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# EXPLORING THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY, PSYCHOLOGICAL WELL-BEING AND PHYSICAL SELF- PERCEPTION IN DIFFERENT EXERCISE GROUPS

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***ABSTRACT***

*The value of various forms of physical activity, exercise and sport in health promotion is universally acknowledged. This research compared psychological well-being and physical self-perception of persons who regularly engage in various forms of physical activity, exercise and sport with a control group of non-exercisers. Different physical activities selected included health club exercises (mainly resistance training), hockey (a team sport), and running (mainly aerobic exercise). Main findings were that persons engaging in regular physical activity perceived themselves as having more autonomy, personal growth, environmental mastery, purpose in life, positive relations with others, self-acceptance, sport competence and conditioning than non-exercisers. Regular exercisers also attached more importance to sport, conditioning, body attractiveness and strength than non-exercisers. Hockey players perceived themselves as having more positive relations with others and sport competence than either health club members or runners. The relevance of these findings and further implications for health and sport psychological research and interventions were discussed.*

**Key words:** Physical activity; Psychological well-being; Physical self-perception.

## INTRODUCTION

The value of various forms of physical activity, exercise and sport for the promotion of health in general and mental health in particular has been emphasised in recent research and intervention programmes (Fox, 2000a; Edwards, 2003). From an international perspective, since about 1980, there seems to have been less emphasis on international dominating types of competitive physical activity as in the Olympic Games, and more recognition given to physical activity as a multifaceted social enterprise, where the meaning and motive of the physical activity are based on the choice of a specific exercise or sport setting (Stelter, 2003). The terms exercise and sport refer to organised forms of physical activity that take place in various contexts for competitive, play, health, well-being, recreational and other reasons. The terms overlap considerably and are conveniently defined in terms of personal reasons chosen for the activity and the contexts in which such activities occur. For example, hockey might be meaningfully defined as a competitive sport for one provincial player trying to be selected for the national team and as an activity undertaken for exercise, health and social reasons by another.

Sport and exercise psychology refer to two interrelated yet distinct sciences of human behaviour, with particular theoretical and practical applications in sport and exercise contexts respectively. As academic and professional disciplines, sport and exercise psychology have developed rapidly over the past 30 years. In their related concerns with the psychology of sport and exercise, they are often treated together for convenience as evident in the official journal of the European Federation for Sport Psychology (FEPSAC), the *Psychology of Sport and Exercise*, first published in 2000 and official journal of the International Society for Sport Psychology, the *International Journal of Sport and Exercise Psychology*, first published even more recently in 2003. This latter journal reflects the beginning of comprehensive academic and professional reflexivity, experienced by those fortunate to attend the Tenth World Congress of Sport Psychology in Skiathos, 2001, in articles tracing the history of the society, as well as training, selection and competencies required of sport and exercise psychologists (Morris *et al*., 2003; Morris, Hackfort & Lidor, 2003; Tenenbaum *et al*., 2003).

**Psychological well-being and its subset of physical self-perception**

In 1946, the World Health Organization (WHO) defined health in terms of not merely the absence of disease, but also as state of complete physical, mental and social well-being (WHO, 1946). Positive mental health and/or psychological well-being have been the subject of extensive research (Jahoda, 1958; Wolman, 1965; Wissing & van Eeden 1998; Cowan, 2000; Edwards, 2002; Wissing & van Eeden, 2002). While mental health generally implies some experience of psychological well-being, in the context of the present research "psychological well-being" also refers to a particular empirical construct, conceptually and theoretically grounded on various research traditions which lead to the establishment of a specific measurement scale (Ryff, 1989). It should therefore be distinguished from the popular neo-Adlerian concept of wellness, which refers to a general approach for improving quality of life through healthy and integrated styles of living (Sweeney & Witmer, 1991).

Although illness and well-being are typically conceptualised as existing on a continuum, general and psychological well-being may also be considered as independent dimensions, distinct from illness. From phenomenological, cognitive and positive psychological and public health perspectives, there is clear evidence that positive and negative aspects of experience are best conceptualised in terms of two distinct systems, that it is important to consider both in understanding health, that absence of the negative (or positive) is different from presence of the positive (or negative) and that prevention and promotion principles and strategies respectively apply. That is to say that, along with preventing distressing experiences, psychological well-being research and practice is concerned with the promotion of positive experiences, health, strength, resources, supplies, competencies and skills. Secondly, conceptualisations of psychological well-being in the literature have been very diverse, which is understandable when we consider that it is a transient situation, which is multi-factorial in etiology, process and promotion. For example, factors that define psychological well-being will differ at different ages and in different circumstances. Thirdly, psychological well-being has multidimensional personal, transactional and environmental determinants, which become more complex as the human life cycle progresses. Environmental factors also include non-psychological factors such as housing, food and employment. Fourthly, it is better to promote psychological well-being than prevent factors impeding well-being. Fifthly, in that there are various conceptual routes to psychological well-being, there are various methods to measure

and promote it (Jahoda, 1958; Wolman, 1965; Wissing & Van Eeden 1998; Cowan, 2000; Edwards, 2002; Wissing & van Eeden, 2002).

Ryff's (1989) objective, standardised scale of Psychological Well-Being (PWB) was theoretically grounded on Maslow's (1968) conception of self-actualisation, Rogers' (1961) view of the fully functioning person, Jung's (1933) formulation of individuation, Allport's (1961) conception of maturity, Erikson's (1959) psychosocial stage model, Buhler's (1935) basic life fulfillment tendencies, Neugarten's (1973) descriptions of personality change in adulthood and old age and Jahoda's (1958) six criteria of positive mental health (Keyes *et al*., 2002; Ryff, 1989). The scale is presently regarded as the best objective, standardised measure of psychological well-being (Conway & Macleod, 2002) and, in view of methodological weaknesses and lack of consensus concerning the measurement of psychological well-being in physical activity research (Biddle *et al.,* 2000), its use is recommended in future research to facilitate comparisons across studies in exercise and sport contexts.

The PWB scale includes six subscales of psychological well-being in self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life and personal growth. These subscale dimensions are essentially the same as the criteria elicited by Jahoda in her extensive review (Jahoda, 1958). Four of the dimensions are essentially the same: self-acceptance, autonomy, personal growth and environmental mastery. While Ryff's (1989) dimensions of positive relations with others and purpose in life are given distinct status, rather than Jahoda's (1958) broad criteria of personal integrity and perception of reality, these dimensions are basically different combinations of Jahoda's (1958) criteria in the light of subsequent theory and research.

Research with the PWB scale has revealed that psychological well-being develops through a combination of emotional regulation, personality characteristics, identity and life experience (Helson & Srivastava, 2001), increases with age, education, extraversion and consciousness and decreases through neuroticism (Keyes *et al*., 2002). Similar to Erikson's (1959) theoretical perspective, each psychological well-being dimension can be viewed as articulating a form of life challenge; self-acceptance of personal strengths and limitations, developing and maintaining positive relations with others, mastering the environment so as to meet needs and desires, seeking autonomy through self-determination and personal authority, finding personal meaning through purpose in life and optimising unique abilities and talents through personal growth. In both Jahoda's (1958) and Ryff's (1989) research the most commonly occurring theme centers around various perspectives on the self, which is especially meaningful if credence is given to Leahey's (1980) view of the history of psychology as humanity's attempt to understand the self.

While most human beings have some experience of self, as a fundamentally complex concept, the self is essentially socio-culturally constructed. The term self-acceptance implies some sense or perception of self, leading to the related more abstract and evaluative terms of self-concept and self-esteem respectively. The self can be conceptualised in various forms. William James (1890) distinguished between self as subject and self as object, as well as referring to different forms of material, social and spiritual selves. Yogis' view a goal of yoga as union of personal and universal self (Reid, 2001). Post-modern conceptualisations of human functioning include multiple selves–in-context (Sparkes, 1997). The focus of this research is on physical self-perception.

Physical self-perception may be viewed as a sub-set of global self–concept. Physical self-esteem, which refers to the evaluative element of self-concept, may be viewed as sub-set of global self-esteem, psychological well-being, health and life (Fox, 1990; Fox, 1997; Fox, 2000a). Fox (1990) has developed a Physical Self-Perception Profile (PSPP), which describes self-perception in terms of five categories. Sport competence refers to perceptions of sporting ability, ability to learn sport skills and confidence in a sporting environment. Physical conditioning includes perceptions of level of physical condition, stamina and fitness, ability to maintain exercise and confidence in the exercise setting. Body attractiveness refers to perceived attractiveness of physique, ability to maintain an attractive body and confidence in appearance. Physical strength includes perceived strength, muscle development and self-assurance in situations requiring strength. Physical self-worth or self-esteem is a general measure of physical self-perception, which includes global feelings of happiness, satisfaction, pride, respect and confidence in the physical self. The PSPP includes a Perceived Importance Scale that is used to assess the degree of meaning associated with the individual's sport competence, physical condition, body attractiveness and physical strength. Perceived importance is linked to self-perception and has an impact on an individual's overall self-worth (Fox, 1990; Fox, 1997). The PSPP is an indicator of psychological health and well-being of particular relevance in various health, physical activity, exercise and sport settings.

**Psychological well-being and physical self-perception in exercise and sport**

Research has demonstrated that psychological well-being is promoted through regular exercise and sport, which occurs for at least twenty minutes a day, three or more times a week (Sinyor *et al*., 1983; Pate *et al.*, 1995; Scully *et al.*, 1998; Biddle *et al.*, 2000; Yiannakis *et al*., 2001; Edwards, 2002). Regularly exercising health club members were found to be more psychologically well than irregular exercisers (Edwards, 2003). Similar improved psychological well-being has been found with swimming, yoga and fencing (Berger & Owen, 1998), rugby (Maynard & Howe, 1987), karate, weight training and jogging (McGowan *et al*., 1991). In addition, Krawczynski and Oszewski (2000) were able to demonstrate the longitudinal effectiveness of a physical activity programme on the psychological well-being of persons over sixty years of age.

Psychological explanations of why exercise enhances psychological well-being include the following: enhanced feelings of control, improved self-concept, self-esteem and self-efficacy and more positive social interactions (Scully *et al.*, 1998). The role of social agents as additional determinants of psychological well-being indicates the need for health workers to promote social exercise and team sport in particular. Furthermore exercise has been found to increase academic performance, assertiveness, confidence, emotional stability, intellectual functioning, internal locus of control, memory, perception, positive body image, self-control, sexual satisfaction, well-being and work efficacy and decreases: absenteeism at work, alcohol abuse, anger, confusion, depression, headaches, hostility, phobias, psychotic behaviour, tension, type A behaviour and work errors (Weinberg & Gould, 1999).

Many research studies involving randomised controlled trials addressing the effect of exercise on physical self-perceptions have produced sound evidence that regular physical activity can improve physical self-perceptions in various age groups and contexts, although the association with global self-esteem is weak and inconsistent (Fox, 2000b; Fox, 2000c). Physical activities researched in relation to physical self-perception have included various team and individual,

endurance and resistance activities such as physical education classes, jogging, running, swimming, gymnastics, volleyball, yoga, weight training, specific aerobic sessions, progressive relaxation, walking, tai chi, back exercises, cross country cycling (Asci *et al*., 1998; Chow & Tsang, 2001; Fox 2000b; Fox, 2000c; Newsham, 2001; Goni & Zulaika, 2000). The intimate relationship between exercise and physical self-perception in elite sport has been demonstrated in a one year study following the Sydney Olympics where athletes in transition out of competition showed decreased physical self-esteem and global self-esteem during an adjustment stage of six months before a period of adaptation and increase in physical and global self-esteem (Stephan *et al*., 2003).

PSPP norms also show that males generally have higher perceptions of body attractiveness, physical conditioning, sport competence and strength than females (Caglar *et al*., 2001; Hayes *et al*., 1999). Maschette and Sands (2001) research findings indicated that males and females focus on different areas of the body after exercising. Having a shapely body is an important motivating factor for many women who exercise (Minarikova & Stackeova, 2001) and Silva *et al*. (2001) found that girls have higher fat perception and body dissatisfaction than boys. Although high levels of self-confidence result in greater sporting performance, no significant difference in body image between exercisers and non-exercisers has been found (Silva *et al*., 2001; Vealey *et al*., 2001).

An extensive review of the literature has revealed that, while there are exceptions and some contradictory results, most research studies have indicated that both individual and team, resistance and aerobic activities are generally related to improved mental health, well-being and physical self perception (Biddle *et al*., 2000*;* Edwards, 2002; Fox, 2000a; Fox, 2000b; Fox, 2000c; Scully *et al*., 1998; Weinberg & Gould, 1999). However, studies on physical activity and psychological well-being have lacked both clarity on this concept as well as an objective, standardised measure of psychological well-being. No research has specifically examined the relationship between psychological well-being, physical self-perception and regular physical activity involving both individual and team, aerobic and resistance activities. It was considered that such a study could yield valuable scientific information of practical value in exercise and sport psychological interventions.

## AIM

The specific aim of this research was to compare the psychological well-being and physical self-perception of persons involved in various forms of regular physical activity, exercise and sport, with a control group of students, who exercised irregularly and did not participate in organised sport. Physical activities were selected to represent aerobic exercise (running), resistance training (health club activities) and a team sport (hockey).

## HYPOTHESES

Firstly, it was hypothesised that persons who engage in regular physical activity of whatever form would have significantly higher psychological well-being and physical self-perception scores than irregular exercisers. Secondly, it was expected that compared to other forms of physical activity, health club members, hockey players and runners would score differentially higher on strength, sport competence and conditioning respectively.

Subsidiary hypotheses were that men would score higher than women on the Physical Self-Perception Scale (PSPP) scale, as has been evident in earlier research, and that the Psychological Well-being (PWB) and PSPP scales would be positively correlated, as physical self-perception is conceptualised as a component of psychological well-being.

## METHOD

### Participants

The total sample consisted of 277 participants, 183 women and 94 men. This consisted of convenience samples of 169 regular exercisers (69 health club members, 60 hockey players and 40 runners) and a control group of 108 non-exercising students from the Universities of Natal and Zululand in South Africa. Regular exercise was defined as occurring at least 30 minutes a day, at least three times a week. The mean age of the sample was 25.2 with a standard deviation of 8.7 and range of 16 to 64 years. The mean age of the women was 25.7 and the men 24.2 years. Home language distribution consisted of 109 Zulu, 39 English, 30 Siswati, eight Xhosa and two Afrikaans speakers.

This essentially exploratory study was based on the assumption that these convenient samples of physical activities would in fact represent aerobic exercise (running), resistance training (health club activities) and a team sport (hockey) and that sufficient sample sizes would cancel out any possible confounding of variables through selection of individuals who represented either or both of the other activities. Clearly such relatively small sample sizes constitute a research limitation, which is discussed in the results section.

### Measuring instruments

Ryff's (1989) short standardised 18 item scale of objective psychological well-being was used to assess the participants on the six dimensions of well-being: self-acceptance, positive relations, autonomy, environmental mastery, purpose in life and personal growth.

This scale has also been standardised through comparisons with subjective measures of psychological well-being (life satisfaction, positive and negative affect), is significantly linked to personality factors (Schmutte & Ryff, 1997) and has been cross-culturally validated (Staudinger *et al*., 1999).

The six subscales have high levels of internal consistency: positive relations with others .88, autonomy .83, environmental mastery .86, personal growth .85, purpose in life .88, and self-acceptance .91. The six subscales have high levels of correlation with the 20-item parent scale: positive relations with others .98, autonomy .97, environmental mastery .98, personal growth .97, purpose in life .98, and self-acceptance .99. The scale has a .89 level of AGFI (adjusted goodness-of-fit index) suggesting that it is a very-good-fitting model. The combined scores on the six dimensions can also be used for an overall well-being percentage (Ryff, 1989).

Fox's (1990) Physical Self-Perception Profile (PSPP) was used to assess participants on five subscales each composed of six questions. These subscales are: sports competence, physical condition, body attractiveness, physical strength and physical self-worth. Each of the 30 questions is divided into two sub questions. Respondents were required to answer the sub

question which most related to them, ticking off either "sort of true for me" or "really true for me". The PSPP has a high internal consistency of .81 for males and .92 for females. The item total correlation score for all the subscales is .69 for females and .63 for males.

The Physical Self-Perception Profile has wide cross-cultural applicability, internal consistency and reliability and has been translated into various languages (Asci *et al*., 1999; Thogersen & Fox, 2001; Van de Vliet *et al*., 2002). The Perceived Importance Profile that was constructed to accompany the PSPP was used to assess perceived importance of the physical self-perception of the participants on the same subscales.

**Procedure**

A well-being questionnaire, which included the PWB and PSPP, was used to collect biographical data as well as type, frequency, intensity and duration of main exercise and sporting activities. An SPSS statistical programme was used to analyse data. In the following results tables, dependent variables from the Ryff and Fox scales are coded as follows: autonomy (a), personal growth (pg), environmental mastery (em), purpose in life (pl), positive relations with others (pr), self acceptance (sa), sport competence (sp), conditioning (co), body attractiveness (bo), strength (st), physical self worth (psw), sport importance (spi), conditioning importance (coi), body importance (boi) and strength importance (sti). The single (*) and double asterisks (**) indicate significant findings at the five and one percent level of significance respectively. Non-significant findings are designated as NS.

**RESULTS AND DISCUSSION**

Table I refers to the mean scores on dimensions of the PWB and PSPP scales of 169 regular exercisers (69 health club members, 60 hockey players and 40 runners) and control group of 108 non-exercisers**.** Analysis of variance of this data supported hypotheses in revealing that regular exercisers scored significantly higher than controls on 11 of the 15 dimensions of psychological-well-being and physical self-perception. The specific F ratios for the dimensions were as follows: autonomy (11.3**), personal growth (35.4**), environmental mastery (9.6**), purpose in life (149.2**), positive relations with others (81.6**), self acceptance (50.4**), sport competence (41.3**), conditioning (28.1**), body attractiveness (.2 NS), strength (.1 NS), physical self worth (3.7 NS), sport importance (11.7**), conditioning importance (28.1**), body importance (31.0**), strength importance (.6 NS).

Inspection of Table 1 reveals that the mean scores of two of the four insignificant comparisons (body attractiveness and strength importance) are in the expected direction of exercisers scoring higher than controls. In view of the general pattern of other significant trends, the unexpected higher mean scores of non-exercisers on strength and physical self-worth could be simply due to overestimation of non-exercisers and/or underestimation of exercisers in their perceptions of these variables.

Further analysis of variance with Tukey HSD multiple comparisons between the different exercise types, revealed that health club members scored significantly higher than controls on autonomy, personal growth, environmental mastery, purpose in life, positive relations, self acceptance, sport competence, conditioning, conditioning importance and body importance. Hockey players scored significantly higher than controls on personal growth, purpose in life,

positive relations, self acceptance, sport competence, conditioning, sport importance, conditioning importance and strength importance.

*TABLE 1.* **MEAN SCORES OF REGULAR EXERCISERS (HEALTH CLUB MEMBERS, HOCKEY PLAYERS AND RUNNERS) ON DIMENSIONS OF PSYCHOLOGICAL WELL-BEING AND PHYSICAL SELF-PERCEPTION**

| | a | pg | em | pl | pr | sa | sp | co | bo | st | psw | spi | coi | boi | sti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exercisers (N=169) | 13.7 | 15.5 | 13.3 | 14.1 | 13.7 | 14.6 | 16.4 | 16.8 | 15.4 | 15.3 | 16.2 | 5.9 | 6.2 | 6.0 | 5.8 |
| Health (N=69) | 13.9 | 15.6 | 13.6 | 13.9 | 12.5 | 14.3 | 15.2 | 16.3 | 15.9 | 15.1 | 16.1 | 5.4 | 6.1 | 6.2 | 6.0 |
| Hockey (N=60) | 13.5 | 15.5 | 12.4 | 14.5 | 14.6 | 15 | 18.3 | 17.8 | 15 | 15.6 | 16.5 | 6.2 | 6.2 | 5.7 | 5.3 |
| Runners (N=40) | 13.9 | 15.3 | 13.9 | 13.9 | 14.3 | 14.6 | 15.6 | 16.2 | 15.1 | 15.2 | 15.6 | 6.2 | 6.3 | 6.1 | 6.2 |
| Control (N-108) | 12.5 | 13.6 | 12.0 | 9.6 | 9.9 | 12.2 | 13.3 | 14.4 | 15.1 | 15.5 | 17 | 5.2 | 5.2 | 5.0 | 5.6 |
| Women (N= 183) | 13.1 | 14.6 | 12.8 | 11.9 | 11.9 | 13.4 | 14.3 | 15.1 | 14.7 | 15.2 | 16.4 | 5.4 | 5.6 | 5.5 | 5.8 |
| Men (N=94) | 13.5 | 15.1 | 12.8 | 13.2 | 12.8 | 14.2 | 16.9 | 17.3 | 16.4 | 15.8 | 16.7 | 6.0 | 6.1 | 5.8 | 5.7 |

Runners scored significantly higher than controls on autonomy, personal growth, environmental mastery, purpose in life, positive relations, self acceptance, sport competence, conditioning, sport importance and conditioning importance.

Significant comparisons between the three types of physical activity indicated that hockey players and runners scored higher than health club members on positive relations, hockey players scored higher than both health club members and runners on sports competence and runners scored higher than hockey players on strength importance.

The second main hypothesis was thus partially confirmed in the differentially higher scores of the hockey players on sports competence, but no significantly higher scores of the health club members on strength or runners on conditioning were recorded. This could be due to confounding variables in the design of the questionnaire, which simply asked participants for their main type of exercise or sport. It is conceivable that many of the exercisers also participated in one or both of the other two types of sport in the present investigation. For example, it is possible that the finding that runners scored higher than hockey players on strength importance could be related to perceptions based on more actual resistance training amongst runners. Such limitations could have been better controlled for with more specific questions that ruled out the presence of other activities and/or the use of larger samples.

The insignificant results could be due also to the possibility that the chosen physical activity categories of health club and running do not sufficiently reflect resistance and aerobic training respectively. The failure of the health club members to score higher on strength could simply be due to sample members de-emphasising resistance training in their health club activities. On the other hand the choice of hockey as an example of a team sport seems to have been vindicated. The fact that hockey players also scored higher on positive relations with others indicates that hockey players in this sample perceived themselves to be generally more social

and team orientated than participants engaging primarily in health club or running activities. In view of the current very limited scientific evidence base, further research is needed to determine the impact, interaction or specific contribution of social and team factors in promoting psychological as well as physical and social well-being in social exercise and team sport contexts. Similarly, the recent Chief Medical Officer's report in the United Kingdom is of the opinion that the impact of physical activity on social outcomes is greater than the limited evidence base suggests and has also called for more research in this area (Department of Health, Physical Activity, Health Improvement and Prevention, 2004).

In comparisons amongst the three forms of physical activity, hockey players have generally scored higher on psychological well-being and physical self-perception than health club members or runners. Their higher scores on the variable of positive relations with others and the social nature of team sports relates to research on the importance of social support in the promotion of mental health (Orford, 1992; Edwards, 2002). Furthermore although running and health club activities have been generally distinguished as individual sports in this research, both also provide considerable social support to exercisers. Previous research found that regularly exercising health club members scored significantly higher than irregular exercisers on a standardised scale of fortitude, which included many social support items. Further exercise and sport research, which included a specific social support scale such as that of Procidano and Heller (1983) would be valuable in further investigating this relationship.

The value of various forms of physical activity, exercise and sport for the promotion of mental health has been emphasized in recent research and intervention programmes (Fox, 2000a; Edwards, 2002; Edwards, 2003). The findings support and extend earlier studies on the general beneficial, effects of aerobic, resistance and team sport orientated, physical exercise on mental health and psychological well-being (Sinyor *et al*., 1983; Roth & Holmes, 1985; Hayes & Ross, 1986; Stephens, 1988; Berger, 1994; Pate *et al*., 1995; Anshel, 1996; Berger, 1996; Scully *et al*.1998; Summers, 1999; Biddle *et al*., 2000; Fox, 2000a; Berger, 2001; Biddle & Faulkner, 2001). These findings provide further motivation for the recommendation that health professionals in general and mental health workers in particular should routinely consider referrals of persons with mental health and/or stress related problems to health clubs as well as recommending regular, moderate exercise, suitable for and enjoyed by the particular client or patient concerned.

Previous research established the benefits of regular over irregular exercise and that health club members were more mentally healthy and/or psychologically well than non-members (Edwards, 2003). The present results provided further support for the vital role that health clubs and regular exercise play in the promotion of mental health and well-being. In particular, the present research also emphasised the value of running and hockey, as regular social and team orientated sport, in the promotion of mental health.

No previous research has investigated the relationship between health club activities, hockey, running and psychological well-being. While no causal inferences or directions can be made, as the research was correlational in nature, enhanced perceptions of psychological well-being and physical self-perception related to health club activities, hockey and running were clearly evident in comparison with the non–exercising control group. In addition to the need for randomised controlled trials to demonstrate the specific effect of various forms of physical activity on psychological well-being as measured on standardised scales, future research

should also not neglect qualitative inquiry in order to continue to research best practice models of empathically fitting individualised physical activity interventions appropriate for specific people and contexts. Such limitations in the present research have also been addressed elsewhere (Fox, 1997; Stelter, 1998; Fox, 2000b; Fox, 2000c; Stelter, 2000; Edwards, 2001; Stelter, 2001; Edwards, 2002; Stelter, 2003).

As previously mentioned this study was based on the assumption that these convenient samples of physical activities would in fact represent aerobic exercise (running), resistance training (health club activities) and a team sport (hockey) and that sufficient sample sizes would cancel out any possible confounding of variables through selecting individuals who represented either or both of the other activities. While the hypothesis related to hockey was confirmed**,** confounding variables and relatively small sample sizes were probable reasons that health club members and runners did not score differentially higher on strength and conditioning respectively. In practice, health club members are typically involved in both aerobic and resistance training, and many runners complement their running programmes with resistance training in the form of home gyms or at least dumbbells. Future research investigating these associations further needs to exclude any such possible confounding variables.

Analysis of variance of sex differences supported the findings of earlier research (Fox, 1990) with regard to men scoring higher on sport ($F$=27.2**), conditioning ($F$=20.1**), body ($F$=13.3**), sport importance ($F$=7.2**) and conditioning importance ($F$=6.3**). This first subsidiary hypothesis was further supported with multivariate analysis to investigate the influence of gender on physical activity, which indicated significant differences between men and women on 10 of the 15 subscale dimensions, namely autonomy, personal growth, environmental mastery, purpose in life, positive relations with others, self-acceptance, sport competence, conditioning, conditioning importance and body importance. Further multivariate analyses, with regularity and type of exercise as fixed factors and gender, age and language and covariates, confirmed these findings while correcting for any independent effects of gender, age and language on regularity and type of exercise. In this latter analysis, while no significant influences of age or language were observed, gender was related to perceptions of sport competence (F=9.3**), conditioning (F= .0**), and body attractiveness (F=13.5**).

Other findings with regard to multivariate analyses performed on the data, which need brief reporting as relevant but peripheral to the present study were the significant influences of frequency of exercise on conditioning; of duration on self-acceptance, sport competence, conditioning and strength, and of intensity on positive relations with others, sport competence and perceptions of the importance of sport, conditioning, body attractiveness and strength.

From Table 2, it can be observed that out of a total of 105 possible correlations amongst the subscales of the two measures, there were 99 positive correlations, 65 of which reached significance. None of the six small negative correlations were significant. Table 2 therefore provided general support for the second subsidiary hypothesis that subscale dimensions would be positively correlated with each other.

*TABLE 2.* **CORRELATIONAL MATRIX OF PSYCHOLOGICAL WELL-BEING AND PHYSICAL SELF-PERCEPTION DIMENSIONS**

| | a | pg | em | pl | pr | sa | sp | co | bo | st | psw | spi | coi | boi | sti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **a** | | | | | | | | | | | | | | | |
| **pg** | **.39**** | | | | | | | | | | | | | | |
| **em** | **.36**** | **.39**** | | | | | | | | | | | | | |
| **pl** | **.28**** | **.47**** | **.33**** | | | | | | | | | | | | |
| **pr** | **.38**** | **.42**** | **.39**** | **.46**** | | | | | | | | | | | |
| **sa** | **.28**** | **.39**** | **.36**** | **.42**** | **.40**** | | | | | | | | | | |
| **sp** | **.02** | **.17**** | **.01** | **.20**** | **.20**** | **.22**** | | | | | | | | | |
| **co** | **.03** | **.10** | **.07** | **.19**** | **.17**** | **.13*** | **.70**** | | | | | | | | |
| **bo** | **.05** | **.07** | **.10** | **.00** | **.06** | **.01** | **.40**** | **.50**** | | | | | | | |
| **st** | **.02** | **.03** | **.07** | **-.03** | **.08** | **.04** | **.51**** | **.52**** | **.50**** | | | | | | |
| **psw** | **.07** | **-.01** | **.11** | **-.01** | **.02** | **-.01** | **.37**** | **.52**** | **.60**** | **.58**** | | | | | |
| **spi** | **.05** | **.09** | **.03** | **.14** | **.15*** | **.18**** | **.36**** | **.27**** | **.19**** | **.21**** | **.10** | | | | |
| **coi** | **.16** | **.17**** | **.21**** | **.24**** | **.27**** | **.19**** | **.26**** | **.34**** | **.13*** | **.14*** | **.10** | **.40**** | | | |
| **boi** | **.10** | **.17**** | **.12** | **.23**** | **.20**** | **.24**** | **.20**** | **.15*** | **.15*** | **.12*.10** | **-.03** | **.37**** | **.41**** | | |
| **sti** | **.12*** | **-.00** | **.10** | **.06** | **.10** | **.13*** | **.09** | **.11** | **.15*** | **.26**** | **.08** | **.37**** | **.44**** | **.54**** | |

As expected the six well-being dimensions all correlated positively and significantly with each other. Similarly positive significant correlations were found amongst the nine physical self-perception measures. Weaker, mostly positive correlations were found across the two scales. Out of a possible 54 cross scale correlations, there were 21 significant, positive correlations.

Table 2 revealed the following significant positive correlations across the two scales: autonomy correlated significantly with conditioning importance (.16) and strength importance (.12), personal growth correlated significantly with sport competence (.17), conditioning importance (.17), and body importance (.17); environmental mastery correlated significantly with conditioning importance (.21); purpose in life correlated significantly with sport competence (.20), conditioning (.19), conditioning importance (.24), and body importance (.23); positive relations correlated significantly with sport competence (.20), physical conditioning (.17), sport importance (.15), conditioning importance (.27) and body importance (.20), and self-acceptance correlated significantly with sports competence (.22), conditioning (.13), sport importance (.18), conditioning importance (.16), body importance (.16) and strength importance (.13).

No previous research has used both the Ryff (1989) and Fox (1990) scales of psychological well-being and physical self-perception concurrently. These standardised scales were found to be brief, easy to use, reader friendly and comparable. The results generally indicated the two scales were moderately positively correlated. This supported the second subsidiary hypothesis and was expected in view of conceptualisation that physical self-perception is a component of psychological well-being.

## CONCLUSION

The value of various forms of physical activity, exercise and sport for the promotion of mental health has been emphasised in recent research and intervention programmes. The present research was conducted to investigate the relationship between different types of regular exercise: health club activities, hockey and running when compared to a non-exercising control group and in relation to components of psychological well-being and physical self perception as standardised by Ryff (1989) and Fox (1990).

Data analysis revealed moderate positive correlations within and between the two scales, supporting the conceptualisation that physical self-perception is a subsystem of the more general construct of psychological well-being. As in previous research, men generally scored higher than women on the physical self-perception scales and the influence of gender on physical activity was also indicated through significant differences between men and women on 10 of the 15 subscale dimensions, namely autonomy, personal growth, environmental mastery, purpose in life, positive relations with others, self-acceptance, sport competence, conditioning, conditioning importance and body importance.

Comparisons between health club members, hockey players, runners and a control group of non-exercising students revealed that all three forms of physical activity were associated with higher scores on the psychological well-being and physical self-perception scales than the control group. More specific findings were that persons engaging in regular physical activity perceived themselves to be having more autonomy, personal growth, environmental mastery, purpose in life, positive relations with others, self-acceptance, sport competence and conditioning than non-exercisers. Regular exercisers also attached more importance to sport, conditioning, body attractiveness and strength than non-exercisers. The findings highlighted the importance of the relationship between social or team sport factors and physical activity. Hockey players perceived themselves as having more positive relations with others and sport competence than either health club members or runners. These findings support and extend health promotion research on the general beneficial effects of team and individual, aerobic and resistance orientated physical activity, exercise and sport on mental health, psychological well-being and physical self-perception.

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