

***Exercising the Self:
On the Role of Exercise, Gender and
Culture in Physical Self-Perceptions***

Magnus Lindwall



*Department of Psychology
Stockholm University*

2004

**EXERCISING THE SELF:
ON THE ROLE OF EXERCISE, GENDER AND
CULTURE IN PHYSICAL-SELF PERCEPTIONS**

MAGNUS LINDWALL



**DEPARTMENT OF PSYCHOLOGY
STOCKHOLM UNIVERSITY**

2004

Cover: "Running Free" by Lee W. Mothes

Reprinted with kind permission from Lee W. Mothes

© 2004 Magnus Lindwall

ISBN 91-7265-871-1

Intellecta DocuSys AB, 2004

Doctoral Dissertation 2004
Department of Psychology
Stockholm University
SE-106 91 Stockholm
Sweden



Abstract

In modern society, individuals constantly pass judgments on their own body and physical competence as well as that of other people. All too often, the verdict is less favourable. For the person, these physical self-perceptions (PSP) may negatively affect global self-esteem, identity, and general mental well being. The overall aim of this thesis is to examine primarily the role that exercise, but also the roles that gender and culture, play in the formation of PSP. In Study I, using confirmatory factor analyses, strong support for the validity of a first-order, and a second-order hierarchical and multidimensional model of the Physical Self-Perception Profile (PSPP: Fox & Corbin, 1989) was found across three national samples (Great Britain, Sweden and Turkey) of university students. Cross-cultural differences were detected, with the British sample demonstrating higher latent means on all PSPP subdomains except for the physical condition subdomain (Condition), than the Swedish and Turkish samples. In Study II, a higher self-reported exercise frequency was associated with more positive PSP (in particular for Condition) and more importance attributed to PSP in Swedish university students. Males demonstrated higher overall PSPP-scores than females. In Study III, a true-experimental design with randomisation into an intervention and a control group was adopted. Strong support for the effects of an empowerment-based exercise intervention programme on PSP and social physique anxiety (SPA) over six months for adolescent girls was found. The relations of exercise, gender and culture with PSP, SPA and self-esteem are discussed from the standpoints of a variety of theoretical models (e.g., the EXSEM-model), and frameworks (self-presentation and objectification theory). The two theories of self-enhancement and skill-development are examined with regard to the direction of the exercise-physical self relationship and motivation for exercise. Arguments for the relevance of exercise and PSP for practitioners in promoting general mental well-being and preventing modern-day diseases are outlined.

Key words: Physical self-perceptions, exercise, gender, culture, social physique anxiety, self-presentation

*“To my parents, Eva and Bennett,
for love and support and for keeping the faith”*

*“The fundamental datum for our science is a fact that at first seems banal, or irrelevant: it is the fact that– as far as we can tell– all organisms like to “feel good” about themselves.... Thus in the most brief and direct manner, we have a
law of human development”*
(Becker cited in Brown, 1998; p. 193).

*“It is pretty well understood now that the result of physical training is to train
the nervous centres more than the muscles”*
(James, 1899; p. 220).

Acknowledgements

The work presented in this doctoral dissertation was supported financially by the following institutions: The Department of Psychology, Stockholm University; The Swedish National Center for Research in Sports (CIF); The School of Social and Health Sciences, Halmstad University and Stockholm University College of Physical Education and Sports.

Writing a doctoral dissertation can be described as being stranded (fortunately mentally more than physically) on a deserted island for four years. In the quest for survival in the academic jungle (i.e. in the context of writing a PhD dissertation, to finish in the predetermined time of four years), the famous philosophical quotation from the poet and theologian John Donne (1573-1631): "No man is an island, entire of itself; every man is a piece of the continent, a part of the main", truly applies. In other words, ultimately, one requires the help of others to develop and emerge from the process intact.

During the four years, many persons have visited my island. Some have been regular guests, providing me with the necessary tools for development and survival, whereas some have just passed by occasionally to say "hi", seemingly unaware of what was going on, but nevertheless showing interest and giving me a mental clap on the shoulder. In the end, they have all contributed, in one way or another, to the end-result, manifested in the following pages, and I am indebted to them all. So, having said this, if I should accidentally forget anyone in this limited space allotted to acknowledgements, rest assured that your contribution has, nevertheless, been noted and appreciated.

With these words in mind, I would like to thank the following persons or groups:

My supervisor Peter Hassmén, for guiding me through the process with a balance of professional attitude and relaxed atmosphere; for letting me develop into an independent researcher at my own pace, for treating me as an equal colleague with the responsibility to share knowledge as well as to learn; and for having taught me the craft of doing good research and the scientific virtues of being meticulous, critical, patient and to the point, yet, at the same time, productive.

My foreign research collaborators in England, Turkey and Canada: Dr. Martin Hagger, Dr. Hulya Asci and Dr. Kathleen Martin Ginis for sharing ideas and inspiration.

My Swedish collaborators: Dr. Eva-Carin Lindgren, for letting me take part in her intervention project; and Ph.D. student Andrew Naylor for valuable discussions regarding differences and similarities between our two disciplines, psychology and physiology.

Nathalie Hassmén, for constant encouragement and interesting discussions regarding theoretical and statistical issues.

From the Stockholm sport psychology group: Göran (for teaching me all about the symptoms and consequences of a genuine caffeine-addiction); Carolina (for being a good "office-buddy", thereby sacrificing her own self-esteem in the service of my constant need to criticise the surroundings); Leif; and especially Johan for being a great friend and for endless entertaining discussions on sports,

psychology, science, relationships, and life in general, in addition to occasional (!) chats about football during the last seven years.

At the Department of Psychology in Stockholm University, my fellow Ph.D student colleagues for having shared their knowledge on other exciting fields in PhD courses. Special thanks go to Mats Najström and Cindy de Frias with whom I've shared many lunches and good conversations outside the realm of the university. Also I like to thank the “KI-stress-course group” for making friday-afternoons a very pleasant experience during the last year. Moreover, I would like to acknowledge the input of the teachers on the high-quality Ph.D courses at the department. In particular, I would like to thank Professors Birgitta Berglund, Henry Montgomery and Associate Professor Magnus Sverke for contributing to the development of my scientific critical thinking.

At Halmstad University, I would like to thank:

Urban Johnsson, for having introduced me to the exciting world of sport psychology, and for having given me the opportunity to develop as a teacher and start the journey towards the PhD at Halmstad University. Also for being a great role model, sharing never-fading inspiration and motivation, as a mentor in the beginning and later on as a colleague and collaborator, in writing books, in doing research and in the practical application of sport psychology knowledge on the field.

Hansi Hinic, for being a great "travel-buddy" and for helping me keep my spirits up on endless planes, trains, buses, undergrounds, cars, and on foot with a great sense of humour (including an endless source of inimitable quotes and jokes) during the first two tough years of commuting from Halmstad to Stockholm.

Tomas Berggren, for sharing his "big bank of knowledge" on psychology with me and for many great discussions concerning the nature of psychology and science, which encouraged me to go back to the roots of theories and models.

The rest of the sport-psychology- and psychology group for showing interest and giving me support throughout the process.

Professor Natalia Stambulova and Associate Professor Mark Andersen for giving me critical, valid, and constructive feedback on my early scientific writing.

All my friends outside the academic setting, around Sweden and in the rest of the world, for having stimulated the emotional and social domains of my self on a regular basis and for helping me uphold a sound balance between work and the rest. I am sorry that I cannot name everyone here, but I have a feeling you know who you are! A special thanks goes to the "Halmstad-gang" for keeping my feet steadily on the ground with the uniquely harsh and cynical but friendly and hilarious jargon and atmosphere. To the football clubs and players in IS Örnia (Halmstad) and IK Mockasinen (Stockholm) and the floor-hockey players in "Innebandyns vänner" for helping me keep my physical self in shape.

Finally, and most importantly, my parents, Eva and Bennett, for having provided me with all the necessities a man needs in this world throughout the years: unconditional love and support, financial and emotional security, and food and shelter whenever I returned home, in addition to the extremely comfortable (and underrated) emotion of actually feeling at home. You are the greatest.

List of studies

This dissertation is based on the following studies, which are referred to in the text by their Roman numerals:

- I. Hagger, M. S., Lindwall, M., & Asçi, F. H. (in press). A cross-cultural evaluation of a multidimensional and hierarchical model of physical self-perceptions in three national samples. *Journal of Applied Social Psychology*.
- II. Lindwall, M., & Hassmén, P. (in press). The role of exercise and gender for physical self-perceptions and importance ratings in Swedish university students. *Scandinavian Journal of Medicine and Science in Sports*.
- III. Lindwall, M., & Lindgren, E-C. (2004). The effects of a 6-month exercise intervention programme on physical self-perceptions, importance ratings, and social physique anxiety in non-physically active adolescent Swedish girls. Manuscript submitted for publication.

Table of contents

1. Introduction	1
2. The self	2
2.1. Why the self.	2
2.2. The nature of the self.....	3
2.3. The tasks of the self-director	4
2.4. The structure of the self.....	5
2.5. The healthy self.....	8
2.6. Self-concept and self-esteem.....	9
2.7. Self-esteem	11
2.8. Discounting: The importance of importance.....	13
2.9. Gender, self-concept and self-esteem.....	15
2.10. Culture, self-concept and self-esteem	17
2.11. Self-presentation/impression management	24
3. The physical self and the body	25
3.1. Body image and body ideals	25
3.2. Social physique anxiety.....	26
3.3. Physical self and global self-esteem.....	28
3.4. Models and measurements of the physical self.....	29
3.5. Gender differences in body image, body dissatisfaction and physical self-perceptions	33
3.6. Explanations to gender differences in body image and physical self-perceptions	36
3.7. Cultural differences in body image and body dissatisfaction	39
3.8. Cross-cultural measurement of, and differences in, the physical self: A question of equivalence	40
4. Exercise	41
4.1. A history of exercise	41
4.2. Physical activity vs. exercise.....	42
4.3. The effects of exercise on health.....	43
4.4. Mechanisms.....	43
4.5. Motives for exercising.....	44
4.6. Motives for exercising: A socio-cultural perspective	45
4.7. The exercise stereotype	47
5. Exercise and the self	48
5.1. The self and the environment: Two perspectives.....	48
5.2. Models and meta-analyses	49
5.3. Mechanisms.....	53
5.4. Body image and exercise.....	55

5.5. Exercise and social physique anxiety.....	56
5.6. The role of physical self-perceptions in motivation for exercise.....	58
5.6.1. Harter’s competence motivation	58
5.6.2. Exercise self-schemata	59
5.6.3. Self-presentation.....	60
5.6.4. Self-efficacy	61
5.6.5. Self-determination theory.....	62
5.7. Physical self-perceptions, exercise involvement and sport participation..	63
5.8. Physical self-perceptions and life adjustment correlates.....	65
5.9. The change and stability of physical self-perceptions: Links to exercise and sport participation.....	65
5.10. The effects of exercise/sport on physical self-perceptions.....	66
6. Aims of the dissertation and studies conducted	67
6.1. Study I: <i>A cross-cultural evaluation of a multidimensional and hierarchical model of physical self-perceptions in three national samples</i>	68
6.1.1. Method.....	69
6.1.2. Results	70
6.1.3. Discussion	70
6.2. Study II: <i>The role of exercise and gender for physical self-perceptions and importance ratings in Swedish university students</i>	71
6.2.1. Method	72
6.2.2. Results	73
6.2.3. Discussion	74
6.3. Study III: <i>The effects of a 6-month exercise intervention programme on physical self-perceptions, importance ratings and social physique anxiety in non-physically active adolescent Swedish girls</i>	75
6.3.1. Method	76
6.3.2. Results	78
6.3.3. Discussion	79
7. General discussion ..	81
7.1. The physical self and culture.....	81
7.2. The physical self, gender and exercise.....	84
7.3. The physical self, body image and exercise.....	88
7.4. Mechanisms and a model	101
7.5. Methodological issues	105
7.5.1. Design.....	105
7.5.2. Participants	106
7.5.3. Instruments	107
7.6. Future studies	108
7.7. Prospects: Exercising the self in the field	109
8. References.....	111

1. Introduction

“The self begins with the body, and people everywhere have bodies, but beyond that basic fact selves begin to vary” (Baumeister, 1995; p. 55). In the context of a doctoral dissertation on the physical self, the quotation by Baumeister seems a very suitable point of departure. In the modern world, our body and self have to relate to everything around us, and, more importantly, our self has to relate to our own body, physique and physique-related competence. In this intimate and inevitable relationship, physical activity and regular exercise play important roles. Negative self-perception and low self-esteem are widely established markers of negative health and health-damaging behaviour, whereas positive self-perceptions and high self-esteem seem to accompany a wide array of positive factors linked to health, achievement and behaviour. The impact of physical activity and exercise on general physical health, as well as on important aspects of mental well-being, (depression, anxiety and mood) is also today well-documented. Given the robust association of both self-perception/self-image and exercise with mental as well as physical health, a fundamental question is: What role does regular exercise play in the shaping of, and evaluation of, individuals’ self-perception? This question constitutes the core of this dissertation.

In modern society, gender issues are debated on a daily basis and the development in globalisation and increased cross-cultural communication via media and the internet make the process of sharing ideas, ideals and values much more wide-reaching than it was a mere 20 years ago. In this context, the role played by gender and culture in the self-perception of the body is of major interest. In this dissertation it is hypothesised that the three factors of exercise,

gender and culture have a substantial impact on individuals' perceptions of their body and the domain of their physical self.

Regardless of the fact that similar questions most probably occupy the minds of millions of individuals every day, we do not from a scientific standpoint have a very clear insight into the complex concept of the physical self, although evidence of substantial qualitative as well as quantitative growth in the area has been found in recent years (see Fox, 1998, 2000a). What we do know is that many people today look at themselves, in a mirror or through the eyes of others, and do not like what they see. This subjective verdict leads, for far too many, to severe repercussions manifested in negative self-perceptions, low self-esteem, and, frequently also to a sedentary body that in turn may lead to ill health both physically and mentally. The overall aim of this dissertation is to investigate primarily the role that exercise but also the roles that gender and culture play in how people perceive themselves in terms of their body and physique. In a broader perspective, this dissertation puts the famous, but often misused, ancient Latin expression of: "mens sana in corpore sano" (a healthy mind in a healthy body) under the microscope.

2. The Self

2.1. Why the self?

At the heart of the scientific study of the human mind, namely consciousness and behaviour, the self-concept has a vital role to play (Damasio, 1999). Whether viewed as a highly valuable outcome in itself, as a moderating variable that affects health and achievement, or as a generally powerful informer and predictor of human action, the self-concept remains one of the most widely and commonly investigated phenomena in the social sciences (Baumeister, 1987; Harter, 1996; Shavelson, Hubner & Stanton, 1976). In fact, in the last 30 years,

compared to research in general, there has been a threefold increase in research on the self (Tesser, 2000). Overall, the self-concept is at the epicentre of the most influential theoretical and therapeutic frameworks in modern psychology, from psychoanalysis (Freud, 1923/1960) to cognitive behavioural therapy and Rogerian therapy (Beck, 1976; Rogers, 1951). Moreover, the self-concept is a construct that goes beyond common scientific disciplinary boundaries and has united psychologists, sociologists, anthropologists, philosophers and theologians in the pursuit of knowledge.

2.2. The nature of the self

Although the roots of the self-concept can be traced back to the ancient Greeks, mirrored in the famous inscription in the Apollon-temple of Delphi: “gnoti sauton” (know thyself), researchers (Baumeister, 1987) have stated that the Western concept of the self and self-hood should most probably be viewed as fairly modern phenomena. The modern scientific perspective on the self-concept starts with the influential work of William James (1890) and symbolic interactionists such as Cooley (1902) and Mead (1925, 1934). One of many contributions made by James to modern research on the self was the important distinction between the “I” and “Me”, which reflects the subject and the object of the self. Thus, the “I” is capable of making judgement about the objective self the “Me”. James' perspective on the self in general, and the distinction between the “I” and the “Me” in particular, have strongly influenced modern theoretical frameworks of the self (for a review, see Hattie, 2000; Marsh & Hattie, 1996). Cooley and Mead, on the other hand, focused more on the nature and development of the self in the context of social interactions and considered the self to be primarily a social construction. Hence, their contribution to later work on the self lies foremost in the highlighting of the significance of others to the self (Harter, 1996).

Today, theorists usually view the self as a complex system. It may be perceived as a cognitive construction with shared meaning among members of a given culture (Wood & Wood, 1999). This perspective is mirrored in Murphy's (1947) description of the self-concept: "the individual as known by the individual" (p. 996). The current view is that a self-director works at the centre of the self-system (Fox, 1997; Harter, 1996, 1999). Analogously to the chief executive of a large corporation, the self-director is believed to be the force that is responsible for processing information, decision-making, and managing the activities of the individual, thus guiding him/her to a healthy and meaningful life. An important principle is that the self-concept is self-descriptive and non-evaluative.

2.3. The tasks of the self-director

The self not only contains important cognitive features (as a "knower") but also functions as a vital motivational force (as a "wanter") (Baumeister, 1995). In order to successfully carry out its chief objectives (making sense of the world and incoming information and directing the individual towards a healthy life), the self-director primarily has two major tasks: self-enhancement and self-consistency (Brown, 1993).

It is widely recognised that most people exhibit a modest bias towards self-enhancement (Taylor & Brown, 1988; Tesser, 1988). This bias towards task is based principally on the notion of the self as driven by hedonistic principles, such as the need to feel competent, appreciated and loved by others and generally valued. Hence, this has led several theorists to argue that the existence of a drive towards self-enhancement is a basic facet of human behaviour. In the quest to achieve these basic needs, the self-system and self-director utilise several strategies to ensure a healthy and beneficial life for their host (Fox, 1997): These include the following: guiding the self towards domains in life that may result in success and positive affect (Harter, 1990; White, 1959),

withdrawing or staying away from domains that may result in failure and negative affect and/or discounting the importance of these domains (Harter, 1993), constructing attributions that enable one to take pride in one's success and view failure as a learning experience (hoping for the best, being prepared for the worst; Blaine & Crocker, 1993), self-affirmation and self-verification at times when the self is under threat (Tice, 1993), and maximising social support and approval (Harter, 1996).

Self-consistency strategies help the individual's self-system to achieve a feeling of stability, control and predictability as well as playing an important role in organising experiences in a coherent structure. The two strategies of self-enhancement and self-consistency may often assist and work alongside each other smoothly and without problem, in particular for people with high self-esteem. For people with low self-esteem, these two strategies may work in opposite directions; the self-enhancement strategies guide the acquisition of positive information that boosts the self-esteem, whereas the self-consistency strategies instead focus on perceiving information that seems predictable, i.e. on reinforcing an already low self-esteem. Consequently, these two strategies may provide important information on the different effects of exercise and physical activity on self-esteem and PSP for different people or groups. The drive to understand the world as coherent, stable and predictable (self-consistency) may, in individuals with initially low self-esteem, override and be stronger than the self-enhancement strategies induced by, for example, an exercise intervention, resulting in the failure of the intervention to show any facilitative effects on self-esteem (Brown, 1993).

2.4. The structure of the self

A commonly mentioned problem surrounding the self-concept and related research is that everybody has an instant apprehension of the self-concept and

thereby has an opinion to share (Byrne, 1996; Marsh & Hattie, 1996), thus making the development of definitions, theories and models seemingly abundant. One of the earlier theorists, William James (1890), distinguished between three constituents of the self, namely the material, social and spiritual, based on a multidimensional view of the self. However, James as well as Mead also put forward the notion of a unidimensional global self-concept, which had a more evident impact on later work (see Byrne, 1996; Harter, 1996, 1999). Consequently, as interest in the self-concept grew in the 1960s and 70s, the construct was primarily viewed (and consequently instrumentally operationalised) as unidimensional. However, starting with theorists such as Epstein (1973), Coopersmith (1967) and Fitts (1965), the self-concept was later described as multidimensional. Although several multidimensional models have been proposed over the last 20 years (see Marsh & Hattie, 1996), the model of the self-concept that has gained the greatest amount of empirical support is the multidimensional model of Shavelson, Hubner, and Stanton, (1976). Shavelson et al. (1976) viewed the self-concept in its broadest sense as: “a person’s perception of himself” (pp. 411). In their frequently cited paper, based on the nomological network-perspective on construct validation of Cronbach and Meehl (1955), they argued that previous definitions of the self-concept suffered from imprecision and variability. Moreover, Shavelson and colleagues presented seven features that form the core of the self-concept, which they described as organised, multifaceted, hierarchical, stable, developmental, evaluative, and differentiable. Based on the alleged hierarchical and multifaceted nature of the self-concept, they presented a hierarchical, root-like model, with specific aspects of the self at the base and a stable global self-concept at the apex, dividing the general self-concept into academic and non-academic parts (see Figure 1). The academic self-concept consists of subjects such as English, Mathematics and Science, whereas the non-academic dimension of the general self consists of social, emotional and physical self-concepts. These subdomains, situated at a

lower hierarchical level in the model, while the general self-concept is at the top, may be further divided into more specific components or sub-areas. According to the model, the general self-concept at the apex level should be more stable over time in terms of change, compared to the more situation-specific self-concepts at the lower level.

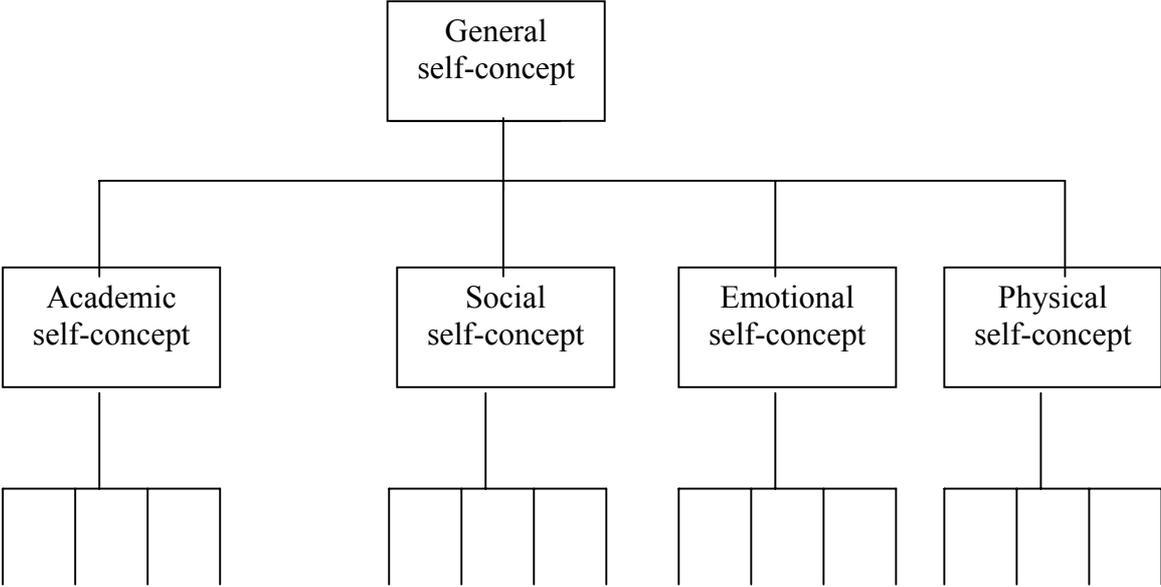


Figure 1. A multidimensional and hierarchical model of the self-concept. Adapted from Shavelson, Hubner, and Stanton (1976).

With regard to the question of the direction of causal flow in the hierarchical model, three different models should be considered (Marsh & Yeung, 1998): (a) a bottom-up model depicting a flow from the most situation-specific elements of the self, moving up through the subdomains and eventually reaching the global domains as antecedents of global self-worth (Shavelson et al., 1976); (b) a top-down model describing a process where global-self-esteem filters down through the hierarchy of the model to the more situation-specific domains (Brown, 1993); and (c) a reciprocal flow model where the flow is presented in both directions. In this connection, the validity of the hierarchical model of the self has recently been questioned, as research has found little support for either

bottom-up or top-down effects (Kowalski, Crocker, Kowalski, Chad, & Humbert 2003; Marsh & Yeung, 1998). Instead, support for a horizontal model (stability) over time has been found, indicating that at least the subdomains of the model are relatively stable over time (Marsh & Yeung, 1998). Similarly, another criticism of the hierarchical model is that the general self-concept at the top of the model (i.e., global self-worth or global self-esteem) has proved less stable over time than self-concepts at the subdomain level (physical self-evaluations), which runs contrary to the prediction of the hierarchical model of the self (Amorose, 2001; Kowalski et al., 2003). Based on the information-processing model (e.g., Schwarz & Strack, 1991), a suggested explanation for these results is that global self-evaluations may be more affected by mood and the actual situation, and, thereby, more likely to vary over time than specific self-concepts (Marsh & Hattie, 1996; Marsh & Yeung, 1998).

2.5. The healthy self

The question of what constitutes a healthy self, or what signifies the lack of a healthy self, and consequently how such a condition should be treated, is of great relevance for researchers and practitioners. Based on significant frameworks and theories of the self, Rodriguez (2000) proposed several characteristics that are indicative of a healthy self: a strong sense of autonomy without missing out on the positive sides of culture; the ability to express feelings; being creative and finding novel uses for familiar objects are important features of the healthy self; being self-activated and identifying unique wishes and pursuing them; having self-awareness and self-perceptions that are congruent with reality; maintaining a balance between pleasure and pain, thus having normal levels of anxiety and depression; feeling entitled to experiences of mastery and pleasure, thereby enjoying the art of learning new skills and expanding knowledge, being socially committed to people yet fully content with being alone; being capable of role-playing for adaptive purposes without

allowing it to obstruct valued objectives; being problem-focused and directing the attention outwards rather than ruminating inwards towards self-inadequacies; being capable of accepting oneself and others without being judgmental. According to Rodriguez, all of the above characteristics are vital for the development of a healthy self, and together they help the individual to adapt successfully to the environment. As failure to adapt to the environment is associated with low self-esteem and negative affect (Harter, 1990; Rosenberg, 1995), the development of a healthy self, high self-esteem and positive self-perceptions may be viewed as tantamount to successful adaptation to the environment. In general, the purpose of the self can be seen as providing a sense of continuity, order, and determination (Rodriguez, 2000).

2.6. Self-concept and self-esteem

The self-concept is broad and includes cognitive, affective, and behavioural aspects. Self-esteem, on the other hand, is viewed as a narrower, evaluative component of the self (see Byrne, 1996; Harter, 1996). Campbell (1984) defined self-esteem as: “the awareness of good possessed by self” (p. 9). The distinction between self-concept and self-esteem is vital, as they refer to different processes of the self that may have different effects on the general well being and behaviour of the individual. In this context, self-concept may, at the individual level, be viewed as a descriptive or cognitive component (i.e. “who am I?”), whereas self-esteem is the evaluative or affective component, answering the question: “how do I feel about who I am?” (Brinthaupt & Erwin, 1992; Campbell et al., 1996). However, the self-descriptive and self-evaluative processes of the self are inexorably intertwined and are often used interchangeably in research because it is difficult to describe the self without linking it to affect and evaluation (e.g., Byrne, 1996; Sonstroem, 1997). Another important distinction has been drawn between global and domain-specific evaluations of the self. Global self-evaluations have been referred to as "self-

esteem" (Rosenberg, 1979), "self-worth" (Crocker & Wolfe, 2001; Harter, 1993), or "general self-concept" (Marsh, 1986). The relation between the descriptive (self-concept and self-perceptions) and the evaluative (self-esteem) aspects has been presented in several frameworks and models. One such model (see Figure 2), which depicts how self-perceptions (of the physical self) at varying levels of specificity are linked to self-esteem on a global level, has been outlined by Fox (1998).

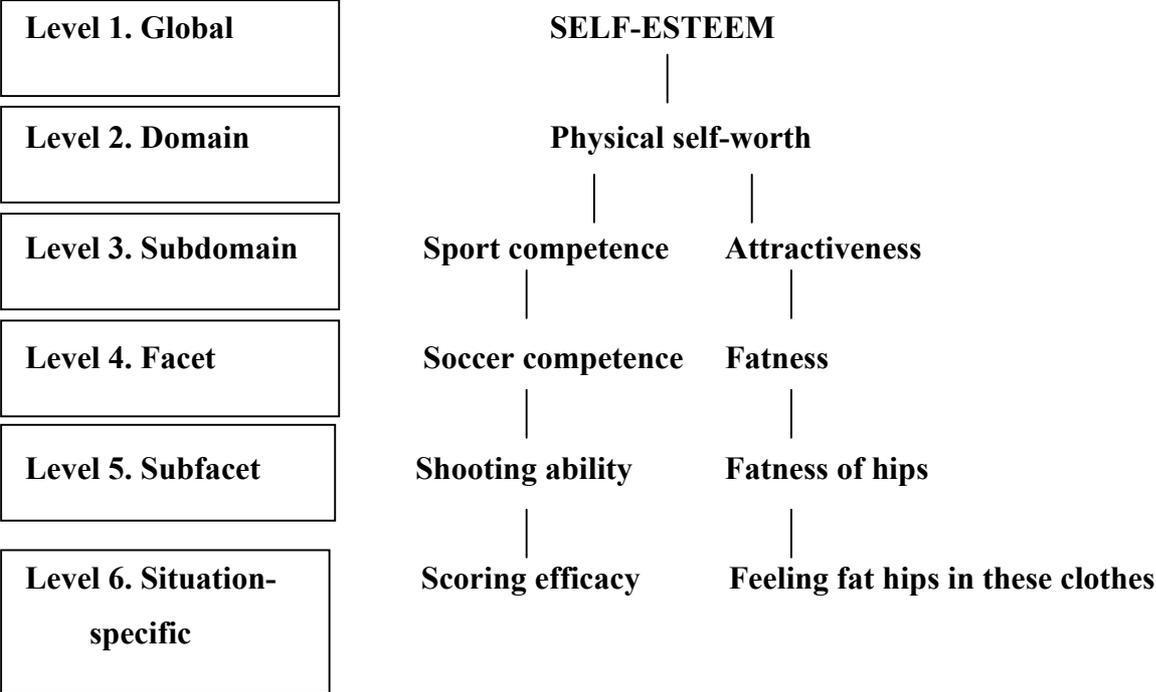


Figure 2. The link between self-esteem and self-perceptions in the context of the body. Adapted from Fox, (1998).

In line with the theory of the hierarchical structure of the self, the model holds that there exist several measurable levels of physical self-perceptions and that the link between these different levels and global self-esteem depends on where they are situated in the tree-like, or root-like, hierarchy of the model. For example, physical self-worth at the domain level should be more closely related

to global self-esteem than should scoring efficacy or shooting ability at lower, more task-specific and time/state focused levels.

2.7. Self-esteem

Few psychological constructs have received such attention in research as self-esteem (Fox, 2000a; Harter, 1999). A search in the PsychINFO database from 1967 to 2002 revealed citations from over 20,000 studies on self-esteem (Watson, Suls, & Haig, 2002). Of these, more than 11,000 were published after 1990. The vast amount of research spawned by the concept of self-esteem, over the years, is not coincidental or without reason. High self-esteem has been associated with: (a) emotional stability and adjustment to life demands (Sonstroem, 1997); (b) subjective well being, happiness, life-satisfaction and resilience to stress (Diener & Diener, 1995; Wylie, 1989); and (c) healthy behaviours (Torres & Fernandez, 1995). Low self-esteem, on the other hand, has been closely related to mental illness and psychopathology, such as depression and anxiety (Baumeister, 1993; Watson, Suls, & Haig, 2002) and eating disorders (Polivy & Herman, 2002). In fact, Solomon et al. (1991) hold that: “It is difficult to conceive of an area of behaviour that has not been linked in some way to a need for self-esteem” (p. 107).

Taken together, it seems appropriate to view self-esteem as a critical component of human functioning and performance (Baumeister, 1987; Campbell, 1984). Accordingly, self-esteem was placed in the second highest category of Maslow's (1943) hierarchy of human needs. Moreover, from a clinical perspective, the enhancement of self-esteem has accorded high priority by the majority of psychotherapies and used as a marker for development and success (Rogers, 1951, Wylie, 1979).

Compared to those with high self-esteem, individuals with low self-esteem seem to be described as: (a) neutral rather than negative in terms of self-esteem, i.e., they are less likely to both confirm positive, and disconfirm negative, aspects of themselves (Baumeister, 1993); (b) they have a less clear view of their self-concept and less well-defined self-knowledge (Campbell, 1990; Campbell & Lavalley, 1993; Campbell et al., 1996); (c) they have fewer and simpler elements attached to their self-concept, resulting in less opportunities for self-affirmation when under threat (Spencer, Josephs, & Steele, 1993); (d) they have greater discrepancies between perceived competence and the importance attached to the domain(s) in question (Harter, 1990); and (e) social support is conditional upon their achievements (Harter, 1993, 1996, 1999).

Hence, the use, or lack of, self-strategies seems vital for an understanding of the phenomenon of low self-esteem. Drawing on the pioneering work of James, Hattie (2000) recognised three major strategies of the self for handling information and maintaining a healthy state: self-enhancement (seeking positive or self-enhancing feedback); self-verification (seeking accurate or self-verifying feedback); and finally self-strategies such as self-handicapping, discounting and social comparison. Similarly, Tesser (1988, 2000) discusses self-esteem regulation mechanisms, used for maintaining high self-esteem. Three such mechanisms are social comparison, cognitive dissonance and value expression. Mechanisms of social comparison emphasise the importance attributed to a given dimension, i.e. if a domain is deemed important by the individual, social comparisons may be perceived as threatening to the self-esteem, whereas evaluation on a dimension perceived as unimportant may instead enhance self-esteem. Hence, it follows that the individual can either change the importance of the domain, reduce or increase distance to the individual with whom one compares oneself, or attempt to change the difference in performance in order to maintain self-esteem. Cognitive dissonance and value expression mechanisms

focus either on self-affirmation or on the change in behaviour, attitude and values in resolving a self-esteem threatening dissonance between cognition and behaviour or to ensure self-affirmation. Although qualitatively different, these mechanisms have one important factor in common: arousal or affect. For example, threats to self-esteem tend to generate negative affect, whereas positive affect is related to a bolstering of self-esteem. In addition to the level (high vs. low) of self-esteem, stability of self-esteem has been identified as an important factor in predicting reactions to feedback, motivation and behaviour (Kernis, Cornell, Sun, Berry, & Harlow, 1993). In this context, the importance of perceived competence seems to predict stability of self-esteem, in particular in the domain of physical attractiveness (Kernis et al., 1993).

2.8. Discounting: the importance of importance

“I, who for the times have staked my all on being a psychologist, am mortified if others know much more psychology than I. But I am contented to wallow in the grossest ignorance of Greek” (James, 1890, p. 310)

Linked to the quotation, James (1890) suggested that the importance people attribute to the area of evaluation, in combination with the evaluation itself (rather than just the evaluation), influence how events and situations will affect self-esteem. Put differently, James suggested that self-esteem represented a ratio of success to pretensions, i.e. high self-esteem would follow if the individual's perceived success was greater than, or equal to, her pretensions for success. Failure in an area deemed not important would not lead to lowered self-esteem, whereas failure in domains attributed as very central to the person would harm his/her self-esteem. Following James, Hattie (2000) also stressed the relevance of the importance attributed to various self-concept domains for self-esteem, but suggested that self-esteem is less a function of our pretensions alone, than a function of our success/failures plus our pretensions. Similarly, Harter (1985,

1986) has argued for the relevance of incorporating importance (salience) and strength of the domain in which the individual will self-evaluate and found support for this in her empirical work (Harter, 1993, 1996, 1999). In summary, the theory elucidated by James, Hattie and Harter states that in domains deemed highly important by the individual, the general self-concept will be affected by perceptions of competence, whereas the self-rating in domains interpreted as unimportant will have little impact on the general self-concept. Furthermore, it follows that an individual can discount the importance of some domains where they have low perceived competence, thus protecting their self-esteem from the negative impact of a possible competence-importance discrepancy. Some domains, however are more difficult to discount, due to the fact that they constitute highly valued characteristics by important others, such as peers, parents, or even the media. As a consequence, these domains are more powerful and more predictive of self-worth and global self-esteem. The most predictive domain that has shown the consistently highest relation to self-esteem is physical appearance (Harter, 1993, 1999). Building on the work of James and Harter, Crocker and Wolfe's model of the contingencies of self-worth rests on the notion that a person's view of her/his value depends on her/his success or failure in regard to certain highly valued domains or categories (contingencies) of the self, on which the individual has staked her/his self-esteem (Crocker & Wolfe, 2001). The basic tenets of the model are that people differ in those contingencies on which they base their self-esteem, and that both trait and state self-esteem may be understood in terms of contingencies of self-worth. Running parallel with the concept of discounting (cf. Harter, 1986, 1993), the model predicts that some contingencies will be associated with lower self-esteem, because it is more difficult to find consistent support and satisfaction for them in the environment. One such domain is appearance (Crocker & Wolfe, 2001).

The ratio between perceptions of competence and attributed importance on that domain has been labelled the "actual/importance discrepancy score" (Marsh, 1993; Marsh & Hattie, 1996). Although the notion of importance/discrepancy may be theoretically relevant, it has been criticised on several counts (e.g., Byrne, 1996). These include the inherent tendency of discrepancy scores to be unreliable, problems associated with the interpretation of the variance of two separated constructs when merged into one, and finally, weaknesses in the metric of the scores and the interpretation of interval scores. In accordance with these statements, research has failed to find empirical support for the validity of the importance-discrepancy perspective (Marsh, 1986a, 1993). However, providing preliminary support for the relevance of the importance concept, research has shown that adding constant weights of importance – the importance weights for each domain are the same for all individuals – to each self-concept domain rating (so called constant-weighted models; see Marsh, 1993) predict self-esteem scores better than self-concept ratings without importance ratings (simple unweighted models).

2.9. Gender, self-concept and self-esteem

Stereotypes of males and females typically suggest that males are more agentic (self-assertive and motivated to master) and females more communal (selfless and concerned with others) (Eagly, 1987). However, research on gender differences in self-esteem has been equivocal. Two earlier meta-analyses both found small differences favouring males (Feingold, 1994; Hall, 1984). A more recent meta-analysis, which used predominantly North American samples, again revealed an overall small effect size of 0.21 favouring males with respect to global self-esteem (Kling, Hyde, Showers, & Buswell, 1999). A significant quadratic effect with age was also found, which indicated that the largest difference emerged in late adolescence. Although the differences between gender in global, or general, self-concept appear small, evident differences in

particular domains have consistently been reported (cf. Marsh & Hattie, 1996). For example, a meta-analysis, incorporating over 400 effect-sizes, revealed gender differences in self-concept scores in mathematics and physical ability self-concepts favouring males, whereas females were higher in verbal self-concept (Hattie & McInman, 1991, cited in Hattie, 2000). Similarly, a recent meta-analysis demonstrated that adolescent boys in general revealed higher means in non-academic self-concept domains, such as physical ability and physical appearance, whereas girls revealed higher or equal means in most academic self-domains (Wästlund, Norlander, & Archer, 2001). Thus, important and significant gender differences in various subdomains may be masked by global or total self-concept scores, which indicates that these total scores may not describe gender differences in self-concept accurately. In physical activity contexts, males generally demonstrate greater self-confidence than do females (Lirgg, 1991), although this effect is not large. Differences are, however, greater the more masculine the tasks are.

Several explanations for the differences in self-esteem between genders have been suggested (c.f. Kling et al., 1999). Some have focused on gender roles, where many qualities associated with the male role are naturally linked to a high self-esteem (Koivula, 1999a). Others have proposed violence against females, differences in peer interaction, and a school system (e.g., feedback from teachers) that favours males over females in developing a high self-esteem, as potential explanations. Finally, it has been suggested that the cultural emphasis on physical appearance may, through a greater dissatisfaction with their own bodies compared to boys and men, contribute to the lower self-esteem of girls and women (Brownell, 1991a; Fredrickson & Roberts, 1997).

However, despite all these potential assaults on females self-esteem, the gender differences are small. This has led researchers (e.g., Kling et al., 1999) to

suggest that females may utilise certain self-esteem protection strategies, highlighted in Crocker and Major's (1989) theoretical model of social stigma and self-esteem, such as: (a) attributing any negative feedback they receive to prejudice against themselves as members of their own group; (b) comparing their outcome with their own disadvantaged group (females) rather than the advantaged group (males); and (c) devaluing those domains where the group does not do well while valuing other domains where they do perform well.

It has been proposed that differences in self-esteem scores are more likely to mirror the different strategies of integrating self-concept, where females are more likely to use self-testing tendencies (being more reactive to the importance of feedback) and males self-status quo tendencies. (Roberts & Nolen-Hoeksema, 1989). Hence, it seems that females are more willing to recognise negative attributes (tending to be self-verifiers), whereas males tend to be more self-enhancers, i.e. processing positive attributions (Hattie & Marsh, 1996). The possibility that males and females have different sources of self-esteem has also been raised. Lending support to this hypothesis, longitudinal studies have revealed that characteristics consistent with gender role at age 14 predict increases in self-esteem from early adolescence to early adulthood (Block & Robins, 1993; Stein, Newcomb & Bentler, 1992).

2.10. Culture, self-concept and self-esteem

The self-concept of the individual does not develop within a cultural vacuum, isolated from the outside world. On the contrary, going back to the perspective of James (1890) and the symbolic interactionists (e.g., Mead & Cooley), it may be argued that the concept of self esteem cannot be understood without a parallel examination of: (a) the cultures to which the individual subscribes, (b) the value systems of those cultures, and (c) the degree to which the individual adopts these values (Fox, 2002). This issue was emphasised by Oyserman and Markus

(1993): “though individuals world-wide all appear to have a sense of the self, its content, processes, and structures are bound to sociocultural context and thus are likely to differ” (p. 212). In this context, the definition of the key concept of culture is vital. Triandis (1989) suggested that: “Culture is to society what memory is to the person” (p. 511). Although no clear and, among social scientists, universally accepted definition exists (Hughes, Seidman, & Williams, 1993; Triandis & Suh, 2002), culture may be viewed as a social construct that broadly encapsulates “shared attitudes, beliefs, categorisations, expectations, norms, roles, self-determinations, values, and other such elements of subjective culture found among individuals whose interactions are facilitated by shared language, historical period, and geographic region” (Triandis, 1972, p.3).

The sociocultural influence on the self-concept was highlighted by Triandis (1989) and Markus and Kitayama (1991), who claimed that the notion of the self as independent, autonomous, separate and agentic may be appropriate for Western individuals, but that the self of non-Western persons was more likely to be interdependent, communal and relational. Furthermore, they contended that differences in self-construal could explain culture and gender differences in cognition, emotion, and motivation. For example, previous research has consistently shown that self-enhancement biases are less prevalent in collectivistic East Asian cultures than in typically individualistic Western cultures (for a review, see Heine, Lehman, Markus, & Kitayama, 1999). However, cross-cultural research on the self has demonstrated that self-esteem is not differently related to self-construals across cultures (Singelis, Bond, Sharkey, & Lai, 1999).

Moreover, different dimensions of culture may be outlined (for a review, see Triandis & Suh, 2002). These include: complexity (e.g., hunters/gatherers/information societies and gross national product per capita),

tightness (conformity to, or deviation from, norms resulting in “loose” or “tight” cultures) and collectivism/individualism. Hofstede (1980, 1983, 1991) constructed an index of the dimension of individualism-collectivism (I-C) based on research on IBM employees in 50 countries, and argued that differences in this cultural dimension would accompany differences in self-concept. For example, Americans have typically been viewed as more individualistic whereas non-Western cultures, especially Japanese culture, have been characterised as collectivistic (for a review, see Oyserman, Coon, & Kemmelmeier, 2002). Swedish culture has instead been described as a culture of separateness where personal autonomy is valued (Daun, 1989), whereas Turkish culture is described as a culture of relatedness (Kagitçbasi, 1996). Supporting this, in Hofstede’s (1983) research, Turkey was viewed as a clearly collectivistic culture, whereas Sweden was categorized as more individualistic.

Critics of the distinction between individualist and collectivist cultures hold that culturally normative conceptions are not always manifested in behaviour (Spiro, 1993). Research has demonstrated that cultural differences in motivation may not be accounted for by theories of non-Western collectivistic versus Western individualistic cultures (Phalet & Claeys, 1993). In addition, recent work suggest that self-enhancement may be positively related to self-esteem and well-being in both individualistic and collectivistic cultures, and that differences in self-enhancement may depend on cultural restrictions (such as the emphasis on modesty in collectivistic cultures) rather than on a lack of motivation for self-enhancement (e.g., Brown & Kobayashi, 2003; Kurman, 2003).

Moreover, the notion that individuals in non-Western cultures may be characterised as more collectivistic has recently been questioned (Dinnel, 2000; Watkins, 2000; Watkins et al., 1998). Watkins (2000), summarising the results of a large-scale cross-cultural research programme incorporating between 16

and 25 countries, concluded that while there were clear differences in self-construal between cultures, these differences are not readily explicable by underlying dimensions such as Hofstede's I-C component. Also, within-cultural changes have been evident since Hofstede's (1980, 1983) research on the I-C continuum, making the conclusions even more complex. For example, the Turkish sample highly valued both interdependent and independent statements of the self, which indicates a change from the endorsement of more collectivist ideals to a mix of individualist and collectivist values. *A priori* hypothesised gender differences in self-construal (males being more likely to adopt individualist, independent and autonomous self-cognitions, whereas the self-cognitions of females rather are based on collectivistic and interdependent features; see Josephs, Markus, & Tafarodi, 1992) were most apparent in English heritage countries but in general inconsistent across countries (Watkins, 2000; Watkins et al., 1998). This mirrors the results of Wästlund et al. (2001), who found that gender differences in self-concept domains for adolescents were more similar than different across culture groups. Moreover, recent meta-analyses (Oyserman et al., 2002) showed that, although European Americans (e.g. Italian Americans, Irish Americans) scored higher regarding individualism than other groups (albeit not compared to most European countries included in the analyses), they did not score lower regarding collectivism than Japanese or Koreans. Nor were the results as robust as previous research and frameworks have suggested.

Other scholars have questioned the contention that the concepts, and definitions, of self-esteem and self-regard are universally relevant, valid and may be directly operationalised and measured in non-westernised cultures, such as Japan (Heine, Lehman, Markus, & Kitayama, 1999; Singelis et al., 1999). Examining the universal need of positive self-regard, Heine and co-workers stated as their basic premiss that the current conceptualisation of self-esteem is a prototypical North

American construct. As typically North American values such as independence and individualism lie at the centre of the self-esteem construct used today, and as the concept of self-esteem is very much on the everyday agenda in the Western world, a high self-esteem may be a more important and more highly valued aspect of life than in other Non-Western countries. This could, to some extent, explain differences in self-esteem between Western countries and non-Western countries. Linked to the lack of clear-cut cross-cultural differences in studies, it has been suggested that cross-cultural differences in self-perceptions may be shrinking in the younger generation, as a result of a tendency (i) for the younger generation in former collectivistic countries to be more individualistic and (ii) for the younger generation in typical individualistic countries to be more collectivistic (Watkins, 2000). In this context, increased exposure to different cultural ideals via media, movies, and not least through the expansion of the internet in the last decade, may serve to explain, at least in part, the lack of empirical support for the theoretical frameworks of, for instance, Markus and Kitayama, and Hofstede (Dinnel, 2000).

Based on previous work (e.g., Markus & Kitayama, 1991; Triandis, 1989), Duda and Hayashi (1998) concluded that "Legitimate cross-cultural comparisons are based on theoretical or conceptual frameworks that attempt to explain and predict behaviour among individuals from various cultures" (p. 478). In this context it is relevant to consider the question of bottom-up versus top-down research strategies (Betancourt & Lopez, 1993). The bottom-up strategy refers to the process whereby researchers study psychological processes in their own culture and then investigate those processes cross-culturally. Conversely, the top-down perspective starts with a general conceptual framework of human functioning and then incorporates dimensions of culture to broaden the picture. In exercise and sport psychology, both of these approaches have been adopted and may be perceived as complementary to one another, rather than as mutually

exclusive. A related issue is whether a concept under consideration (for example, self-esteem) should be viewed as a universal trait (etic) or as a culture-specific trait (emic) (Triandis et al., 1993).

The issue of what aspects of culture affect human cognition, emotion, perception, and behaviour is of great relevance. On an individual level of analysis, persons in individualistic cultures appear to be idiocentric, i.e. have greater access to individualist cognitive structure and assign priority to the goals of individuals, whereas individuals in collectivist cultures are allocentric, i.e. have greater access to collectivist cognitive structures and assign priority to the goals of the collective (Triandis et al., 1985, 1993). Different cognitive structures thereby seem to influence self-construals. Idiocentrics perceive a relatively large distance between self and all others, whereas allocentrics instead have been reported to perceive a large distance between self and enemies but a relatively small distance between self and friends (Iyengar et al., 1999). Moreover, as pointed out by Bond & Cheung (1983), it is almost impossible to determine whether cross-cultural differences in self-evaluations and perceptions reflect different culturally-bound modes of self-presentation (e.g., Baumeister, 1982) or different levels of self-feelings. The possibility that differences in levels of optimism could be related to variations in cognitive self-appraisals has also been raised (Markus & Kitayama, 1991).

Regarding problems and biases in the context of cross-cultural research on the self, three sources of such bias are: (a) the construct of interest (the construct being measured meaning different things in different cultures); (b) method or methodological problems (e.g., sample incomparability, different responses with regards to patterns of response and response style of cultural groups to the structured format of the instrument); and (c) item bias (different meanings or interpretations of instrument items for cultural groups) (Byrne, 1996; 2000).

Similarly Helms (1992) discusses the importance of six types of cultural equivalence: functional equivalence (do assessment scores have the same meaning regarding, and reflect characteristics that occur with the same frequency within, different cultural groups?); conceptual equivalence (are different groups familiar with the items to a similar degree and do they interpret them in similar ways?); linguistic equivalence (does the language used by the different groups carry the same meaning?); psychometric equivalence (does the instrument tap the same construct at the same levels for different cultural groups?); testing condition equivalence (are the testing procedures similarly familiar and comfortable across different groups?); and sampling equivalence (are the samples representing each group comparable at the different stages of the research process?). All these components pose severe threats to the validity of studies conducting cross-cultural, or trans-national, research. As stated by Duda and Hayashi (1998): “To combat cultural bias in our work, cross-cultural investigations must incorporate an accurate conceptualisation of culture. We must be cognisant that culturally dependent values, norms, and attitudes may impact whether the constructs have the same meaning (or even meaning at all) across different cultural groups” (p. 473). In addition to this, questions of validity in cross-cultural research on the self have been raised regarding, for instance, the treating of nations as cultures and cultures as a continuous quantitative variable, and problems regarding the generalisation of results due to the usage of college students who may be more westernised, more individualistic and less collectivistic than the rest of the population in collectivistic cultures (Fiske, 2002). Furthermore, in light of the reference-group effect, (stemming from the social comparison theory of Festinger [1954], according to which different cultural groups use different referents (primarily themselves) when comparing or evaluating themselves (e.g., Americans compare themselves against other Americans, and so forth), it may be suggested that people from different cultures use different standards when evaluating

themselves on subjective Likert-type scales, which poses a considerable threat to the validity of cross-cultural research (Heine, Lehman, Peng, & Greenholtz, 2002).

2.11. Self-presentation/impression management

Individuals generally have a basic interest in how others perceive them and a basic need to manipulate the way in which others perceive them. Hence, the ability to present the self favourably to the outside world is considered to be a vital component of human functioning; particularly with respect to social adjustment (Goffman, 1959). Sociologists (e.g., Featherstone, 1991; Shilling, 1993) talk about “the performing self”, a constantly active agent that monitors the behaviour and appearance of the individual, to ensure the successful presentation of the self in social contexts. The foundation for this performing self is the need for the individual to emphasise his/her competence and positive character. Linked to this, an increased interest in the concept of impression management, or self-presentation, has been noted (Leary, 1995, 2001). Impression management/self-presentation has been referred to as the: “attempt to control images that are projected in real or imagined social interactions” (Schlenker, 1980, p. 6), or: “the process by which individuals attempt to control the impressions others form of them” (Leary & Kowalski, 1990, p. 34). Although impression management is perceived as being broader than self-presentation, these two concepts are used interchangeably (henceforth, the term “self-presentation” will be used). The striving to maximise expected rewards and minimising expected punishments has been suggested as the chief motive for engaging in self-presentational activities (Schlenker, 1989). Moreover, Leary and Kowalski (1990) proposed that self-presentation may be used as an instrument to increase subjective well being in three interrelated ways: (a) by maximising the reward-cost ratio in social settings; (b) through the enhancement of self-esteem, and (c) through the facilitation of developing desired identities.

In their paper, Leary and Kowalski (1990) presented a model of impression management in which they distinguished between two major processes involved in self-presentation: impression motivation (IM) and impression construction (IC). IM is linked to the desires and motives of the individual to change others' perceptions of him/herself, whereas IC denotes the strategies and concrete behaviours that the individual later uses to alter others' perceptions of him/herself. The proposed antecedent factors in the model underlining IM are a) goal relevance of impressions, b) value of desired goals, and c) discrepancy between desired and current image. The background factors posited to influence IC, i.e. the specific strategies and behaviours that the individual chooses are: a) self-concept, b) desired and undesired identity images, c) role constraints, d) target's values and e) current or potential social image.

From a self-presentational perspective, the body has a significant part to play in the relationship between the self-identity and social identity of the individual.

3. The physical self and the body

3.1. Body image and body ideals

Stressed in the following quotation from Plato (cited in Cash, 2004, p. 1): “we are bound to our bodies like an oyster is to its shell”, the body constitutes an indisputable, and inevitable, source of all human emotions, feelings and states from fear, anxiety, shame and guilt to pride, esteem and harmony (cf. Bullington, 1999). Body image today plays an important role in the development and maintenance of the self (Davis, 1997). For females especially, a negative body image has been identified as a central component of major health problems such as eating disorders (see Levine & Piran, 2004), obesity (see Schwartz & Brownell, 2004), and depression (see Cash & Pruzinsky, 2002). The term body image can generally be understood as “the picture of our body which we form in our mind” (Schilder, 1935, p. 11). More modern definitions focus on the internal

representation of our outer appearance (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999), or one's body-related self-perceptions and self-attitudes, including thoughts, beliefs, feelings, and behaviour (Cash, 2004). Two related concepts are body affects (body esteem) and body cathexis. Body affect reflects the degree of satisfaction or dissatisfaction the individual holds towards different parts of his/her body (Secord & Jourard, 1953). Body cathexis was originally presented as an attempt to dissociate individuals' subjective feelings about their bodies from the objective size and shape. Lately, body image has been conceptualised as an umbrella term that includes the following components: a) a perceptual component of appearance (representing the accuracy of perceptions regarding body size), b) a cognitive component, such as thoughts about the body and body satisfaction, c) an affective component reflecting the anxiety and other feelings linked to the public presentation of the body, and d) a behavioural component involving behaviour linked to body image, e.g. exercise or eating (Bane & McAuley, 1998).

3.2. Social physique anxiety

Within a self-presentational framework (see Leary, 1992), the affective responses that individuals experience to exercise and sport are relevant to the behavioural outcome. Social physique anxiety (SPA: Hart, Leary & Rejeski, 1989) is such an affective response. The concept stems from the general construct social anxiety, which reflects the anxiety people feel when they perceive themselves as being unable to behave, or present themselves, in ways that they think that others expect (Schlenker & Leary, 1982). Viewed from an information-processing perspective (Heinrichs & Hoffmann, 2001) it has been suggested that social anxiety and social phobia distort individuals' attention to, and interpretation/judgement of, socially threatening information. Linked to the physical self, bodily flaws become social liabilities and potential sources for rejection and humiliation, at least in the subject's eyes. Social physique anxiety

is defined as: “a subtype of social anxiety that occurs as a result of the prospect or interpersonal evaluation involving one’s physique” (Hart et al., 1989, p. 96). It is posited that individuals with high SPA will be more likely than people with low SPA to avoid situations in which they are forced to reveal their physique to others and thereby face a potential evaluation of others. Although this concept represents a fairly new area within sport and exercise psychology research, it has received substantial interest and attention during the last 10 years, especially in regard to the concomitant instrument of the Social Physique Anxiety Scale (SPAS: Hart et al., 1989). SPAS-scores have, in previous studies, been associated with several relevant factors, such as body and weight dissatisfaction (Hart et al., 1989; Thompson & Chad, 2002) and eating attitudes and eating disorders (Diehl, Johnson, Rogers & Petrie, 1998; Frederick & Morrison, 1998; Haase & Prapavessis, 1998; Haase, Prapavessis, & Owens, 2002; Hausenblas & Mack, 1999), especially for females. Moreover, age and physical maturation seem related to social physique anxiety for females, as females categorized as being more anxious about their physique have been shown to be older, taller, and heavier compared to a low anxiety group in adolescents (Thompson & Chad, 2002). Furthermore, preliminary studies suggest that SPA may be linked to stable personality traits, such as perfectionism (Haase et al., 2002) in athletes.

In Sweden, a secular trend study from 1974-1995 on adolescents revealed that even though girls in 1995 felt more satisfied with their sport performance in physical education they also felt more anxious about physical education lessons than did girls in 1974 (Westerståhl, Barnekow-Bergkvist, Hedberg, & Jansson, 2003). No such trend was detected for boys. Although several alternative explanations for this trend could be outlined (such as fear of failure or appearing physically incompetent), the results may mirror an increase in self-presentational anxiety that is linked to appearance and fear of evaluation of the physique, such as SPA, for adolescents. In addition, the results support the consistent and robust

trend of gender differences in research on SPA, with females reporting higher SPAS-scores than males (Conroy & Motl, 2001; Hart et al., 1989; Lindwall in press).

3.3. Physical self and global self-esteem

The physical self, and physical self-perceptions (PSP), have been demonstrated to have the closest relation to global self-esteem of the various domains in the self-concept models (e.g., Harter, 1993, 1999), thereby being the most predictive component of self-regard. The average correlations between appearance and global self-esteem/self-worth have typically been as high as between 0.7 and .08 (Harter, 1986, 1993). Recent work also shows that the association between physical appearance and global-self worth is stronger in children with low motor co-ordination than in children with high motor co-ordination (Rose & Larkin, 2002). Further supporting the link between physical appearance and global self-esteem, meta-analyses have shown self-esteem to be the strongest personality correlate of self-rated physical attractiveness (Feingold, 1992), and that attractive adults possess more favourable self-perceptions and perceive themselves to be more competent than unattractive adults (Langlois, Kalakanis, Rubenstein, Larson, Hallam & Smoot, 2000). Consistent with this picture, recent research, based on extant data, has further documented that body-esteem is predictive of self-esteem (Mendelson, Mendelson, & White, 2001; Mendelson, McLaren, Gauvin, & Steiger, 2002).

Drawing on these robust results, the question why an individual's outer physical self is so closely tied to the inner psychological self is clearly relevant. One possible explanation is that the physical self is qualitatively different than the other self-domains, being constantly on display to others and the self to observe and evaluate (Harter, 1993). Linked to the previously mentioned concept of self-presentation, the physical self may be perceived as a public self. Reasoning

along these lines, it has been suggested that the body functions as the bridge between the mental self-concept of the individual and the outside physical world. The significance of the body as a bridge to the surrounding world is captured by Fox (1998):

“The body provides the vehicle through which we interface with life. Through embodiment, we explore, learn, present ourselves, and express our sexuality; and through its appearance, the physical self becomes a central element of the whole self. Our perceptions of our physical selves therefore provide a key to understanding the constitution of our identities, the basis of our self-esteem, and many of our behaviour patterns” (p.295).

3.4. Models and measurement of the physical self

In the Shavelson et al. (1976) model, the non-academic self-concept of physical self was divided into physical ability and physical appearance. These two concepts (with physical competence usually being substituted for physical ability) have retained their utility over the years and remain as the most important anchors in physical self-concept theory and instrumentation today.

In the development of the concept of the physical self, theory, models, and instrumentation construction and development form an essential partnership and are inextricably linked (Fox, 1998). Hence, it makes sense to describe and discuss theory and measurement together rather than separately. Early interest in the physical domain of the self can be traced back to an article by Secord and Jourard in 1953, in which appraisal of the body and various parts of it were measured *via* the Body Cathexis Scale. For example, Secord and Jourard hypothesised, and found support for, the notion that feelings about the body are commensurate with feelings about the self. One of the first multidimensional self-concept tests to incorporate a physical parameter was the Tennessee Self-

Concept Scale (TSCS: Fitts, 1965). However, this test has been subjected to significant criticism over the years (Fox & Corbin, 1989; Marsh & Richards, 1988) due the fact that it focuses on too wide a range of physical components, thereby leading to confounding results.

Given the increased need for a multidimensional self-concept test that managed to fully grasp the body and physical aspects, the development of the two tests the Physical Self-Perception Profile (PSPP: Fox & Corbin, 1989) and the Physical Self-Description Questionnaire (PSDQ: Marsh & Redmayne, 1994; Marsh, Richards, Johnson, Roche, & Tremayne, 1994) most strongly facilitated research on the physical self. The more recent PSDQ is comprised of 11 scales concerning the physical self-concept: strength, body fat, endurance/fitness, sport competence, co-ordination, health, appearance, flexibility, general self-concept, and self-esteem. It has been found to possess very stable psychometric properties with good internal consistency, a clearly defined structure, and external validity, regarding components of physical fitness (for a review, see Marsh, 1997, 2001). The PSPP originally was based on the self-concept model of Shavelson et al. (1976) and the research by Harter (1985). This instrument captures the physical self by using the four subvariables of: physical condition, physical strength, body attractiveness and sport competence, along with a fifth, more general, variable of physical self-worth. Fox (1998), in line with the theory of the hierarchical structure of the self, argues that there exist several measurable levels of the physical self and that it is of high theoretical importance to identify the level at which a measurement aims to operate. The four subvariables in PSPP are situated on a subdomain level (see previously presented Figure 2) whereas the fifth variable of physical self-worth is based on the higher domain level.

The PSPP has been shown to measure the perceptions of the physical self in a valid and reliable way (Fox, 1998; Fox & Corbin, 1989; Sonstroem, Harlow & Josephs, 1994; Sonstroem, Speliotis & Fava, 1992), and be relatively insensitive to social desirability effects (Sonstroem & Potts, 1996). Furthermore, the PSPP has been translated into several languages and has shown construct validity for different cultures (Aşçi, Aşçi & Zorba, 1999; Hagger, Ashford & Stambulova, 1998; Van De Vliet, Knapen, David, Onghena, Van Coppenolle & Fox, 2001). Moreover, research on versions of the PSPP for children and youths (CY-PSPP; Whitehead, 1995) have supported its hierarchical multidimensional factor structure and predictive and construct validity (Eklund, Whitehead, & Welk, 1997; Welk & Eklund, in press).

Studies that adopted a construct validity approach, using multitrait-multimethod analyses, have found support for both the convergent and discriminant validity of the PSDQ and the PSPP (Marsh, Marco, & Aşçi, 2002a; Marsh et al., 1994). Comparing the two instruments, it appears that, psychometrically, the PSDQ is the stronger, at least in Australian and Turkish samples. The primary problem, or weakness, of the PSPP seems to be associated with its idiosyncratic response style. This format asks the participants to respond to two contrasting descriptions of people and consequently choose which one of the two is "sort of true" or "really true" of themselves. This response style, originally constructed by Harter (1985) to reduce social desirability effects, has been linked to systematic method effects (e.g., Marsh et al., 2002b).

To accompany the PSPP, the Perceived Importance Profile (PIP) was developed. The purpose of this instrument was to measure the importance that individuals attach to the four subdomain variables of condition, strength, body attractiveness and sport competence. Drawing on the work of Harter (see previous section 2.8), which posits that individuals attribute different levels of importance to different

aspects of themselves, the PIP affords the possibility of investigating competence-importance discrepancies linked to facets of the physical self. Furthermore, Harter claimed that the concept of discounting, i.e. attaching a low importance to areas where low competence is perceived, should be seen as a vital self-enhancement strategy for the individual when protecting global self-esteem. Although results from studies using the PSPP on a wide range of populations tend to show patterns that support Harter's results and framework (see Fox, 1997) other researchers (Marsh, 1986a; Marsh & Sonstroem, 1995; Rose & Larkin, 2002) have consistently failed to find support for the use of importance-weighted average models or importance-discrepancy models in the prediction of self-esteem. However, one of the few domains in which the competence-importance interaction has gained some support (Marsh, 1986) is physical ability. Moreover, the importance ratings of the physical self-concepts have been related to exercise activity, which indicates that they may be more useful in predicting external criteria than global self-esteem (Marsh & Sonstroem, 1995). A problem generally found in the competence-importance research, in regard to both the physical self and other domains, is the use of single items when measuring importance ratings, which constitutes an evident psychometric weakness (cf. Marsh, 1986, Fox, 1998). This weakness could, to some extent, explain the gap between the promising theoretical underpinnings of the concept of importance and supporting empirical evidence.

With respect to the link between the domain component of physical self-worth and the subdomains, bodily attractiveness has been reported to be the factor that is related most closely to physical self-worth, with typical correlations of around $r = 0.7$ in most studies (see Fox, 1997). This mirrors the aforementioned well-documented close relation between appearance and the body to self-esteem and overall physical self-worth (Harter, 1993) and may, according to Sonstroem (1997a), be interpreted from at least three different viewpoints: (a) an attractive

body is, in the eyes of people, synonymous with physical self-worth and self-esteem; (b) an attractive body is perceived as being synonymous with health and health is perceived as closely related to self-esteem and self-worth; (c) the scales overlap due to the use of similar phrases, pride and confidence for instance, in the item construction.

As most models of the physical self heavily draw on the framework and model of Shavelson et al. (1976), the question of the multidimensionality and the hierarchical structure of the physical self is important. Whereas strong support for the multidimensional nature of the physical self now exists (see Marsh, 1997; Sonstroem, 1997a, 1997b), the question of the hierarchical nature of the physical self is more equivocal. Three different perspectives of the directional flow in the hierarchy have been proposed: a bottom-up model that hypothesizes a causal flow from the more specific aspects up to the global self-esteem (Shavelson & Bolus, 1982), exemplified by the EXSEM model; a top-down model stating that general global self-esteem generalizes “down” in the model to more specific aspects (Brown, 1993b); and a reciprocal flow model that posits flow in both directions (Marsh & Yeung, 1998). The few studies that have so far been conducted on the directional flow of the physical self provide little support for either the bottom-up or the top-down models, especially when PSPs are measured over time. Rather, support for a horizontal model, indicating that the self-concept factors at time 2 were primarily a function of their time 1 status (Kowalski, Crocker, Kowalski, Chad, & Humbert, 2003; Marsh & Yeung, 1998;), has been demonstrated.

3.5. Gender differences in body image, body dissatisfaction and physical self-perceptions

As stated by Smolak (2004): “Then there is the issue of gender. Body image, as well as its risk factors and outcomes, is a gendered phenomenon” (p. 25). A

wealth of studies have demonstrated that females are more critical of their bodies, overestimate their body size more and are more dissatisfied with their bodies than males (Bowker, Gadbois, & Cornock, 2003; Gray, 1977; Hueneman, Shapiro, Hampton & Mitchell, 1966; Loland, 2000; Miller, Linke & Linke, 1980). In fact, the overwhelming evidence for females' dissatisfaction with their bodies has led scholars to suggest the existence of a "normative discontent" with regards to women's weight (Rodin, Silberstein, & Striegel-Moore, 1985).

Furthermore, differences regarding the direction of body dissatisfaction have been observed. Dissatisfied females are more prone to see themselves as too big and heavy, whereas dissatisfied males have a tendency to perceive themselves as being too small and underweight (Moore, 1990). Overall, the evidence is robust for gender differences in body image in adolescents and children, with girls being more dissatisfied with their body and concerned with their weight (see Smolak, 2004). Studies on adolescents have also demonstrated that, although boys and girls showed comparable degrees of body dissatisfaction, the direction of this dissatisfaction was in a very different direction; an equal number of boys wanted to be thinner as heavier, whereas the majority of the girls wanted to be thinner (Furnham, Badmin, & Sneade, 2002). These trends are further reflected in studies in which females report lower body-esteem (in particular in relation to appearance and weight) than do males (Mendelson et al., 2001). A meta-analysis, using 222 studies ranging from the 1950s to 1998 (Feingold & Mazzella, 1998), found gender differences in all four measured categories; namely, physical attractiveness (rated by objective judges), self-rated physical attractiveness, body image/body satisfaction, and a mixed category containing self-evaluations of physical attractiveness or satisfaction with one's own physique. Even though females were, overall, objectively rated as more attractive, males rated themselves as more physically attractive than did females. Males also showed, overall, more positive body image and physical self-

evaluations, with average moderate effect sizes of about 0.50. The detected differences were most pronounced in adolescence and diminished in adulthood. Moreover, the gender differences in body image and self-rated physical attractiveness were significantly greater in studies published in the 1990s than pre-1970, which suggests that differences in how males and females perceive themselves, physically, seem to be increasing rather than decreasing.

Despite the fact that dissatisfaction with the body and awareness of cultural ideals of the body has been documented in girls as young as five years of age, which indicates that the foundations of body image and body dissatisfaction are laid very early in childhood, the development and onset of body image is not well understood (Smolak, 2004). However, it has been suggested that the ability of social comparison plays an important role in the development of the body image. In addition, it seems quite clear that the widely reported body dissatisfaction of females remains relatively stable across the life span, although the importance attributed to body appearance seems to decrease (see Tiggemann, 2004).

Translated into PSP, studies have constantly depicted females as having less positive PSP, lower scores on the PSPP subdomains, and a greater negative competence-importance discrepancy than males (Fox & Corbin, 1989, Hayes, Crocker & Kowalski, 1999; Sonstroem et al., 1992). Moreover, different links between the four subdomain scales and the mediating effect of physical activity have been identified between males and females (Hayes et al., 1999). All four subscales of the PSPP were associated with physical activity levels for males, but only Physical Conditioning was related to physical activity for females. Gender, and more specifically, gender role orientation, has also been shown to predict feelings about one's own appearance and athletic competence, with more feminine individuals who participate in competitive sport reporting lower

athletic competence and global self-worth (Bowker, Gadbois, & Cornock, 2003).

3.6. Explanations for gender differences in body image and physical-self-perceptions

Overall, in regard to the development of gender differences in body image, it is of great importance whether males and females have different experiences of their bodies and whether these experiences have different meanings (Smolak, 2004). Explanations of the consistent demonstrated gender differences in PSP and body image have been linked to different cultural expectations of males and females with respect to body ideals (Schwalbe & Staples, 1991; Striegel-Moore, Silberstein, & Rodin, 1986) and the fact that different images of males and females are disseminated and reinforced by the media (e.g., Harter, 1993; Smolak & Murnen, 2001). Moreover, from the perspective of social comparison, girls seem to engage more in social comparison regarding attractiveness attributes than boys (Jones, 2001). Males and females also seem to differ in how they perceive their body and the importance attributed to the appearance of the body through self-acceptance and self-esteem (Page & Fox, 1997). For example, in adolescents, body image dissatisfaction has been negatively related to self-esteem for girls but not for boys (Furnham, Badmin, & Sneade, 2002). In addition, the reasons for exercising seem to have different importance for males and females. Consistent gender differences have been demonstrated, with females exercising more for weight control, appearance, mood, and tone, and males more for fitness and competition/excitement (Furnham, Badmin, & Sneade, 2002; Ingledew & Sullivan, 2002; Markland & Hardy, 1993; Koivula, 1999b; Tiggemann & Williamson, 2000).

Following the demonstration that masculinity is strongly related to scores of self-esteem (e.g., Spence & Helmreich, 1978), some researchers have claimed

that differences in body dissatisfaction of males and females should be understood as consequences of differences in self-esteem, rather than as a results of gender-mediated socialisation (Forbes, Adams-Curtis, Rade, & Jaberg, 2001). It has also been demonstrated that physical attractiveness is more closely related to self-esteem and a more important determinant of popularity with the opposite sex for females than for males (Feingold, 1990, 1992). However, as a caveat to this suggestion, other meta-analytic reviews (Eagly et al., 1991; Langlois et al., 2000) have not found support for the hypothesis that the physical attractiveness stereotype is stronger for females than for males. Moreover, it has been suggested that males' masculinity, and thus indirectly self-esteem, is affected by different factors (assertiveness, competitiveness and control) than those affecting females' femininity and indirectly self-esteem, such as appearance, beauty and fitness (Bordo, 1994). In addition, the male body, if given attention at all, has traditionally been perceived as a performing active body, whereas the female body has, by contrast, been viewed as a passive object for critical scrutiny and evaluation against tough and unrealistic standards (as pointed out by Fredrickson & Roberts [1997], only 1 in 40,000 women actually meet the requirements of a model's size and shape). Thus, the male body, at least traditionally, may have been judged on the basis of what it does, whereas the female body is judged on the basis of what it is and how it looks (Bordo, 1994)

Providing a theoretical framework for the understanding of psychological experiences that seem uniquely female, Fredrickson and Roberts (1997) proposed an objectification theory. The theory places female individuals in a sociocultural context where she is viewed, and treated as, a body. Drawing on the previously discussed substantial empirical data demonstrating the different views of males and females towards the body, the theory holds that females are socialised into, or unconsciously forced into, an internalisation of an observer's perspective on the physical self, thereby seeing themselves, to some extent, as

objects to be evaluated and appreciated by others. The internalised perspective of viewing one's own body as an object may, for example, lead to increased body monitoring, shame and appearance anxiety (cf. previously discussed social physique anxiety) and have a detrimental impact on mental health, expressed, for example, in depression and eating disorders. Research has supported the central tenets of the objectification theory, linking body objectification in women directly to body shame, appearance anxiety, lack of psychological well-being and reduced self-esteem, decreased levels of intrinsic motivation and self-efficacy, and indirectly to eating pathology (Gapinski, Brownell, & LaFrance, 2003; Noll & Fredrickson, 1998; McKinley, 1999; Strelan, Mehaffey, & Tiggemann, 2003; Tiggemann & Slater, 2001). Furthermore, participation in sport or physical activity has been related to greater body shame (Parsons & Betz, 2001), which indicates either that participating in sport or physical activities may be one strategy females use to cope with their feelings of body shame, or that sport or physical activity may foster, or strengthen, pressure to live up to certain socio-cultural ideals of the body. In addition, reasons for exercise have been found to mediate the relationships between body-objectification, body esteem and self-esteem; females who rated appearance-related reasons (e.g., weight control or attractiveness) for exercise as important experienced higher self-objectification and lower body esteem and self-esteem (Strelan, Mehaffey, & Tiggemann, 2003). However, exercise and sport may also be perceived as a means of empowerment for females (Lindgren, 2002). Empowerment may be described as a social process of recognising, promoting and enhancing one's abilities to meet one's own needs, solve one's own problems and mobilise the necessary resources in order to feel in control of one's own life (Gibson, 1991). In this sense, exercise may serve as a powerful tool for enhancing the perception of individual control and competence, in particular for adolescent girls.

3.7. Cultural differences in body image and body dissatisfaction

A previous contention in research was that body dissatisfaction and eating pathology were exclusively, or primarily, western phenomena (see Striegel-Moore & Smolak, 1996). However, although a recent meta-analysis did confirm that white populations report significantly greater eating disturbance and body dissatisfaction than non-white populations, this seems to be true mainly when comparing whites to blacks rather than Asians (Wildes, Emery, & Simons, 2001). In fact, Asian samples reported more eating disturbances and body dissatisfaction than whites in the majority of the studies in the meta-analyses, providing strong support for the notion that concerns about body image, and consequently eating pathology, may today be found in cultures other (in particular Asian cultures) than the typical Western. For example, in China, a somewhat heavy body and filled-out physique used to give out positive signals, because it was perceived as a symbol of family, fertility and wealth. However, it seems that dramatic changes in cultural beliefs and ideals of beauty have occurred lasting recent years, which have resulted in substantial distortion of weight perception associated with increased levels of anxiety and depression in adolescents (Xie et al., 2003). It has been suggested that an intensified exposure to imported Western media, advertising and life-style, along with additional sociocultural pressure from peers and significant others are important potential explanatory factors for the rapid changes in self-perceptions of body weight (Xie et al., 2003). However, conversely, empirical support also exists for the notion that there indeed are cultural variations in the way individuals evaluate and relate to their body. For example, weight concern in relation to eating pathology has been documented primarily in female white populations (e.g., Crago, Shisslak, & Estes, 1996) in comparison to black females.

3.8. Cross-cultural measurement of, and differences in, the physical self- a question of equivalence

Returning to the previously discussed contentions of Helms (1992) and Duda and Hayashi (1998), the importance of conceptual equivalence and measurement equivalence across groups, such as gender, age and culture, has been stressed by several scholars (Byrne, 1996; Byrne & Watkins, 2003; Marsh, 1993). This issue is particularly relevant in regard to research on the self-concept, given the question of appropriateness for transferring the westernised concept of the self into non-Western contexts (e.g., Markus & Kitayama, 1991; Triandis, 1989). In exercise and sport psychology, the need for methodologically sound and valid cross-cultural studies has been recognised (Duda & Allison, 1990; Duda & Hayashi, 1998; Si & Chung, 2001). The importance of, and rationale for, conducting cross-cultural research in sport and exercise, thereby filling an apparent void in the contemporary field, rests on several notions (Duda & Allison, 1990; Si & Chung, 2001). For example, the overemphasis on a narrow range of populations (typically western societies) makes generalisations of theories and results cumbersome. Furthermore, culture and ethnicity may be important explanatory components in models of cognition, affect and behaviour in sport and exercise. Viewed in this light, it should be a high priority for researchers to develop instruments that may, validly and equivalently, be used to compare groups across cultures on, for example, the physical self. Looking at the physical self-domain, although several studies have found support for the underlying model of the PSDQ and the PSPP in different cultures (for review, see Fox, 1998; Marsh, 1997, 2001), few studies have simultaneously compared different cultures, which would thereby afford the possibility of examining measurement invariance of the physical self. However, a recent cross-cultural study, across three national (British, Russian and Hong-Kong) adolescent samples, found support for the generalisability of the hierarchical and multidimensional model of the physical self of Fox & Corbin (1989), which

underlies the PSPP (Hagger, Biddle, Chow, Stambulova, & Kavussanu, 2003). Moreover, although factor pattern and model parameters were invariant, latent means differences were demonstrated, with the British samples reporting significantly higher scores on all PSPP subdomains, in addition to physical self-worth and global self-esteem, than the Russian and Hong-Kong samples. Similarly, support for the cross-cultural generalisability of the factor structure for the PSDQ was found (Marsh, Marco, & Aşçi, 2002a) across samples from three countries (Australia, Spain and Turkey). However, no comparison of latent means was here conducted.

4. Exercise

4.1. A history of exercise

There seems little doubt that: (a) through evolution, the human body has become adapted for physical activity; and (b) even across substantial technological and cultural changes, the part of our genome that determines anatomy and physiology has remained relatively stable for the last 40,000 years (Cordain, Gotshall, Eaton, & Eaton, 1998). Thus, it is not surprising that physical activity and exercise have been central components of a healthy life for individuals throughout the history; from the pre-agricultural period 10,000 years ago until the present (Blair, 1988). In ancient Greece, an athletic ideal that focused on a sound balance and harmony between a trained body and enlightened soul was established. Consequently, exercise and physical training constituted an essential part of a healthy and good life, making athletes a highly respected group (Annerstedt, 1989, Blom & Linderöth, 1995). The importance of exercising the body was also highlighted in the mid-19th century movement called “Muscular Christianity”, which focused on the development of a fit and muscular body as a means of worshiping God, showing that the individual took care of the body in a proper way. Similarly, in Sweden, the gymnastic-system of Ling, incorporating

different structured natural body movements, had a major impact as a public movement in putting exercise on the agenda. The purpose and development of both the Muscular Christianity movement and the gymnastic system of Ling were related strongly to building strong character and identity, and hence on developing potent citizens for nationalistic and collectivistic reasons (see Johansson, 1998). The trend through the mid 20th century up to the present, however, has shifted from collectivistic reasons for exercising towards more individualistic, such as the responsibility of the individual to improve/maintain his/her own health and well-being. An important means of achieving this goal is afforded by the regular and systematic use and maintenance of the body that exercise offers. In Sweden, the impact of this trend is, for example, expressed in the major growth and development of gymnasiums and exercise facilities during the last 30 years (see Johansson, 1998; Söderström, 1999). On a national level, the recent health campaign of “Sweden on the move-2001” further emphasized the value and importance attributed to regular exercise as a means of gaining public health benefits.

4.2. Physical activity vs. exercise

The concepts of physical activity and exercise are often used interchangeably and an overlap between them is often noted (Biddle & Mutrie, 2001; Buckworth & Dishman, 2002). Physical activity is the broader concept and has been defined as any bodily movement produced by skeletal muscles that results in energy expenditure (Caspersen, Powell, & Christenson, 1985). Exercise, on the other hand, is viewed as a subtype of physical activity that consists in planned, structured, repetitive bodily movements in which people engage for the conscious purpose of improving or maintaining physical fitness or health. In the present work, the focus is foremost on exercise.

4.3. The effects of exercise on health

The physiological and medically beneficial effects of exercise and physical activity on health are well established and widely recognised. Physical activity has been linked to overall healthy living and longevity, and providing protection against coronary heart diseases and stroke, obesity, hypertension, osteoporosis and diabetes (US Department of Health and Human Services, 1996 (USDHHS). The role of exercise in the facilitation and maintenance of positive mental health and well-being is today also well documented (for reviews, see Biddle, 2000; Boutcher, 2000, Mutrie, 2000; Taylor 2000). As mental illness constitutes one of modern society's most serious health problems (both in regard to premature death, human suffering as well as financial costs), the recent documented link between physical activity, exercise and mental well-being is highly significant (see Biddle & Mutrie, 2001; Fox, Boutcher, Faulkner and Biddle, 2000; Morgan, 1997).

4.4. Mechanisms

Several mechanisms have been suggested to explain the positive relationship between physical activity and mental health (Salmon, 2001). In addition to a number of bio- and neurochemical factors, two of the most common discussed psychological, or psychosocial, mechanisms are: (a) a distraction hypothesis, which proposes that the time-out associated with physical activity or exercise may function as a vital and health distractor from destructive and unsound thoughts, rumination, and stressors and hassles of everyday life, thereby contributing to the perceived mental health effect; and (b) a mastery hypothesis, that the sensation of being able to master a highly valued task (e.g., running 10Km without stopping or managing to follow an aerobic-class) may facilitate, for instance, the enhancement of mood or self-esteem (Biddle & Mutrie, 2001; Buckworth & Dishman, 2002; Petruzello et al., 1991). Providing support for the latter mechanism, the role of coping self-efficacy as a mechanism in the positive

effect of exercise on depression, has recently been demonstrated (Craft, in press). The same study also provided partial support for the hypothesis that reduction in ruminative strategies would follow from exercise, reflecting the distraction hypothesis. From a psychobiological perspective, the effects of exercise on, for instance, stress tolerance and resilience, may be explained using a conditioning-based theory of counterconditioning (Lees & Dygdon, 1988; Salmon, 2001). Drawing on classical conditioning theory (e.g., Schull, 1979), this theory describes how initially aversive stimulus (e.g., negative physiological, psychological or social experiences from the first run or aerobic class) may be transferred to positive motivational and emotional attributes through the association of later physical and, in particular, social reinforcers (e.g., praise and envy from others) linked to the exercise experience. However, it is very unlikely that one single theory will suffice to explain the effects of exercise on mental health. Rather, the various biochemical and psychological mechanisms underlying the somatopsychic processes that create the perceived mental health effects probably overlap and work together in a complex pattern that also is affected by the cultural and social context in which exercise occurs (La Forge, 1995, Salmon, 2001).

4.5. Motives for exercising

In the context of the physical self, different motives for exercising have been outlined in the research. Population surveys have typically revealed the most important motives for physically activity/exercise to be “to feel in good shape physically”, “to improve or maintain health” and “to feel a sense of achievement” (e.g., The Sports Council and Health Education Authority, 1992). Moreover, for females, weight control and motives related to physical appearance have also been reported as significant. In the mainstream sport and exercise psychology research, the most common motives/reasons utilised in questionnaires and tests are these: exercising for interest/enjoyment,

competence, fitness, body-related motives such as weight control, improving body tone and overall physical attractiveness, health/health pressures, ill-health avoidance, stress management improving mood, affiliation, challenge, competition, revitalisation, and social recognition (Markland & Hardy, 1993; Silberstein, Striegel-Moore, Timko, & Rodin 1988). These various motives/reasons for exercise seem to have different importance at different stages of exercise, with motives concerning appearance and weight-control being more pertinent in the initiation-stage, and enjoyment and revitalisation being more important for progression to the maintenance of regular exercise (Ingledeu, Markland, & Medley, 1998).

4.6. Motives for exercising: A socio-cultural perspective

As stated by Fredrickson and Roberts (1997): “Bodies exist within social and cultural contexts...”(p.174). Hence, in addition to the previously mentioned theoretical frameworks on motives and exercise, it may be useful to consider an alternative, more socio-cultural perspective. Indeed, the self-perceptions and self-esteem of the individual are closely linked to social and cultural ideals, which through early socialisation are adopted and integrated in the self-system and hence influence its function. It has been suggested, primarily in the sociology literature, that the focus on exercise and the maintenance of the body, at least from an individualistic perspective, reflects the development of modern society, culture and, more specifically, the central values and attitudes of present-day Western lifestyles (e.g., Johansson, 1998; Featherstone, 1991; Söderström, 1999; Turner, 1992).

In the pursuit of the highly-valued fit and attractive body (the athletic ideal), the three areas of diet/nutrition, exercise, and plastic surgery provide the most commonly used tools (Brownell, 1991a). Two assumptions are made in the search for the “better” body: (a) the body is malleable (i.e., with the right

training programme. everybody can succeed), and (b) the effort will be worthwhile in the end, that is, substantial rewards await. The latter notion receives empirical support from the fact that physical attractiveness and outer appearance are, in the eyes of the people, naturally associated with highly prized personality traits and characteristics, such as social competence, potency and adjustment (Eagly, Ashmore, Makhijani, & Longo, 1991; Feingold, 1992; Langlois, Kalakanis, Rubenstein, Larson, Hallam & Smoot, 2000). Thus, it seems correct to view exercise as a means of affecting and manipulating the outer appearance, and, indirectly, obtaining the aforementioned associated benefits.

The perfect body has more than purely physiological or aesthetic significance. The perfect, or fit, body stands as a symbol for control and discipline, which are two highly esteemed virtues in modern society (Brownell, 1991a, 1991b). Put differently, a fit body sends signals to the surrounding that the owner has self-control and is a disciplined hard-worker. In contrast to, for instance, cosmetic surgery (Davis, 2002), exercise may constitute an activity in the pursuit of which individuals, especially men, can learn, foster, and maintain self-control, which leads indirectly to an increased sense of pride, self-worth and competence (Bordo, 1994). Through incorporating these ancient virtues into the lifestyle, the individual may control, discipline, and hence sculpt, the body to conform to the overarching body ideals of the modern era (i.e., slender, slim, muscular and fit), ensuring him/her substantial internal, as well as external, rewards (Brownell, 1991a; Johansson, 1998). In addition, some have argued that exercise is indirectly linked to moral behaviour, and that an active lifestyle has become a moral obligation in westernised cultures (White, Young & Gillett, 1995). This notion is captured by the following excerpt of Brownell (1991b): “Self-management, hard-work, delay of gratification, and impulse control are qualities projected on people with the right body. People with the wrong bodies, those

overweight and unfit, are thought to be indulgent, lazy, and lacking control.” (p. 304)

4.7. The exercise stereotype

Linked to the above quotation from Brownell, and the widely acknowledged physical attractiveness stereotype (Eagly et al., 1991; Langlois et al., 2000), it seems pertinent to ask how exercise-related information and impressions may affect others’ evaluation of the individual. Research has demonstrated that information regarding people’s exercise habits has been shown to affect the impressions that others form of them (Hodgins, 1992). More specifically, targets described as fit and regular exercisers were rated more favourably on a variety of personality variables than were people described as not regular exercisers and not fit. Supporting these results, later research (Martin, Sinden & Fleming, 2000; Martin Ginis, Latimer & Jung, 2003; Lindwall & Martin, 2003) demonstrated that, when manipulating exercise information, male and female targets described as regularly engaging in vigorous, structured exercise (i.e., typical exercisers) were perceived as fitter, stronger, healthier, more muscular and more physically attractive, compared to non-exercising targets or controls. In addition to this, exercisers were also rated more favorably on non-physical attributes such as self-confidence, sociability, self-control and being a hard worker, compared to non-exercisers and controls. The finding that exercisers are perceived more favourably than nonexercisers regarding attributes that are not typically related to exercise behaviour per se (e.g., self-confidence, sociability) suggests that there may also be a halo effect (Cooper, 1981) for exercise. That is, people may form general, positive impressions of exercisers, which in turn positively bias their evaluations of all aspects of the exercising target, not just those related to exercise.

5. Exercise and the self

5.1. The self and the environment: Two perspectives

When considering possible explanations for the effects of any intervention on a specific factor, it is relevant to examine how that factor interacts with the environment. It has been suggested that self-esteem interacts with the environment in a two-way bi-directional process, i.e. individuals are influenced, for good or bad, by the environment, but also operate on it, consequently affecting its influence on them. From this reasoning, two different hypotheses have been derived: the Skill-Development hypothesis (SDH) and the Self-Enhancement hypothesis (SEH; Marsh, 1986b; Sonstroem, 1997b, 1998). The SDH suggests that by experiencing success and receiving rewards, people feel better about themselves and strengthen their perceived competence. Related to exercise and physical activity, the SDH holds that improvements in physical fitness or skills, which result, for example, from following a programme of exercise, will lead to an enhanced sense of the self. Conversely, in accordance with the SEH, a high self-esteem may operate on the environment to maintain its status, i.e. people with a high self-esteem tend to behave in accordance with their self-image in order to confirm it. Furthermore, it has been suggested that the development and evaluation of the self are affected by social and cultural factors. In this process, external standards, such as referred appraisal and social comparison, are important (Sonstroem, 1998). Referred appraisal describes how individuals think that significant others perceive them and how this, in turn, affects their self-image. Social comparison is the tendency for individuals to observe others and compare themselves with others. Hence, the social context has a significant impact on how people perceive and evaluate themselves. A phenomenon that illustrates the power of the social comparison standard is the “big-fish-little-pond” effect (e.g., Marsh, 2000), which demonstrates how

physically fit and active individuals may perceive their physical competence as being lower than that of non-active individuals due to a tougher framework of comparison (e.g., training together with, or in the same facilities as, even fitter persons).

5.2. Models and meta-analyses

While there is a significant amount of anecdotal evidence for the positive effects of sport, exercise and physical activity on the self, little robust scientific evidence from well-designed and well-controlled studies exists (Buckworth & Dishman, 2002; Fox, 2000a). Self-esteem is a frequently mentioned concept, both in the context of being a key mechanism in the general positive effect of exercise on depression and anxiety, and also for being a highly valued outcome of exercise in itself (Fox, 2000a). Two key questions seem particularly relevant within this framework: (a) What are the effects of exercise on self-esteem? and (b) What are then the underlying mechanisms of the postulated relation?

One of the first models to link PSP and self-esteem to exercise was presented by Sonstroem (1978, 1997a). The search for a variable mediating the association between fitness and self-esteem, thus functioning as a bridge between the physical world of activity and the psychological state of self-esteem, resulted in the Psychological Model for Physical Activity Participation (see Figure 3). The model claims that participation in physical activity produces increased physical ability/fitness, which in turn brings about psychological benefits as reflected in positive changes in self-esteem. This alleged change in self-esteem is mediated by the factor estimation, i.e. perceived physical competence and attraction. Consequently, increased fitness/physical ability would result in the enhancement of self-esteem in conjunction with increased perceived physical competence and attraction, which would lead to increased physical activity. Moreover, the model holds that people tend to engage in modes of behaviour that will maintain their

positive self-esteem and that the drives towards self-enhancement and self-development are powerful motivational human forces that constantly affect our lives. Hence, the model may be viewed as based both on the skill-development and the self-enhancement hypotheses. The validity of the model has been tested with mixed outcomes. On the one hand, studies have demonstrated that estimation is related to physical fitness (Sonstroem, 1974, 1978), but on the other hand few studies have attempted, or managed, to show that increases in physical fitness cause increases in estimation. Relations between estimation scores and self-reports of exercise have been found (Fox, Corbin & Couldry, 1985, Sonstroem, 1978), although the model in general not has been effective at predicting exercise adherence.

Mirroring the above-mentioned positive relation between sport/exercise and body image, Sonstroem (1984) found in a narrative review of 16 studies that participation in exercise programmes was linked to increased self-esteem scores.

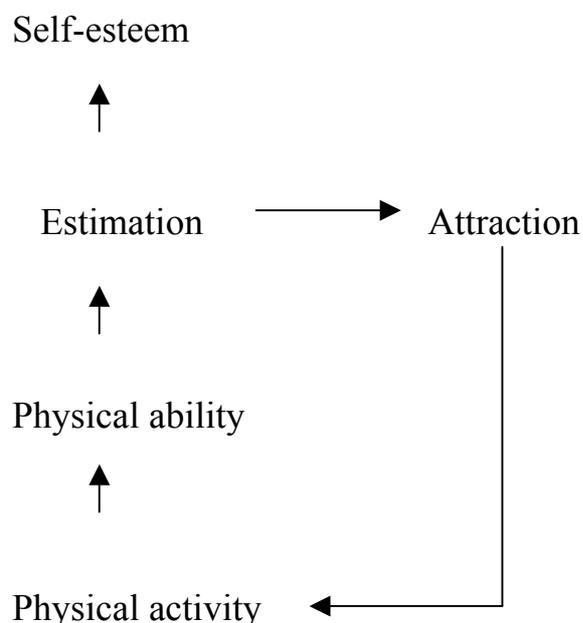


Figure 3. A psychological model for physical activity participation. Adapted from Sonstroem, (1978).

However, as only 10 studies included control groups, only four studies had a randomized design, and half the studies contained 20 or fewer participants in the experiment group, the result of this review should be interpreted with caution.

Later on Fox (2000b) conducted an extensive meta-analysis of studies on exercise and self-esteem since 1970. Fox, compared to Sonstroem (1984), focused specifically on randomised control trials (RCTs). The reason for choosing RCT's was principally to recognise and overcome the previous difficulties in research on self-esteem of separating main effects from social desirability, expectancy, self-presentational strategy, pleasing the research leader, and temporary versus lasting effects. In the meta-analyses, 36 RCT's were found. In addition to this, 44 non-randomised studies were identified for further consideration. The major conclusions drawn from this study were: (a) exercise is a valuable tool for increasing and maintaining physical self-worth and other PSP, as 78% of the RCTs demonstrated a significant positive change in physical self-esteem; (b) half the studies showed no change in global self-esteem, although there were improvements shown. Hence, changes in self-esteem do not seem to be automatic consequences of exercise; (c) positive effects were demonstrated for all age groups, but the effects seem to be greatest and clearest for children and middle-aged adults; (d) positive effects were shown both for women and men (however, as females constantly rate themselves lower on self-esteem, body image and physical self-worth, the facilitating effects may be greater for females); (e) weight training and aerobic training had the greatest impact in the short term, although a variety of other types of exercise also seem to have this beneficial effect on self-esteem; (f) the effects of exercise are greatest for individuals with previously low self-esteem.

Based on the seven postulates of Shavelson and colleagues (1976), Sonstroem and Morgan (1989) presented a model for examining the mechanisms of self-esteem change through exercise (adopting a perspective that uses hypotheses about skill-development). The model, called “Exercise and Self-Esteem Model”, explains how specific bouts of sport and exercise are translated into increased global self-esteem. The key constructs of this model are physical self-efficacy, physical competence, physical acceptance and general self-esteem. Physical self-efficacy plays a special role in this model, because it is viewed as the first cognitive link between higher-order psychological self-constructs (such as the four subdomains of PSPP, physical self-worth and global self-esteem) and actual behaviour (Sonstroem & Morgan, 1989). The notion of physical self-efficacy stems from the work of Bandura (1977, 1997) on his more general self-efficacy construct. It here denotes the strength and level of belief that one can perform a given physical task successfully. Physical competence refers to the broader perceptions and evaluations of one’s body and its capacity, i.e. a sort of overall more stabile summation of various physical self-efficacies. Physical acceptance refers to the perceived satisfaction the individual feels about different parts of his/her body. The rationale for implementing physical acceptance and competence into a self-esteem/exercise model is that self-perceptions of one’s body often tend to be closely related to general self-regard (cf. Harter, 1993; Feingold, 1992). Starting at the base of the model, objective evaluations of physical performance, enhanced through training, lead to an increased sense of physical self-efficacy (which is the first self-perception concept in the model and thus represents the bridge between the physical world and the perceptions of the physical self in the human psyche). Moving up in the model, increased physical self-efficacy influences the closely related physical competence and physical acceptance that are believed to affect global self-esteem. Later on, in relation to the development of the PSPP, Sonstroem, Harlow and Josephs (1994) expanded the Exercise and Self-Esteem Model through the implementation of

the four PSPP subdomain variables of sport competence, condition, strength and body attractiveness and the fifth, general, domain physical self-worth (see Figure 4), naming it “EXSEM” to separate it from the old model. Hence, the previous unidimensional concept of physical competence in the old model was replaced with a multidimensional concept of physical competence, which gives the model enhanced strength and potential for detecting mechanisms that underlie links between exercise and self-esteem and provides greater opportunities to test the discriminant validity of the model and to link it to external criteria (Sonstroem, 1997a). The validity of both the old model and, in particular, the new one, has received support or partial support in several studies (Alfermann & Stoll, 2000; Sonstroem, Harlow, Gemma & Osborne, 1991; Sonstroem, Harlow & Salisbury, 1993, Sonstroem et al., 1994). With regard to the link between physical self-efficacy, the PSPP subdomain variables, physical self-worth and self-esteem, it seems that physical self-efficacy is most closely related to the condition variable, whereas body attraction relates most strongly to physical self-worth, and thus indirectly to global self-esteem (Aşçi, Aşçi & Zorba, 1999; Sonstroem et al., 1994). Consequently, viewed from an applied perspective, these trends seem to imply that the physical self perception subdomains that are most related to physical self-efficacy, and thereby easiest to change, (physical condition) are not the same ones that are most highly related to the higher levels of general physical self-worth and self-esteem (body attractiveness).

5.3. Mechanisms

Several potential mechanisms for the positive effects of exercise on self-esteem and PSP have been suggested (Fox, 2000a, 2000b; Sonstroem, 1997a): (a) an unidentified psychophysiological factor that increases mood and self-regard; (b) enhanced body image, body satisfaction and body acceptance in relation to weight loss or increased muscle tone and fitness; (c) enhanced physical

competence through improved skills, abilities and fitness; (d) increased sense of effectiveness, self-determination and control over body functioning and increased sense of autonomy; (e) enhanced self-acceptance; and (f) improved feelings of belonging to a group and having relationships within the exercise group.

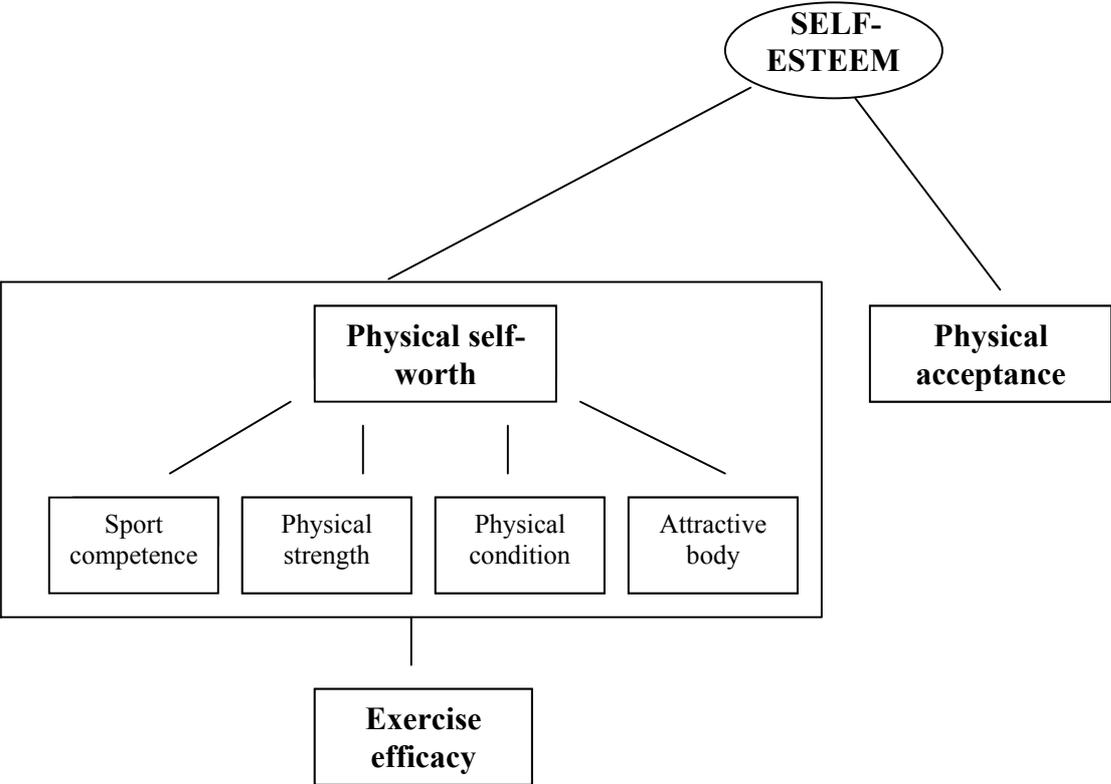


Figure 4. The expanded EXSEM model using the PSPP. Adapted from Sonstroem, Harlow & Josephs (1994).

In addition to this, several artificial, methodological factors linked to the research design may, at least partially, explain some of the effects of exercise on self-esteem (Morgan, 1997). Two such factors associated with the expectations of the experimenter are the Rosenthal effect and demand characteristics. The

Rosenthal effect entails a self-fulfilling prophecy that tends to make participants improve with respect to the dependent variable due to expectations communicated by the experimenter, whereas demand characteristics involve the tendency for the participants themselves to identify the purpose of the study in order to accord with it. In addition to this, the Hawthorne effect, which refers to the improvement in a variable because participants received special attention, and placebo-effects (cf. Desharnais, Jobin, Coté, Lévesque, & Godin, 1993; Ojanen, 1994) may also moderate any demonstrated effects.

5.4. Body image and exercise

Together with low self-esteem, body dissatisfaction has revealed itself as one of the most consistent and robust predictors of eating pathology (Cash & Deagle III, 1997; Polivy & Herman, 2002; Stice, 2002). It seems pertinent to consider how sport and exercise participation may affect body image, given, on the one hand, the reported robust association between body image/dissatisfaction and eating disorders, and, on the other hand, the inconsistent results linking sport and exercise to eating disorders. The relationship between body image and exercise is complex, especially regarding females (e.g., Davis, 1997). For example, successful weight loss and moderate exercise may lead to enhanced body-esteem and self-esteem, (cf. the previously discussed EXSEM-model), whereas excessive exercising in combination with eating pathology can involve very detrimental effects on body-image and health for some individuals (Hausenblas & Carron, 1999; Hausenblas & Symons-Downs, 2002; Szabo, 2000). Some studies investigating the link between body image and sport/exercise participation found no differences in body image disturbances between exercisers and non-exercisers (Davis & Cowles, 1991), whereas others found that exercise is related to reductions in body-image disturbances, and more favourable evaluations of physical appearance, fitness and health (Bane & McAuley, 1996; McAuley, Bane & Mihalko, 1995). Looking at the effect of the

interaction between age and exercise on body satisfaction, satisfaction with bodily appearance has been shown to increase with age for moderately/highly physically active individuals but decrease for inactive individuals (Loland, 2000). Regarding gender differences in the relation between exercise and body image, it has been found that exercise behaviour predicts body satisfaction for males, whereas other factors, such as body mass index (BMI), predicts body satisfaction for females more strongly (Hausenblas & Fallon, 2001; Loland, 2000). A meta-analytic review, incorporating 78 studies, demonstrated a small effect, indicating that athletes had a more positive body image than nonathletes (Hausenblas & Symons Downs, 2001).

5.5. Exercise and social physique anxiety

Overall, studies show that exercise and physical activity are related to levels of SPA (for reviews, see Hausenblas, Brewer, & Van Raalte, 2004; Martin Ginis & Leary, 2004). Specifically, SPA has been linked to all of exercise participation, exercise attitudes (Crawford & Eklund, 1994; Lantz, Charles; & Ainsworth, 1997; Spink, 1992), and reasons for exercise (Eklund & Crawford, 1994). Greater exercise has been shown to predict higher body satisfaction and lower SPA for males, whereas BMI seems to be a stronger predictor of SPA for females (Hausenblas & Fallon, 2002). However, the direction of the SPA-exercise relationship remain unclear as SPA has been identified both (i) as a potential barrier to exercise, due to concerns of showing one's physique to others in an exercise setting, and (ii) as an incentive or motive to exercise in order to reduce SPA *via* the development of a fitter and more attractive physique (see Martin Ginis & Leary, 2004). Given the equivocal findings in studies examining the relation of physical activity and SPA, it has been suggested (e.g., Gammage, Hall, & Martin Ginis, in press; Sinden, Martin Ginis, & Angrove, 2003) that other variables, such as levels of self-presentational-efficacy may moderate or mediate this relationship.

Only a small number of studies have examined the effects of exercise intervention programmes on SPA. The results have, in general, shown that exercise interventions may reduce levels of SPA. More specifically, an intervention study conducted over five months demonstrated that exercise participation effectively reduced SPA, and that changes in efficacy and outcome expectations predicted reductions in physique anxiety for sedentary adults (McAuley, Bane, & Mihalko, 1995). Similarly, women taking part in an aerobic exercise course significantly reduced their SPA and increased their body esteem over a 10-week period, whereas no such effects were found for the control group (Bartlewski, Van Raalte, & Brewer, 1996). Reduction of SPA has also been found in shorter (six-week) circuit training programmes (Williams & Cash, 2001). However, most of these studies have adopted quasi-experimental or pre-post designs, which constitute a threat to the validity of the results and render interpretation of the results more complex (Hausenblas et al., 2004). For example, the SPA levels of participants in control groups (enrolled in a developmental psychology course) and of participants in various exercise classes have been found to decrease to a similar degree (Diehl & Petrie, 1995). Hence, it is of great significance to search for those mechanisms in the exercise intervention that may account for the positive effects on SPA. Bartlewski et al. (1996) suggested three potential mediators of the effects of exercise on SPA and concerns about self-presentation. First, familiarity with the exercise setting may affect body concerns and SPA. Second, changes in SPA may be seen as a natural consequence of physiological changes resulting from the exercise programme, such as weight loss and increased muscle tone. Finally, positive SPA changes due to exercise may go hand in hand with changes in other psychological components, such as the self-concept (Fox, 2000a). Moreover, social support, reductions in state anxiety following exercise, and repeated exposure to sources of anxiety (e.g., other people in gyms or locker rooms or mirrors in the gym)

have been mentioned as potential mediators of the exercise-SPA relationship (Carron, Burke, & Prapavessis, 2004; Hausenblas et al., 2004).

5.6. The role of physical self-perceptions in motivation for exercise

As the impact of the self-concept is so pervasive, many motivational theories predicting exercise participation have been built around self-perceptions and have clear relevance for the understanding of the physical self (Biddle, 1997; Fox, 1998). Examples of these theories include the following: effectance motivation (White, 1959), competence motivation (Harter, 1978), self-schema (Kendzierski, 1994), self-presentation (Leary, 1992), self-efficacy (Bandura, 1977, 1997), and self-determination (Deci & Ryan, 1985).

5.6.1. Harter's competence motivation theory

Developing the framework of White (1959) on effectance motivation, Harter (1978) further emphasised the importance for motivation of demonstrating competence in achievement domains, especially those deemed to be significant to the individual. In her theoretical framework, she related self-perceptions of competence to motivation and the concept of control. According to the theory, individuals will experience positive emotion and low anxiety if they are able to successfully master a task in conditions under which an internal locus of control is perceived. Moreover, the theory predicts that individuals whose self-perceptions of their physical ability are high will be more likely to take part in exercise and physical activity, because this affords the possibility of demonstrating competence. Hence, individuals with positive PSP and an internal locus of control should be more motivated to participate in exercise and physical activity and more likely to actually participate. Following these arguments, a positive cumulative effect (similar to a “snowball” effect) might occur for people already high in self-esteem and PSP, as they, through their increased

motivation to, and participation in, exercise will probably reap further benefits that are linked to their self-image from the experience. By contrast, people initially low in self-perceptions may instead stay away from exercise as the opportunity to demonstrate competence and control the task, initially at least, may be scarce. As a result, their perceived physical competence may remain low, constituting a barrier for starting exercising. These predictions have been supported in research (Weiss, 1987).

5.6.2. Exercise self-schemata

Closely linked to self-perceptions and motivation is the concept of self-schemata (Markus, 1977). This social-psychological construct is defined as "a cognitive structure that represents knowledge about a concept or type of stimulus, including its attributes and the relations among those attributes" (Fiske & Taylor, 1991, p. 98). Hence, self-schemata focus on how people describe and perceive themselves, which self-descriptions and self-perceptions, according to the theory, will affect their behaviour. Transferring the concept of self-schemata to exercise settings, Kendzierski (1990a, 1990b, 1994) identified and separated three types of individual: exerciser schematics, nonexerciser schematics, and aschematics. The exerciser schematics describe themselves as typical active exercisers and value these perceptions as important to their self-image, whereas nonexerciser schematics perceive these aforementioned exercise-related constructs as atypical of themselves, yet value their importance. Aschematics, on the other hand, neither perceive statements such as being an exerciser as suitable descriptions of themselves, nor attribute any importance to them. Studies have found that exerciser schematics were more likely to start exercise and reported higher levels of exercise than did the other two groups (Kendzierski, 1988, 1990b).

5.6.3. Self-presentation

From a self-presentational perspective (cf. Leary, 1992, 1995), it is relevant to discuss the link between physical-self-perceptions and motivation for exercise, and such discussion may provide an increased understanding of why individuals invest time and energy in sport and exercise. In the search for the social approval of others, presenting the exercise-related impressions to the surrounding milieu may offer the individual significant advantages. Leary (1992) linked the concept of self-presentation to sport and exercise and argued that people express two motives in particular for exercising that reflect self-presentational motives: (i) improving or maintaining a highly valued physical appearance and (ii) maintaining their social identities as athletic types, thereby gaining continued social praise for being fit and athletic. Furthermore, Leary proposed that self-presentational factors may influence several physical activity and exercise parameters, such as choice of physical activity, exercise and sport context, expressed and/or real degree of effort and exertion and specific psychological phenomena linked to performance, such as choking under pressure and self-handicapping.

In general, later studies have provided preliminary support for the notion that self-presentation is related to exercise cognitions, attitudes, and behaviour (for a review, see Hausenblas et al., 2004). Specifically, recent research, using the Self-Presentation in Exercise Questionnaire (SPEQ; Conroy, Motl, & Hall, 2000) has shown that SPEQ scores are related to self-reported exercise frequency (Conroy et al., 2000; Conroy & Motl, 2003; Lindwall, 2003), exercise duration and exercise identity (Lindwall, 2003). Based on the components of the Leary & Kowalski (1990) model, it seems likely that self-presentational motives, strategies and processes are associated with perceptions of competence, but even more clearly with competence/importance discrepancies linked to the physical self. In this context, awareness of low competence in a highly valued

domain may influence motives to manipulate others' impressions and subsequently self-presentational-awaken behaviour. Conversely, being high in the dispositions of public-self-consciousness and impression management, or being present in an evaluative situation (e.g., a gym, in an exercise class, or in a PE class at school for youths) that provokes self-presentational-laden cognitions and emotions, may lead to competence/importance perceptions, and feelings of inadequacy.

5.6.4. Self-efficacy

Self-efficacy is one of the most investigated concepts within sport, exercise and health-psychology (Bandura, 1997). Bandura (1986) defined it as: "people's judgements of their capabilities to organise and execute a course of action required to attain designated types of performances" (p. 391). In the broad theoretical framework surrounding self-efficacy, a distinction between "efficacy expectations" and "outcome expectations" is drawn. Efficacy expectations denote the individual's belief, in a specific situation, that (s)he can execute the behaviour in question. Outcome expectations, on the other hand, refer to the belief that a successful execution of the behaviour will lead to certain outcomes (e.g., improved fitness or an attractive physique). From a motivational perspective on the physical self, this distinction is important (e.g., McAuley & Mihalko, 1998), as the two dimensions may have different effects on the initiation and maintenance of, for example, exercise behaviour. Extended research has consistently shown that exercise-related self-efficacy is linked to choice, effort, persistence, and emotional dimensions of exercise behaviour, which makes it an important determinant of physical activity and exercise (for a review, see Bandura, 1997; McAuley & Mihalko, 1998). More specifically, both long-term exercise participation and acute bouts of exercise seem to enhance cognitions of self-efficacy (McAuley, Courneya, & Lettunich, 1991). Although clearly distinct from the concepts of self-perceptions and self-esteem, self-

efficacy, being focused on specific domains or situations has, both theoretically and empirically, been linked to more general perceptions of competence, acceptance and global self-esteem (Sonstroem & Morgan, 1989; Sonstroem, Harlow & Josephs, 1994). Thus, exercise-related self-efficacy plays a crucial part in the link between exercise behaviour and global self-regard.

5.6.5. Self-determination theory

The self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) was developed from the more narrow cognitive evaluation theory (CET: Deci & Ryan, 1985). According to the CET, peoples' intrinsic motivation will depend on their feelings of competence and perceptions of locus of causality and autonomy. Self-determination theory emphasises the role of three basic needs: competence, autonomy, and relatedness to intrinsic motivation. More specifically, it focus on how activities that are initially uninteresting and boring may become internalised, and perceived as rewarding and interesting, if they are deemed to be important for social functioning. The theory posits that self-determination ranges from amotivation (lack of motivation), through four types of extrinsic motivation, to intrinsic motivation. Different types of behaviour can be placed between these poles, depending how internalised the behaviour is. This means that a person's motivation towards exercise behaviour changes gradually, rather than directly, from primarily external contingencies in the initiation-process towards intrinsic motivation in later stages. Empirical support for the validity of the self-determination continuum has recently been documented in studies (Wilson & Rodgers, 2002) and in a meta-analysis (Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003). Linked to PSP, it has been suggested that self-determination theory may provide a vital missing link between self-esteem and behaviour (Biddle, 1997). In particular, in situations where direct rewards and paybacks to the invested behaviour are lacking, which makes the self-enhancement theory invalid as a source of explanation, the self-

determination theory may be helpful. In the initiation process, for instance, people who start exercising primarily for expected future psychological and social benefits (e.g., appearance- or health reasons) rather than for a direct physiological payback, may, through internalising the prior external motives to intrinsic regulations, justify their investment and maintain motivation for their behaviour long enough for them to reap other highly-valued benefits, such as more positive perceptions of their physique and, eventually, a heightened sense of self-esteem. This line of reasoning has been supported by the demonstration of a pattern of positive relationship between more autonomous and intrinsic exercise motives and higher physical self-perception and physical self-esteem (Boyd, Weinmann, & Yin, 2002; Wilson & Rodgers, 2002). For example, females who endorsed intrinsic reasons, or regulations closer to the intrinsic side of the continuum, reported higher (more positive) perceptions of their physical self-worth than females using more external regulations (Wilson & Rodgers, 2002). Similarly, PSP has been positively related to intrinsic motivation criteria such as interest/enjoyment, competence and effort/importance, whereas it was negatively related to perceptions of tension/pressure during exercise (Boyd et al., 2002).

5.7. Physical self- perceptions, exercise involvement and sport participation

Supporting Sonstroem's (1978) Psychological Model of Physical Activity Participation, research using the PSPP has consistently documented that individuals with higher (i.e., more positive) PSP are more likely to be physically active and exercise regularly (Fox & Corbin, 1989; Sonstroem et al., 1992, 1994). Fox and Corbin (1989) classified 355 American university students into exercisers and non-exerciser groups. The ability of the PSPP to predict exercise involvement on the basis of the four subdomain variable scores was then tested through discriminant analyses. Based on their PSPP score, 71% of the female sample and 70% of the male sample were classified correctly. Perceived

physical condition was the single greatest contributing factor and thus the most important factor in separating exercisers and non-exercisers. This study was later replicated by Sonstroem and colleagues (Sonstroem et al., 1992) on 260 male and female students. However, Sonstroem et al. also included the fifth domain variable of physical self-worth in the prediction process. The PSPP scales in this study classified 88% of females and 80% of males into the correct group. Once again, perceived physical condition was the biggest contributor to the predictions. Participants were further divided into four groups, depending on their degree of exercise involvement based on frequency and duration. 59% and 54% for females and males respectively were correctly classified. These accurate predictions further support the notion that exercisers and non-exercisers differ in their perceptions of their physical self and that the PSPP is a highly valid instrument for classifying individuals as exercisers or non-exercisers.

The positive link between PSP and physical activity has also been demonstrated for children. For example, mirroring the documented positive effect of physical activity on self-esteem for children (Fox, 2000b; Gruber, 1986), PSP models have been found to predict between 27% and 29% of the variance in physical activity scores for boys and girls aged 10-14 (Crocker, Eklund, & Kowalski, 2000). Looking at the relationship of sport participation to self-esteem, body image and PSP, Richman and Shaffer (2000) demonstrated that pre-college sport participation for college females predicted self-esteem and that physical competence and body image mediated this relationship. Hence, the results indicate that sport participation may not enhance later self-esteem unless it also promotes factors such as physical competence, body image, and academic competence. In fact, when not accompanied by these links to self-esteem, sport participation was negatively related to self-esteem.

5.8. Physical self-perceptions and life adjustment correlates

Sonstroem and Potts (1996) tested the relationship between physical self-concepts and measures of life adjustment. They found that self-perceptions of physical competence were essentially related positively to life adjustments such as positive affect and negatively to negative affect, depression and health complaints, independent of social desirability effects and global self-esteem. Supporting these results, from a clinical perspective, depressed patients have been found to report lower self-esteem and PSP compared to non-patients (Van de Vliet et al., 2002). In addition, recent research has linked positive PSP (i.e. high scores on the PSPP) to athletic identity and positive attitudes towards self-aging (Phoneix, Faulkner, & Sparkes, in press).

5.9. The change and stability of physical self-perceptions: Links to exercise and sport participation

The issue of change or stability in PSP is important, because the majority of studies on the self have used a “one-shot” cross-sectional design, thus overlooking important dynamic aspects of the self-concept. As stated by Crocker et al. (2003): “Change analysis moves us one step closer to establishing causal claims between variables and within settings that are difficult to manipulate experimentally” (p. 335). Adopting longitudinal, prospective research designs, only a few studies have managed to examine this issue. Lintunen (1995) examined the change of PSP in adolescent boys and girls over four years and found that the stability and change of self-perceptions varied considerably, depending on the specific domain and gender. For example, perceptions of fitness for both boys and girls were very stable, whereas perceptions of appearance decreased for girls but increased for boys over the follow-up period. Moreover, it was found that physically active girls revealed more positive perceived fitness at follow-up than did sedentary girls, although no differences were detected at the beginning of the study, which indicates a

more positive trend over time for active girls than for sedentary girls. Active boys revealed more positive perceived fitness, both at the beginning and at follow-ups, than did sedentary boys. By contrast, perceived appearance did not change over time or differ as a function of activity level for boys or girls. Moreover, support was found for the Psychological Model of Physical Activity (Sonstroem, 1978; see Figure 3), linking physical ability to self-perceptions, in particular for older girls (aged 15). More recently, Crocker et al., (2003) reported small but significant group increases in SPA and decreases in all PSPP subdomains except for body over 12 months in female adolescents. Moreover, changes in some PSP-subdomains (physical conditioning for physical activity and body attractiveness for SPA and dietary restraint) were related both to changes in physical activity, SPA, and dietary restraint, independent of BMI.

5.10. The effects of exercise/sport on physical self-perceptions

Compared to the previously described cross-sectional studies on the relationship of exercise/sport and self-perceptions, very few studies have adopted stronger longitudinal true-experimental or quasi-experimental designs where change may be investigated. Looking specifically at PSP and its relation to sport/exercise and exercise involvement, the majority of intervention-studies in the last 10 years that have gone beyond simple cross-sectional designs have used one of the two most validated and sound instruments; the PSPP or the PSDQ. Some studies investigating the change of physical self-perception through exercise and aerobic programmes have failed to find significant changes on any PSP subvariable over 8 to 10 weeks of exercising (Aşçi, Kin & Kosar, 1998; Caruso & Gill, 1992). Other studies have found significant increases in perceived strength, condition and physical self-worth (Page, Fox, MacManus & Armstrong, 1993) over an eight-week exercise programme undertaken by females, and improvements in physical self-concepts and self-esteem after a six-month exercise programme, both for the experiment group and for the control

group (Alfermann & Stoll, 2000). Moreover, a 12-week, family-based physical activity intervention on mother/daughter pairs demonstrated significant improvements in three of the five PSPP-scales; sport competence, strength, and physical condition (Ransdell, Dratt, Kennedy, O'Neill, and DeVoe, 2001). Recently Aşçi (2003) found that participants in a physical training programme improved significantly over 10 weeks in only four of the 11 PSDQ subscales (physical activity, coordination, sport competence, and flexibility) in addition to having a significant reduction on trait anxiety compared to the control group. To summarize, the results of the effects of exercise programmes on PSP in different studies are equivocal, although most of them show support for the change of one or more domains.

Additionally, recent research supports the notion that the positive effects of exercise on the physical self may extend beyond non-clinical samples of young and middle-aged adults, to clinically diagnosed mental health patients. For example, personalized and gradual psychomotor fitness programmes have been found to improve PSP in non-psychotic patients with severe symptoms of depression, anxiety and personality disorders (Knapen et al., 2003). Given the previously mentioned relation between low self-esteem, PSP and depression in clinical samples of psychiatric patients (e.g., Van de Vliet et al., 2002), these results are significant, both in terms of improvements in life-quality for patients, and in regard to the economic burden of mental health problems on society.

6. Aims of the dissertation and studies conducted

The overall aim of the dissertation is to investigate the relationships of exercise, gender and culture to physical self-perceptions (PSP) in young adults and adolescents through three interrelated studies. These studies examine: (a) the validity of the hierarchical and multidimensional model underlying the Physical Self-Perception Profile (PSPP: Fox & Corbin, 1989) across cultures, and cultural

differences in PSP in Great Britain, Sweden and Turkey; (b) the relationship of PSP, and importance ratings of physical self-perception domains, to exercise and gender in Swedish young adults; and (c) the effects of a 6-month exercise intervention programme on PSP and SPA in adolescent girls, using a randomised- controlled design.

6.1. Study I: *A cross-cultural evaluation of a multidimensional and hierarchical model of physical self-perceptions in three national samples*

Recent research has demonstrated that physical self-perceptions (PSP) play a vital role in the initiation and continuation of physical activity and are instrumental in increasing global self-esteem and psychological well-being (e.g., Fox, 1997). Drawing heavily on the influential theoretical framework of Shavelson, Hubner, and Stanton (1976), studies have generally supported multidimensional and hierarchical models of the self and its various domains on different levels. One such model underlies the Physical Self-Perception Profile (PSPP: Fox, 1990; Fox & Corbin, 1989). The model posits that a superordinate structure of global self-esteem governs the domain-level construct of *physical self-worth*, which in turns encompasses the four subdomains of *sports competence*, *body attractiveness*, *physical strength* and *physical conditioning*. Previous research has provided support for the reliability and validity of the PSPP in various samples of children and adults (see Fox, 1997), and for the structure of the underlying model. However, the PSPP was developed and validated in the United States, and further research regarding other countries has focused primarily on samples from English-speaking nations and has been conducted with a strong emphasis on individualism (e.g., Biddle et al., 1993; Crocker, Eklund, & Kowalski, 2000; Hagger, Ashford, & Stambulova, 1997). Given that one of the original conceptions of Shavelson and co-workers (1976) was to be able to demonstrate the general applicability of their models across

populations and subgroups, the importance of rigorous and appropriate translation and testing of the psychometric properties of the PSPP in different cultures is apparent. Moreover, in the light of previous cross-cultural research and frameworks on the self (e.g., Markus & Kitayama, 1991; Triandis, 1995), it would seem relevant to examine differences in PSP in more individualistic versus more collectivistic-oriented cultures. Hence, the primary purpose of the present study was to examine the cross-cultural validity of the hierarchical model of PSP, and differences in latent means of the PSPP items and factors, across three nations that represented diverse, multi-regional cultures, namely the Middle East (Turkey), Western Europe (Great Britain) and Northern Europe (Sweden).

6.1.1. Method

The participants were 1644 university students, distributed as follows: 291 from Great Britain, 164 females, 127 males; age, $M = 31.5$, $SD = 10.8$), 217 were from Sweden (110 females, 107 males; age, $M = 23.1$, $SD = 4.6$) and 1137 were from Turkey (534 females, 603 males; age, $M = 21.3$, $SD = 1.9$). The 30-item PSPP (Fox & Corbin, 1989) was administered to each of the samples. Standardised back translation techniques (cf. Brislin, 1986) were employed to develop language-specific versions of the PSPP for the Swedish and Turkish samples. The evaluation of the PSPP, using the EQS ver. 5.0 computer program (Bentler, 1989), included three steps: (a) single-sample evaluations of two hypothesised theoretical models (a first order model and a second order model) of PSP for each sample using confirmatory factor analyses (CFA); (b) investigations of the efficacy of both models in explaining the data across the national samples using multi-sample covariance structure analyses (cf. Bentler, 1989; Byrne, 1994; Pentz & Chou, 1994); and (c) testing of the equivalence of the intercepts or means of the scores for the items specified in the model and the

means of the latent factors in the models across the samples. Multiple criteria for goodness of fit were used to evaluate the models in the analyses.

6.1.2. Results

Results showed that the fit of the hypothesised first-order model was inadequate in the British and Turkish samples. Significant correlated uniqueness was found, which indicates possible method bias effects, and possible redundant content across the items in the PSPP not accounted for by the model. When correlated uniqueness terms were included, both the first- and second-order models made an adequate fit for all three national samples. Moreover, the inter-factor correlations, and the standardised factor loadings for the PSPP items on their latent factors, were typically high and significant in all samples. Notwithstanding significant decrement in model fit for the more constrained models and differences across a number of factor loadings within constructs, support for invariance in the underlying pattern of theoretical structure across the samples were found. However, invariance testing of latent means revealed variant structural parameters. For example, the latent subdomain means of the British sample were significantly higher than those of the Swedish and Turkish samples across all PSPP subdomains, with the exception of the physical condition subdomain, which was significantly higher in both the Turkish and the Swedish samples.

6.1.3. Discussion

The CFA analyses provided strong support for the Fox and Corbin (1989) model of PSP, and the PSPP, based on the multidimensional and hierarchical structure of self-concept by Shavelson and co-workers (1976), across three samples from different national groups. These results are consistent with previous research (e.g., Crocker et al., 2000; Page et al., 1993; van de Vliet et al., 2001). The satisfactory fit of the second-order model, which included a higher-order PSW

factor, supports the proposal of a general, global construct to explain adequately the relationships between the subdomain factors. The only significant difference in the contribution of each subdomain to the general physical self-worth factor in the second-order CFA, i.e. the relationships between general physical self-worth and sports competence for the British and Swedish samples, suggests a substantial degree of consistency of the sports competence, physical conditioning, body attractiveness and physical strength subdomains with overall physical self-worth across the samples. The cultural differences in latent means may be explained as a function of differences in individualist-collectivist orientation (cf. Hofstede, 1993; Markus & Kitayama, 1991), cultural norms, and socio-political differences (e.g., Schooler, 1996) in the three samples; although the value of the individualist-collectivist continuum may be questioned (e.g., Watkins, 2000.) Due to limitations in the present study regarding the use of a restricted spectra of samples (i.e., students), thereby possibly weakening the generalisation of results to the general population, further cross-cultural studies of physical self-models with a variety of samples are called for. In addition, future longitudinal designs of models are encouraged, to investigate the causal nature of PSP linked to exercise and sport.

6.2. Study II: The Role of Exercise and Gender for Physical Self-Perceptions and Importance Ratings in Swedish University Students

Despite the well-documented physiological and psychological benefits of regular exercise (e.g., Fox, 2000a; Hassmén, et al., 2000), the majority in various populations around the world are not sufficiently active, and a drop-out rate of about 50% in the first six months is typically reported in supervised exercise programmes all around the world (Dishman, 1988). In this context, it is relevant to consider the role of physical self-perceptions (PSP) for exercise motivation and other positive psychological outcomes such as self-esteem, positive affect, and lowered negative affect, depression, and health complaints

(Biddle, 1997; Fox, 1997, 2000b; Sonstroem & Morgan, 1989; Sonstroem & Potts, 1996). Moreover, the importance that individuals attribute to different aspects of themselves and their physical self vis-à-vis their perceived competence in that domain has been described as one factor affecting the exercise behaviour and overall physical self-evaluation of the individual (e.g., Fox, 1990; Harter, 1986). Furthermore, PSP have been highly related to gender, demonstrated in the reported consistent gender differences in body image and PSP, with females displaying lower scores on all sub-domains than males (Fox & Corbin, 1989; Hayes et al., 1999). Given the emphasis on Anglo-Saxon populations in previous research on PSP, and the long tradition of, and recent national focus on, exercise in Sweden, it is relevant to investigate the link between PSP, exercise and gender in the cultural context of Sweden. The purpose of this study was to investigate how exercise frequency, exercise duration and gender relate to PSP and importance ratings of PSP in Swedish university students.

6.2.1. Method

164 university students (78 males and 86 females) in sport and exercise psychology courses volunteered to participate in the study and completed the 30-item Physical Self-Perception Profile (PSPP; Fox & Corbin, 1989), the 8-item Perceived Importance Profile (PIP; Fox, 1990) and a questionnaire focusing on exercise frequency and duration, during their first week of enrolment at the University. The mean age was 22.9 years (SD=4.3) for males and 23.2 years (SD=4.9) for females. The self-report inventory of PSPP, measuring the four sub-domains Perceived Sport Competence (Sport), Physical Conditioning (Condition), Bodily Attractiveness (Body), Physical Strength (Strength), along with the higher-order domain-construct of Physical Self-Worth (PSW), has demonstrated strong validity and robust reliability in various samples of adults and children (see Fox, 1998) and across different cultures

(Hagger, Lindwall, & Asçi, in press). Translation of the PSPP and PIP into Swedish was conducted according to a standardized back-translation procedure (see Brislin, 1986). In the present study, the internal consistency values for the five subscales of the PSPP ranged from .72 (Body) to .86 (Condition) for men and from .75 (PSW) to .89 (Sport) for women. For PIP, the internal consistency values were low for three out of four sub-domains. Standard multiple regression analyses, with PSPP and PIP-subdomains as dependent variables and exercise frequency, exercise duration, and gender as predictors, were completed to investigate the relationship of exercise frequency, exercise duration, and gender with PSPP and PIP.

6.2.2. Results

The majority of the males and females exercised two to three times a week (65% of males and 56% of females), and on average, 46-90 minutes (58% of men and 67% of women) on each occasion. Exercise frequency, duration, and gender together predicted between 35.5% and 10.5% of the PSPP sub-domain variances. The strongest prediction was found on the sub-domain of Condition ($R^2 = .355$) followed by Sport ($R^2 = .311$). The predictions of the PIP sub-domains were, in general, lower than for the PSPP sub-domains. Exercise frequency and gender contributed significantly to the prediction in four of the five PSPP sub-domains, whereas exercise duration added significantly to the prediction in three sub-domains (Sport, Condition, and PSW). Exercising more frequently, and for a longer time on each occasion, was related to higher PSPP and PIP scores. Males reported significantly higher PSPP scores on all sub-domains than females, and also perceived the sub-domains of the PSPP to be more important than did females. Exercise frequency was shown to be a more robust predictor of PSPP and its perceived importance than was duration.

6.2.3. Discussion

The results of the present study, which were that both exercise frequency and duration were significant predictors of PSPP sub-domains, except for Body, support previous work on the link between PSP and exercise (Bruya, 1977; Fox, 2000a; Fox & Corbin, 1989; Leith, 1994; Sonstroem et al., 1992) and the EXSEM model (e.g., Sonstroem, Harlow, & Josephs, 1994). The strongest prediction of the Cond sub-domains indicates that increased exercise participation seems to be linked particularly strongly to individuals' perception of stamina and fitness. The results fit nicely with the theoretical framework of Harter's (1978, 1985) competence motivation theory, which states that individuals seek out activities that give them the opportunity to demonstrate competence. However, no clear answer to the question of direction of effect in the exercise-PSP relationship (cf. Marsh, 1986; Sonstroem, 1997) can be given by the present study, due to its cross-sectional design. Looking at the relation between perceived importance and exercise frequency, according to cognitive consistency and dissonance theories (Festinger, 1957; Heider, 1958), it is reasonable that an increased investment in exercise should be accompanied with a higher attributed importance on this domain in order to prevent undesired inconsistency between attitude and behaviour. The gender differences with females depicting lower scores, especially on the Sport and Body subdomains, corroborate the robust findings in previous work (e.g., Fox & Corbin, 1989; Hayes et al., 1999; Loland, 1998; McAuley & Bane, 1998), and further emphasise the important role of gender in self-evaluation of the physical self and body image, potentially influenced by socio-cultural norms and strengthened by, for instance, the media (cf. Koivula, 1999). Future studies should adopt strong experimental and longitudinal designs, using samples other than university students, to investigate the causal nature and direction of the PSP-exercise relationship. From an applied perspective, the results emphasise the importance for practitioners of understanding the role of PSP in exercise motivation,

especially for groups with potentially low PSP in the initial stage of the exercise process.

6.3. Study III: The Effects of a 6-Months Exercise Intervention Programme on Physical Self-Perceptions, Importance Ratings, and Social Physique Anxiety in Non-Physically Active Adolescent Swedish Girls

Positive physical self-perceptions (PSP) have been targeted as highly important aspects of a healthy human mind, both as mediators of self-esteem and mental well-being and as valued outcomes in themselves (Fox, 2000a; Sonstroem, 1997; Sonstroem & Potts, 1996). Hence, it is important to search for instruments that may foster positive perceptions of the physical self and body image. In this context, regular exercise has been recognized as a powerful source of physical self-enhancement. Exercise has also been related to the self-presentational concept of social physique anxiety (SPA; Hart, Leary & Rejeski, 1989), denoting the concerns of others' negative evaluation of one's physique. Although evidence of the positive relation between exercise and the self exists (e.g., Fox & Corbin, 1989, Lindwall & Hassmén, in press; Sonstroem, Harlow, & Josephs, 1994), the majority of these studies have adopted cross-sectional designs with methodological weaknesses, which limits the potential for clear and valid conclusions regarding, for example, the direction of effects (see Morgan, 1997). Some of the few documented studies adopting an experimental design have shown that exercise intervention programmes of different length and content may enhance PSP and decrease SPA (Alfermann & Stoll, 2000; Bartlewski, Van Raalte, & Brewer, 1996; McAuley, Bane, & Mihalko, 1995; Ransdell, Dratt, Kennedy, O'Neill, & DeVoe, 2001; Williams & Cash, 2001). However, other studies have demonstrated only partial (Asçi, 2003) or no support for the positive effect of exercise on the physical self (Asçi, Kin, & Kosar, 1998; Caruso & Gill, 1992).

Given the documented link, in particular for females, between low self-regard/self-esteem and severe health-problems such as eating disorders and depression (see Cash & Pruzinsky, 2002; Levine & Piran, 2004), and the fact that females consistently show more negative PSP and higher SPA (Hayes, Crocker & Kowalski, 1999; Hart et al., 1989; Lindwall & Hassmén, in press) than males, it seems significant to examine the effects of exercise on the self and body image for adolescent girls. Moreover, some researchers have emphasized the relevance of the importance people attribute to various domains of the physical self (e.g., Fox, 1997; Harter, 1993), which suggests that competence-importance discrepancies also may be associated with exercise. Aiming at overcoming some of the methodological weaknesses in previous work, the purpose of this study was to examine the effects of a six-month exercise intervention programme on PSP, importance of PSP, and SPA for non-physically active adolescent girls, using an experimental design with control group and theory-driven validated instruments.

6.3.1. Method

Participants in the study were 110 non-physically active adolescent girls, aged 13 to 20 (M: 16.4; SD: 1.6). The participants were randomised into an intervention (n=56) or control group (n=54). The participants in the intervention group took part in an empowerment-based exercise intervention programme (EIP), which consisted of exercise activities (45 minutes) and discussion sessions concerning healthy lifestyles (15 minutes) on each occasion. The participants in the control group were put on a waiting list, which meant that they were invited to take part in the EIP after six months. A wide range of exercise activities, influenced by the participants themselves, were used over the course of the intervention programme. The EIP was offered twice a week for six months. The intervention staff, who led the exercise and discussion sessions, were exercise instructors and assisting coaches in the sport clubs. The study was

conducted in accordance with the ethical guidelines of the Swedish Humanistic-Social Science Research Board. Written and oral information about the study was provided, which information made it clear (i) that participation was voluntary, (ii) that all information received would be treated confidentially, and (iii) that the participants were free to withdraw at any time. The participants' parents gave their written approval for participation in the study. The participants completed the Physical Self-Perception Profile (PSPP; Fox & Corbin, 1989), the modified Perceived Importance Profile (PIP-R), and the Social Physique Anxiety Scale (SPAS; Hart, Leary, & Rejeski, 1989), along with measures of body weight, height, and physical fitness (measured by submaximal bicycle work test; cf. Åstrand, 1976) at pretest and posttest. The 30-item PSPP measures the four subdomains of Sport Competence (Sport), Physical Conditioning (Condition), Bodily Attractiveness (Body), Physical Strength (Strength) along with the domain factor of Physical Self-Worth (PSW). The modified version of the Perceived Importance Profile (PIP-R; M.S. Hagger, personal communication, September 12, 2001) includes one perceived importance item for each of the 30 PSPP items. Hence, the PIP-R consists of one scale, each consisting of six items, for each of the four subdomains in the PSPP (labeled PIPSport, PIPCondition, PIPBody, PIPStrength), in addition to six items that assess the perceived importance of the physical self-worth domain (PIPPSW). A modified version (item 4 divided into two separate items) of the previous empirically supported unidimensional seven-item version of the SPAS was used. Competence scores for every PSPP subdomain were divided by its respective PIP-R importance scale to create five discrepancy score variables, named DisSport, DisCondition, DisBody, DisStrength, and DisPSW. At pretest, the participants also completed a questionnaire focusing on age, previous sport participation and education of parents. 2x2 (Group X Time) univariate and multivariate analyses of repeated measures were conducted to examine the effects of the intervention programme on the dependent variables. GLM analysis

of covariance, adjusting for pretest scores, was used to investigate posttest differences between the experiment and control group. Zero-order correlations were used to examine the relation between changes in physiological variables and changes in PSPP- and SPA-scores.

6.3.2. Results

Sixty-two of the 110 (57%) participants followed through the intervention. Twenty-six of these were in the experiment group and 36 in the control group. The dropouts did not differ from the participants that followed through on any of the dependent variables at pretest. The intervention and control groups did not differ in the education of parents, living area, parents' exercise habits, previous membership and participation in sport clubs, or previous exercise participation (all $p_s > 0.05$). Nor did they differ in pretest scores on any of the dependent variables. A significant interaction effect (Group X Time) was found on SPA, showing that the experiment group revealed lower levels of SPA at posttest, whereas the control group reported elevated SPAS scores. A significant main effect for Time on the PSPP variables was detected. More specifically, significant effects for Sport, Condition, Strength, and PSW in addition to a non-significant trend for Body ($p=0.08$) were detected. Moreover, significant Time X Group effects for Sport, Condition, and PSW were revealed, indicating that the experiment group increased more than the control group on these subscales. None of the main effects for Time, Group or the interaction were significant for the PIP-R subscales. The three variables of DiscCondition, DiscBody, and DiscPSW showed significant Time effects. Moreover, a significant interaction effect for DiscCondition was identified, indicating that the experiment-group experienced a more positive competence-importance change than the control group. GLM analysis controlling for pretest scores revealed that the experiment group had higher scores on Sport, Condition, and PSW and lower scores on SPAS than did the control group at posttest. Only the Condition subdomain was

significantly (albeit weakly) related to changes in weight, BMI, and physical fitness.

6.1.3. Discussion

Overall, the results showed strong support for the positive effect of exercise on PSP and SPA, with the experiment group showing a positive, or more positive, change in PSP and SPA compared to the control group where the changes were negative (SPA) or less positive. These results corroborate some previous intervention studies (e.g., Alfermann & Stoll, 2000; Bartlewski et al., 1996; McAuley et al., 1995; Ransdell et al., 2001; Williams & Cash, 2001), while contradicting others (e.g., Asçi, 2003; Asçi, et al 1998; Caruso & Gill, 1992). Moreover, the results are in accordance with: (a) previous longitudinal studies (Lintunen, 1995); (b) meta-analyses (Fox, 2000) and; (c) the EXSEM-model (e.g., Sonstroem, 1997a; Sonstroem et al., 1994); all of which link exercise to PSP. The largest versus smallest effect sizes for Condition and Body, respectively, also accord with previous research (Fox & Corbin, 1989; Kowalski, et al., 2001; Lindwall & Hassmén, in press). To explain these consistent results, it has been suggested (Fox, 1990; Lindwall & Hassmén, in press) that the definition and operationalization of Condition seem more closely tied to the physical part of exercise, compared to the other PSPP sub-domains. Similarly, the Body sub-domain of PSPP focuses on appearance components instead of perceived competence and is probably more difficult to change by exercising, because people find it less easy to control and the outcome evaluation is based on more diffuse criteria than the other sub-domains. The finding that changes in PSP and SPA were, on the whole, unrelated to changes in physiological parameters, such as BMI and physical fitness, support previous reviews (Fox, 2000a; Sonstroem, 1997) stating that the mechanisms underpinning the exercise-physical self relation most probably are more psycho-social than psychophysiological in nature.

In regard to the direction of effects, the results support the skill-development hypothesis (Marsh, 1986), which states that exercise participation causes increased self-perceptions and self-esteem through feelings of competence, rather than the self-enhancement hypothesis (Sonstroem, 1997, 1998), which focuses more on the use of exercise/sport as a domain in which one can demonstrate competence and maintain a positive self-image. However, these two hypotheses most probably work simultaneously and interactively to create and uphold the positive link between exercise and the self. In addition to other suggested mechanisms behind the exercise-physical self relationship (such as psychophysiological factors, increased autonomy and personal control, and an enhanced sense of belonging and significance) nuisance factors such as placebo- and Hawthorne effects should be considered as being responsible for the effects in the present study. Moreover, the dropout rate of roughly 40% and the choice of sample (students) should be viewed as a limitation of this study with respect to the generalisation of results and formulation of methodology. Future studies that use experimental designs when investigating the effects of exercise on body image and the physical self should implement the concept of practical significance as a complement to statistical significance, and link changes in test-scores to relevant behavioural changes when analyzing the results (e.g., Ogles, Lunnen, & Bonesteel, 2001; Stoové & Andersen, 2003). From an applied perspective, the results highlight exercise as a powerful instrument for practitioners in the struggle against modern health problems such as depression and eating disorders, in particular for females through the fostering of positive feelings of competence, self-worth and acceptance in regard to the body. Moreover, given the documented role of PSP and body image as significant mediators in the sport-self-esteem relationship (Richman & Shaffer, 2000), understanding how these factors may be enhanced by exercise and sport provide new and important insights into the dynamic and complex nature of the self.

7. General discussion

7.1. The physical self and culture

Reflecting on the statements of previous scholars (Duda, 1998; Duda & Allison, 1990) that emphasise the lack of, and hence, importance of conducting, sound cross-cultural research in sport and exercise psychology, Study I contributes to the field by filling part of this void, at least in the area of the physical self and PSPP.

The results of Study I are similar to those of the cross-cultural study of Hagger et al. (2003), in which samples of British adolescents reported higher latent means on all PSPP subdomains than did samples of Russian and Hong Kong adolescents. Finding straightforward explanations of the results of Study I and the Hagger et al. (2003) study based on the literature is, however, not easy.

It might seem that the differences in I-C continuum between England, Sweden, and Turkey (with England as the most individualistic country, followed by Sweden and Turkey) in Hofstede's (1980, 1983, 1991) categorisation may serve as a potentially useful explanation of the results in Study I. On the level of individual analysis (Triandis et al, 1985, 1993), corresponding to individualism-collectivism, it may be suggested that the personality attribute of allocentrism is more prevalent in Turkey and Sweden than in England, where idiocentrism should be more common. Hence, this difference may be thought to reflect on levels of self-perceptions, as well as on self-presentational modes of responding to self-report-questionnaires, which pushes the British sample scores more to the extremes of every item, and allows the British subjects to express a distance between themselves and others of the same age and gender.

However, as more recent work (e.g., Watkins, 2000) depicts both Sweden and Turkey as being categorized both by individualist and collectivist values, which supports the notion of rapid changes in socio-cultural values systems over the last 20 years, it seems of limited value to use the Hofstede's I-C continuum as a significant source of explanation for the fact that the British sample revealed higher latent means on four of the five PSPP subdomains in Study I. This reasoning is in line with a recent critique on the use of the Hofstede's I-C factor as an explanation of cross-cultural differences in psychological constructs (Oyserman et al., 2002; Watkins, 2000; Watkins et al., 1998). In Study I, this is especially striking in regard to the higher latent means for the Swedish and Turkish samples compared to the British on the Condition subdomain, where the results definitely go against a strict individualism-collectivism perspective. Moreover, students in general have been shown to be more Western, more individualistic, and less collectivistic than other adults (e.g., Fiske, 2002). Hence, cultural differences regarding the I-C dimension were most probably smaller between the samples in Study I compared to the general population, which offers another potent argument for why the I-C dimension may not be a valid framework for interpreting the differences in PSPP scores.

Rather, explanatory frameworks other than that of I-C need to be implemented to understand the results of Study I. For example, from a competence-importance perspective (Harter, 1978, Fox, 1990), it may be argued that differences in importance and values attached to the different domains of the physical self in the three cultures and samples may have influenced reported levels of PSP. Put differently, the aspect of being fit with a strong stamina and endurance may have been more highly endorsed in the Swedish and Turkish samples than in the British, resulting in higher scores on Conditioning to avoid importance-competence discrepancy. Underlying reasons for such cultural differences in regard to values attached to the different facets of the physical self

may relate to social and socio-political structures and value-systems, such as the degree to which national health-bodies and organizations use, and put resources into, the area of physical activity and exercise as a means of securing the general health of the population. For example, the recent national health campaign of "Sweden on the move-2001", which emphasizes heavily the role of physical fitness for well-being and quality of life, bears witness to the increased focus on, and consciousness of, the benefits of regular physical activity and exercise at the macro level. In addition, specific socio-cultural norms may have influenced the response patterns differently in the three samples. For example, what is known as the "Jante-law" in Sweden, which states that one should stay in the highly-valued middle, be moderate ("lagom" in Swedish), and not ""stick out" from others, is one example of a cultural norm that may dictate self-presentational modes (e.g., Bond & Cheung, 1983) of response patterns and bias in self-report questionnaires. Such cultural norms offer another potential explanation to why the Swedish and Turkish samples reported lower latent means than the British sample in four of the five PSPP subdomains.

From a methodological standpoint, the results of Study I should also be interpreted from a cultural equivalence perspective (Byrne, 1996; 2000; Helms, 1992). From this viewpoint, it may be argued that the results in Study I satisfied all six types of equivalence: functional, conceptual, linguistic, psychometric, testing condition, and sampling equivalence. Hence, as each of these types of equivalence, or more correctly, their absence, constitute a severe threat to the validity of cross-cultural studies, the validity of the results in Study I are strengthened. However, the assumption that the study managed to satisfy some aforementioned types of equivalence to a higher degree than others should also be recognised. For example, the issue of differences in regard to how well the different languages manage to tap the same meaning of the subdomains is highly complex to evaluate. In addition, the results showed that although the fit of the

models overall were equivalent across the groups, several single items were found to be non-invariant, which indicates a potential threat to the conceptual equivalence. In addition, the issue of whether assessment scores reflect characteristics that occur with the same frequency across groups was not evaluated (except for the relations of the PSPP subdomains to the domain of physical self-worth, which showed a great deal of consistency between the groups). Although the invariance of model fit between the groups indicates that the participants in the three samples in Study I interpreted and calibrated the scales and subdomains in similar ways, the possibility should be considered that the results of questionnaires measuring the physical self may, in general, mask more profound cultural differences regarding how the various subdomains and domains of the physical self are defined, interpreted, and valued (mirroring the question of the physical self as a culture-specific or universal construct [Si & Chung, 2001]).

7.2. The physical self, gender, and exercise

The results in Study II show clearly that gender is a significant predictor of PSP, (in particular for the Body subdomain), which supports the wealth of previous studies that demonstrate that females perceive their physical self and body image more negatively (e.g., Bowker, et al., 2003; Fox & Corbin, 1989; Gray, 1977; Hayes et al., 1999; Hueneman et al., 1966; Loland, 2000; Sonstroem et al., 1992) than males. Thus, in addition to Smolak's (2004) finding that body image is a gendered phenomenon, it appears that PSP also should be perceived as a gendered phenomenon. Relevant questions for the present work are: (a) how does exercise participation relate to body image and PSP for females; (b) what mechanisms may account for the potential effects, and (c) how may these operating agents (mechanisms) be related to the various explanations and frameworks given for gender differences in body image and PSP?

In regard to the first question, Study III affords strong evidence for the notion that regular exercise for six months may enhance PSP and reduce physique-related anxiety (SPA) for adolescent girls. Hence, in the debate (e.g., Hausenblas & Carron, 1999; Parsons & Betz, 2001; Smolak et al., 2000; Sundgot-Borgen, 1993, 1994; Szabo, 2000) about the positive versus negative effects of sport and exercise on body image and health problems associated with body-image (eating disorders and exercise dependence), the results of Study III clearly support the positive effects, at least in regard to effects on body image and PSP. However, as a variety of factors, such as the content, physical and social context, frequency, duration, and intensity of the exercise activity, along with certain personality traits (e.g., perfectionism and self-esteem), seem to moderate or mediate the direction of effects, the potential negative effects of exercise must still be recognised and given more specific attention in the future. In addition, in the light of the documented link between concern about the body and eating disorder symptoms, in particular for females, (Williamson et al., 1995), the results of Study III support the notion that exercise also has the potential to lower body concerns and enhance body satisfaction, as opposed to contributing to the development of dissatisfaction with the body and, subsequently, eating pathology.

Concerning mechanisms that could explain the potential positive effects, specifically for females, the role of exercise as a means in the process and outcome of empowerment (Lindgren, 2002) is interesting. In this context, exercise may promote females' abilities to meet their own needs, and mobilise the resources necessary to feel competent and in control of their own lives. However, the questions of whether the potential empowering effects may arise from the positive effects of exercise on PSP, anxiety, mood and mild depression (see Biddle, 2000; Fox, 2000a; Mutrie, 2000; Taylor, 2000) or, conversely, whether these well-documented effects develop simultaneously with, or as

consequence of the potential empowerment process, may not be answered at this point, but deserve increased scientific attention.

When trying to link the mechanisms of the exercise-physical self relationship to explanations of why females perceive their body and physique more negatively than males (e.g., different socio-cultural ideals, expectations, and pressures linked to the body of males and females [e.g., Bordo, 1994, Brownell, 1991a; Striegel-Moore et al., 1986], the role of media [e.g., Koivula, 1999a; Smolak & Murnen, 2001], and different importance attributed to the body, linked to self-esteem and social comparison for males and females [e.g., Fox & Davis, 1997; Furnham et al., 2002]), it would seem beneficial to use the objectification theory approach (Fredrickson & Roberts, 1997). A potential negative consequence of the body objectification process for females may be that self-enhancing strategies are more difficult to adopt and use, due to the concrete (i.e. either you fulfill the ideal look or not) and inevitable (i.e. it is almost impossible to shield oneself from it due to the extent of its reach, hidden in media and everyday conversation) nature of the negative feedback associated with the passive body as an object, compared to the more vague and subjective evaluation feedback and criteria of the performing body (more often associated with males). This may explain the consistently reported more negative body image and lower self-esteem of females compared to males.

In this context, exercise may have several significant positive effects, which serve as a potential buffer against the negative impact of the objectification theory. First, regular exercise has a tendency to automatically make the participant adopt a more competence-based approach regarding the body, focusing more on the performing body rather than the passive, objectified body, which may have positive effects on self-perceptions and self-evaluations. Linked to this, as an individual starts to exercise regularly the motives for exercising

(Koivula, 1999b; Markland & Hardy, 1993) may change, from a focus on appearance, strongly linked to the objectification process, to a focus on health, social esteem or competition, factors that are less related to the objectification of the body.

Second, even if the individual still views her body from an objectified perspective, the potential positive physiological effects afforded by exercise for females, such as weight reduction and a more toned physique, may be accompanied by a more positive perception of the body and its attractiveness, due to the perceived body shape being closer to one's own, or the socio-cultural, ideal.

Third, linked to the process of empowerment, with increased participation in exercise (assuming that the physical and social settings for exercise are sound) may come an enhanced awareness of the unrealistic and unsound socio-cultural ideals and perspective of viewing the body as a passive object to be evaluated. However, as a caveat to this point, it should be noted that exercise also has been targeted as a sub-culture, in which the negative and unhealthy body ideals inherited in the objectification theory may flourish and be magnified (Brownell, 1991a, 1991b; Hausenblas & Carron, 1999; Söderström, 2000; Williamson et al., 1995), hence constituting an environment that could contribute to, and strengthen, the detrimental body objectification phenomena for some individuals.

Fourth, from a self-presentational perspective and in accordance with the exercise stereotype (see Hodgins, 1992; Martin et al., 2000), as exercise-related information seems to be associated with overall positive evaluation in the eyes of other people, not only regarding traits naturally related to exercise, but also regarding other highly-valued personality characteristics such as control and

autonomy (the halo-effect; Cooper, 1981), the positively biased social feedback that results from this phenomena may reflect favourably on female exercisers' own perceptions and evaluation of their physical selves.

Overall, based on the results of Study II and III, it seems reasonable to draw the conclusions that exercise can help females to view their bodies as instruments to be used, rather than as objects to be viewed and evaluated, and can help to make them active agents of their physique and bodies, consequently affecting their general physical self-worth and self-esteem in a positive way. Moreover, given the documented positive relationship between self-esteem and sport participation (Richman & Schaffer, 2000), mediated by PSP, such a reasoning may also be generalized from exercise to sport participation. From a broader mental health perspective, the increased attention given by the media in Sweden (although the amount of attention given to women's sport compared to men's sport in Sweden still is very unequal; see Koivula, 1999a) to female sport in general, and the variety of prominent, and popular female sport personalities serving as important role-models in particular, may influence more young females to start regular exercise or engage in sport activities and hence benefit from the positive effects on the physical self.

7.3. The physical self, body image, and exercise

A key question of the present work is how exercise relates to perceptions of the self, and specifically the physical self. In combination with previous cross-sectional studies (Fox & Corbin, 1989; Sonstroem, Harlow, & Josephs, 1994), longitudinal studies (Lintunen, 1995), intervention studies (Alfermann & Stoll, 2000; Page, Fox et al., 1993; Ransdell et al., 2001) and meta-analyses (Sonstroem, 1984; Fox, 2000a), the results of Studies II and III offer strong support for the notion that exercise fosters positive self-perceptions regarding the body and its capacity. Supporting the statement of Fox (2000a), there is now

ample scientific evidence for the view that exercise helps people to feel better about themselves physically. Hence, Studies II and III add to the growing pile of confirmations of the beneficial effects of exercise on the self.

Looking at the different domains of the physical self, it also seems quite clear that the strongest link to exercise is manifested in the Condition subdomain. One reason for this may be that the definition, and subsequently operationalisation, of this subdomain assess most directly the natural consequences of regular exercise, that is, increased general fitness and stamina (see the discussion sections for Studies II and III). By contrast, the Body subdomain has, in several studies, been revealed as the weakest link to exercise, and has consequently been targeted as the PSPP-subdomain least susceptible to change as a function of exercise interventions (see Fox, 1997). This tendency was clearly mirrored in both Studies II and III, as Body showed the weakest relation of the PSPP subdomains to exercise frequency and duration (Study II), and showed the lowest effect size in the intervention (Study III). Given the facts that physical appearance has consistently shown itself to be the strongest predictor of global self-esteem (e.g., Harter, 1986, 1993), and that the Body subdomain has been shown to be the strongest predictor of physical self-worth (see Fox 1997), the question of why that domain of the physical self that is most highly linked to global self-esteem and physical self-worth is the most difficult one to change is of great significance. From a self-presentational perspective (cf. Leary & Kowalski, 1990) it may here be beneficial to consider how public the different domains of the physical self are. As stated by Fox (1998), the body (and hence physical appearance) could be perceived as a bridge between the inner mental world and the outer physical environment. Hence, the body, and its appearance, are constantly available for others to evaluate, whereas the more competence-based domains of the physical self (sport competence, physical conditioning, and physical strength) reveal themselves more for scrutiny and feedback in

specific contexts and situations. This could partially explain why the body and appearance aspects of the physical self are valued so highly and are linked so strongly to global self-esteem. The reason for why the body appears weakest in relation to exercise and sport may relate to the fact that the physical parameters linked to the Body subdomain (body weight, BMI, and muscle tone) may simply be more difficult to change than the physical parameters that correspond to the Condition and Strength subdomains (physical strength, general and specific fitness). In addition, the feedback of positive change is probably more direct and apparent for Condition, Strength and Sport. That is, being able to lift more weights, running faster on 10K or being able to run for a longer distance, or performing better, at least technically, in sports, constitutes greater concrete evidence of successful changes than does a better looking body where the evaluation is more vague and dependent on the source. In addition, from the perspective of social comparison (cf. Sonstroem, 1998), individuals probably more easily compare their progress with themselves as standards when it comes to Condition, Strength, and Sport, whereas the comparison with other fit bodies on display is often inevitable (cf. Brownell, 1991; Featherstone, 1991) and creates a tougher, and constantly changing, frame of reference (also labelled “shifting goal posts phenomena”; see Fox, 2000b). Linked to the “big-fish-little-pond” effect (see Marsh, 2000), these processes may result, ironically, in individuals actually managing to get a fitter and more toned body from an exercise programme, yet perceiving themselves as worse off (and consequently score lower on the PSPP Body subscale) than when they started. From a broader perspective, the differences in change of Body in comparison to the other subdomains are very much in accordance with the conceptual differences between the constructs of physical competence versus physical acceptance in the Exercise and Self-esteem Model (Sonstroem & Morgan, 1989). As self-acceptance, compared to perceived competence, may be more linked to unconditional self-esteem and depend more on internal evaluation and

subjective feed-back, the external feedback on the bodily changes given by exercise and an exercise programme may not provide the right information, or enough information, to foster positive change in perceptions of, and acceptance of, body attractiveness.

However, similar to other studies (Bartlewski et al., 1996; McAuley, Bane, & Mihalko, 1995; Williams & Cash, 2001) the results of Study III, which show a reduction in SPAS-scores for the experiment group, indicate that exercise also has the potential to foster positive body images, provided that it is conducted in adaptive settings and accompanied by a critical discussion of, and reflection on, maladaptive body- and beauty ideals. Given that the control group, by contrast, demonstrated elevated SPA-scores after 6 six months, which mirrors one of the possible interpretations of the findings of Westerståhl et al., (2003), i.e. that physique-related anxiety of girls may be increasing, it seems even more pertinent to emphasise the documented beneficial effects of exercise for the experiment group. Several of the previously suggested mechanisms (Bartlewski et al., 1996; Carron et al., 2004; Hausenblas et al., 2004) such as social support, perceived body change (reflected by the increased scores on the PSPP Body subdomain) and reduction of state anxiety, may have accounted for the positive effects of the intervention programme on SPA. Moreover, the following quotation by Hausenblas and colleagues (2004) identifies another important potential mechanism: “Initiating physical activity in settings which minimise evaluative threat may allow women with SPA to avoid self-presentational anxiety, while providing them the opportunity to enhance their perceptions of their exercise abilities and body image.” (p. 12). Linked to the exercise programme in Study III, its empowerment-focused design, which made the participants active agents who could influence the choice of activities, presumably contributed to non-evaluative exercise settings in which the participants felt safe in terms of self-presentational concerns.

In the context of differences in effects of various studies and exercise interventions on the self, the frequency, duration, intensity, and perhaps most importantly, the content of the exercise programme should be considered. Contrary to the majority of previous intervention studies, which have focused on one specific exercise mode or type (e.g., aerobic, dance, running, or weight training), using strictly standardised exercise parameters regarding intensity, duration, and frequency, Study III adopted a variety of activities without any specific recommendation or specification of intensity. On the one hand, this different interventional design may, to some extent, explain the positive changes on the physical self for the experiment group compared to previous studies, because the more natural and non-standardised structure of exercise may have been able to affect dimensions of the physical self that typically one-mode standardised exercise programs do not. On the other hand, the lack of standardised parameters, at least for intensity, and the variety of activities, renders it problematic to draw conclusions regarding what part(s) of the intervention acted as the active program agents and contributed to the effects. For example, in addition to the potential influence of previously discussed empowerment-related factors, the possible impact of group-dynamic components incorporated in the EIP, such as belongingness and cohesion, should be recognised. Research has demonstrated that stronger belief about cohesiveness in exercise classes has been linked to greater amounts of positive affect related to exercise and stronger beliefs about efficacy related to exercise (see Paskevich, Estabrooks, Brawley, & Carron, 2001). Thus, it seems feasible that an increased sense of belongingness and group cohesion, derived from the regular meetings and common collective experiences afforded by the EIP, may have contributed to elevated feelings of competence and acceptance linked to the physical self through increased exercise-related self-efficacy (in accordance

with the EXSEM-model) and subsequently to the demonstrated effects on PSP and SPA for the intervention group.

Moreover, the question of positive versus negative (e.g., exercise dependence and eating disorders; see Hausenblas & Symons Downs, 2002; Szabo, 2000) effects associated with exercise, in particular for girls/women, most probably also relate to the mode, intensity, frequency, and duration of the activity performed. As documented by previous work (Hausenblas & Carron, 1999; Smolak et al., 2000), some sports (e.g., dance and performance sports) or activities, in combination with certain personality types (e.g., perfectionism and low self-esteem) are probably linked to increased risk of detrimental health effects, rather than positive. Although few studies so far have investigated the role of PSP in exercise dependency and eating disorders, it is highly likely that levels of PSP, and their link to the importance attributed to sports and exercise, could also play a relevant part here, especially given the documented relations between, on the one hand PSP, motivation to exercise, and self-esteem, and on the other hand self-esteem, motives to exercise, eating disorders and exercise dependency.

When a relationship between two variables has been confirmed, as in the case of exercise and the self, it is of great significance to consider the direction of the effects. In the context of the physical self, the two hypotheses of skill-development (SDH) and self-enhancement (SEH) afford two diametrically opposing perspectives to this issue: SDH emphasises the influence of exercise on the self, whereas SEH focuses on the role of self-perceptions in choosing suitable settings and activities to maintain a positive self-image (Marsh, 1986b; Sonstroem, 1997b, 1998). Investigating these two perspectives is very much a question of design. In this dissertation, the cross-sectional design of Study II makes it impossible to draw a clear-cut conclusion that favours one over the

other of the two hypotheses, although the results strongly support the positive relation of exercise to the self and PSP. However, Study III does corroborate the Exercise and Self-Esteem Model (Sonstroem & Morgan, 1989) and more specifically, the EXSEM-model (Sonstroem et al., 1994) and offers robust support for the SDH, at least for adolescent girls. However, as both perspectives have received empirical support, setting them against each other does not increase the understanding of the dynamics of the physical self or of the link between exercise and the self. Rather, as was suggested in Studies II and III, the SDH and SEH should be seen as complementary and as two sides of the same coin, working simultaneously to uphold the reciprocal dynamic relation between exercise and self-perceptions.

Looking at the natural stability vs. change of PSP over time, the relatively stable PSP scores over six months for the control group in Study III are in accordance with previous longitudinal studies (Crocker et al., 2003; Kowalski et al., 2003; Lintunen, 1995) in that they depict the domain, and subdomain levels of the physical self, presented in the Fox (1998) model (see Figure. 2) as quite stable for change, unless indirectly or directly manipulated by, for example, exercise interventions. Linked to the two hypotheses of direction, it is important to discuss the role of PSP for motivation (cf. Biddle, 1997) to start exercise, as well as for adhering to an exercising programme. It seems quite clear that PSP have a central part to play as middle-links between behaviour and global self-esteem (as presented in Figure.4), with the potential to influence the intensity, direction and perseverance of the exercise behaviour. Starting from the direction of the SEH, the Competence Motivation (Harter, 1978) perspective may explain the relation between PSP and exercise behaviour that was observed in Study II, because people are motivated to seek out settings and activities that will enable them to demonstrate competence. Hence, it would seem rational to suppose that individuals with positive PSP will continue to exercise regularly to boost their

self-esteem. Similarly, from a self-presentational approach (cf. Leary, 1992), people who have positive perceptions of their physical self would want to seek out activities where they may present the strong domains of their self to the social surroundings. PSP, and changes in PSP, are also intimately related to exercise identity and exercise self-schemata (Kendzierski, 1990, 1994). More positive PSP, derived from participation in an exercise programme, most probably influences how closely tied and important exercise is to the exerciser's identity and how (s)he processes exercise-related information. From a SDH-perspective, the role of self-efficacy, in terms of expectations of both efficacy and outcome, are vital as mediators of the effect of exercise on more general perceptions of competence, acceptance, and ultimately global self-esteem (e.g., Bandura, 1997; Sonstroem & Morgan, 1989; Sonstroem et al., 1994). In addition, the core components of the Self-Determination theory (Deci & Ryan, 1985), i.e., feelings of competence, autonomy, intrinsic motivation, and locus of causality, also go hand in hand with levels of, or development in, PSP, from both SDH and SED- perspectives. Hence, PSP may indirectly regulate exercise behaviour (and subsequently themselves) through their close link to source motivation (e.g., Fox, 1997), mirroring the "healthy-circle" phenomena that surround the reciprocal nature of the exercise and self relationship.

To summarise the relationship of exercise, PSP and the self, it seems suitable to link the results of Studies II and III in this dissertation to the four introductory questions that Sonstroem (1997b) poses in a review of the relationship between physical activity and self-esteem. Although the empirical studies discussed in this dissertation focus on self-perceptions rather than self-evaluation and self-esteem, the close relationship between these two aspects of the self make Sonstroem's four questions nice anchors for a summary.

(a) Are increases in self-esteem (PSP) scores directly related to increases in physical fitness?

In general, the results of Study III show clearly that changes in the physical self and SPA are not related to changes in body weight, BMI, or physical fitness (submaximal oxygen uptake). These results are in line with what has been proposed in previous reviews (Fox, 2000a; Sonstroem, 1997b) and recent empirical studies (e.g., Knapen et al., 2003). Similar results were found in an interdisciplinary pilot study investigating the effects, over eight weeks, of an aerobic exercise programme on physical fitness and PSP for previously sedentary middle-aged women (Lindwall & Naylor, 2002). Significant improvements were found in all PSP subdomains, whereas no significant changes were detected on various fitness measures of heart rate and submaximal oxygen uptake. Based on these results, and the existing literature, two hypotheses seem reasonable at this stage: (a) changes in psychological self- and body-related concepts, such as PSP and SPA, may not be dependent on physiological changes; and (b) when they do co-exist, changes in the self- and body-perceptions seem to precede robust physiological changes that demand longer time-frames than the typical 8-12 weeks included in intervention studies. As a caveat here, however, changes in the Body subdomain have been associated strongly with changes in weight change and BMI-change (Lindwall & Naylor, 2002). Hence, although the bulk of studies suggest that psycho-social, rather than psycho-physiological, mechanisms are primarily responsible for the beneficial effects of exercise on the self, the possibility should not be ruled out that physiological feedback (e.g., decreased weight or increased physical fitness) may be more important to some groups or individuals, and consequently linked more closely to changes in PSP.

(b) Are increases in self-esteem (PSP) scores limited to those subjects with initially lower scores?

It has been suggested in previous reviews that groups initially lower in PSP and self-esteem (females in general, people with mild depression, obese) may reap the greatest benefits from exercise interventions and programmes (Fox, 2000a, 2000b; Sonstroem, 1997b). However, several studies do indicate that positive effects may be experienced by all groups. For example, Studies II and III show that: (a) exercise participation is associated with more positive PSP in non-clinical samples of students; and (b) an exercise intervention over six months resulted in increased PSP and lowered SPA for a non-clinical sample of adolescent girls. Hence, although changes in self-perception may be most pertinent in groups with initially low scores, in contrast to groups with already high PSP scores, due to “ceiling-effects” (cf. Morgan 1997), valid, reliable and sensitive measures of self-perceptions, measured on the right degree of focus, specificity and nature of content (see Fox, 1998), will most probably be able to detect positive changes also for individuals not initially low in self-perception and evaluation.

(c) Are increases in self-esteem (PSP) independent of confounding factors such as the placebo effect, response distortion, and social desirability?

In regard to social desirability, one of the main reasons why the PSPP was used in all three empirical studies was that its response format was originally created to reduce social desirability, which has been mirrored in later studies showing that the PSPP is quite insensitive to social desirability (see Fox, 1998). Given this fact, measures of social desirability were not used in any of the studies, which should be identified as a potential limitation of the studies. On the other hand, one might question the capacity and validity of social desirability self-report instruments to capture a phenomenon that, by definition, incorporates responding in a biased way in self-report instruments. However, the issue of

social desirability was most probably of less concern in the empirical studies than were expectancy effects. As stated by several scholars, various forms of expectancy effects, such as placebo and Hawthorne, may influence and blend in with the true effects in all research that uses psychological constructs as dependent variables, (e.g., Morgan, 1997). Separating these nuisance factors from the effects of the *a priori* targeted independent variable constitutes one of the key challenges in experimental research. Yet, because it is very difficult, if not impossible, to separate true effects from placebo effects in the context of exercise interventions (Ojanen, 1994), this process is very delicate. Hence, the true effects in Study III are very difficult to disentangle from the potential accompanying effects of various experimenter expectancy factors. As no measures of expectancy were used in the pre-test, no clear conclusions can be drawn on this matter. However, bearing in mind the fact that we should try to separate these different effects, we should also recognise that, on a conceptual level, a wide mix of beliefs, attitudes, norms, as well as expectancy-related cognitions and emotions underlie self-perceptions and self-evaluations. Hence, any eventual placebo and expectancy effects may be intimately intertwined with the dependent variables. Overall, though, the differences in effects of the various physical self-domains, which show the same pattern as previous research, do offer support for the incidence of true effects associated directly with the intervention, rather than other side-effects such as placebo (assuming that experimenter effects do not systematically covary with the different domains of the self, which then could mask the true effects).

(d) Are increases in self-esteem (PSP) permanent or do they disappear after several months?

It is important to consider the stability of positive changes afforded by exercise programmes. The issue bears on whether positive PSP, like physical stamina and fitness, are “perishables”, which need to be regularly entertained and stimulated

to maintain their high levels. Drawing on a SEH-perspective, and given the role of PSP regarding the motivation to initiate and adhere to regular exercise (e.g., Biddle, 1997), it may be hypothesised that increases in self-perceptions and self-esteem will work automatically to conserve their high levels by seeking out activities that subsequently will maintain and strengthen the processes underlying the change. However, given that Study III measured changes directly only after the intervention, no empirical support for this hypothesis may be derived from it. As few studies have examined the stability of change in post-intervention designs, it would be beneficial if future studies were to highlight this particular issue.

Moreover, two conclusions (presented as hypotheses) of the Sonstroem (1997b) review should be commented on in light of the results of the empirical studies and the theoretical background outlined in the present work:

(a) The use of component importance ratings will increase our understanding of the self in exercise.

Theoretical underpinnings for the link between competence, importance of competence and self-esteem have been proposed by several scholars (e.g., Fox, 1990; Harter, 1985). However, the empirical evidence has been equivocal on this matter, failing to find support for the notion that competence/importance ratings will predict self-esteem better than competence ratings alone, but also showing that importance ratings are linked to self-reported levels of physical activity (Marsh & Sonstroem, 1995). Study II shows that, self-reported levels of exercise frequency in particular were related to importance ratings, which offers some support, albeit weak, for the hypothesis stated by Sonstroem. In addition, the effects of the exercise intervention on two of the five PSPP/PIP discrepancy subscales for the experiment-group in Study III give some support for the relationship between competence/importance ratings of the physical self and

exercise. The issue of measurement reliability, or lack thereof, is pertinent here, given that the original PIP is flawed by weak internal consistency due to the low number of items. As the modified PIP-R used in Study III demonstrated more stable internal consistency compared to previous work (including Study II) using the old version, the results of Study III may be more relevant. On the other hand, given suggestions that the value of competence-importance ratings of the self is more interesting as a predictor of exercise participation from a SEH perspective (Sonstroem, 1997), the lack of more robust support for the hypothesis of Sonstroem and others in Study III seems reasonable. In general though, drawing on James' (1890) statement of more than 100 years ago, to the effect that self-esteem represents a ratio of pretensions to success, the theoretical framework of competence vs. importance is of great relevance in the context of exercise. For example, the question of how self-presentational processes, i.e. impression motivation and strategies of the individual, are associated with levels of PSP is interesting. Linked to the perceived importance of PSP, competence/importance discrepancies may be related to self-presentational concerns as the individual may feel a lack of competence in a domain that (s)he deems important. Starting to exercise may be one strategy used to overcome the imbalance between one's desired and one's current image. Hence, looking at the impression management model of Leary & Kowalski (1990), it seems relevant to consider the PSP competence/importance equation when considering the development of motives for the presentation of the physical self to others. As appearance aspects of the physical self appear to be the most highly valued domains of the physical self in the interaction with the world (Fox, 1998; Harter, 1993), and the hardest to discount, the PSP subdomain of body attractiveness is particularly interesting in this context. Moreover, taking into account the self-presentational concept of SPA, a highly perceived body attractiveness competence/importance discrepancy could conceivably be seen as a prerequisite when developing SPA. In other words, the SPA phenomena may very well stem, at least partially, from

a perceived PSP competence/importance imbalance. Hence, importance ratings most probably will contribute to a substantially increased understanding of the self in physical activity and exercise when researchers manage to merge theory and measurement successfully and to elucidate the specific role(s) of importance ratings in various settings, groups and situations.

(b) PSP are associated significantly with favourable life adjustment.

This hypothesis, which receives support of previous studies (e.g., Sonstroem and Potts, 1996) suggests that PSP, and in particular PSW, should be viewed not only as important middle-links to self-esteem and over-all mental well-being, but also as valued outcome in themselves. Drawing from the characteristics of a healthy self (Rodriguez, 2000), positive PSP, derived from exercise participation, probably also entail general adaptive functions in terms of life-adjustment, such as a strong sense of autonomy, expressing feelings, self-awareness, self-perceptions being congruent with reality, maintaining a balance between pleasure and pain, and being able to accept oneself. From this perspective, exercise may be viewed as one of many operating agents that help the individual to adapt successfully to the environment through the development of positive PSP.

7.4. Mechanisms and a model

As the evidence for the positive effect of exercise on the self and PSP grows, it seems pertinent to consider what are the mechanisms governing this relation. Future investigations of the mechanisms of change, linked both to self-esteem and PSP, have repeatedly been called for (Fox, 1998, 2000a, 2000b). In order to capture the complex and multilevel effects of exercise on the human psyche, and to be able to develop a broad foundation for the understanding and elucidation of the mechanisms, how they function, and how they interact to affect the individual, it is important to implement both psychophysiological/biological and

psychological, as well as socio-cultural factors. As cited by Salmon (2001; p.51): “...exercise is a complex psychobiological stimulus, which changes as its cultural significance changes. Therefore the challenge for future research is to be grounded in psychobiological theory, while also being sensitive to the social and cultural context in which exercise occurs”. Hence, such a framework emphasizes the effects of exercise on the physical self from micro-level to macro-level, recognizing the roles of molecules as well and sociocultural norms and values. In exercise psychology, psychobiological models have occasionally been presented and adopted to study, for example, adherence to exercise (Dishman & Gettman, 1980) and the antidepressant and anxiolytic effects of exercise linked to sensitivity to stress (Salmon, 2001). However, such models have rarely been given the systematic attention (Biddle & Mutrie, 2001) they deserve. The biopsychosocial model presented here should be perceived as a dynamic framework for future studies on the mechanisms of exercise on the physical self, rather than as a complete unifying theory. Overall, the model (see Figure. 5) rests on the notion that various feedback systems linked to human functioning, occurring on different levels and through different channels, operate as active agents to make individuals feel better about themselves and their physiques when they exercise.

Starting with the psychophysiological/biological aspect, the three hypothesized mechanisms that seem to have received most empirical support, at least regarding effects on reducing anxiety and depression and elevating mood, are those relating to endorphin, serotonin and norepinephrine (for reviews, see Chaouloff, 1997; Dishman, 1997; Hoffmann, 1997). In short, the endorphin hypothesis focuses on the activation of endogenous opioid systems by exercise, whereas the serotonin and norepinephrine hypotheses highlight the interaction between physical activity and central serotonin (5-HT) and changes in

noradrenergic activity after physical activity. The empirical support for these hypotheses rests on a combination of animal models and research on humans.

Moving to the psychological factors, several variables have been suggested to account for the positive effects of exercise on the self, including increased perceived competence linked to the physical self and the body, enhanced self-acceptance and body satisfaction, increased sense of autonomy and control, and exercise as a more pertinent aspect of one's identity, affecting the development exercise-related schemas and subsequently information-processing. In addition, strongly related to competence and sense of control, exercise may serve as a vital token of, or proof of, the healthy physical status of the individual in terms of bodily functions. That is, the cognitive and emotional interpretation and evaluation following an exercise bout, i.e. that one can trust the body and that it will not fail in terms of functions, may contribute significantly to enhanced PSP and, subsequently to increased global self-esteem, especially for individuals rehabilitating from various psychosomatic or stress-related health-problems where experiences and memories of the body losing its normal functioning may linger for a long time after the incidence and affect negatively the individual's general mental health.

It should be noted that the psychological factors in the model are clearly rooted in the previously presented most influential theoretical frameworks and models, such as Harters (1978) Competence Motivation theory, Sonstroem and Morgans (1989), Exercise and Self-Esteem Model, Deci & Ryan's (1985) Self-Determination theory, and Kendzierski's (1990, 1994) Exercise Schema theory. Furthermore, in accordance with the work of sociologists (e.g., Featherstone, 1991; Johansson, 1998; Söderström, 1999; Turner, 1992), we see the influence of general socio-cultural value systems manifested in the modern Western world that are linked to the body and its role in general health and well-being. Overall,

the exercise stereotype (e.g., Hodgins, 1992; Martin et al., 2000; Martin Ginis et al., 2003; Lindwall & Martin, 2003), supports the notion that exercise is accompanied by other attributes that are valued highly by other people, values that extend to non-physical attributes such as self-control and being a hard worker (i.e. the halo-effect; Cooper, 1981). Furthermore, given ideals and socio-cultural pressures regarding the development and maintenance of both an attractive and aesthetically ideal body as well as a functional, fit and most importantly healthy physique (e.g., Brownell, 1991a, 1991b; White et al., 1995) free from pandemic modern day stress-related diseases, the communication to others that one subscribes to the prevalent ideals and practices regarding exercise, may result in substantial positive feedback. In addition, the social support inherent in the social processes of, for example an exercise programme group or recreational sport team, also provides the individual with positive feedback that reflects positively on self-evaluations. In the parlance of Cooley's (1902) theory of the "looking glass self" (positing that self-esteem was shaped by interpretations of others' reactions and attitudes towards one's own characteristics and behaviours), the social appraisal and positive feedback from significant others in relation to one's exercise lifestyle, reflected for instance in the exercise stereotype and halo effects previously described, should have natural positive consequences for self-evaluations on different levels.

Overall, as all the factors in the model co-develop, interact and overlap, and are more relevant in some situations and for some groups than others, a highly relevant challenge for future researcher is to outline when, under what circumstances, and for whom the various factors are most active. Moreover, another relevant task for the future is to separate the effects of the mechanisms in the models from confounding factors such as various expectancy effects.

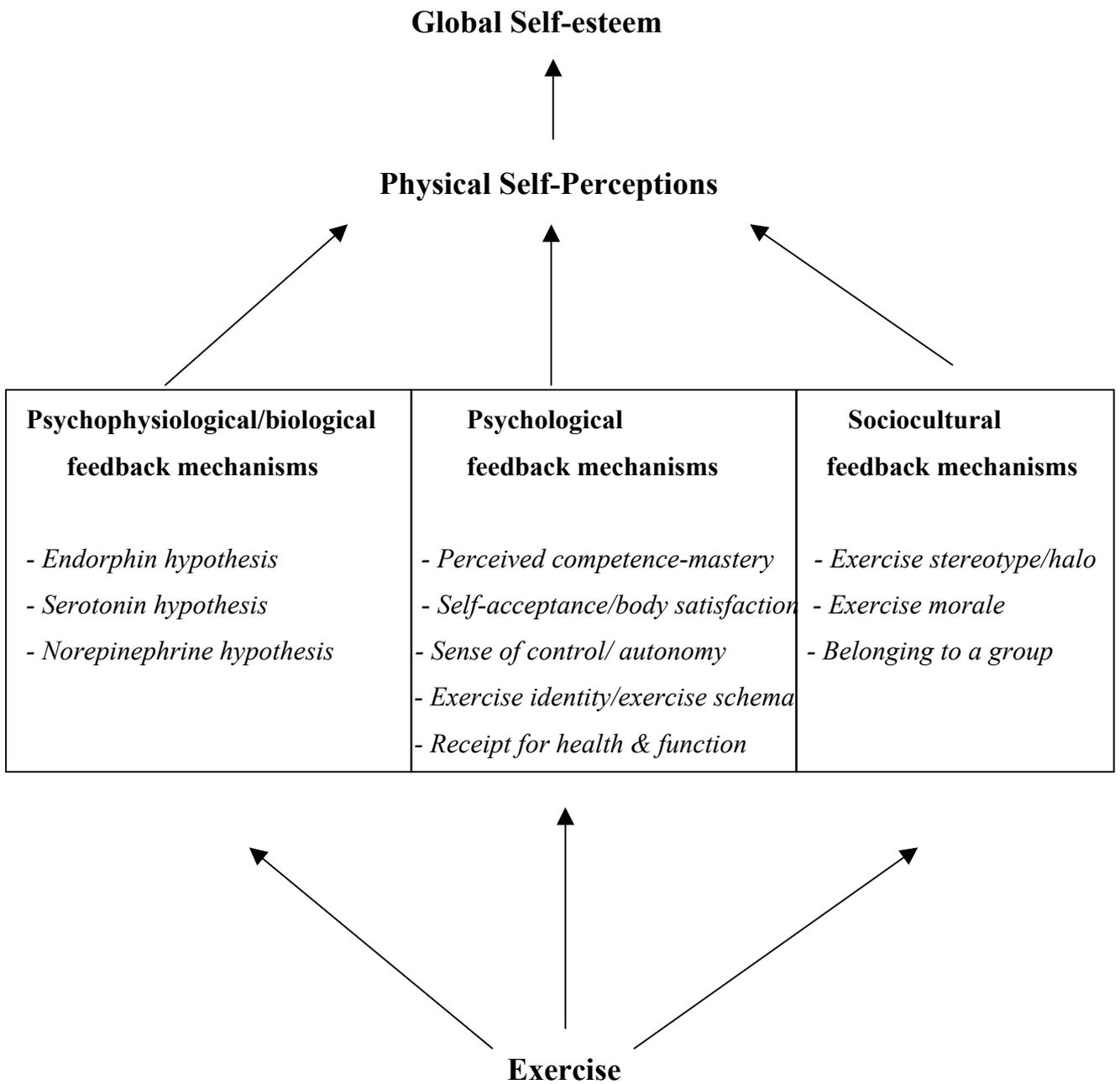


Figure. 5. A biopsychosocial feedback-model of mechanisms in the exercise-physical self relationship.

7.5. Methodological issues

7.5.1. Design

The cross-sectional design of Study II limits the drawing of any conclusions related to, for example, the causes of effects. In contrast, Study III adopted a mix

between true-experimental and quasi-experimental design (e.g., Dooley, 1984), which allows the possibility of drawing conclusions also about causes and effects. The difference between quasi-experiments and true-experiments is primarily a question of control of the research situation. Hence, as Study III was conducted in natural settings, the control of outer nuisance factors that could have affected the results was limited. In that sense, the design may be viewed as quasi-experimental. However, Study III also contained the two features that mark a true-experimental design: (i) two or more differently treated groups and (ii) random assignment into these groups. Moreover, the question of design also reflects the issue of internal versus external validity (Cook & Campbell, 1979). In this context, the results of Study III, similarly to the majority of studies in sport and exercise psychology conducted outside the laboratory, have weaker internal validity (due to lack of complete control and confounding variables nested in the design) whereas the external validity is stronger due to the fact that the study was conducted in natural settings, which makes possible the generalization of the results to every-day contexts.

7.5.2. Participants

As in the majority of research in mainstream psychology, two of the three studies in this dissertation used university students as subjects (Study I and II). It has been suggested that students differ from their peers with respect to significant characteristics such as self-perception, self-awareness and attitudes (Sears, 1986). Such differences would generate a potential threat to the external and ecological validity of research (see Bronfenbrenner, 1977). However, it is evident that the majority of previous studies in sport and exercise psychology have used the same population as the studies in this dissertation, which makes comparisons more relevant and valid. There are two additional reasons that warrant the use of a student population for the present work: (a) to the best of the author's knowledge, no previous research exists on PSP in Swedish students;

and (b) it has been estimated that roughly half of the school population in Sweden proceed to study at universities or colleges, making university students a very large group to which the results may be generalized.

7.5.3. Instruments

“A laudable empirical question, sound methodological design, and sophisticated data analysis will not make up for a faulty selection of a measurement tool or misinterpretation of the construct indexed by a particular measure” (Thompson, 2004; p. 7). As the quotation suggests, the choice of, and use of, measurement instruments lies at the heart of all scientific work. The use of the PSPP has several advantages. First, it is a theory-driven instrument, which affords the possibility of interpreting the results from a broad theoretical framework. Second, from a construct-validation perspective (cf. Marsh, 1997, 1998, 2001), the PSPP has been used widely, on different groups and in different cultures, and has been demonstrated to possess internal as well as external construct validity (Fox, 1998). Regarding internal construct-validation, the results of Study I, together with the results of the Hagger et al. (2003) study, clearly show that the PSPP measures the multidimensional and hierarchical nature of the physical self in a valid and reliable way. Moreover, given the importance of demonstrating invariance in measurement parameters in all comparisons of groups, but particularly in regard to cross-cultural research (Byrne, 1996; 1998; Byrne & Watkins, 2003), the results of Study I that demonstrate the equivalence of factor structure parameters across cultures further strengthen the internal construct validity of the PSPP. In addition, the use of confirmatory statistical approaches of structural equation modeling, rather than exploratory factor analyses, provides important advantages in terms of interpreting the relation between theory, model, and measurement (see Bollen, 1989; Byrne, 1998). Third, the PSPP was constructed to reduce, and has been demonstrated to be resistant towards, social desirability effects (Fox, 1990, 1998). Similarly, the

SPAS has been widely investigated (see Bane & McAuley, 1998) and has stable psychometric properties. Overall, given the fact that the psychometric properties of the Swedish versions of both the PSPP and SPAS have been investigated rigorously (Study I; Lindwall in press), the choice of instruments should be perceived as a substantial methodological strength in the present work.

7.6. Future studies

In addition to the recommendations offered above, future work should investigate the self, the physical self and their link to exercise from an interdisciplinary perspective, with cooperative contributions being made by scholars in biology, physiology, psychology, and sociology. In addition, we need a better understanding of the dynamic nature of the physical self. Thus, longitudinal, prospective, and experimental designs where conclusions regarding causes and effects can be drawn would be beneficial. Moreover, we need to know how groups other than university students perceive themselves and their physique. For example, it would be of interest to assess the role of exercise for self-perceptions and well-being in clinical groups of depressed, burned-out, obese, or patients with eating disorders. In addition, exercise has been shown to influence the aging process and have beneficial effects on general mental health, cognitive functioning, brain function and brain plasticity in the elderly (e.g., Boutcher, 2000; Churchill et al., 2002; Cotman & Berchtold, 2002). The role of regular exercise for the elderly in shaping their identity and affecting their perceived quality of life may be different than for young adults and adolescents (e.g., Hardcastle & Taylor, in press). Hence, the notion that exercise may have a different impact on specific domains of physical self-perceptions or on general physical self-worth for the elderly than for younger people should be examined further. Future work should also adopt approaches other than the predominant nomothetic, positivistic research perspective, according to which the primary aim is to generalize and find objective universal laws that may predict human

behaviour. For example, to better understand the complex nature and dynamics of self and self-evaluations, we also need to acknowledge, and examine, the individual and subjective aspects of the exercise experience. Hence, intra-individual approaches such as HICLAS (e.g., Vanden Auweele, De Cuyper, Van Mele, & Rzewnicki, 1993; Van de Vliet et al., in press) along with idiographic research approaches, according to which the tales and narratives surrounding the body and the physical self may contribute to an understanding of the lived body in sport and exercise (see Bullington, 1999; Sparkes, 1997, 2002), should be used to complement the quantitative inter-individual methods that are commonly used (see Biddle, Markland, Gilbourne, Chatzisarantis, & Sparkes, 2001).

7.7. Prospects: Exercising the self in the field

To recapitulate, given the documented association of negative self-perceptions and low self-esteem with growing health-problems such as depression and eating disorders, the positive relation of exercise to the physical self reported in Study II and III, should also be viewed from the broader perspective of applied mental health. Considering the robust scientific evidence that links exercise to general well-being, life adjustment and positive self-evaluation, it seems evident that exercise and physical activity have a lot to offer health practitioners as a complement to therapy and medication (Cash, 1997; Levine & Piran, 2004) regarding eating disorders and depression; whether viewed as a therapy for the treatment of mental illness or as an important tool in the prevention of mental illness or promotion of quality of life.

When translating the results of the studies in this dissertation to an applied setting, the main message is that exercise is related to, and presumably leads to, more positive evaluations and perceptions of the physical self, especially for groups previously low in self-regard and self-esteem (e.g., females). Moreover,

following previous recommendations (e.g., Pate et al., 1995), it seems that frequency of the activity, rather than the duration and intensity, is vital for the demonstrated significant effects on the physical self. In addition to demonstrating relationships between relevant variables in well-conducted studies, however, a vital task for exercise scientists is to “spread the word” and communicate their results in a meaningful way to governing health bodies and practitioners in the field (cf. Fox, 2000b). It is, therefore, pertinent to ask what the reported statistical effects mean in terms of relevant behavioural changes (see Kaplan, 1990; Sechrest, McKnight, & McKnight, 1996). Hence, the statistical effects need to be further translated and transferred into meaningful behavioural changes (for example, what does the effects size of .21 for the SPA variable in the experiment group in Study III mean in terms of changes in relevant behaviour, such as visits to the gym despite the evaluation of others?). Some effects may be highly statistically significant but not practically relevant, while non-significant statistical trends (due to lack of power for example) may reveal themselves to be highly interesting and positive from a practical or clinical perspective, so it is essential to interpret the dependent variables and the size of the effects in studies from a practical perspective (Stoové & Andersen, 2003). From a clinical perspective, as exercise has been outlined as a “double-edged” sword with the potential both to heal and harm, it is of the utmost importance that medical doctors and health professionals, with the authority to prescribe exercise to patients, understand the effects and mechanisms of exercise on mental well-being and have correct information about suitable modes and types of activities as well as levels of intensity, frequency and duration of the exercise activity.

8. References

- Alfermann, D., & Stoll, O. (2000). Effects of physical exercise on self-concept and well-being. *International Journal of Sport and Exercise Psychology*, 30, 47-65.
- Amorose, A.J. (2001). Intraindividual variability of self-evaluations in the physical domain: Prevalence, consequences, and antecedents. *Journal of Sport and Exercise Psychology*, 23, 222-244.
- Annerstedt, C. (1989). *Pedagogers syn på fysisk fostran: Ett didaktiskt perspektiv*. [Teachers view on physical education: A didactic perspective]. In Swedish. Department of Education, University of Gothenburg (1989:13).
- Aşçi, F.H. (2003). The effects of physical fitness training on trait anxiety and physical self-perceptions on female university students. *Psychology of Sport and Exercise*, 4, 255-264.
- Aşçi, F.H., Aşçi, A., & Zorba, E. (1999). Cross-cultural validity and reliability of Physical Self-Perception Profile. *International Journal of Sport and Exercise Psychology*, 30, 399-406.
- Aşçi, F.H., Kin, A., & Kosar, S.N. (1998). Effects of participation in an 8 week aerobic program on physical self-perception and body images satisfaction. *International Journal of Sport and Exercise Psychology*, 29, 366-375.
- Augestad, L.B., & Flanders, W.D. (2002). Eating disorder behavior in physically active Norwegian women. *Scandinavian Journal of Medicine and Science in Sports*, 12, 248-255.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1986). *Social foundations of thoughts and action*. Englewood Cliffs, NJ: Prentice Hall, Inc.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bane, S.M., & McAuley, E. (1996). Reducing social physique anxiety in college females. *Medicine and Science in Sport and Exercise*, 28, S85.
- Bane, S., & McAuley, E. (1998). Body image and exercise. In J.L. Duda (Ed.), *Advances in sport and exercise psychology measurement* (pp.311-322). Morgantown, WV: Human Kinetics.

- Bartlewski, P.P., Van Raalte, J.L., & Brewer, B.W. (1996). Effects of aerobic exercise on the social physique anxiety and body esteem of female college students. *Women in Sport and Physical Activity Journal*, 5, 49-62.
- Baumeister, R.F. (1993). Understanding the inner nature of self-esteem. In R.F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp.201-218). New York: Plenum.
- Baumeister, R.F. (1995). Self and identity: An introduction. In A. Tesser (Ed.), *Advanced social psychology* (pp. 51-99). New York: McGraw-Hill.
- Beck, A.T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.
- Betancourt, H., & Lopez, S. (1993). The study of culture, ethnicity, and race in American psychology. *American Psychologist*, 48, 629- 637.
- Biddle, S.J.H. (1997). Cognitive theories of motivation and the physical self. In: K.R. Fox (Ed.), *The physical self: From motivation to well-being* (pp. 59-82). Champaign, IL: Human Kinetics.
- Biddle, S.J.H. (2000). Emotion, mood and physical activity. In S.J.H Biddle, K.R. Fox & S.H. Boutcher (Eds.), *Physical activity and psychological well-being* (pp. 63-88). London: Routledge & Kegan Paul.
- Biddle, S.J.H., Markland, D., Gilbourne, D., Chatzisarantis, N.L.D., & Sparkes, A.C. (2001). Research methods in sport and exercise psychology: Quantitative and qualitative issues. *Journal of Sport Sciences*, 19, 777-809.
- Biddle, S.J.H., & Mutrie, N. (2001). *Psychology of physical activity: Determinants, well-being and interventions*. London: Routledge.
- Blaine, B., & Crocker, J. (1993). Self-esteem and self-serving biases in reaction to positive and negative events: An integrative review. In R.F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp.55-86). New York: Plenum Press.
- Blair, S.N. (1988). Exercise within a healthy lifestyle. In: R.K. Dishman (Ed.), *Exercise adherence: Its impact on public health* (pp. 75-89). Champaign, IL: Human Kinetics.
- Block, J., & Robins, R.W. (1993). A longitudinal study of consistency and change in self-esteem from early adolescence to early adulthood. *Child Development*, 64, 909-923.
- Blom, K.A., & Linderöth, K. (1990). *Från antikens arenor till modern massrörelse*. [From the arenas of ancient Greece to modern mass-movement]. In Swedish. Farsta, Stockholm: SISU idrottsböcker.
- Bollen, K.A. (1989). *Structural equations with latent variables*. New York: Wiley.

- Bond, M.H., & Cheung, T.S. (1983). College students spontaneous self-concept: The effects of culture among respondents in Hong Kong, Japan, and the United States. *Journal of Cross-Cultural Psychology, 14*, 153-171.
- Bordo, S. (1994). Reading the male body. In: L. Goldstein (Ed.), *The male body* (pp. 265-306). Ann Arbor: Michigan University Press.
- Boutcher, S.H. (2000). Cognitive performance, fitness and ageing. In S.J.H Biddle, K.R. Fox and S.H. Boutcher (Eds), *Physical activity and psychological well-being* (pp. 118-130). London: Routhledge & Kegan Paul.
- Boyd, M.P., Weinmann, C., & Yin, Z. (2002). The relationships of physical self-perceptions and goal orientation to intrinsic motivation for exercise. *Journal of Sport Behavior, 25*, 1-18.
- Bowker, A., Gadbois, S., & Cornock, B. (2003). Sports participation and self-esteem: Variations as a function of gender and gender role orientation. *Sex Roles, 49*, 47-58.
- Brinthaup, T.M., & Erwin, L.J. (1992). Reporting about the self: Issues and implications. In T.M Brinthaup & R.P. Lipka (Eds.), *The self: Definitional and methodological issues* (pp.137-171). Albany: State University of of New York Press.
- Brown, J.D. (1993a). Motivational conflict and the self: The double bind of low self-esteem. In R.F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp. 117-130). New York: Plenum Press.
- Brown, J.D. (1993b). Self-esteem and self-evaluation: Feeling is believing. In J. Suls (Ed.), *Psychological perspectives on the self* (Vol. 4, pp. 27-58). Hillsdale, NJ: Erlbaum.
- Brown, J.D. (1998). *The self*. Boston: McGraw-Hill.
- Brown, J.D., & Kobayashi, C. (2003). Introduction: Culture and self-enhancement bias. *Journal of Cross-Cultural Psychology, 34*, 492-495.
- Brownell, K.D. (1991a). Dieting and the search for the perfect body: Where physiology and psychology collide. *Behavior Therapy, 22*, 1-12.
- Brownell, K.D. (1991b). Personal responsibility and control over our bodies: When expectations exceeds reality. *Health Psychology, 10*, 303-310.
- Buckworth, J., & Dishman, R.D. (2002). *Exercise psychology*. Champaign, IL. Human Kinetics.
- Bullington, J. (1999). *The mysterious life of the body: A new look at psychosomatics*. Stockholm: Almqvist & Wiksell International.
- Byrne, B.M. (1996). *Measuring self-concept across the lifespan: Issues and instrumentation*. Washington, DC: American Psychological Association.

- Byrne, B.M. (1998). *Structural equation modelling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming*. London: Lawrence Erlbaum Associates.
- Byrne, B.M. (2000). Measuring self-concept across culture: Issues, caveats, and practice. In R.G. Craven, & H.W. Marsh (Eds.), *Self-concept theory, research and practice: Advances for the new millennium: Collected papers of the inaugural self-concept enhancement and learning facilitation (SELF) research centre international conference* (pp. 30-41). Sydney, Australia: SELF Research Centre.
- Byrne, B.M., & Watkins, D. (2003). The issue of measurement invariance revisited. *Journal of Cross-Cultural Psychology, 34*, 155-175.
- Campbell, R.N. (1984). *The new science: Self-esteem psychology*. Lanham, MD: University Press of America.
- Campbell, J.N. (1990). Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology, 59*, 538-549.
- Campbell, J.N., Trapnell, P.D., Heine, S.J., Katz, I.M., Lavalley, L.F., & Lehman, D.R. (1996). Self-concept clarity: Measurement, personality correlates and cultural boundaries. *Journal of Personality and Social Psychology, 70*, 141-156.
- Carron, A.V., Burke, S.M., & Prapavessis, H. (2004). Self-presentation and group influences. *Journal of Applied Sport Psychology, 16*, 41-58.
- Caruso, M.C., & Gill, D.L. (1992). Strengthening physical self-perception through exercise. *The Journal of Sport Medicine and Physical Fitness, December*, 416-427
- Cash, T.F. (1997). *The body-image workbook: An 8-step program for learning to like your looks*. Oakland, CA: New Harbinger.
- Cash, T.F. (2004). Body image: Past, present, and future. *Body Image, 1*, 1-5.
- Cash, T.F., Deagle III, E.A. (1997). The nature and extent of body-image disturbances in anorexia nervosa and bulimia nervosa: A meta-analysis. *International Journal of Eating Disorders, 22*, 107-125.
- Cash, T.F., & Pruzinsky, T. (Eds.). (2002). *Body image: A handbook of theory, research, and clinical practice*. New York: Guilford Press.
- Caspersen, C.J., Powell, K.E., & Christenson, G.M. (1985). Physical activity, exercise, and physical fitness: Definitions, and distinctions for health-related research. *Public Health Reports, 101*, 126-146.
- Chaouloff, F. (1997). The serotonin hypothesis. In W.P. Morgan (Ed.), *Physical activity and mental health* (pp. 179-198). London: Taylor & Francis.

- Chatzisarantis, N.L.D., Hagger, M.S., Biddle, S.T.H., Smith, B., & Wang, J.C.K. (2003). A meta-analysis of perceived locus of causality in exercise, sport, and physical education contexts. *Journal of Sport and Exercise Psychology, 25*, 284-306.
- Churchill, J.D., Galvez, R., Colcombe, S., Swain, R.A., Kramer, A.F., & Greenough, W.T. (2002). Exercise, experience and the aging brain. *Neurobiology of Aging, 23*, 941-955.
- Conroy, D.E., Motl, R.W., & Hall, E.G. (2000). Progress toward construct validation of the Self-Presentation in Exercise Questionnaire (SPEQ). *Journal of Sport and Exercise Psychology, 22*, 21-38.
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-Experimentation: Design & analysis issues for field settings*. London: Houghton Mifflin Company.
- Cooley, C.H. (1902). Human nature and the social order. New York: Scribner's.
- Cooper, W.H. (1981). Ubiquitous halo. *Psychological bulletin, 90*, 218-244.
- Coopersmith, S. (1967). *The antecedents of self-esteem*. San Francisco: Freeman, Cooper.
- Cordain, L., Gottshall, R.W., Eaton, S.B., & Eaton, S.B. (1998). Physical activity, energy expenditure and fitness: An evolutionary perspective. *International Journal of Sports Medicine, 19*, 328-335.
- Cotman, C.W., & Berchtold, N.C. (2002). Exercise: A behavioral intervention to enhance brain health and plasticity. *Trends in Neurosciences, 6*, 295-301.
- Craft, L.L. (in press). Exercise and clinical depression: Examining two psychological mechanisms. *Psychology of Sport and Exercise*.
- Crago, M., Shisslak, C.M., & Estes, L.S. (1996). Eating disturbances among American minority groups: A review. *International Journal of Eating Disorders, 19*, 239-248.
- Crawford, S., & Eklund, R.C. (1994). Social physique anxiety, reasons for exercise and attitudes toward exercise settings. *Journal of Sport and Exercise Psychology, 16*, 70-82.
- Crocker, J., & Major, B. (1989). Social stigma and self-esteem: The self-protective properties of stigma. *Psychological Review, 96*, 608-630.
- Crocker, J., & Wolfe, C.T. (2001). Contingencies of self-worth. *Psychological Review, 108*, 593-623
- Crocker, P.R.E., Eklund, R.C., & Kowalski, K.C. (2000). Children's physical activity and physical self-perceptions. *Journal of Sports Sciences, 18*, 383-394.
- Crocker, P., Sabiston, C., Forrester, S., Kowalski, N., Kowalski, K., & McDonough, M. (2003). Predicting change in physical activity, dietary restraint, and physique anxiety in adolescent girls. *Canadian Journal of Public Health, 94*, 332-337.

- Cronbach, L.J., & Meehl, P.E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52, 281-302.
- Damasio, A.R. (1999). *The feeling of what happens: Body, emotion and the making of consciousness*. London: Vintage.
- Daun, Å. (1989). *Svensk mentalitet: Ett jämförande perspektiv* [Swedish mentality: A comparative perspective]. Simrishamn: Rabén & Sjögren.
- Davis, C. (1997). Body image, exercise, and eating behaviors. In K.R. Fox (Ed.), *The physical self: From motivation to well-being* (pp. 143-174). Champaign, IL: Human Kinetics.
- Davis, K. (2002). A dubious equality: Men, women and cosmetic surgery. *Body & Society*, 8, 49-65
- Davis, C., & Cowles, M. (1991). Body image and exercise: A study of relationships and comparisons between physically active men and women. *Sex Roles*, 25, 33-44.
- Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Desharnais, R., Jobin, J., Côté, C., Lévesque, L., & Godin, G. (1993). Aerobic exercise and the placebo effect: A controlled study. *Psychosomatic Medicine*, 55, 149-154.
- Diehl, N.S., Johnson, E.J., Rogers, R.L., & Petrie, T.A. (1998). Social Physique Anxiety and disordered eating: What's the connection? *Addictive Behaviors*, 23 (1), 1-6.
- Diehl, N., & Petrie, T. (1995). A longitudinal investigation of the effects of different exercise modalities on social physique anxiety [Abstract]. *Journal of Applied Sport Psychology*, 7, S55.
- Diener, E., & Diener, M. (1995). Cross-cultural correlates of life-satisfaction and self-esteem. *Journal of Personality and Social Psychology*, 68, 653-663.
- Dinnel, D.L. (2000). Culture and self: A reconsideration of the role of individualism and collectivism. *Self-concept theory, research and practice: Advances for the new millennium: Collected papers of the inaugural self-concept enhancement and learning facilitation (SELF) research centre international conference* (pp. 202-208). Sydney, Australia: SELF Research Centre.
- Dishman, R.K. (1997). The norepinephrine hypothesis. In W.P. Morgan (Ed.), *Physical activity and mental health* (pp. 199-212). London: Taylor & Francis.
- Dishman, R.K., & Gettman, L. (1980). Psychobiologic influences on exercise adherence. *Journal of Sport Psychology*, 2, 295-310.
- Dooley, D. (1984). *Social research methods*. Englewood Cliffs: Prentice Hall.

- Duda, J. L., & Allison, M.T. (1990). Cross-cultural analysis in exercise and sport psychology: A void in the field. *Journal of Sport and Exercise Psychology, 12*, 114-131.
- Duda, J.L., & Hayashi, C.T. (1998). Measurement issues in cross-cultural research within sport and exercise psychology. In J.L. Duda (Ed), *Advances in sport and exercise psychology measurement* (pp.471-483). Champaign, IL: Human Kinetics.
- Eagly, A.H. (1987). *Sex differences in social behavior: A social-role interpretation*. Hillsdale, NJ: Erlbaum.
- Eagly, A.H., Ashmore, R.D., Makhijani, M.G., & Longo, L.C. (1991). What is beautiful is good, but...:A meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin, 110*, 109-128.
- Eklund, R.C., & Crawford, S. (1994). Active women, social physique anxiety, and exercise. *Journal of Sport and Exercise Psychology, 16*, 431-448.
- Eklund, R.C., Whitehead, J.R., & Welk, G. J. (1997). Validity of the Children and Youth Physical Self-Perception Profile: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport, 68*, 249-256.
- Epstein, S. (1973). The self-concept revisited or a theory of a theory. *American Psychologist, 28*, 405-416.
- Featherstone, M. (1991). The body in consumer culture. In: M. Featherstone, M. Hepworth & B. S. Turner (Eds.), *The body: Social process and cultural theory*. London: Sage Publications.
- Feingold, A. (1990). Gender differences in effects of physical attractiveness on romantic attraction. A comparison across five research paradigms. *Journal of Personality and Social Psychology, 59*, 981-993.
- Feingold, A. (1992). Good looking people are not what we think. *Psychological Bulletin, 111*,304-341.
- Feingold, A. (1994). Gender differences in personality: A meta-analyses. *Psychological Bulletin, 116*, 429-456.
- Feingold, A., & Mazzella, R. (1998). Gender differences in body image are increasing. *Psychological Science, 9*, 190-195.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*, 117-140.
- Fiske, S.T.,& Taylor, S.E. (1991). *Social cognition*. New York: McGraw-Hill.
- Fiske, A.P. (2002). Using individualism and collectivism to compare cultures- A critique of the validity and measurement of the constructs: Comments on Oyserman et al. (2002). *Psychological Bulletin, 128*, 78-88.

- Fitts, W.H. (1965). *Tennessee Self-Concept Scale: Manual*. Los Angeles: Western Psychological Services
- Forbes, G.B., Adams-Curtis, L.E., Rade, B., & Jaberg, P. (2001). Body dissatisfaction in women and men: The role of gender-typing and self-esteem. *Sex Roles, 44*, 461-484.
- Fox, K.R. (1990). *The Physical Self-Perception Profile manual*. Dekalb, IL: Office for Health Promotion, Northern Illinois University.
- Fox, K.R. (1997). The physical self and processes in self-esteem development. In K.R. Fox (Ed.), *The physical self: From motivation to well-being* (pp. 111-140). Champaign, IL: Human Kinetics.
- Fox, K.R. (1998). Advances in the measurement of the physical self. In J.L.Duda (Ed), *Advances in Sport and Exercise Psychology Measurement* (pp.295-310). Morgantown, WV: Human Kinetics.
- Fox, K.R. (2000a). Self-esteem, self-perceptions and exercise. *International Journal of Sport and Exercise Psychology, 31*, 228-240.
- Fox, K.R. (2000b). The effects of exercise on self-perceptions and self-esteem. In S.J.H Biddle, K.R. Fox and S.H. Boutcher (Eds), *Physical activity and psychological well-being* (pp. 88-118). London: Routledge.
- Fox, K.R. (2002). Self-perceptions and sport behavior. In T. Horn (Ed.), *Advances in sport psychology* (2nd ed.) (pp. 83-99). Champaign, IL: Human Kinetics.
- Fox, K.R., Boutcher, S. H., Faulkner, G.E., & Biddle, S.J.H. (2000). The case for exercise in the promotion of mental health and psychological well-being. In S.J.H. Biddle, K.R. Fox, & S.H. Boutcher (Eds.), *Physical activity, mental health and psychological well-being* (pp.1-9). London: Routledge & Kegan Paul.
- Fox, K.R., & Corbin, C.B. (1989). The Physical Self-Perception Profile: Development and preliminary validation. *Journal of Sport and Exercise Psychology, 11*, 408-430.
- Fox, K.R., Corbin, C.B, & Couldry, W.H. (1985). Female physical estimation and attraction to physical activity. *Journal of Sport Psychology, 7*, 125-136.
- Frederick, C.M., & Morrison, C.S. (1998). A mediational model of social physique and eating disordered behaviors. *Perceptual and Motor Skills, 86*, 139-145.
- Fredrickson, B.L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experience and mental health risks. *Psychology of Women Quarterly, 21*, 173-206.
- Freud, S. (1923/1960). *The ego and the id*. New York: Norton.

- Furnham, A., Badmin, N., & Sneade, I. (2002). Body image dissatisfaction: Gender differences in eating attitudes, self-esteem, and reasons for exercise. *The Journal of Psychology, 136*, 581-596.
- Furnham, A., & Calnan, A. (1998). Eating disturbances, self-esteem, reasons for exercising and body weight dissatisfaction in adolescent males. *European Eating Disorders Review, 6*, 58-72.
- Gammage, K., Hall, C., & Martin Ginis, K.A. (in press). Self-presentation in exercise contexts: Differences between high and low frequency exercisers. *Journal of Applied Social Psychology*.
- Gapinski, K.D., Brownell, K.D., & LaFrance, M. (2003). Body objectification and “fat talk”: Effects on emotion, motivation and cognitive performance. *Sex Roles, 48*, 377-388.
- Gibson, C.H. (1991). A concept analysis of empowerment. *Journal of Advanced Nursing, 16*, 354-361.
- Goffman, E. (1959). *The presentation of self in everyday life*. Garden City, NY: Doubleday Anchor.
- Gray, S.H. (1977). Social aspects of body image: Perception of normalcy of weight and affect of college undergraduates. *Perceptual and Motor Skills, 45*, 1035-1040.
- Gruber, J.J. (1986). Physical activity and self-esteem development in children: A meta-analysis. *American Academy of Physical Education Papers, 19*, 330-348.
- Haase, A.M., & Prapavessis, H. (1998). Social Physique anxiety and eating attitudes: Moderating effects of body mass and gender. *Psychology, Health and Medicine, 3*, 201-211
- Haase, A.M., Prapavessis, H., & Owens, R.G. (2002). Perfectionism, social physique anxiety and disordered eating: A comparison of male and female elite athletes. *Psychology of Sport and Exercise, 3*, 209-222.
- Hagger, M., Ashford, B., & Stambulova, N. (1998). Russian and British children’s physical self-perceptions and physical activity participation. *Pediatric Exercise Science, 10*, 137-152.
- Hagger, M.S., Biddle, S.J.H., Chow, E.W., Stambulova, N., & Kavussanu, M. (2003). Physical self-perceptions in adolescence: Generalizability of a hierarchical multidimensional model across three cultures. *Journal of Cross-Cultural Psychology, 34*, 611-628.
- Hall, J.A. (1984). *Nonverbal sex differences*. Baltimore, MD: The Johns Hopkins University Press.

- Hardcastle, S., & Taylor, A.H. (in press). Finding an exercise identity in an older body: “It’s redefining yourself and working out who you are”. *Psychology of Sport and Exercise*.
- Hart, E.A., Leary, M.R., & Rejeski, W.J. (1989). The measurement of social physique anxiety. *Journal of Sport and Exercise Psychology*, *11*, 94-104.
- Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development*, *21*, 34-64.
- Harter, S. (1985). Competence as a dimension of self-evaluation: Toward a comprehensive model of self-worth. In R. Leahy (Ed.), *The development of the self* (pp.55-122). San Diego, CA: Academic Press.
- Harter, S. (1986). Processes underlying the construction, maintenance and enhancement of self-concept in children. In J. Suls & A. Greenwald (Eds.), *Psychological perspective on the self*: (Vol. 3, pp.136-182). Hillsdale, NJ:Erlbaum.
- Harter, S. (1990). Causes, correlates, and the functional role of global self-worth. In R.J. Sternberg & J. Koligian, Jr (Eds.), *Competence considered* (pp.67-97). New Haven, CT:Yale University.
- Harter, S. (1993). Causes and consequences of low self-esteem in children and adolescents. In R.F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard*, (pp.87-116). New York: Plenum Press.
- Harter, S. (1996). Historical roots of contemporary issues involving self-concept. In B. A. Bracken (Ed.), *Handbook of self-concept* (pp.1-37). New York: Wiley.
- Harter, S. (1999). *The construction of the self: A developmental perspective*. New York: Guilford Press.
- Hassmén, P., Koivula, N., & Uutela, A. (2000). Physical exercise and psychological well-being: A population study in Finland. *Preventive Medicine* *30*, 17-25.
- Hattie, J. (2000). Getting back on the correct pathway for self-concept research in the new millennium: Revisiting misinterpretations of and revitalising the contributions of James’ agenda for research on the self. In R.G. Craven, & H.W. Marsh (Eds.), *Self-concept theory, research and practice: Advances for the new millennium: Collected papers of the inaugural self-concept enhancement and learning facilitation (SELF) research centre international conference* (pp. 42-66). Sydney, Australia: SELF Research Centre, University of Western Sydney.
- Hausenblas, H.A., Brewer, B.W., & Van Raalte, J.L. (2004). Self-presentation and exercise. *Journal of Applied Sport Psychology*, *16*, 3-18.

- Hausenblas, H.A., & Carron, A.V. (1999). Eating disorder indices and athletes: An integration. *Journal of Sport and Exercise Psychology*, 21, 230-258.
- Hausenblas, H.A., Fallon, E.A.(2002). Relationship among body image, exercise behavior, and exercise dependence symptoms. *International Journal of Eating Disorders*, 32, 179-185.
- Hausenblas, H.A., & Mack, D.E. (1999). Social physique anxiety and eating disorder correlates among female athletic and nonathletic populations. *Journal of Sport Behavior*, 22, 502-514.
- Hausenblas, H.A., Symons-Downs, D. (2001). Comparison of body image between athletes and nonathletes: A meta-analytic review. *Journal of Applied Sport Psychology*, 13, 323-339.
- Hausenblas, H.A., Symons-Downs, D. (2002). Exercise dependence: A systematic review. *Psychology of Sport and Exercise*, 3, 89-123.
- Hayes, S.D., Crocker, P.R.E., & Kowalski, K.C. (1999). Gender differences in physical self-perceptions, global self-esteem and physical activity: Evaluation of the Physical Self-Perception Profile model. *Journal of Sport Behaviour*, 22, 1-14.
- Heine, S.H., Lehman, D.R., Markus, H.R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review*, 106, 766-794.
- Heine, S.J., Lehman, D.R., Peng, K., & Greenholtz, J. (2002). What's wrong with cross-cultural comparisons of subjective Likert scales?: The reference-group effect. *Journal of Personality and Social Psychology*, 82, 903-918.
- Heinrichs, N., & Hofmann, S.G. (2001). Information processing in social phobia: A critical review. *Clinical Psychology Review*, 21, 751-770.
- Helms, J.E. (1992). Why is there no study of cultural equivalence in standardized cognitive ability testing? *American Psychologist*, 47, 1083-1101.
- Hodgins, M (1992). A person-perception study of the "healthy body-healthy mind" stereotype. *The Irish Journal of Psychology*, 13, 161-187.
- Hoffmann, P. (1997). The endorphin hypothesis. In W.P. Morgan (Ed.), *Physical activity and mental health* (pp. 163-177). London: Taylor & Francis.
- Hofstede, G. (1980). *Culture's consequences: International differences in work related values*. London: Sage.
- Hofstede, G. (1983). Dimensions of national cultures in fifty countries and three regions. In J. B. Deregowski & S. Dziuraciec & R. C. Annis (Eds.), *Explications in cross-cultural psychology* (pp. 335-355). Lisse, Holland: Swets & Zeitlinger.

- Hofstede, G. (1991). *Cultures and organizations: Software of the mind*. NY: McGraw-Hill.
- Huenemann, R.L., Shapiro, L.R., Hampton, M.C., & Mitchell, B.W. (1966). A longitudinal study of gross body composition and body conformation and their association with food and activity. *American Journal of Clinical Nutrition*, *18*, 325-338.
- Hughes, D., Seidman, E., & Williams, N. (1993). Cultural phenomena and the research enterprise: Toward a culturally anchored methodology. *American Journal of Community Psychology*, *21*, 687-703.
- Ingledeu, D.K., Markland, D., & Medley, A.R. (1998). Exercise motives and stages of change. *Journal of Health Psychology*, *3*, 477-489.
- Iyengar, S.S., Lepper, M.R., & Ross, L. (1999). Independence from whom? Interdependence with whom? Cultural perspectives on ingroups versus outgroups. In D. Miller & D. Prentice (Eds.), *Cultural divides: Understanding and overcoming group conflict* (pp. 273-301). New York: Sage.
- James, W. (1890). *Principles of psychology*. Chicago: Encyclopedia Britannica.
- Johansson, T. (1998). *Den skulpterade kroppen*. [The sculptured body]. In Swedish. Stockholm: Carlssons.
- Jones, D.C. (2001). Social comparison and body image: Attractiveness comparisons to models and peers among adolescent girls and boys. *Sex Roles*, *45*, 645-664.
- Josephs, R.A., Markus, H.R., & Tafarodi, R.W. (1992). Gender and self-esteem. *Journal of Personality and Social Psychology*, *63*, 391-402.
- Kagitçibasi, C. (1996). *Family and human development across cultures: A view from the other side*. New Jersey: Lawrence Erlbaum.
- Kaplan, R.M. (1990). Behavior as the central outcome in health care. *American Psychologist*, *45*, 1211-1220.
- Kendzierski, D. (1988). Self-schemata and exercise. *Basic and Applied Social Psychology*, *9*, 45-59.
- Kendzierski, D. (1990a). Decision making versus decision implementation: An action control approach to exercise adoption and adherence. *Journal of Applied Social Psychology*, *20*, 27-45.
- Kendzierski, D. (1990b). Exercise self-schemata: Cognitive and behavioral correlates. *Health Psychology*, *9*, 69-82.
- Kendzierski, D. (1994). Schema theory: An information processing focus. In R. K. Dishman (Ed.), *Advances in exercise adherence* (pp. 137-159). Champaign, IL: Human Kinetics.

- Kernis, M.H., Cornell, D.P., Sun, C.R., Berry, A., & Harlow, T. (1993). There's more to self-esteem than whether it is high or low: The importance of stability of self-esteem. *Journal of Personality and Social Psychology, 65*, 1190-1204.
- Kling, K.C., Hyde, J.S., Showers, C.J., & Buswell, B.N. (1999). Gender differences in self-esteem: A meta-analysis. *Psychological Bulletin, 125*, 470-500.
- Knapen, J., Van de Vliet, P., Van Coppenolle, H., David, A., Peuskens, J., Knapen, K., & Pieters, G. (2003). The effectiveness of two psychomotor therapy programmes on physical fitness and physical self-concept in nonpsychotic patients: A randomized controlled trial. *Clinical Rehabilitation, 17*, 637-647.
- Koivula, N. (1999a). *Gender in sport*. Edsbruk, Sweden: Akademitryck. Unpublished Doctoral Dissertation
- Koivula, N. (1999b). Sport participation: Differences in motivation and actual participation due to gender typing. *Journal of Sport Behavior, 22*, 1-22.
- Kowalski, K.C., Crocker, P.R.E., Kowalski, N.P., Chad, K.E., & Humbert, M.L. (2003). Examining the physical self in adolescent girls over time: Further evidence against the hierarchical model. *Journal of Sport and Exercise Psychology, 25*, 5-18.
- Kurman, J. (2003). Why is self-enhancement low in certain collectivist cultures? An investigation of two competing explanations. *Journal of Cross-Cultural Psychology, 34*, 496-510.
- La Forge, R. (1995). Exercise-associated mood alterations: A review of interactive neurobiological mechanisms. *Medicine, Exercise, Nutrition and Health, 4*, 17-32.
- Langlois, J.H., Kalakanis, L., Rubenstein, A.J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin, 3*, 390-423.
- Lantz, C.D., & Hardy, C.J., & Ainsworth, B.E. (1997). Social physique anxiety and perceived exercise behavior. *Journal of Sport Behavior, 20*, 83-94.
- Leary, M.R. (1992). Self-presentation processes in exercise and sport. *Journal of Sport and Exercise Psychology, 14*, 339-351.
- Leary, M.R. (1995). *Self-presentation: Impression management and interpersonal behavior*. Milwaukee, WI: Brown & Benchmark.
- Leary, M.R. (2001). Social anxiety as an early warning system: A refinement and extension of the self-presentation theory of social anxiety. In S. G. Hofmann & P. Marten-DiBartolo (Eds.), *From social anxiety to social phobia: Multiple perspectives* (pp. 321-334). London: Allyn and Bacon.

- Leary, M.R., & Kowalski, R.M. (1990). Impression management: A literature review and two-component model. *Psychological Bulletin*, *107*, 34-47.
- Lees, L.A., & Dygdon, J.A. (1988). The initiation and maintenance of exercise behavior: A learning theory conceptualization. *Clinical Psychology Review*, *8*, 345-353.
- Levine, M.P., & Piran, N. (2004). The role of body images in the prevention of eating disorders. *Body Image*, *1*, 57-70.
- Lindgren, E.C. (2002). *Empowering young female athletes: A possible challenge to the male hegemony in sport. A descriptive and interventional study.*. Gothenburg, Sweden: Gothenburg University. Unpublished doctoral dissertation.
- Lindwall, M. (2003). *Examining the validity of a Swedish version of the Self-Presentation in Exercise Questionnaire*. Manuscript submitted for publication.
- Lindwall, M. (in press). Factorial validity and invariance testing of the Swedish Social Physique Anxiety Scale: Arguments for gender-specific scales. *Journal of Sport and Exercise Psychology*.
- Lindwall, M. & Martin-Ginis, K.A. (2003). *Moving towards a favorable image: The self-presentational benefits of exercise and physical activity*. Manuscript submitted for publication.
- Lindwall, M., & Naylor, A. (2002, august). *The physiological and psychological effects of an 8 week aerobic exercise program on previously sedentary women: An interdisciplinary approach*. Poster presented at the Seventh International Congress of Behavioural Medicine, Helsinki, Finland.
- Lintunen, T. (1995). *Self-perceptions, fitness, and exercise in early adolescence: A four-year follow-up study*. Studies in Sport, Physical Education and Health (Report No. 41). Jyväskylä, Finland: Jyväskylä University Printing House.
- Lirgg, C.D. (1991). Gender differences in self-confidence in physical activity: A meta-analysis of recent studies. *Journal of Sport and Exercise Psychology*, *8*, 294-310.
- Loland, N.W. (2000). The aging body: Attitudes toward bodily appearance among physically active and inactive women and men of different ages. *Journal of Aging and Physical Activity*, *8*, 197-213.
- Loumidis, K.S., & Wells, A. (1998). Assessment of beliefs in exercise dependence: The development and preliminary validation of the Exercise Belief Questionnaire. *Personality and Individual Differences*, *25*, 553-567.

- Loumidis, K.S., & Wells, A. (2001). Exercising for the wrong reasons: Relationships among eating disorder beliefs, dysfunctional exercise beliefs and coping. *Clinical Psychology and Psychotherapy*, 8, 416-423.
- Madison, J.K., & Ruma, S.L. (2003). Exercise and athletic involvement as moderators of severity in adolescents with eating disorders. *Journal of Applied Sport Psychology*, 15, 213-222.
- Markland, D., & Hardy, L. (1993). The Exercise Motivations Inventory: Preliminary development and validity of a measure of individuals' reasons for participation in regular physical exercise. *Personality and Individual Differences*, 15, 289-296.
- Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, 35, 118-133.
- Markus, H.R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.
- Marsh, H.W. (1986a). Global self-esteem: Its relation to specific facets of self-concept and their importance. *Journal of Personality and Social Psychology*, 51, 1224-1236.
- Marsh, H.W. (1986b). Causal ordering of self-concept and achievement: A multiwave, longitudinal panel analysis. *Journal of Educational Psychology*, 82, 646-656.
- Marsh, H.W. (1993). Relations between global and specific domains of the self: The importance of individual importance, certainty, and ideals. *Journal of Personality and Social Psychology*, 65, 975-992.
- Marsh, H.W. (1997). The measurement of physical self-concept: A construct validation approach. In K. R. Fox (Ed.), *The physical self: From motivation to well-being* (pp. 27-58). Champaign, IL: Human Kinetics.
- Marsh, H.W. (2000). The self-concept enhancement and learning facilitation (SELF) research centre: Research breakthroughs and directions for the new millennium. In R. G. Craven & H. W. Marsh (Eds.), *Self-Concept Theory, Research and Practice: Advances for the New Millennium: Collected Papers of the Inaugural Self-Concept Enhancement and Learning Facilitation (SELF) Research Centre International Conference* (pp. 1-15). Sydney, Australia: SELF Research Centre.
- Marsh, H.W. (2001). A multidimensional physical self-concept: A construct validity approach to theory, measurements and research. In A. Papaioannou, M. Goudas, & Y. Theodorakis, (red.), *Proceedings of the 10th World Congress of Sport Psychology*, 3 (pp. 40-62). Skiathos, Greece: Christodoulidi Publications.

- Marsh, H.W., & Hattie, J. (1996). *Theoretical perspectives on the structure of self-concept*. In B. A. Bracken (Ed.), *Handbook of self-concept* (pp.38-90). New York: Wiley.
- Marsh, H.W., & Redmayne, R.S. (1994). A multidimensional physical self-concept and its relations to multiple components of physical fitness. *Journal of Sport and Exercise Psychology, 16*, 43-55.
- Marsh, H.W., & Richards, G.E. (1988). The Tennessee Self-Concept Scales: Reliability, internal structure and construct validity. *Journal of Personality and Social Psychology, 55*, 612-624.
- Marsh, H.W., & Yeung, A.S. (1998). Top-down, bottom-up, and horizontal models: The direction of causality in multidimensional hierarchical self-concept models. *Journal of Personality and Social Psychology, 75*, 509-527.
- Marsh, H.W., Marco, I.T., & Aşçi, F.H. (2002a). Cross-cultural validity of the Physical Self-Description Questionnaire: Comparison of factor structures in Australia, Spain, and Turkey. *Research Quarterly for Exercise and Sport, 73*, 257-270.
- Marsh, H.W., Marco, I.T., & Aşçi, F.H. (2002b). Multi-trait multi-method analyses of two physical self-concept instruments: A cross-cultural perspective. *Journal of Sport and Exercise Psychology, 24*, 99-119.
- Marsh, H.W., Richards, G.E., Johnson, S., Roche, L., & Tremayne, P. (1994). Physical Self-Description Questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments. *Journal of Sport and Exercise Psychology, 16*, 270-305.
- Martin, K.A., Sinden, A.R., & Fleming, J.C. (2000). Inactivity may be hazardous to your image: The effects of exercise participation on impression formation. *Journal of Sport and Exercise Psychology, 22*, 283-291.
- Martin Ginis, K.A., & Leary, M.R. (2001). Self-presentational determinants of health risk behavior among college freshmen. *Psychology and Health, 16*, 17-27.
- Martin Ginis, K.A., & Leary, M.R. (2004). Self-presentational processes in health-damaging behavior. *Journal of Applied Sport Psychology, 16*, 59-74.
- Martin Ginis, K.A., Latimer, A.E., & Jung, M.E. (2003). No pain no gain? Examining the generalizability of the exercise stereotype to moderately active and excessive active targets. *Social Behavior and Personality, 31*, 283-290.
- McAuley, E., & Mihalko, S.L. (1998). Measuring exercise-related self-efficacy. In J.L. Duda (Ed.), *Advances in sport and exercise psychology measurement* (pp. 371-392). Morgantown, WV: Fitness Information Technology.

- McAuley, E., Bane, S.M., & Mihalko, S.L. (1995). Exercise in middle-aged adults: Self-efficacy and self-presentational outcomes. *Preventive Medicine, 24*, 319-328.
- McAuley, E., Courneya, K.S., & Lettunich, J. (1991). Effects of acute and long-term exercise on self-efficacy responses in sedentary, middle-aged males and females. *The Gerontologist, 31*, 534-542.
- McKinley, N.M. (1999). Women and objectified body conscientiousness: Mother's and daughters' body experience in cultural, developmental, and familial context. *Developmental Psychology, 35*, 760-769.
- Mead, G.H. (1925). The genesis of the self and social control. *International Journal of Ethics, 35*, 251-273.
- Mead, G.H. (1934). *Mind, self, and society*. Chicago: University of Chicago Press.
- Mendelson, B.K., Mendelson, M.J., & White, D.R. (2001). Body-esteem scale for adolescents and adults. *Journal of Personality Assessment, 76*, 90-106.
- Mendelson, B.K., McLaren, L., Gauvin, L., & Steiger, H. (2002). The relationship of self-esteem and body esteem in women with and without eating disorders. *International Journal of Eating Disorders, 31*, 318-323.
- Miller, T.M., Linke, J.G., & Linke, R.A. (1980). Survey on body image, weight and diet of college students. *Journal of American Dietetic Association, 77*, 561-566.
- Moore, D.C. (1990). Body image and eating behavior in adolescent boys. *American Journal of Diseases of Children, 144*, 475-479.
- Morgan, W.P. (1997). Methodological considerations. In W.P. Morgan (Ed.), *Physical activity and mental health* (pp. 3-32). London: Taylor & Francis.
- Motl, R.W., & Conroy, D.E. (2001). The social physique anxiety scale: Cross validation, factorial invariance, and latent mean structure. *Measurement in physical education and exercise science, 5*, 81-95.
- Murphy, G. (1947). *Personality: A biosocial approach to origins and structure*. New York: Harper & Row.
- Mutrie, N. (2000). The relationship between physical activity and clinically defined depression. In S.J.H Biddle, K.R. Fox and S.H. Boutcher (Eds), *Physical activity and psychological well-being* (pp. 46-63). London: Routledge & Kegan Paul.
- Noll, S.M., & Fredrickson, B.L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly, 22*, 623-636.
- Ojanen, M. (1994). Can the true effects of exercise on psychological variables be separated from placebo effects? *International Journal of Sport Psychology, 25*, 63-80.

- Oyserman, D., & Markus, H.R. (1993). The sociocultural self. In J. Suls (Ed.), *The self in social perspective* (pp. 187-220). Hillsdale, NJ: Erlbaum.
- Oyserman, D., Coon, H.M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, *128*, 3-72.
- Page, A., & Fox, K.R. (1997). Adolescent weight management and the physical self. In K.R. Fox (Ed.), *The physical self: From motivation to well-being* (pp. 229-257). Champaign, IL: Human Kinetics.
- Page, A, Fox, A, McManus, A., & Armstrong, N. (1993). Profiles of self-perception change following an eight week aerobic training program. *UK Sport: Partners in Performance. Book of Abstracts* 4-7 November: Manchester.
- Paskevich, D.M., Estabrooks, P.A., Brawley, L.R., & Carron, A.V. (2001). Group cohesion in sport and exercise. In R.N. Singer, H.A. Hausenblas, & C.M. Janelle (Eds.), *Handbook of Sport Psychology*. (2nd ed.). New York: Wiley.
- Parsons, E.M., & Betz, N.E. (2001). The relationship of participation in sports and physical activity to body objectification, instrumentality, and locus of control among young women. *Psychology of Women Quarterly*, *25*, 209-222.
- Pate, R.R., Pratt, M., Blair, S.N., Haskell, W.L., Macera, C.A., Bouchard, C., Buchner, D., Ettinger, W., Heath, G.W., King, A.C., Kriska, A., Leon, A.S., Marcus, B.H., Morris, J., Paffenbarger, R.S., Patrick, K., Pollock, M.L., Rippe, J.M., Sallis, J., & Wilmore, J.H. (1995). Physical activity and public health: A recommendation from the Centers of Disease Control and Prevention and the American College of Sports Medicine. *Journal of the American Medical Association*, *273*, 402-407.
- Petruzzello, S.J., Landers, D.M., Hatfield, B.D., Kubitz, K.A., & Salazar, W. (1991). A meta-analyses on the anxiety-reducing effects of acute and chronic exercise: Outcomes and mechanisms. *Sports Medicine*, *11*, 143-182.
- Phalet, K., & Claeys, W. (1993). A comparative study of Turkish and Belgian youth. *Journal of Cross-Cultural Psychology*, *24*, 319-343.
- Phoenix, C., Faulkner, G., & Sparkes, A.C. (in press). Athletic identity and self-ageing: The dilemma of exclusivity. *Psychology of Sport and Exercise*.
- Polivy, J., & Herman, C.P. (2002). Causes of eating disorders. *Annual Review of Psychology*, *53*, 187-213
- Ransdell, L.B., Dratt, J., Kennedy, C., O'Neill, S., & DeVoe, D. (2001). Daughters and mothers exercising together (DAMET): A 12-week pilot project designed to improve

- physical self-perception and increase recreational physical activity. *Women & Health*, 33, 101-116.
- Richman, E.L., & Shaffer, D.R. (2000). "If you let me play sports": How might sport participation influence the self-esteem of adolescent females? *Psychology of Women Quarterly*, 24, 189-199.
- Roberts, T., & Nolen-Hoeksema, S. (1989). Sex differences in relation to evaluative feedback. *Sex Roles*, 21, 725-747.
- Rodin, J., Silberstein, L., & Striegel-Moore, R. (1985). Women and weight: A normative discontent. In: T.B. Sondregger (Ed.), *Psychology and gender* (pp. 267-307). Lincoln: University of Nebraska Press.
- Rodriguez, D. (2000). Self and adaption: Defining the healthy self. In R.G. Craven, & H.W. Marsh (Eds.), *Self-concept theory, research and practice: Advances for the new millennium: Collected papers of the inaugural self-concept enhancement and learning facilitation (SELF) research centre international conference* (pp. 355-365). Sydney, Australia: SELF Research Centre, University of Western Sydney.
- Rogers, C.R. (1951). *Client-centered therapy*. Boston: Houghton Mifflin.
- Rose, E., & Larkin, D. (2002). Perceived competence, discrepancy scores, and global self-worth. *Adapted Physical Activity Quarterly*, 19, 127-140.
- Rosenberg, M. (1979). *Conceiving the self*. New York: Basic Books.
- Rosenberg, F. (1995). Global self-esteem and specific self-esteem: Different concepts, different outcomes. *American Sociological Review*, 60, 141-156.
- Ryan, R.M., & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well being. *American Psychologist*, 55, 54-56.
- Salmon, P. (2001). Effects of physical exercise on anxiety, depression, and sensitivity to stress: A unifying theory. *Clinical Psychology Review*, 21, 33-61.
- Schilder, P. (1935). *The image and appearance of the human body*. New York: International Universities Press
- Schilling, C. (1993). *The body and social theory*. London: Sage Publications.
- Schlenker, B.R. (1980). *Impression management: The self-concept, social identity, and interpersonal relations*. Monterey, CA: Brooks/Cole Publishing Co.
- Schlenker, B.R., & Leary, M.R. (1982). Social anxiety and self-presentation: A conceptualization and model. *Psychological Bulletin*, 92, 641-669.
- Schull, J. (1979). A conditioned opponent theory of Pavlovian conditioning and habituation. *Psychology of Learning and Motivation*, 13, 57-90.

- Schwalbe, M.L., & Staples, C.L. (1991). Gender differences in sources of self-esteem. *Social Psychology Quarterly*, *54*, 158-168.
- Schwartz, M. B., & Brownell, K.D. (2004). Obesity and body image. *Body Image*, *1*, 43-56.
- Schwarz, N., & Strack, F. (1991). Evaluating one's life: A judgement model of subjective well-being. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being* (pp. 27-47). New York: Pergamon.
- Sears, D.O. (1986). College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature. *Journal of Personality and Social Psychology*, *51*, 515-530.
- Sechrest, L., McKnight, P., & McKnight, K. (1996). Calibration of measures for psychotherapy outcome studies. *American Psychologist*, *51*, 1065-1071.
- Secord, P.F., & Jourard, M.J. (1953). The appraisal of body-cathexis: Body cathexis and the self. *Journal of Consulting Psychology*, *17*, 343- 347.
- Shavelson, R. J., Bolus, R. (1982). Self-concept: The interplay of theory and methods. *Journal of Educational Psychology*, *74*, 3-17.
- Shavelson, R.J., Hubner, J.J., & Stanton, G.C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research*, *46*, 407-441.
- Si, G.Y., & Chung, P.K. (2001). East meets west: Indigenous and cross-cultural analysis of sport and exercise psychology. In A. Papaioannou & M. Goudas & Y. Theodorakis (Eds.), *Proceedings of the 10th World Congress of Sport Psychology* (Vol. 5, pp. 41-47). Skiathos, Greece: Christodoulidi Publications.
- Silberstein, L.R., Striegel-Moore, R.H., Timko, C., & Rodin, J. (1988). Behavioural and psychological implications of body dissatisfaction. Do men and women differ? *Sex Roles*, *19*, 219-232.
- Sinden, A.R., Martin Ginis, K.A., & Angrove. J. (2003). Older women's reactions to revealing and non-revealing exercise attire. *Journal of Aging and Physical Activity*, *11*, 445-458.
- Singelis, T.M., Bond, M.H., Sharkey, W.F., & Lai, C.S.Y. (1999). Unpacking culture's influence on self-esteem and embarrassability. *Journal of Cross-Cultural Psychology*, *30*, 315-341.
- Smolak, L. (2004). Body image in children and adolescents: Where do we go from here? *Body Image*, *1*, 15-28.

- Smolak, L., & Murnen, S. (2001). Gender and eating problems. In: R. Striegel-Moore & L. Smolak (Eds.), *Eating disorders: Innovative directions in research and practice* (pp. 91-110). Washington, DC: American Psychological Association.
- Smolak, L., Murnen, S.K., & Ruble, A.E. (2000). Female athletes and eating problems: A meta-analysis. *International Journal of Eating Disorders*, 27, 371-380.
- Söderström, T. (1999). *Gymkulturens logik: Om samverkan mellan kropp, gym och samhälle*. [The Logic of Gym Culture: On the interplay between the body, gyms, and society]. In Swedish. Umeå, Sweden: Umeå universitets tryckeri. Unpublished Doctoral Dissertation.
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behavior. The psychological function of self-esteem and cultural worldviews. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 93-159). San Diego, CA: Academic Press.
- Sonstroem, R.J. (1974). Attitude testing examining certain psychological correlates of physical activity. *Research Quarterly*, 45, 93-103.
- Sonstroem, R.J. (1978). Physical estimation and attraction scales: Rationale and research. *Medicine and Science in Sports*, 10, 97-102
- Sonstroem, R.J. (1984). Exercise and self-esteem. *Exercise and Sport Sciences Reviews*, 12, 123-155.
- Sonstroem, R.J. (1997a). The physical self-system: A mediator of exercise and self-esteem. In K.R. Fox (Ed), *The physical self: From motivation to well-being* (pp. 3-26). Champaign, IL: Human Kinetics.
- Sonstroem, R.J. (1997b). Physical activity and self-esteem. In W.P. Morgan (Ed.), *Physical activity and mental health* (pp. 127-144). Bristol: Taylor and Francis.
- Sonstroem, R. J. (1998). Physical self-concept: Assessment and external validity. *Exercise and Sport Science Reviews*, 26, 133-164.
- Sonstroem, R.J., & Morgan, W.P. (1989). Exercise and self-esteem :Rationale and model. *Medicine and Science in Sports and Exercise*, 21,329-337.
- Sonstroem, R.J., & Potts, S.A. (1996). Life adjustment correlates of physical self-concepts. *Medicine and Science in Sport and Exercise*, 28, 619-625.
- Sonstroem, R.J., Harlow, L.L., & Josephs, L. (1994). Exercise and self-esteem: Validity of model expansion and exercise associations. *Journal of Sport and Exercise Psychology*, 16, 29-41.

- Sonstroem, R.J., Harlow, L.L., & Salisbury, K.S. (1993). Path analysis of a self-esteem model across a competitive swim season. *Research Quarterly for Exercise and Sport*, *64*, 335-342.
- Sonstroem, R. J., Speliotis, E.D., & Fava, J. L.(1992). Perceived physical competence in adults: An examination of the Physical Self-Perception Profile. *Journal of Sport and Exercise Psychology*, *14*, 207-221.
- Sonstroem, R.J., Harlow, L.L., Gemma, L.M., & Osborne, S. (1991). Test of structural relationships within a proposed exercise and self-esteem model. *Journal of Personality Assessment*, *56*, 348-364.
- Sparkes, A.C. (1997). Reflections on the socially constructed physical self. In K.R. Fox (Ed.), *The physical self: From motivation to well-being* (pp. 83-110). Champaign, IL: Human Kinetics.
- Sparkes, A.C. (2002). *Telling tales in sport and physical activity: A qualitative journey*. Champaign, IL: Human Kinetics.
- Spence, J.T., & Helmreich, R.L. (1978). *Masculinity & femininity: Their psychological dimensions, correlates, and antecedents*. Austin: University of Texas Press.
- Spencer, S. J., Josephs, R. A., & Steele, C. M. (1993). Low self-esteem: The uphill struggle for self-integrity. In R. F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp. 21-36). New York: Plenum Press.
- Spink, K.S. (1992). Relation of anxiety about social physique to location of participation in physical activity. *Perceptual and Motor Skills*, *74*, 1075-1078.
- Spiro, M.E. (1993). Is the Western conception of the self "peculiar" within the context of world cultures? *Ethos*, *21*, 107-153.
- The Sports Council and Health Education Authority (1992). *Allied Dunbar National Fitness Survey: Main findings*. London: Sports Council and Health Education Authority.
- Stein, J.C., Newcomb, M.D., & Bentler, P.M. (1992). The effect of agency and communality on self-esteem: Gender differences in longitudinal data. *Sex Roles*, *26*, 465-483.
- Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin*, *128*, 825-848.
- Strelan, P., Mehaffey, S.J., & Tiggemann, M. (2003). Self-objectification and esteem in young women: The mediating role of reasons to exercise. *Sex Roles*, *48*, 89-95.

- Striegel-Moore, R.H., & Smolak, L. (1996). The role of race in the development of eating disorders. In: L. Smolak, M. P. Levine, & R. Striegel-Moore (Eds.), *The developmental psychopathology of eating disorders* (pp. 259-284). Mahwah, NJ: Lawrence Erlbaum Associates.
- Striegel-Moore, R.H., Silberstein, L.R., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist*, *41*, 246-263.
- Sundgot-Borgen, J. (1993). Prevalence of eating disorders in elite female athletes. *International Journal of Sport Nutrition*, *3*, 29-40.
- Sundgot-Borgen, J. (1994). Risk and trigger factors for the development of eating disorders in female elite athletes. *Medicine and Science in Sport and Exercise*, *26*, 414-419.
- Szabo, A. (2000). Physical activity as a source of psychological dysfunction. In S.J. Biddle, K. R. Fox, & S. H. Boutcher (Eds.), *Physical activity and psychological well-being* (pp. 130-153). London: Routledge.
- Taylor, A. (2000). Physical activity, anxiety, and stress. In S.J.H. Biddle, K.R. Fox, & S.H. Boutcher (Eds.), *Physical activity, mental health and psychological well-being* (pp.10-46). London: Routhledge & Kegan Paul.
- Taylor, S.E., & Brown, J.D. (1988). Illusion and well-being: A social-psychological perspective on mental health. *Psychological Bulletin*, *103*, 193-210.
- Tesser, A. (1988). Towards a self-evaluation maintenance model of social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol 21. pp 181-227). New York: Academic.
- Tesser, A. (2000). On the confluence of self-esteem maintenance mechanisms. *Personality and Social Psychology Review*, *4*, 290-299.
- Thompson, J.K. (2004). The (mis)measurement of body image: Ten strategies to improve assessment for applied and research purposes. *Body Image*, *1*, 7-14.
- Thompson, A.M., & Chad, K.E. (2002). The relationship of social physique anxiety to risk for developing an eating disorder in young females. *Journal of Adolescent Health*, *31*, 183-189.
- Thompson, J.K., Heinberg, L.J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. Washington, DC: American Psychological Association.
- Tice, D.M. (1993). The social motivations of people with low self-esteem. In R.F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp.37-54). New York: Plenum Press.

- Tiggemann, M. (2004). Body image across the adult life span: Stability and change. *Body Image, 1*, 29-41.
- Tiggemann, M., & Slater, A. (2001). A test of objectification theory in former dancers and nondancers. *Psychology of Women Quarterly, 25*, 57-64.
- Tiggemann, M., & Williamson, S. (2000). The effect of exercise on body satisfaction and self-esteem as a function of gender and age. *Sex Roles, 43*, 119-127.
- Torres, R., & Fernandez, F. (1995). Self-esteem and the value of health as determinants of adolescent health behavior. *Journal of Adolescent Health Care, 16*, 60-63.
- Triandis, H.C. (1972). *The analysis of subjective culture*. New York: Wiley.
- Triandis, H.C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review, 96*, 506-520.
- Triandis, H.C., Leung, K., Villareal, M., & Clack, F.L. (1985). Allocentric versus idiocentric tendencies: Convergent and discriminant validation. *Journal of Research in Personality, 19*, 395-415.
- Triandis, H.C., McCusker, C., Betancourt, H., Iwao, S., Leung, K., Salazar, J.M. et al. (1993). An etic-emic analysis of individualism and collectivism. *Journal of Cross-Cultural Psychology, 24*, 366-383.
- Turner, B.S. (1992). *Regulating bodies. Essays in medical sociology*. London: Routledge.
- U.S. Department of Health and Human Services. (1996). *Physical Activity and Health: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.
- Vanden Auweele, Y., De Cuyper, B., Van Mele, V., & Rzewnicki, R. (1993). Elite performance and personality: From description and prediction to diagnosis and intervention. In: R. N. Singer, M. Murphey & L. K. Tennant (Eds.), *Handbook of research on sport psychology* (pp. 257-289). New York: Macmillan Publishing Company.
- Van de Vliet, P., Knapen, J., David, A., Onghena, P., Van Coppenolle, H., & Fox, K.R. (2001). Validity of the Physical Self-Perception Profile in Flemish adults: Normal individuals versus depressed psychiatric inpatients. In A. Papaioannou, M. Goudas, & Y. Theodorakis, (red.), *Proceedings of the 10th World Congress of Sport Psychology, 3* (pp. 376-378). Skiathos, Greece.

- Van de Vliet, P., Knapen, J., Onghena, P., Fox, K.R., David, A., Morres, I., Van Coppenolle, H., & Pieters, G. (2002). Relationships between self-perceptions and negative affect in adult Flemish psychiatric in-patients suffering from mood disorders. *Psychology of Sport and Exercise*, 3, 309-322.
- Van de Vliet, P., Vanden Auweele, Y., Knapen, J., Rzewnicki, R., Onghena, P., & Van Coppenolle, H. (in press). The effects of fitness training on clinically depressed patients: An intra-individual approach. *Psychology of Sport and Exercise*.
- Wästlund, E., Norlander, T., & Archer, T. (2001). Exploring cross-cultural differences in self-concept: A meta-analysis of the Self-Description Questionnaire-1. *Cross-Cultural Research*, 35, 280-302.
- Watkins, D. (2000). The nature of self-conception: Findings of a cross-cultural research program. In R. G. Craven & H. W. Marsh (Eds.), *Self-concept theory, research and practice: Advances for the new millennium: Collected papers of the inaugural self-concept enhancement and learning facilitation (SELF) research centre international conference* (pp. 108-117). Sydney, Australia: SELF Research Centre.
- Watkins, D., Adair, J., Akande, A., Gerong, A., McInerney, D., Sunar, D., Watson, S., Wen, Q., & Wondimu, H. (1998). Individualism-collectivism, gender and the self-concept: A nine culture investigation. *Psychologia*, 41, 259-271.
- Watson, D., Suls, J., & Haig, J. (2002). Global self-esteem in relation to structural models of personality and affectivity. *Journal of Personality and Social Psychology*, 83, 185-197.
- Weiss, M.R. (1987). Self-esteem and achievement in children's sport and physical activity. In: D. Gould & M. Weiss (Eds.), *Advances in pediatric sport sciences* (pp. 87-119). Champaign, IL: Human Kinetics.
- Welk, G.J., & Eklund, B. (in press). Validation of the children and youth physical self-perception profile for young children. *Psychology of Sport and Exercise*.
- Westerståhl, M., Barnekow-Bergkvist, M., Hedberg, G., & Jansson, E. (2003). Secular trends in body dimensions and physical fitness among adolescents in Sweden from 1974 to 1995. *Acta Paediatr*, 92, 128-137.
- White, R.W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297-333.
- White, P., Young, K., & Gillett, J. (1995). Bodywork as a moral imperative: Some critical notes on health and fitness. *Society and Leisure*, 18, 159-181.
- Whitehead, J.R. (1995). A study of children's physical self-perceptions using an adapted Physical Self-Perception Questionnaire. *Pediatric Exercise Science*, 7, 132-151.

- Wildes, J.E., Emery, R., Simons, A.D. (2001). The roles of ethnicity and cultures in the development of eating disturbance and body dissatisfaction: A meta-analytic review. *Clinical Psychology Review, 21*, 521-551.
- Williams, P.A., & Cash, T.F. (2001). Effects of a circuit training program on the body images of college students. *International Journal of Eating Disorders, 30*, 75-82.
- Williamson, D.A., Netemeyer, R.G., Jackman, L.P., Anderson, D.A., Funsch, C.L., & Rabalais, J.Y. (1995). Structural equation modeling of risk factors for the development of eating disorder symptoms in female athletes. *International Journal of Eating Disorders, 17*, 387-393.
- Wilson, P.M., & Rodgers, W.M. (2002). The relationship between exercise motives and physical self-esteem in female exercise participants: An application of self-determination theory. *Journal of Biobehavioral Research, 7*, 30-43.
- Wood, S.E., & Wood, E.G. (1999). *The world of psychology* (3rd ed.). Boston: Allyn and Bacon.
- Wylie, R.C. (1989). *Measures of self-concept*. Lincoln: University of Nebraska Press.
- Xie, B., Liu, C., Chou, C-P., Xia, J., Spruijt-Metz, D., Gong, J., Li, Y., Wang, H., & Johnson, C. A. (2003). Weight perception and psychological factors in Chinese adolescents. *Journal of Adolescent Health, 33*, 202-210.