interpret the extent to which the intensity of symptoms associated with pre-competition anxiety facilitates or debilitates performance (Jones, 1995: *British Journal of Psychology*, 86, 449–478). Research supporting this distinction has been consistent, cascading the view that ‘direction’ may be more sensitive in distinguishing between group differences when compared with the intensity of the response. Studies comparing elite and non-elite performers have shown skill to be an important individual difference variable. Even though no differences between anxiety intensity have been shown, elite performers have reported significantly more facilitative interpretations of cognitive and somatic symptoms associated with anxiety (Woodman and Hardy, 2001: In *Handbook of Research on Sport Psychology*, 2nd edn, edited by R. Singer, H.A. Hausenblas and C.M. Janelle. New York: Wiley). A line of future investigation in this area is to examine those individual differences that provide an explanation as to the possible mechanisms underlying debilitative and facilitative anxiety states in sport performers. As a result, Jones (1995) adapted and modified Carver and Scheier’s (1988: *Anxiety Research*, 1, 17–22) model of test anxiety to allow predictions for competitive anxiety in sporting contexts. However, only Jones and Hanton (1996: *Journal of Sport and Exercise Psychology*, 18, 144–157) have examined these suggestions. Thus, the aim of the present study was to further test the predictions of Jones’ (1995) control model of debilitative and facilitative competitive anxiety, incorporating skill as an important individual difference variable.

A large sample of elite and non-elite athletes from open-skilled sports (n = 233) were measured on their trait multidimensional anxiety intensity and direction responses and self-confidence levels using a modified version of the Competitive State Anxiety Inventory-2 (CSAI-2; Jones and Swain, 1992: *Perceptual and Motor Skills*, 74, 467–472). Scales examining their level of expectancy about achieving the outcome, performance and process goals they would normally set for an important match or competition were also administered. Dividing participants into outcome, performance and process goal groups, MANOVA and follow-up ANOVA supported Jones’ (1995) predictions on a trait level. Specifically, main effects for goal attainment showed participants with positive expectations reported more facilitative interpretations of anxiety symptoms than those with negative expectations, who were debilitative, across all three goal types. Effect sizes within the three goal groups for cognitive anxiety direction (outcome = 0.31; performance = 0.29; process = 0.36) and somatic anxiety direction (outcome, performance, process = 0.17) suggest a decisive dispositional relationship between anxiety interpretation and the perceived achievement of competition goals. Standardized discriminant function coefficients revealed cognitive anxiety direction to contribute most consistently and significantly to maximizing group differences, as a function of goal attainment expectations, further supporting the model. At an interactional level, the elite positive group demonstrated the greatest facilitation for cognitive anxiety direction (F = 5.17, P < 0.024), although this was limited to the outcome goal group. Additionally, the elite negative group reported debilitative interpretations. This result not only confirms the importance of individual differences in Jones’ (1995) model, but also highlights the role of perceived control and outcome goals in understanding the emotional and affective responses to competitive stress. Practitioners and coaches need to ensure that competition targets are realistic, controllable and are perceived as attainable, particularly during the early career of a sports performer, to promote the development of a positive dispositional expectation of goal attainment. Future research should identify the possible antecedents of perceived control over goal attainment (e.g. attribution style) using Jones’ (1995) model as a theoretical framework.

### Multiple motivation theory testing in secondary school physical education

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represents a relatively under-researched area in terms of examining specifically the motivational antecedents and the affective, cognitive and behavioural outcomes associated with physical activity participation. In fact, relatively limited research has been conducted thus far in this domain to determine the relationships between: (a) achievement goal orientations and self-determination; (b) self-determination and affective, cognitive and behavioural outcomes within the same study; and (c) reported enjoyment and attitude towards participation in PE. In accordance with the recommendations of Landers (1983: *Journal of Sport Psychology, 5*, 135–151) to test multiple theories, the aim of the present study was to test a model of conceptual links among key constructs of achievement goal theory, self-determination theory, the competence motivation model and the hierarchical model of intrinsic and extrinsic motivation, using a prospective design. The present study investigated hypothesized independent effects of: (a) achievement goal orientations and perceived competence on self-determination; (b) task orientation and perceived competence on affective, cognitive and behavioural outcomes; (c) self-determination on affective, cognitive and behavioural outcomes; and (d) reported enjoyment on attitude towards PE participation.

Participants comprised 262 year 9 and 10 pupils aged 13–15 years (13.8 ± 0.7 years; mean ± s), who competed two batches of questionnaires with a one-week time gap in between. At Time 1, a set of measures assessing goal orientations (the TEOSQ), perceived competence (the Self-Perception Profile for Children) and behavioural regulations (a modified version of the Model of PLOC) was administered. At Time 2, the second set of measures assessing enjoyment (a set of four questions), attitude towards PE participation (a set of six statements), concentration (a modified version of the Trait Flow Scale) and effort (a three-item scale adapted from the IMI) was administered.

The data were analysed using the EQS structural equation modelling programme (Bentler, 1995: *EQS: Structural Equation Program Manual*. Encino, CA: Multivariate Software, Inc.). Using SPSS, 30 univariate outliers were detected and deleted. Subsequently, five multivariate outliers were detected and deleted using the Mahalanobis distance method, and seven cases with the largest contribution to Mardia’s coefficient at P < 0.001 (through EQS) were deleted. SEM analysis was performed on the remaining 220 cases. Subsequent assessment of χ² statistics and standard errors took into account a demonstrated aspect of non-normality by use of robust maximum likelihood methodology. On the basis of the univariate and multivariate Lagrange multiplier tests and theoretical relevance, three paths were added. The final estimation yielded the following fit indices: Satorra-Bentler scaled χ² (24, N = 220) = 52.03, P < 0.001, robust CFI = 0.97, SRMR = 0.05. All hypothesized independent effects were confirmed.

The present findings confirm the adaptive features of task orientation in fostering self-determined motivation in PE classes, and a range of positive motivational outcomes. The findings also underline the need to design and implement PE programmes which are likely to promote self-determined motivation to facilitate such positive outcomes. For example, programmes which allow an element of choice for pupils in terms of the activities that they engage in.

**Effects of asynchronous music on flow states and shooting performance among netball players**

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The sport psychology literature contains an abundance of anecdotal and qualitative evidence suggesting that optimal performance depends, in part, on the intensity and experience of a mental state described as flow (e.g. Jackson and Csikszentmihalyi, 1999: *Flow in Sports: The Keys to Optimal Experiences and Performances*. Champaign, IL: Human Kinetics). Jackson and Marsh (1996: *Journal of Sport and Exercise Psychology, 18*, 17–35) have recently developed a quantitative method for assessing flow called the Flow State Scale (FSS). The development of this scale enabled Karageorghis and Terry (1999: *Journal of Sports Sciences, 17*, 61) to examine the relationship between flow and the motivational qualities of music. Additionally, the effect of music on performance has also been reported (see, for example, Ferguson et al., 1994: *Perceptual and Motor Skills, 78*, 1217–1218). Taken together, the findings suggest that music may enhance performance by changing a player’s perception of flow. This study examined this conjecture using an idiographic single-subject multiple baseline design (Wollman, 1986: *Journal of Sport Psychology, 8*, 135–138).

Specifically, this study investigated the effects of a music intervention upon flow states and shooting performance of three female collegiate netball players. The design required the observation of baseline performance and treatment phases for each of the participants with the length of the baseline increased for each succeeding player used in the analysis. The music intervention was introduced when a stable baseline or a trend in the opposite direction of the change anticipated became apparent for each of the participants. A
sequential application of the music was administered until all participants received the intervention. It was anticipated that the effects of music would be optimized through asking players to self-select music they associated with memories of their most outstanding athletic performances. Performance was measured by summing the scores for 12 shots. Specifically, four shots were taken from the left and four from the right side of the netball posts from a distance of 3.2 m and at an angle of 45° from the back line. The remaining four shots were taken directly in front of the netball posts, again at a distance of 3.2 m. The experimenter recorded each attempt using the following scoring system: 0 for a complete miss; 1 for the ball hitting the rim and not going through the net; 2 for the ball hitting the rim and going through the net; and 3 for a ‘clean’ basket. In addition to the performance data, information on the intensity of flow experienced by the participants was assessed using the Flow State Scale (Jackson and Marsh, 1996). It should be noted that performance and flow data were collected from 10 trials lasting approximately 4 weeks. Data were examined by way of changes in the mean, level, trend and variability between baseline and intervention (Hrycaiko and Martin, 1996: Journal of Applied Sport Psychology, 8, 183–199).

The results indicated that all three participants utilizing the intervention increased their performance from baseline to intervention. Performance improvements ranged from 13% to 16%. Additionally, all three participants increased their flow scores from baseline to intervention. Flow improvement ranged from 6% to 19%. These results suggest that music may be an effective tool for improving flow and shooting performance in netball players.

On your marks, get stereotyped, go! Novice coaches and Black stereotypes in sprinting

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Although the latter part of the twentieth century has seen a marked growth of interest in the study of sport, race and ethnicity, racial stereotypes in sport remain among the least challenged stereotypes in society today. In general, people appear to believe that Black individuals of African ancestry are inherently superior in their physical ability, as reflected in their large representation in some sports such as sprinting (Entine, 2000: Taboo: Why Black Athletes Dominate Sports and Why We’re Afraid to Talk About It. New York: Public Affairs). A study by Johnson et al. (1999: Journal of Sport Behaviour, 22, 45–54) with undergraduate students used pictures to evoke racial stereotypes to explain the success of African American men and White men in collegiate basketball. Based entirely on pictures showing only the head, they found that the undergraduates attributed the success of White men to hard work and socio-economic factors, whereas they attributed the success of African American men to innate genetic factors. The aim of the present study was to examine novice coaches’ use of Black stereotypes using similar pictures of supposed sprinters.

We hypothesized that the success of White individuals would be attributed to hard work and socio-economic factors, whereas that of Black individuals would be attributed to innate genetic factors.

Although many studies have confirmed the existence of stereotypes, both in sport and in general, we could find no study that tried to evaluate coaches’ use of common racial stereotypes in determining and attributing physical ability. This would be important, since coaches have a significant impact on the selection, the shaping and, ultimately, the success of potential athletes.

Thirty-six undergraduates (21 males, age 21.8 ± 3.8 years; 15 females, age 22.3 ± 6.2 years; mean ± s) from coaching modules at the University of Luton volunteered to participate. The participants rated eight items on a 7-point Likert scale, in relation to sprinting success, for four pictured individuals (one white and one black male, one white and one black female) shown in randomized order. A two-way within-subjects design was used.

A 2 × 2 analysis of variance indicated a significant interaction between Black/White photos and Black/White stereotypical survey items (F1,35 = 16.9, P < 0.005). Further analysis using paired t-tests revealed significant differences between Black photos with Black survey items and White photos with Black survey items (t35 = 4.65, P < 0.0025, one-tailed), and between White photos with White survey items and Black photos with White survey items (t35 = 2.87, P < 0.007, one-tailed).

The results support the concept that certain Black phenotypic characteristics evoke beliefs about innate athletic abilities, whereas White phenotypic characteristics induce beliefs about athletic success as a result of socio-economic factors. Novice coaches need to be self-aware regarding preconceptions of athletes based on racial stereotypes so that they can promote equality of opportunity and avoid the self-fulfilling prophecy. These stereotypes may be subconsciously used and may be explained in part by schema theory and false associations in the development of semantic networks (Levy, 2000: Journal of Genetic Psychology, 161, 400–420). However, they must be recognized and challenged within the coaching context.
The contribution of physical activity to the subjective well-being of older adults enrolled in exercise referral schemes

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Physical activity can positively contribute to addressing many of the needs expressed in the new National Service Framework for Older People (Department of Health, 2001: National Service Framework for Older People. London: HMSO). To help manage the disproportionate burden of physical and mental health problems among older adults, general practitioners (GPs) may refer them to specialist activity classes (exercise referral schemes), which have become one major routeway for introducing older people to regular physical activity (www.doh.gov.uk/exercisereferrals/). With a growing population of older adults, there is an urgent need to obtain authentic feedback on how existing exercise referral schemes can complement elements of the wider lives of older people. This study examined the qualitative perspectives of how physical activity is situated in notions of subjective well-being among older adults enrolled in exercise referral schemes.

Thirteen community-dwelling, retired, older adults (8 males, 5 females) aged 63–79 years participated by choice in either an individual or a group semi-structured interview. All participants attended one of three exercise referral schemes in South-West England. Using cross-case analysis, the main themes were identified and grouped through common content into the following four dimensions of subjective well-being: (1) developmental well-being, (2) physical well-being, (3) mental well-being and (4) social well-being. Credibility of the data analysis was ensured mainly through member checking by interviewees who confirmed the accuracy of the transcripts and the theme classifications.

The findings support the multidimensionality of subjective well-being of older people (Stathi et al., 2002: Journal of Aging and Physical Activity, 10, 76–92) and the contribution of physical activity to each of the dimensions (Table 1). Older adults reported that physical activity: (a) was an essential feature that offered them autonomy and made life busy and purposeful; (b) was a yardstick of health, as it helped alleviate pains and discomfort and improved functional ability and mobility; (c) was seen as having a positive impact on mental alertness and attitude towards life; (d) helped them to prevent, or recover from, loneliness and isolation.

Respondents were concerned about the risks of participation in exercise programmes. They also experienced improved social well-being from purposeful involvement with other older adults, although this was not evident in all schemes.

These findings provide an alternative expression of how a programme of physical activity can contribute to dimensions of subjective well-being in older adults. GPs and referral staff may see the findings as feedback on

Table 1. Contribution of exercise referral programmes to dimensions of subjective well-being

<table>
<thead>
<tr>
<th>Subjective well-being</th>
<th>Activity beliefs</th>
<th>Immediate activity concerns or effects</th>
<th>Exercise referral programme outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental</td>
<td>So to be happy you do need a challenge. You do need to be active. Mentally probably more than physically ...</td>
<td>I have achieved something I have never achieved before ...</td>
<td>After the first 4 weeks you feel that you have more control ...</td>
</tr>
<tr>
<td>Physical</td>
<td>If you do not feel fit in everything you do, you do not enjoy it ... physical activity is to slow down the effects of ageing ...</td>
<td>I like to feel my heart pumping ... I want to do the exercises right ... As long as you don't go too far ...</td>
<td>In 6 weeks I could walk to town ... It helps stop my knees from aching ...</td>
</tr>
<tr>
<td>Mental</td>
<td>The physical work makes me think more ... in retirement one needs to maintain physical and mental activity ...</td>
<td>It helps to take the stress out of anything ... it's very calming ...</td>
<td>I feel younger ... life looks better ...</td>
</tr>
<tr>
<td>Social</td>
<td>Without being fit you can't do any of the social things, you cannot go out ...</td>
<td>It gets me out of the house ...</td>
<td>I have a different approach to people ...</td>
</tr>
</tbody>
</table>
how older adults experience participation in exercise referral programmes. The adults in this study emphatically expressed their on-going need for challenge, autonomy, fitness and functionality, mental health and social interaction, and they had clear views about how physical activity assisted in fulfilling some of their current needs.

**Evaluation of the motivational quality of music played during exercise at two fitness centres using the Brunel Music Rating Inventory**

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Music is believed to facilitate exercise behaviour through motivation, synchronization of movement and mental distraction from physical fatigue (Karageorghis and Terry, 1997: *Journal of Sport Behavior, 20*, 54–68). It is not surprising, therefore, that upbeat music is continuously played in the fitness suites (gyms) of most leisure centres. However, the exercise-facilitating properties of music depend largely on how the ‘quality’ of music is perceived by the exercisers. The aim of this study was to investigate the motivational quality of music played at two leisure centres, one managed by a borough council and the other privately owned. The equipment and facilities differ to a large extent between such centres and this is reflected in the cost of membership. Consequently, another aim of this research was to determine whether the motivational climates, facilitated via the playing of music, also differ between a relatively low-cost and a relatively high-cost fitness centre.

One hundred people participated in the study. Fifty individuals from each leisure centre, comprising an equal number of men and women, were tested during their exercise routine. All participants completed the Brunel Music Rating Inventory (BMRI), developed by Karageorghis *et al.* (1999: *Journal of Sports Sciences, 17*, 713–724), five consecutive times by giving verbal responses to the experimenter during five different pieces of music. Because we were interested in ‘a general picture’ about the music played, the scores obtained for the five pieces of music were averaged for each participant. The data were scored in line with the method prescribed by Karageorghis *et al.* (1999). Five dependent measures were obtained: one for each of the four subscales of the BMRI (association, cultural impact, musicality and rhythm response) and one total motivational score based on the sum of the ratings of the four subscales.

The data were analysed with a two (sex) by two (leisure centre) multivariate analysis of variance. The findings only yielded a significant multivariate main effect for leisure centre (Wilks’ lambda = 0.709, $F_{5,92} = 7.55, P < 0.001$). Univariate follow-up tests showed that rhythm response and total motivational quality of music were significantly higher in the privately managed centre than in the council-managed centre (means = 10.11 vs 8.13, $F_{1,96} = 21.7, P < 0.001$, effect size = 0.86 for rhythm; means = 16.43 vs 14.36, $F_{1,96} = 6.71, P < 0.01$, effect size = 0.48 for the total motivational quality of music).

These findings suggest that in contrast to the council-managed centre, the private centre provided more motivating music in its fitness suites. However, the total motivational qualities of music, at both fitness centres examined, were slightly below the median score (18.33) reported by Karageorghis *et al.* (1999). Furthermore, while Karageorghis *et al.* (1999) found differences between the sexes, no such differences emerged in the present study. A noteworthy difference in the procedures that could have influenced the result is that in the current study participants completed the questionnaire *during* rather than before or after exercise (and hence music attendance), as in the study by Karageorghis *et al.* (1999). We have opted for this method because the motivational characteristics of music may emerge when exercisers attend to music, while exercising, rather than before or after. *Post-facto* evaluation of music is subject to memory distortions, making it hard to link the motivational qualities of music to exercise behaviour. In spite of differences between the current results and those reported by Karageorghis *et al.* (1999), it is safe to conclude that the BMRI is a sensitive tool for gauging the motivational aspects of music in exercise settings.

**The effects of manipulated self-efficacy on effort expenditure and performance in an accuracy-based throwing task**

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Self-efficacy has been defined as the belief one has in one’s ability to successfully execute a specific task to obtain a certain outcome (Bandura, 1977: *Psychological Review, 84*, 191–215). Bandura (1977) hypothesized that efficacy beliefs influence the amount of effort that an individual will expend on a task. This hypothesis has received support from laboratory experiments that have addressed the issue of causality (Weinberg *et al.*, 1979: *Journal of Sport Psychology, 1*, 320–331; Fitzsimmons *et al.*, 1991: *Research Quarterly for Exercise and Sport, 62*, 424–431). These studies demonstrated that experimental manipulation of self-efficacy influenced effort-based
performance (e.g. weightlifting). In particular, Fitzsimmons et al. (1991) showed that when the self-efficacy of weightlifters was enhanced through deceptive performance feedback, they were subsequently able to lift heavier weights. However, while there is evidence that self-efficacy impacts effort-based performance, it is unclear whether changes in self-efficacy would affect performance and effort expended on an accuracy-based task (e.g. basketball shooting, golf-putting). The aim of the present study was to examine the effects of manipulated self-efficacy on the performance and effort expended on an accuracy-based task.

The participants were 24 undergraduate males aged 18–25 years (19.2 ± 1.6 years; mean ± s). The task was to throw a standard tennis ball from a distance of 6 m as accurately as possible at a mounted target. The target consisted of five concentric rings; the bull’s eye had a radius of 0.05 m, with each additional ring increasing in radius by 0.1 m. Up to 5 points could be scored on each throw (5 points = bulls’ eye, 1 point = outer ring). A repeated-measures design was utilized, with participants performing three sets of 10 throws in each of three conditions (positive, negative, control). In the positive and negative conditions, participants were given manipulated performance feedback after sets 1 and 2 and accurate feedback after set 3. Accurate feedback was given throughout the control condition. Manipulated feedback consisted of a performance total 20% greater than real performance in the positive condition, and 20% less than real performance in the negative condition. Measurements of self-efficacy were taken before every set following the guidelines of Bandura (1977). Furthermore, measurements of perceived effort expenditure were taken after every throw in all sets. Perceived effort expenditure was measured on an 11-point scale ranging from zero (minimum effort) to 100 (maximum effort) in 10-unit increments.

Analysis of variance indicated that feedback manipulation was successful at changing participants’ ratings of self-efficacy. This analysis revealed a significant set × condition interaction ($F_{4,88} = 7.43, P = 0.001$). Bonferroni-corrected t-tests revealed that self-efficacy increased significantly from set 1 to set 3 in the positive condition ($t_{22} = 3.96, P = 0.01$), decreased significantly from set 1 to set 3 in the negative condition ($t_{22} = 2.63, P = 0.015$) and did not change in the control condition. Further analysis was conducted to examine changes in perceived effort expenditure and performance. These analyses revealed there were no significant changes in either perceived effort expenditure or performance in any of the conditions ($P > 0.05$).

The results of this study do not lend support to Bandura’s (1977) hypothesis that efficacy beliefs influence the amount of effort than an individual will expend on a task, nor do they support previous research that has demonstrated a causal link between self-efficacy and performance. It is proposed that this discrepancy may be due to the specific accuracy-based nature of the task employed in the present study. The findings suggest specifically that self-efficacy may have a limited impact on tasks that are dependent on accuracy-based performance. It is suggested that further research should be conducted to investigate the differential effects of self-efficacy on effort-based and accuracy-based tasks.

A temporal approach to the dimensions of competitive anxiety

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Research has advocated viewing competitive anxiety as a construct encompassing intensity, directional interpretation and frequency of intrusion components (Woodman and Hardy, 2001: In Handbook of Research on Sport Psychology, 2nd edn, edited by R. Singer, H.A. Hausenblas and C.M. Janelle. New York: Wiley). Also, the emotionality literature has noted the need to view stress reactions as temporal processes that unfold over time, with the frequency component of responses being particularly important (Cerin et al., 2000: Journal of Sports Sciences, 18, 605–626). In this study, we integrated these issues and assessed the temporal characteristics of intensity, direction and frequency of competitive state anxiety and self-confidence in the week before competition. The factor skill was used to determine whether elite or non-elite athletes showed any differences in their responses over time.

Table 1. Results of repeated-measures analyses of variance for change-over-time effects

<table>
<thead>
<tr>
<th>Dimension/construct</th>
<th>d.f.</th>
<th>$F$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intensity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>3,226*</td>
<td>5.95</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Somatic</td>
<td>3,250*</td>
<td>23.3</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Self-confidence</td>
<td>3,264*</td>
<td>3.84</td>
<td>0.008</td>
</tr>
<tr>
<td><strong>Frequency of intrusions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>3,264</td>
<td>45.6</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Somatic</td>
<td>3,199*</td>
<td>22.5</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Self-confidence</td>
<td>2,188*</td>
<td>20.1</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

*Greenhouse-Geisser adjustment applied to correct violation of sphericity.
The 82 participants were separated into elite \((n = 37)\) and non-elite \((n = 45)\) groups. All participants completed the modified Competitive State Anxiety Inventory-2 (Jones and Swain, 1992: *Perceptual and Motor Skills, 74*, 467–472) five times (1 week, 2 days, 1 day, 2 h and 30 min) before a competitive league fixture. The data were analysed for interaction and main effects using a series of 2 (skill: elite vs non-elite) \(\times 5\) (time to competition) repeated-measures multivariate analyses of variance, with univariate analyses of variance and pairwise comparisons (Bonferroni-corrected) following any significant effects.

The results indicated main effects for skill and time to competition, but no interactions. Differences in skill were observed for direction only (Pillai’s \(V = 0.193, F_{3,76} = 6.22, P < 0.001\)), with elite athletes being more facilitative in their interpretation of cognitive \((F_{1,86} = 13.8, P < 0.001)\) and somatic anxiety \((F_{1,86} = 10.5, P < 0.002)\). Effects of change over time were noted in the intensity (Pillai’s \(V = 0.746, F_{12,66} = 16.9, P < 0.001\)) and frequency (Pillai’s \(V = 0.774, F_{12,66} = 19.7, P < 0.001\)) dimensions. Table 1 illustrates the constructs showing time-to-competition effects. Cognitive and somatic intensity increased between 2 h and 30 min pre-competition, with self-confidence decreasing during this time. Frequencies of cognitive intrusions increased between 7 and 2 days before competition, followed by progressive increases from within 1 day of the competition. Somatic frequencies increased between 7 and 2 days before competition and between 2 h and 30 min pre-competition. Finally, self-confidence frequencies increased between 7 and 2 days pre-competition.

The results emphasize the need to consider the dimensions of the anxiety response (cf. Woodman and Hardy, 2001) and to view these dimensions as responses to stress reactions through processes that change over time (cf. Cerin et al., 2000). Furthermore, in studies examining the temporal effects of anxiety dimensions over and above traditional ‘intensity’ approaches (e.g. Wiggins, 1998: *Journal of Applied Sport Psychology, 10*, 201–211), only athletic populations with facilitative interpretations have been used. The use of athletes with negative (debilitative) interpretations might help to expand our knowledge of the change-over-time effects of the separate dimensions.

**Further validity testing of a short-form assessment instrument of competitive state anxiety**

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Research has identified the need to produce a rapid measure of competitive state anxiety across dimensions over and above traditional ‘intensity’-based conceptualizations of anxiety (e.g. Jones, 1995: *British Journal of Psychology, 86*, 449–478). As such, an Immediate Anxiety Measures Scale (IAMS; Thomas et al., in press: *International Journal of Sport Psychology*) has been developed to assess the intensity, directional perceptions and frequency of intrusions of responses via a single-item inventory. Utilising ‘athlete education’ and ‘athlete-friendly definitions’, participants were taught to recognize direct terms associated with the dimensions and constructs of anxiety. Testing through a one-week time-to-event paradigm, the IAMS showed strong concurrent validity with the modified Competitive State Anxiety Inventory-2 (CSAI-2; Jones and Swain, 1992: *Perceptual and Motor Skills, 74*, 467–472), especially at times close to education and competition. However, constraints in the methodological approach limit the application of the IAMS. Specifically, the initial validation used a university-based male sample concentrated in the sport of rugby union. It was the aim of this study to extend validity testing of the IAMS to samples including both sexes, non-university-based participants and individual and team classification sports. Accordingly, non-university athletes \((n = 68)\) of county to national standard \((\text{male} = 35; \text{female} = 33)\) from a range of sporting disciplines (field hockey, rugby union, soccer, athletics and swimming) completed the IAMS and CSAI-2 at four pre-competition temporal stages (1 week, 2 days, 1 day, 1 h). Concurrent validity (Pearson’s \(r\)) was assessed between the inventories for each dimension and construct of anxiety at each temporal stage.

The results (Table 1) generally indicated acceptable concurrent validity for the IAMS in the time leading up to competition, findings that support further application on the scale. However, the coefficients obtained for the intensity and direction dimensions in this study were generally lower than reported by Thomas et al. (in press). This discrepancy could be attributed to sample characteristics. Participants in the original study comprised athletes undertaking some form of university qualification within a sporting faculty, with most experiencing some taught sport psychology content. The participants used in the current study were non-university-based with few receiving any formal education in sport psychology. Possibly, interpretation of the direct terms of the IAMS was more difficult for the athletes used in the current study. More in-depth education and refinement of such sessions may be required for participants not experiencing sport-related university settings. Furthermore, the efficacy of differing education programmes could be explored to ascertain optimal methods for retention effects. These
are all considerations for researchers interested in furthering the use of the IAMS, and for practitioners working in applied settings who require psychological instruments to measure important constructs in minimal time.

**Temporal aspects of competitive anxiety and self-confidence as a function of anxiety perceptions**

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Researchers have identified a need to explore the dimensions of competitive anxiety (i.e. intensity, direction and frequency) as temporal processes that unfold over time (Cerin et al., 2000: *Journal of Sports Sciences*, 18, 605–626; Woodman and Hardy, 2001: In *Handbook of Research on Sport Psychology*, 2nd edn, edited by R.N. Singer, H.A. Hausenblaus and C.M. Janelle. New York: Wiley). However, the limited studies examining change-over-time responses of the dimensions (e.g. Wiggins, 1998: *Journal of Applied Sport Psychology*, 10, 201–211) have used athletes with only facilitative interpretations of competitive anxiety. This study attempted to explore the temporal processes of intensity, direction and frequency in athletes whose perceptions varied across debilitative, facilitative and mixed (cognitive and somatic) interpretations of their anxiety symptoms.

Athletes (n = 60) were categorized as facilitators (n = 20), debilitators (n = 20) or mixed (n = 20) interpreters on direction scores from the modified Competitive Trait Anxiety Inventory-2 (Jones and Swain, 1995: *The Sport Psychologist*, 9, 202–212) and modified Competitive State Anxiety Inventory-2 (CSAI-2; Jones and Swain, 1992). Following selection, they completed the modified CSAI-2 (intensity, direction and frequency) at four pre-competition stages (1 week, 2 days, 1 day, 1 h). Data were analysed using a series of 3 (interpretation) × 4 (time to competition) multivariate analyses of variance (repeated measures on the second factor) with two-way mixed-design analyses of variance and pairwise comparisons (Bonferroni-corrected) following any significant effects.

Results indicated a lack of interactions but displayed main effects for interpretation (P < 0.01) and change over time (P < 0.01). Between-subject differences were only observed between the debilitators and facilitators. Specifically, interpretation influenced: intensities, with debilitators experiencing lower pre-competition self-confidence (P < 0.01); direction, with debilitators being more negative in their interpretation of cognitive and somatic anxiety (P < 0.01); and frequencies, with debilitators experiencing more anxiety cognitions (P < 0.01) and less self-confidence cognitions (P < 0.05) during the pre-competition time period. Change-over-time effects were noted in intensities, with cognitive anxiety (P < 0.01) displaying successive increases from within 2 days of competition; somatic anxiety (P < 0.01) displaying an increase from 7 to 2 days before competition followed by progressive increases from within 1 day of the event; and self-confidence (P < 0.01) decreasing from 1 day to 1 h before the event. For direction of responses, time-to-competition changes were evident in cognitive (P < 0.01) and somatic (P < 0.01) anxiety, with both constructs becoming more negative (or less positive) between the 1 day and 1 h pre-competition times. Finally, frequency changes were noted for cognitive (P < 0.01) and somatic (P < 0.01) anxiety; the amount of time spent thinking about cognitive symptoms increased between 7 and 2 days and between 1 day and 1 h before the event; and the amount of time spent experiencing somatic symptoms increased progressively through the pre-competition time period.

Table 1. Intercorrelations of CSAI-2 constructs to IAMS Items

<table>
<thead>
<tr>
<th>Time</th>
<th>CA-I</th>
<th>SA-I</th>
<th>SC-I</th>
<th>CA-D</th>
<th>SA-D</th>
<th>SC-D</th>
<th>CA-F</th>
<th>SA-F</th>
<th>SC-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 days</td>
<td>0.613</td>
<td>0.523</td>
<td>0.681</td>
<td>0.581</td>
<td>0.454</td>
<td>0.768</td>
<td>0.744</td>
<td>0.740</td>
<td>0.618</td>
</tr>
<tr>
<td>2 days</td>
<td>0.518</td>
<td>0.324</td>
<td>0.627</td>
<td>0.584</td>
<td>0.648</td>
<td>0.770</td>
<td>0.651</td>
<td>0.620</td>
<td>0.628</td>
</tr>
<tr>
<td>1 day</td>
<td>0.427</td>
<td>0.322</td>
<td>0.591</td>
<td>0.381</td>
<td>0.567</td>
<td>0.457</td>
<td>0.696</td>
<td>0.613</td>
<td>0.557</td>
</tr>
<tr>
<td>1 h</td>
<td>0.646</td>
<td>0.681</td>
<td>0.548</td>
<td>0.577</td>
<td>0.665</td>
<td>0.669</td>
<td>0.644</td>
<td>0.699</td>
<td>0.713</td>
</tr>
</tbody>
</table>

Abbreviations: CA = cognitive anxiety; SA = somatic anxiety; SC = self-confidence; I = intensity; D = directional interpretation; F = frequency of intrusions.

These findings emphasize the importance of examining the different dimensions of competitive anxiety and that investigators should attempt to view stress reactions (i.e. reactions to competition) as processes that unfold over time rather than as single unitary time-frame reactions immediately before competition (cf. Cerin et al., 2000; Woodman and Hardy, 2001). Also, these results indicate that athletes with positive and negative perceptions experience different states of anxiety and self-confidence when preparing for competition. Further research, possibly through qualitative
methods, is proposed to identify the underpinning mechanisms between the two groups and the way in which they prepare for competition.

Imagery content: could dancers’ images inspire athletes?

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Mental imagery is a commonly used strategy in the pursuit of performance enhancement, not only within sport but also within dance contexts (e.g. Overby et al., 1997–98: Imagination, Cognition and Personality, 17, 323–337). Imagery content can be categorized along functional dimensions like cognitive or motivational, as in the model of Martin et al. (1999: The Sport Psychologist, 13, 245–268). However, valuable insights into the nature of images may also be gained from studying the content of images more closely and from an emic perspective. This study used a qualitative approach to investigate the use and content of the mental images employed by professional modern dancers to enhance their dancing.

Open-ended interviews were conducted with 11 (4 male and 7 female) professional modern dancers (performing experience 7–40 years; age 28–50 years). The interviews were audiotaped and transcribed. The procedure used for data analysis and interpretation was similar to the one described by Coté et al. (1993: The Sport Psychologist, 7, 127–137), involving a process of de-contextualizing segments of text and re-contextualizing them into higher-order categories. After thorough reading of the manuscripts, the text was broken down into meaningful segments, each relating information about a particular use of imagery. This information was summarized into a table listing image-describing quotations together with indications of by whom, when, how and for what purpose the image was used. The images were subsequently categorized according to content and purpose by both authors. Any discrepant perceptions of the data were discussed until an agreement was reached. Draft interpretations were also sent to the interviewed dancers for feedback and approval. The results indicated that the dancers employed imagery in two situational contexts: (a) practice, including choreographing, learning and rehearsing a dance; and (b) performance, including preparing to perform, performing and reflecting on performance. The analysis led to the identification of 29 types of images, which were grouped into eight higher-order categories. These were: (1) Inspiration images: images that served as an inspiration for both choreographer and dancer. (2) Atmospheric images: images of a form of energy (e.g. water, texture, circles of energy, colour) outside the body which acted on or moved the whole body, creating an atmosphere which helped to attain a desired state of awareness or a particular movement dynamic. (3) Specific movement images: images that enhanced or gave meaning to specific movements. (4) Metaphysical images: images that described a relationship between the dancer and a spiritual or natural energy, often clarifying the dancers’ goals as a dancer and as a human being. (5) Emptying out images: images designed to empty the body of an undesired energy or element or of its own anatomical structures. (6) Filling up images: images of the body being filled up with a substance that provided a desired sensation, movement dynamic or emotion (e.g. colours,denseness). (7) Projection images: images that incorporated ways in which the energy or expressive content of the dance would be transmitted or projected towards the audience. (8) Imagery rehearsal: imaginary rehearsal of a dance or section of a dance in one or more of the sense modalities.

It is clear from the analyses that the dancers employed a rich tapestry of images for a range of purposes and that many images included fantasy elements. Images tended to be multi-sensory, sometimes accompanied by physical movements, and often representing an intricate combination of internal and external perspectives. Many of the dancers’ images were aimed at regulating the mind–body connection before a performance, aiming to achieve a holistic set of psycho-physical qualities that would allow them to express the intent and content of the choreography. The content of the dancers’ images appears to extend further into the realm of fantasy, metaphors and mind–body connections than those commonly reported in the sport literature and, as such, may be of relevance to athletes in some of the aesthetic sports.

Goal orientations as mediators of the influence of values on ethical attitudes in youth sport:
generalization of the model

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The values-expressive theory of attitudes (Katz, 1960: Public Opinion Quarterly, 24, 163–204) proposes that ethical attitudes are expressions of an individual’s underlying value system. This effect was demonstrated in youth sport by Lee et al. (2001: Proceedings of the 10th
World Congress of Sport Psychology, 2, 193–194), who also showed a partial mediating role for goal orientations. The aim of this study was to examine the generalizability of the model and effects by replacing the Perceptions of Success Questionnaire (POSQ: Roberts et al., 1998: Journal of Sports Sciences, 16, 337–347) with the Task Ego Orientations in Sport Questionnaire (TEOSQ; Duda and Nicholls, 1992: Journal of Educational Psychology, 84, 290–299) as the measure of goal orientations.

The participants were 490 youth sport competitors (male = 281, female = 205, unspecified = 4) engaged in 12 team or individual sports at their school or club. They were aged 11.6–16.4 years (13.9 ± 1.1 years; mean ± s) and drawn from two schools in central and southern England. They completed questionnaires to measure three sport values (moral, competence and status), two goal orientations (task and ego), two pro-social attitudes (commitment to sport, respect for conventions) and two anti-social attitudes (endorsement of cheating, endorsement of gamesmanship). The scales were internally consistent, with Cronbach’s alpha ranging from 0.71 to 0.87. It was necessary to further analyse and modify the TEOSQ scales by confirmatory factor analysis to produce scales which met Browne and Cudeck’s (1993: In Testing Structural Equation Models, edited by K.A. Bollen and J.S. Long. London: Sage) criterion of a close fit (RMSEA < 0.05) for male, female and overall samples, because this standard had been used in determining the adequacy of measurement models for the previous study with POSQ. This was achieved by eliminating 5 of 14 potential items for this study, then \( \chi^2(26) = 46.2, \text{RMSEA} = 0.043 \). Subsequently, three variables were selected from each scale, as before, for use as indicators of the ‘true’ latent constructs in two path models. Fit indices for all measurement models were acceptable. For the three sport values, \( \chi^2(24) = 41.6, \text{RMSEA} = 0.041 \), and for the four sport attitudes, \( \chi^2(48) = 90.0, \text{RMSEA} = 0.045 \).

Two structural models were then employed to examine mediation effects. In the direct model, positive paths were drawn from (a) competence values to pro-social attitudes, (b) moral values to pro-social attitudes and (c) status values to anti-social attitudes. A negative path was drawn from moral values to anti-social attitudes. This model had a close fit, \( \chi^2(181) = 348, \text{RMSEA} = 0.052 \), and explained 65% of the variance in pro-social attitudes and 27% in anti-social attitudes. It was not necessary to drop or add any paths. In the complete model, paths were added from competence values through task orientation to pro-social attitudes and from status values through ego orientation to anti-social values. This model had a better fit, \( \chi^2(312) = 516, \text{RMSEA} = 0.044 \), and explained 83% of the variance in pro-social attitudes and 27% in anti-social attitudes. The new indirect effect of competence values on pro-social attitudes through task orientation (0.43) was accompanied by a reduction in the direct effect of competence values from 0.63 to 0.35. Similarly, the indirect effect of status values on anti-social attitudes through ego orientation (0.18) was accompanied by a reduction in the direct effect of status values from 0.43 to an insignificant 0.23. Thus the introduction of task and ego orientation as mediators achieved reductions of 27% and 13%, respectively, in the variance previously explained by the direct effects of values on attitudes.

These data support the generalization of the 2001 model and strengthen the evidence for the mediating role of goal orientations. However, the impact of moral values on pro-social attitudes became insignificant in the complete model. This contrasts with the 2001 study. Previous data indicate that such discrepancies should be further examined in the context of differences between the sexes as well as instrumentation.