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The Exercise and Self-Esteem Model: Inclusion of Physical Acceptance in Tests of Model Constructs

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THE EXERCISE AND SELF-ESTEEM MODEL: INCLUSION OF PHYSICAL
ACCEPTANCE IN TESTS OF MODEL CONSTRUCTS

BY

RAQUEL D. PINO

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
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Abstract

The present investigation examined the relationship between exercise and self-esteem in the context of the Exercise and Self-Esteem Model (EXSEM) (Sonstroem & Morgan, 1989). Physical acceptance and physical evaluation (competence), both at a general domain and a specific domain, were measured and included in tests of model constructs. The sample, comprised of fitness center members and university students (N = 526), completed a survey designed to assess exercise behavior and several self-perception variables. Using Structural Modeling Analysis, several models were examined and compared

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The Exercise and Self-Esteem Model: Inclusion of Physical Acceptance in Tests of Model Constructs

Statement of the Problem

During the past ten years, researchers have begun to discover exciting new information with respect to physical activity and health. For many years, research has indicated that exercise performed at a rate of three to five times per week, for a duration of 20 to 50 minutes per day, at 50 to 85 percent of maximum oxygen uptake (VO_2 max) leads to increased physical fitness (American College of Sports and Medicine, 1978, 1990). However, new evidence suggests that even small bouts of physical activity may be associated with significant improvements in health (DeBusk, Stenestrand, Sheehan, & Haskell, 1990; Leon, Connett, Jacobs, & Rauramaa, 1987).

In a review conducted by Dubbert (1992), on the topic of exercise and behavioral medicine, the following health correlates of physical activity were identified:

- (1) a decreased risk for the development of coronary heart disease (CHD) (Powell, Thompson, Caperser & Kendrick, 1987; Blair, Kohl, Paffenbarger, Clark, Cooper & Gibbons, 1989),
- (2) a decreased risk for development of hypertension (Blair, Goodyear, Gibbons & Cooper, 1984; Martin, Dubbert & Cushman, 1990),
- (3) the prevention and treatment of obesity (Bray, 1990; Segal & Pi-Sunyer, 1989),
- (4) the prevention

Leung & Paffenbarger, 1991), (5) a lower risk for certain reproductive cancers in women (Kohl, LaPorte & Blair, 1988) and colon cancer in men (I-min, Paffenbarger & Hsieh, 1991; Powell, Caspersen, Koplan & Ford, 1989), (6) prevention of osteoporosis in post-menopausal women (Harris, Caspersen, DeFries & Estes, 1989), and (7) prevention and treatment of chronic pain (Minor, 1991; Deyo, Walsh, Martin, Schoenfeld & Ramamurthy, 1990). Furthermore, physical activity has been associated with improved mental health, specifically: (1) decreases in anxiety and depression (Dishman, 1985, 1986), (2) improved reactivity to stress (Brooke & Long, 1987), and (3) increases in self-esteem (Sonstroem, 1984).

The purpose of the present study was to: (1) further examine the relationship between exercise and self-esteem in the context of the Exercise and Self-Esteem Model (EXSEM) (Sonstroem & Morgan, 1989), (2) provide a clear, operational definition of the construct of Physical Acceptance, as it applies to the EXSEM, (3) develop a multi-dimensional measure of physical acceptance that was distinguishable from physical competence, (4) utilize the Physical Self-Description Questionnaire (PSDQ) (Marsh, Richards, Johnson, & Tremayne, 1993) in the definition and measurement of several model constructs, and (5) apply structural modeling techniques in an exploratory manner to examine relationships among model constructs.

Justification and Significance of the Study

Importance and Definition of Self-Esteem

Self-esteem has been identified as one of the most important variables in psychological research. The reason being that self-esteem has been repeatedly associated with personal adjustment variables (Rosenberg, 1986). For example, low self-esteem has been linked to depression (Bachman, 1970; Kaplan & Pokorny, 1969; Luck & Heiss, 1972; Rosenberg, 1965), anxiety (Bachman, 1970; Kaplan & Pokorny, 1969; Luck & Heiss, 1972; Rosenberg, 1965), and negative affective states (Rosenberg, 1985).

In defining self-esteem, one must first address the notion of self-concept. Self-concept has been defined as "an organized configuration of perceptions of the self which are admissible to awareness" (Rogers, 1951, p.379). Self-esteem, on the other hand, has been described as the evaluative component of self-concept (Sonstroem, 1984) and is generally defined as "the extent to which the person feels positive about himself [or herself]" (Gergen, 1971, p. 11). Thus, self-concept is generally associated with a descriptive component of the self, whereas, self-esteem is generally associated with an evaluative component of the self (Sonstroem, 1984). It should be noted however, that the two terms are often used interchangeably.

Models of Self-Esteem

Several models of self-esteem have evolved over the years, each of which has contributed to our understanding of the self. In a review of models and measures of self-concept, Harter (1986) identified five approaches to the self-concept: (1) unidimensional models, (2) multidimensional models, (3) hierarchical models, (4) global self-worth models, and (5) a combination of approaches.

First, unidimensional models view the self-concept as a single construct measured by a variety of content areas. Content areas are weighted equally and combined to form a single composite. The composite is thought to reflect "one's sense of self across a variety of domains of one's life" (Harter, 1986, p. 139).

Second, multidimensional approaches of the self focus on multiple content areas examining the relationship between each content area and the self. For example, Harter (1982,1984) identified five separate domains of the self applicable to children 8 years and older including: (a) scholastic competence, (b) athletic competence, (c) social competence, (d) physical appearance, and (e) behavior or conduct. "Utilizing such an approach, the self is depicted as a profile of evaluative judgements across these domains" (Harter, 1986, p. 139).

Third, hierarchical models of the self place global self-concept at the apex of a model followed by more

specific domains of the self. For example, Shavelson, Hubner, and Stanton (1976) developed a hierarchical model of the self in which self-concept was placed at the apex of the model with the specific subdomains of academic and non-academic self proceeding. The constructs of academic self and non-academic self were further subdivided to include very specific domains of the self (e.g.. math, English, science). Models of this nature are prevalent throughout the literature and appeal to many researchers in the area of self-esteem (e.g. Flemming & Courtney, 1984; Marsh & Shavelson, 1985; Marsh & Redmayne, 1994).

Fourth, global self-worth models are similar to unidimensional models in that they view self-concept as a single construct measured by a variety of content areas. However, for global models, such as Rosenberg's (1979), the content areas are not weighted equally. Specific content areas are weighted according to their importance attached by the individual and subsequently combined to form a single composite.

Finally, Harter (1986) discusses the use of a combination of approaches to evaluate the self. "According to this approach, one needs to take into account the multidimensional nature of domain-specific judgements as well as one's sense of global self-worth, assessing both" (p.142).

For the purposes of the present research, it was

helpful to examine a model that had demonstrated some applicability to exercise behavior. A hierarchical model of self-esteem, similar to that of Shavelson et al. (1976), has some empirical support when related to exercise (e.g. Sonstroem & Morgan, 1989) and was examined in the current study.

Exercise and Self-Esteem

An examination of the literature in the area of exercise and self-esteem has provided overwhelming support for the hypothesis that exercise is related to increased self-esteem.

In 1984, Sonstroem conducted a critical analysis of research in the area of exercise and self-esteem. Sixteen studies were identified, four of which were classified as true experimental designs. Major conclusions are paraphrased below:

- (1) Exercise is associated with significant increases in self-esteem scores.
- (2) The relationship between exercise and self-esteem is especially pronounced in subjects initially lower in self-esteem.
- (3) There is minimal evidence that increased self-regard scores are produced by increases in physical fitness.

Since Sonstroem's review in 1984, several studies have been conducted in the area of exercise and self-esteem, the majority of which are quasi-experimental in nature (see

Table 1). A brief overview of each study will follow including: (a) sample characteristics, (b) assessment tools, (c) study design, and (d) major conclusions. It should be noted that the following literature review is limited to studies focusing on adult, non-clinical populations.

Using an experimental design, Tucker (1983) examined the effects of a 16-week weight training program on various aspects of self-concept in a sample of 272 university males. Self-concept variables and muscular strength were assessed at the onset of the program and again at termination of the program. Self-concept measures included: (1) the Tennessee Self-Concept Scale (Fitts, 1965), specifically the internal, external, and global scales, and (2) the Body-Cathexis Scale (Secord & Jourard, 1953). Results suggested that males involved in a 16-week weight training program displayed significant increases in strength compared to controls. Similarly, males involved in weight training scored significantly higher on measures of self-concept compared to controls.

Similarly, Finkenbergh and Temper (1991) assessed self-concept in competitive bodybuilders as measured by the Tennessee Self-Concept Scale (TSCS). Participants included 29 men and 23 women competing in state and national bodybuilding contests. It should be noted that 26 men and 6 women reported steroid use. The TSCS was used to assess global self-concept and eight specific dimensions. In

addition, the self-criticism scale was utilized as a measure of veracity. Analyses indicated that compared to the established norms of the scale: (1) male body builders scored significantly higher on personal self, social self, and satisfaction dimensions, and significantly lower on the self-criticism dimension, and (2) female body builders scored significantly higher on moral-ethical self, personal self, social self, satisfaction, behavioral dimensions, and total positive, and significantly lower on the self-criticism dimension. In addition, significant differences were found between male and female bodybuilders on moral-ethical self, satisfaction, and total positive, with women scoring significantly higher on all scales. The authors concluded that competitive bodybuilders' perceptions of self-concept are different from non-bodybuilders. However, self-criticism scores indicated that scores were artificially inflated to present a more favorable picture of one-self.

In an investigation of 245 Naval and Marine Corp men, Pavett, Butler, Marcinik, and Hodgdon (1987) assessed the impact of exercise on work attitudes and self-perception. The experimental group (n=111) engaged in a 12-week program of circuit weight training at a frequency of three times per/week. A pre-post assessment was conducted to measure five work attitude variables and five self-perception variables (including self-esteem). Results indicated that

there were significant differences between groups for one of the work attitude variables and two of the self-perception variables following the 12-week program. However, no significant differences in self-esteem were revealed.

In a study of 108 college women, Ford, Puckett, Blessing and Tucker (1989) assessed the effects of an eight-week physical activity course on multiple measures of health-related fitness and psychological well-being. Study participants were registered in an eight-week course of aerobic dance, jogging for fitness, weight training, swimming for fitness, life saving, or health science (control group). A between groups design was utilized to determine the effects of participation in physical activity course on self-esteem, body cathexis, and health related fitness scores. Psychological measures included:

- (1) Rosenberg's Self-Esteem Scale (Rosenberg, 1965), and
- (2) a modified Body Cathexis Scale (reference not provided).

Analyses indicated that significant differences in self-esteem, body cathexis, and health related fitness were found within groups, however between group differences were not statistically significant. It was concluded that eight weeks of participation in physical activity courses had insignificant affects on self-esteem, body cathexis, and health related fitness scores when compared to controls. Possible explanations for the lack of treatment effects as identified by the authors include: (1) insufficient

training period, and (2) physically active control group.

Similarly, Stein and Motta (1992) assessed the effects of non-aerobic and aerobic exercise on depression and self-concept using a between groups design. The sample consisted of 89 undergraduates participating in aerobic exercise (fitness swimming), non-aerobic exercise (weight training) or no exercise (control group). Both forms of exercise were performed twice a week, for 7 weeks (90 minutes per session). Measures included: (a) exercise history and background, (b) the Beck Depression Inventory (Beck, 1978), (c) Depression Adjective Checklist (Lubin, 1965), and (d) the Tennessee Self-Concept Scale (TSCS) (Fitts, 1965). Results indicated that: (1) both exercise groups experienced greater decreases in depression than the control group following treatment, (2) the non-aerobic group exhibited a higher over-all self-concept than both the aerobic and control groups, (3) the non-aerobic group scored significantly higher on the physical self subscale of the TSCS compared to the control group, (4) both the aerobic and non-aerobic groups scored significantly higher on the personal self subscale of the TSCS when compared to the control group, and (5) the non-aerobic group scored significantly higher on the social self-subscale of the TSCS compared to the control group. In addition, while only the aerobic group improved cardiovascularly, both aerobic and non-aerobic exercise groups experienced a reduction in

depression. Overall, the authors suggest that self-concept may be tied to perceptions about one's body and physical appearance, and different forms of exercise have differential effects on psychological variables.

Furthermore, using a quasi-experimental design, Plummer and Koh (1987) assessed the effects of aerobics on self-concept in a sample of college women. The sample consisted of 116 college women enrolled in aerobics classes and a control group of 117 college women enrolled in a non-physical education class. The authors administered the Tennessee Self-Concept Scale (TSCS) (Fitts, 1965) in a between groups design to assess global self-concept and specific dimensions of self-concept including: (1) physical self, (2) moral ethical self, (3) personal self, (4) family self, and (5) social self. In addition, the authors utilized the self-criticism subscale of the TSCS to assess the honesty of the subjects' responses. Intervention consisted of a 10-week aerobic program. Results indicated that the aerobics group was significantly higher on all scales when compared to the control group, with the exception of the self-criticism and moral ethical subscales (no significant differences between groups). In addition, the number of aerobics classes the women attended had no effect on self-concept. Similarly, there was no difference in self-concept between controls who did not exercise regularly, those who exercised twice a week, and those who

exercised more than twice a week. The authors concluded that improvements in self-concept were probably due to participation in the activity of aerobics rather than actual changes in fitness (as measured by the number of aerobic classes attended).

Likewise, Bonheur and Young (1991) conducted an exploratory analysis designed to examine the differences between exercisers and non-exercisers on self-esteem, perceived barriers, and perceived benefits of exercise. The sample consisted of 105 university students who were classified as exercisers or non-exercisers using the Borg Scale. Additional measures included: (1) the Exercise Benefits and Barriers Scale (Pender, 1987), and (2) the Coopersmith Self-Esteem Inventory (Coopersmith, 1981). Results indicated that exercisers reported higher levels of self-esteem compared to non-exercisers. Furthermore, exercisers perceived fewer barriers and more benefits of exercise compared to non-exercisers.

Imm (1990) examined subjective psychological changes in a sample of 29 adults participating in a worksite fitness program. Subjects participated in aerobic dancing three times per week, for 8 weeks (45 minutes per session). Physical and psychological assessment consisted of a 15 item self-report questionnaire constructed by the author. The questionnaire was administered post-intervention. Subjects participating reported that the eight week fitness program

had a large to moderate effect on self-concept, mood, stress, stamina/endurance, and flexibility.

Similarly, Gillis and Perry (1991) examined the relationships between physical activity and health-promoting behaviors in a sample of 92 mid-life women (aged 35-65). A between groups design was used to examine changes in health behaviors following a 12 week exercise program consisting of choreographed dance. Health measures included:

(1) Cantril's Well-Being Ladder (Cantril, 1965), (2) Rosenberg's Self-Esteem Scale (Rosenberg, 1965), (3) Health Locus of Control Scale (Wallston, Wallston, Kaplan, & Maides, 1976), (4) Health Promoting Lifestyle Profile (Walker, Sechrist, Pender, 1987), and (5) Health Perceptions Questionnaire (Ware, 1979). Results suggested that participation in the exercise program lead to greater changes in well-being scores, and health promoting lifestyle scores compared to controls. However, participation in the exercise program did not appear to affect self-esteem, locus of control, and health perceptions scores compared to controls.

Additionally, Ben-Shlomo and Short (1986) examined the effects of a six week physical conditioning program on various dimensions of self-concept in a sample of 15 sedentary females (aged 23-41). A pre-post training design was used to assess self-concept as measured by: (1) the Tennessee Self-Concept Scale (Fitts, 1965) specifically, the

personal self, physical self and self-satisfaction subscales, and (2) the Body-Cathexis Scale (Secord & Jourard, 1953). Results indicated that sedentary females participating in a six week conditioning program displayed significant increases in physical self scores, and self-satisfaction scores compared to controls.

In an investigation of twenty-four older adults (aged 50-64) Netz, Tenenbaum, and Sagiv (1988) examined patterns of psychological fitness as related to patterns of physical fitness. Participants took part in a 12-week physical training program consisting of calisthenics and jogging or brisk walking. Physical fitness measures included anthropometric measures (height, weight, skin fold measures) and graded treadmill testing. Psychological measures consisted of the Tennessee Self-Concept Scale, the State-Trait Anxiety Inventory, and the Cantril Subjective Well-Being Scale. Four assessments periods were employed: (a) baseline (assessment of all variables), (b) time 2 (self-esteem excluded) (c) time 3 (self-esteem excluded) and (d) time 4 (assessment of all variables). Results indicated that significant improvements in fitness occurred over a period of 12 weeks, however psychological variables remained unchanged. The authors note that given the relatively high scores on measures of self-esteem and body image at pre-and post-training assessments, it would be unlikely that changes in these variables would have occurred during a physical

fitness program.

While many of the studies reviewed provided support for the hypothesis that exercise leads to increased self-esteem several problems were inherent to the study designs, including: (1) inadequate sample size, (2) lack of appropriate control groups, (3) inadequate follow-up assessments, (4) inadequate assessment of program agents (eg. social experiences, sense of mastery), and (5) inadequate assessment of score agents (eg. social desirability, expectancy). Weaknesses in study design prohibit one from making any causal statements regarding the relationship between exercise and self-esteem, nonetheless, a positive relationship between exercise and self-esteem has been documented. Many of the weaknesses in study design may be the result of insufficient time and/or resources needed to conduct a well controlled, experimental study in the area of exercise and self-esteem. For this reason, the present study did not address many of the methodological weaknesses identified in the literature. Rather, the primary focus of the present investigation was on instrument development and model testing.

The Exercise and Self-Esteem Model

Over the past twenty-five years, a link between exercise and self-esteem has been established, however few advances have been made in the delineation of theoretical

models linking exercise to self-esteem. One promising model that examines the mechanisms of self-esteem change through exercise is the Exercise and Self-Esteem Model (Sonstroem & Morgan, 1989). The Exercise and Self-Esteem Model proposes that sport and exercise experiences can influence self-esteem along the dimensions of perceived physical competence and perceived physical-acceptance. The model is hierarchical in nature with general self-esteem at the top of the hierarchy followed by more specific aspects of self-esteem at the lower levels. It is postulated that lower level elements are components of higher level elements and that changes in the lower level elements will subsequently effect higher level elements. Lower level elements consist of perceived physical competence, physical self-efficacy, and perceived physical acceptance. To avoid extensive labeling of constructs perceived physical competence will be referred to as 'physical competence' and perceived physical acceptance as 'physical acceptance' throughout the remainder of the paper. It is important to keep in mind, however, that these are perceived variables.

Insert Figure 1 about here

Figure 1 presents the EXSEM as it was originally conceived (Sonstroem & Morgan, 1989). Physical self-efficacy, at the lowest level of the hierarchy, was

operationalized as the extent to which one believes he or she can successfully perform a given physical task. It was hypothesized that physical self-efficacies would be closely related to measures of actual performance. Furthermore, physical self-efficacies were believed to effect evaluations of overall physical competence.

Physical competence was defined as a general evaluation of the self as possessing overall physical fitness. The model postulated that physical competence was related to general self-esteem. Thus, physical competence served as a mediating variable between physical self-efficacy and global self-esteem. Similarly, physical competence was believed to be related to the acceptance of oneself.

Sonstroem and Morgan (1989) suggested that physical acceptance could be measured using the Body Cathexis Scale. Body cathexis has been defined as "the degree of feeling of satisfaction or dissatisfaction with various parts of [and] processes of the body" (Secord & Jourard, 1953, p.343). Sonstroem and Morgan (1989) noted that the Body Cathexis Scale has been interpreted as a measure of body acceptance, particularly when the original response scale was used. Physical acceptance was expected to predict global self-esteem.

Preliminary tests of the EXSEM have provided support for the validity of model constructs (Sonstroem, Harlow, Gemma, & Osborne, 1991; Sonstroem, Harlow, & Salisbury,

1993; Sonstroem, Harlow, & Josephs, 1994). However, model testing has focused exclusively on the perceived competence dimension of the model. The present investigation was an attempt to provide empirical support for the EXSEM with the inclusion of physical acceptance.

Expansion of the EXSEM

Since its conception in 1989, the EXSEM has been expanded to include two levels of physical competence as operationalized by the Physical Self-Perception Profile (PSPP: Fox & Corbin, 1989) (Sonstroem et al., 1994). An expanded version of the EXSEM is presented in Figure 2. [It is important to note that physical acceptance was not included in this version of the EXSEM].

Insert Figure 2 about here

The PSPP (Fox & Corbin, 1989) "separates physical competence into general physical self-worth (PSW), subsuming more domain specific scales of Sports Competence (Sport), Physical Condition (Cond), Attractive Body (Body), and Strength (Stren)" (Sonstroem et al., 1994, p. 30). Consequently, it was necessary to revise the definition of physical competence. Physical competence was no longer viewed as a general evaluation of the self as possessing overall physical fitness, but rather an evaluation of one's physical qualities, abilities, and/or performances in

comparison to a stated or implied standard.

Using Structural Modeling techniques, Sonstroem and colleagues (1994) were able to provide empirical justification for the expansion of the EXSEM to include the two levels of physical competence. However, it was noted that the attractive body scale and the physical self-worth scale possessed a large degree of overlap.

Inclusion of Physical Acceptance in the EXSEM

Before introducing how physical acceptance is utilized in the present study a brief overview of self-acceptance theory will follow. For over a half of century researchers and theorists have been interested in how individuals perceive themselves and to what degree these perceptions determine their behavior. Wells and Marwell (1976) have identified three principle senses of self-regard or self-feeling including: self-love, self-acceptance, and a sense of competence. These are thought to be distinguishable based on the degree to which they emphasize the elements of "affection" and "evaluation". Both self-love and self-acceptance emphasize affection or a person's feelings about themselves. The distinction between these concepts lies in the depth or the intensity of the affection. "Self-love is regarded as a deep and perhaps mystical process, involving instinctual drives and energies" (Wells and Marwell, 1976, p. 62). Self-acceptance, on the other hand, is described as

a "phenomenal" process based on conscious or preconscious judgments.

The third sense of self-regard is a sense of competence. The emphasis here is on evaluation of qualities, abilities, and/or performances compared to some stated or implied standard. Wells and Marwell (1976) recognize that these concepts seem to be empirically related (a person's feelings about herself should be associated with her evaluations of her qualities, abilities, and/or performances). "Like most conceptual distinctions, the one between evaluation and affection is not always easy to make consistently and clearly. However, emphasis upon one or the other processes leads to different forms of description, explanation, and sometimes measurement" (Wells and Marwell, 1976, p. 62).

The EXSEM examines both competence (evaluation) and acceptance (affection) in the physical domain. The model maintains that these concepts contribute differently to a persons overall sense of self-esteem. However, in terms of measurement, issues of competence versus acceptance have yet to be addressed. It may be for this reason that tests of the EXSEM have focused solely on the competence dimension of the model. The present investigation was an attempt to measure physical acceptance and to include physical acceptance in tests of the EXSEM.

Advances in the measurement of multiple dimensions of

physical self-concept (e.g. the PSPP: Fox and Corbin, 1989) have proven to be beneficial to our understanding of physical competence. Since the development of the PSPP, further progress has been made in the measurement of multiple dimensions of physical self-concept (e.g. Marsh, 1992, 1993). Of particular interest is the Physical Self-Description Questionnaire (PSDQ: Marsh et al., 1993). The PSDQ is similar to the PSPP in that it was designed to measure various aspects of physical self-concept. However, the PSDQ differs from the PSPP in the number and nature of components identified, with the PSDQ having a larger number and more diverse subscales than the PSPP. Components of the PSDQ are as follows: Strength, Body Fat, Activity, Endurance/Fitness, Sports Competence, Coordination, Health, Appearance, Flexibility, General Physical Self-Concept, and Self-Esteem.

Administration of the PSDQ to two high school populations has provided evidence for the psychometric soundness of the instrument (Marsh et al., 1993). Furthermore, a comparison of psychometric, theoretical, and pragmatic considerations of three multi-dimensional physical self-concept instruments [PSPP (Fox & Corbin, 1989), Physical Self-Concept (Richards, 1988), and PSDQ (Marsh et al., 1993)] has led to the recommendation of the PSDQ in a wide variety of research and applied settings (Marsh et al., 1993: See methods section for additional psychometric

information).

An examination of the item content of the PSDQ reveals that the majority of items are measuring what Sonstroem and colleagues (1994) refer to as physical competence (an evaluation of one's physical qualities, abilities, and/or performances in comparison to a stated or implied standard). Sample items include, "I have good sports skills", "I would do well in a test of physical endurance and stamina." However, items used to measure general physical self-concept are actually measuring what Sonstroem and Morgan (1989) refer to as physical acceptance (one's feelings of acceptance, satisfaction, or happiness with his/her physical qualities, abilities, and/or performances). Sample items are as follows: "I am satisfied with the kind of person I am physically", "I feel good about who I am physically".

Again, measurement of physical self-concept has progressed in that the dimensionality of physical self-concept has been addressed, however, it may be that progress may come to a standstill if researchers continue to neglect and/or confuse issues of competence and acceptance. The present investigation modified and expanded the PSDQ to: (1) measure physical competence at a general level and a more specific level- specific dimensions of competence included: sport, strength, endurance/fitness, physical appearance, and body fat; and (2) measure general physical

acceptance at a general level and a specific level- specific dimensions of physical acceptance were the same as those for competence.

It is recognized that the labeling of the specific dimensions of competence, particularly physical appearance and body fat, may lead to conceptual confusion since "competence" is generally thought of as "ability" rather than "evaluation". Potential confusion may be reduced by altering the label of physical competence when referring to physical dimensions that do not relate to ability or skill (e.g. body fat and appearance). Therefore, throughout the remainder of this paper physical competence will be referred to as physical evaluation, recognizing that the definition of the construct has remained unchanged.

Research Hypotheses

Several versions of a modified EXSEM were empirically tested using Structural Modeling procedures to explore the relationships between model constructs. First, Model A examined a model that included two levels of physical evaluation and two levels of physical acceptance. In this version of the model, physical self-efficacy predicted all specific physical evaluation and acceptance factors (body fat, appearance, strength, fitness/endurance, sport). In addition, five specific physical evaluation factors

predicted the general factor of physical evaluation, and five specific physical acceptance factors predicted the general factor of physical acceptance. Lastly, physical evaluation and physical acceptance factors predicted general self-esteem.

Insert Figure 3 about here

Second, Model B examined whether or not the general dimension of physical evaluation was essential to the model. In this version of the model, all paths from the specific dimensions of physical evaluation and physical acceptance led to the general dimension of physical evaluation. Paths from physical self-efficacy to the specific dimensions of physical evaluation and physical acceptance remained unchanged.

Third, Model C tested whether the general dimension of physical acceptance was necessary to the model. Analogous to previous models, Model C had all paths from physical self-efficacy predicting the specific dimensions of physical evaluation and physical acceptance. However in Model C, specific dimensions of physical evaluation and physical acceptance predicted the general dimension of physical evaluation.

Fourth, Model D examined whether both the general dimensions of physical evaluation and physical acceptance

were imperative to the model. In Model D, specific dimensions of physical evaluation and physical acceptance predicted general self-esteem. Again, the paths from physical self-efficacy to the specific dimensions of physical evaluation and physical acceptance remain unchanged.

Insert Figure 4 about here

A final version of the EXSEM was tested again using Structural Modeling procedures. In Model E, exercise predicted physical self-efficacy. Previous studies of the EXSEM have tested models with the inclusion of exercise (e.g. Sonstroem et al, 1994). However, these investigations have approached this by utilizing a top-down model with physical competence and physical self-efficacy predicting exercise, rather than a bottom-up model with exercise predicting physical self-efficacy. Given that "pertinent theory suggests that exercise should be most closely allied with the level of self-perception most specific and congruent with itself" (i.e. physical self-efficacy: Sonstroem, 1994, p.33), the present investigation hypothesized that exercise would be able predict self-efficacy, as well as, be predicted by self-efficacy. Thus, a bottom-up version of the EXSEM was examined that included the construct of exercise frequency.

Insert Figure 5 about here

It was hypothesized that Model A would provide the best overall model fit. In addition, several hypotheses were made regarding the expected relationships among model constructs:

- (1) Specific dimensions of physical evaluation (sports ability, strength, endurance/fitness, physical appearance, body fat) were expected to predict a more general dimension of physical evaluation.
- (2) Specific dimensions of physical acceptance (sports ability, strength, endurance/fitness, physical appearance, body fat) were expected to predict a more general dimension of physical acceptance.
- (3) The general dimension of physical evaluation was expected to be related to the general dimension of physical acceptance.
- (4) Physical evaluation and physical acceptance was expected to predict general self-esteem. However, since it is believed that general self-esteem measures are actually assessing self-acceptance rather than self-evaluation (Sonstroem, 1994) it was hypothesized that physical acceptance would be a better predictor of general self-esteem than physical evaluation.

- (5) Self-efficacy was expected to predict specific dimensions of physical evaluation and physical acceptance.

Methods

Participants

Participants were 526 subjects representing two subgroups of the population: (1) fitness center members (n=154), and (2) university students (n=372). Table 2 provides demographics for the combined sample.

Insert Table 2 about here

Fitness Center Members

Fitness center participants were obtained from three fitness centers: (1) Captain Sam's Family Athletic Club, Pueblo, Colorado (n=67), (2) Wakefield Health and Fitness, Wakefield, Rhode Island (n=50), and (3) Physical Pursuit, North Kingston, Rhode Island (n=37). Three one-hundred dollar cash prizes were offered as incentives for fitness center members to participate in the study (one per center). Members were asked to complete a questionnaire at home and return it to the fitness center, anonymity was ensured. A drawing was held at each fitness center upon completion of

data collection (average length of data collection was approximately three months). The fitness sample was comprised of 85 males and 69 females, ranging in age from 18 to 80 years of age (mean = 38). Fitness center participants were largely Caucasian (81.2%) and Catholic (49.4%). Over 75 percent of the sample engaged in some form of aerobic exercise at least 3 times per/week and some form of non-aerobic exercise at least 3 times per/week (see Table 3).

Insert Table 3 about here

University Students

University students were obtained from various departments throughout the University of Rhode Island including: Chemistry (n=220), Psychology (n=24), Physical Education (n=74), and Business (n=54). The researcher sought permission from several Professors to recruit students for participation while class was in session. Students were asked to complete the questionnaire at home and return it to the researcher during the next class session. Two instructors from the Physical Education department allowed their students to complete the questionnaire during class time. All students were compensated in some manner (e.g. extra credit points).

The university sample was comprised of approximately equal numbers of males (n=174) and females (n=198) ranging

in age from 18 to 40 years (Mean = 18). Similar to fitness center participants, student participants were largely Caucasian (89.8%) and Catholic (59.1%). The majority of participants engaged in some form of aerobic exercise at least 3 times per/week (53.2%). However, only 28 percent of the sample engaged some form of non-aerobic exercise at least 3 times per/week (see Table 4).

Insert Table 4 About Here

The principal investigator provided all participants with a brief description of the study along with an explanation of potential benefits of participation. Benefits included: (1) an increased awareness of one's feelings towards oneself, (2) an increased awareness of one's exercise behavior, (3) a chance to win one of three \$100.00 cash prizes (\$100 drawing for each fitness center sample), and (4) providing the researcher with valuable information with regard exercise and self-regard variables. Consent was sought from all participants and anonymity was assured upon consent. It should be noted that a total of six participants were excluded from the study due to insufficient data.

Measures

The questionnaire examined: (1) demographic variables and exercise behavior, (2) physical self-efficacy, (3) general self-esteem, (4) physical evaluation, and (5) physical acceptance.

Exercise Behavior

Items measuring exercise behavior were compiled from a previously developed instrument designed to measure exercise habits (Leveille, 1992). The 4-item scale was designed to measure frequency and duration of aerobic and non-aerobic exercise. A single composite variable was formed by multiplying an individuals exercise frequency score (for both aerobic and non-aerobic exercise) by the individuals exercise duration score (aerobic and non-aerobic), and summing the two values (aerobic and non-aerobic exercise). Tests of reliability and validity were not provided by Leveille.

Participants were also asked to complete an activities checklist. However, data gathered from the activities checklist was not included in the present analyses due to missing data and poor interpretation of the instructions. It should be noted that the activities checklist was attached to the end of the questionnaire and it was the only part of the questionnaire that was not completed on a scantron sheet which may have contributed to missing data

and poor interpretation of the instructions.

Physical Self-Efficacy

A previously developed scale was used in the measurement of physical self-efficacy (Sonstroem et al., 1994). Subjects were asked to indicate how confident they were in their abilities to jog several distances (11 different distances up to 8 miles) and lift weights various weights (9 different weights up to 160 pounds) at the present time. Previous research utilizing the Physical Self-Efficacy scale has revealed high internal consistency (Coefficient Alpha = .84; Sonstroem et al., 1994).

General Self-Esteem

General self-esteem was assessed using two previously developed instruments: (1) the General Self-Worth Scale, and (2) the Self-Esteem Scale.

The General Self-Worth Scale (GSWS) is a subscale of the Adult Self-Perception Profile developed by Messer and Harter (1986). The subscale contains 6 items designed to measure a person's overall self-worth. The original scale employed a "four point structured alternative format designed to reduce socially desirable responses" (Sonstroem et al., 1994). However, based on the recommendations of Sonstroem (personal communication) the response format of the GSWS was modified. A four-point Likert type scale ranging from 1 (strongly agree) to 4 (strongly disagree) was utilized for the present investigation. The GSWS has been

shown to produce moderate to high internal consistency scores (Cronbach Alpha ranges from .70 to .85: Sonstroem et al., 1994).

Similarly, Rosenberg's Self-Esteem Scale (SES: 1965) is a ten item scale designed to measure global self-esteem. Participants were asked to respond to a four-point Likert type scale ranging from 1 (strongly agree) to 4 (strongly disagree). The SES has produced moderate to high internal consistency scores (Cronbach alpha ranges from .77 to .88), as well as, high test-retest reliability (Pearson r ranges from .82 to .85: Blascovich & Tomaka, 1991).

Physical Evaluation

Two levels of physical evaluation were measured: a general dimension of physical evaluation and specific dimensions of physical evaluation (sport, strength, endurance/fitness, physical appearance, and body fat). Again, physical evaluation was defined as an evaluation of one's physical qualities, abilities, and/or performances in comparison to a stated or implied standard. The general dimension of physical evaluation was measured utilizing a study-developed scale consisting of six items. Items were declarative in nature (e.g. "I am physically adept", "I have many excellent physical qualities") to which the subject was expected to respond using a five-point Likert type scale ranging from 1 (strongly agree) to 5 (strongly disagree).

Specific dimensions of physical evaluation were

measured utilizing several scales of the PSDQ (Marsh, 1993) including: sports competence, strength, fitness/endurance, physical appearance, and body fat. The PSDQ was originally designed for an adolescent population, however, Marsh and Colleagues have recommended its use in a variety of populations. Each scale consisted of six items to which the subject was expected to respond using a five-point Likert type scale ranging from 1 (strongly agree) to 5 (strongly disagree). It should be noted that the original response format was modified from a six-point true-false scale to a 5-point Likert type scale for the ease of data entry. Specific evaluation scales (sports competence, strength, fitness/endurance, physical appearance, body fat) have been shown to produce high internal consistency scores (Coefficient Alpha ranging from .88 to .96 : Marsh et al., 1993).

Physical Acceptance

Two levels of physical acceptance were measured along the same dimensions that were used for physical evaluation: a general dimension of physical acceptance and specific dimensions of physical acceptance (sports competence, strength, fitness/endurance, physical appearance, and body fat). To reiterate, physical acceptance was defined as one's feelings of acceptance, satisfaction, or happiness with his/her physical qualities, abilities, or performances. General physical acceptance was measured utilizing a

modified version of the General Physical Self-Concept Scale of the PSDQ. The General Physical Self-Concept scale consists of six items to which the subject is expected to respond using a six-point true-false scale. Again, a five-point Likert type scale ranging from 1 (strongly agree) to 5 (strongly disagree) replaced

Specific dimensions of physical acceptance were measured utilizing a study-developed instrument that measures one's feelings of acceptance along several physical dimensions: sports competence, strength, fitness/endurance, physical appearance, and body fat. Each aspect of physical acceptance was measured using six items to which the subject was expected to respond using a five-point Likert type scale ranging from 1 (strongly agree) to 5 (strongly disagree).

Data Analysis

The data in this study was quantitatively analyzed using the statistical procedures of Principle Components Analysis (PCA), descriptive statistics, Multivariate Analysis of Variance (MANOVA), Confirmatory Factor Analysis(CFA), and Structural Modeling (SM). Analyses were conducted using the BMDP statistical programs (Dixon, 1990) and the EQS computer program (Bentler, 1989).

First, a series of exploratory Principle Components Analyses were conducted on half of the sample (n=213) to

examine the structure of the following scales: the Global Self-Worth Scale, the Self-Esteem Scale, the Physical Self-Efficacy Scale, the General Physical Evaluation Scale, the five specific physical evaluation scales, the General Physical Acceptance Scale, and the five specific physical-acceptance scales. It was expected that each of these scales would be unidimensional, producing a single function with high loadings ($>.50$) for all items within a scale. Items that did not appear to be consistent with the others were dropped. Composite scores were created for each scale by averaging items with loadings $>.50$. It should be mentioned that composite scores were utilized for descriptive statistics and Multivariate Analysis of Variance. All other analyses utilized data at the item level (e.g. PCA, CFA, SM).

Second, descriptive statistics were calculated for all of the major composite variables. This included calculating the means, standard deviations, ranges, skewnesses, kurtoses, and Coefficient Alpha for General Self-Worth (Harter, 1986), General Self-Esteem (Rosenberg, 1965), Self-Efficacy for Jogging, Self-Efficacy for Strength, General Physical Evaluation, General Physical Acceptance, specific dimensions of Physical Evaluation, specific dimensions of Physical Acceptance, and frequency of exercise (aerobic and non-aerobic).

Because it was necessary to combine fitness center

participants and student participants for Confirmatory Factor Analysis and Structural Modeling Analysis, mean differences between samples on the dependent variables were examined. It was expected that the samples would not show significant differences on the dependent variables, thus providing justification for combining the two samples in subsequent analyses. A one-way between-subjects MANOVA was conducted to examine group differences between the two samples: (1) fitness center members, and (2) University students. Dependent variables included: General Self-Worth, General Self-Esteem, Self-Efficacy for Strength, Self-Efficacy for Jogging, General Physical Evaluation, five specific Physical Evaluation variables, General Physical Acceptance, and five specific Physical Acceptance variables. The independent variable was sample with two levels: fitness center members and university students. Followup Analyses of Variance (ANOVAs) were utilized to determine which of the dependent variables showed significant differences across groups. Because differences between the samples on several dependent variables were present, a second set of analyses were conducted to examine whether the mean differences affected the underlying structure of the data (e.g. were the correlations among variables similar in degree and direction for both samples). Using separate samples, results of several Multiple Sample CFAs were examined and compared. Since the underlying structure of the data was similar in

both samples, the samples were combined for the purpose of model testing.

Fourth, CFA was performed on the total sample (N=526) to confirm the factor structure of the following scales: the General Physical Acceptance Scale, the General Physical Evaluation Scale, the five specific physical evaluation scales, and the five specific physical acceptance scales. Since one of the primary focuses of this study was to develop a multi-dimensional measure of physical acceptance that was distinguishable from physical evaluation, the researcher chose to do a more rigorous test to confirm the structure of these scales (CFA). Ideally, one would want to perform a CFA on an independent sample, however, the size and complexity of the models required a large number of subjects to render a solution. Therefore, the full sample of 526 participants was examined for CFA models. Confirmatory Factor Analysis tests the hypothesis that a particular linkage between observed variables and their underlying factors does in fact exist (Byrne, 1994). Similar to that of Structural Modeling, several indices were utilized to examine overall fit of the measurement models: (1) a Chi-Square which is expected to be small in comparison to its degrees of freedom, (2) the Comparative Fit Index (CFI) (Bentler, 1990) which should have values approaching 1.0, and (3) the Average Absolute Standardized Residual (ASSR) which should approach 0. Z-tests of

significance were also examined for all parameters (e.g. factor loadings and regression paths).

Fifth, Structural Modeling was used to test the plausibility of five hypothesized models (see Figures 3, 4, and 5). The EQS computer program (Bentler, 1989) was employed with a Maximum Likelihood solution. This procedure has been shown to be robust to mild departures of normality (Harlow, 1985; Huba & Harlow, 1987). The same fit indices used for CFA models were examined here (i.e. Chi-Square and degrees of freedom, CFI, AASR, and Z-tests).

Results

Principle Components Analysis

Physical Self-Efficacy

Two principle components were identified for the Physical Self-Efficacy scale accounting for a total of 73.3 percent of the total variance in physical self-efficacy. Since it was expected that the two sets of items would be somewhat related, oblique rotation was conducted. The correlation between the two components was .32. The first component, self-efficacy for jogging, consisted of seven items that accounted for 51.7 percent of the variance in physical self-efficacy. Mean item loading was .83 (SD=.09). Eleven items representing self-efficacy for lifting weights formed the second component, which accounted for 21.6

percent of the variance in self-efficacy. Mean item loading was .85 (SD=.11). Responses to the items were used to assess Efficacy for Jogging and Efficacy for Strength.

General Self-Esteem

General self-esteem was assessed using two previously developed instruments: (1) the General Self-Worth Scale (GSW) (Harter, 1986), and (2) the Self-Esteem Scale (SES) (Rosenberg, 1965). A single component was identified for the GSW scale accounting for 61.8 percent of the total item variance. Criteria for item scoring on a component included a loading of at least .50. Five items representing general self-worth formed the component, with a mean item loading of .79 (SD=.08). Responses to the items were used to assess General Self-Worth.

Similarly, a single component was identified for the SES scale accounting for 53 percent of the total item variance. Ten items representing general self-esteem formed the component, with a mean item loading of .73 (SD=.05). Responses to the items were used to assess General Self-Esteem.

Physical Evaluation and Physical Acceptance Scales

Six PCA's were conducted to examine the underlying structure of the Physical Evaluation and Physical Acceptance Scales. Each PCA included twelve items measuring similar content areas (e.g. evaluation of sports competence and sport acceptance). At this point it is important to note

that a four-point likert type scale was used for all evaluation items and all acceptance items due to an unfortunate mistake in editing the questionnaire. The final response category (strongly disagree) was inadvertently deleted from the acceptance scale. Thus, all evaluation items were transformed to a four item scale by changing "strongly disagree" responses (response 5) to "disagree" responses (response 4).

General Physical Scales

Two principle components were identified for items measuring general physical evaluation and general physical acceptance, accounting for a total of 60.7 percent of the total variance in items. Again, oblique rotation was conducted. The correlation between the two components was .51. Criteria for item scoring on a component included a loading of at least .50. The first component, general physical acceptance, consisted of three items accounting for 50.6 percent of the variance in general items. Mean item loading for the first component was .84 (SD=.04). Three items, representing general physical evaluation formed the second component accounting for 10.1 percent of the variance in general items, with a mean loading of .84 (SD=.05). Responses to the items were used to assess General Physical Acceptance and General Physical Evaluation.

Body Fat

As was expected two principle components were identified for body fat items accounting for a total of 70 percent of the total item variance. Again, oblique rotation was conducted. The correlation between the two factors was .59. Criteria for item scoring was at least .50. The first component consisted of three items representing evaluation of body fat which accounted for 61.3 percent of the variance. Mean item loading for this component was .85 (SD=.14). The second component, acceptance of body fat consisted of three items and accounted for an additional 8.7 percent of the variance. Mean item loading for this component was .80 (SD=.12). Responses to the items were used to assess Evaluation of Body Fat and Acceptance of Body Fat.

Physical Appearance

Two principle components were identified for physical appearance items accounting for a total of 66.3 percent of item variance. Using oblique rotation, the correlation between the two factors was .58. Three items representing evaluation of physical appearance formed the first component, which accounted for 55.2 percent of the variance in physical appearance items. Mean item loading was .85 (SD=.06). The second component consisted of three items related to acceptance of physical appearance accounting for a total of 11.1 percent the variance in physical appearance

items. Mean item loading was .86 (SD=.10). Again responses were used to assess Evaluation of Physical Appearance and Acceptance of Physical Appearance.

Strength

As was hypothesized, two principle components were identified for strength items accounting for a total of 60.4 percent of the variance in strength items. Oblique rotation was conducted since it was expected that the two components would be correlated. The correlation between the two components was .63. The first component, evaluation of strength, consisted of three items accounting for a total of 52.2 percent of the variance in strength items. Mean item loading was .83 (SD=.02). The second component, acceptance of strength, also consisted of three items accounting for an additional 8.2 percent of the variance in strength items. Mean item loading for the second component was .83 (SD=.05). Responses to items were used to assess Evaluation of Strength and Acceptance of Strength.

Fitness/Endurance

Two principle components were identified for items measuring fitness/endurance, accounting for a total of 60.3 percent of the total variance in items. Again, oblique rotation was conducted. The correlation between the two components was .46. Criteria for item scoring on a component included a loading of at least .50. Three items, representing acceptance of fitness/endurance, formed the

first component. The first component accounted for 47.1 percent of the variance in fitness items, with a mean loading of .79 (SD=.01). The second component, evaluation of fitness/endurance, accounted for 13.2 percent of the variance in fitness items and had a mean item loading of .85 (SD=.04). Responses to the items were used to assess Acceptance of Fitness/Endurance and Evaluation of Fitness/Endurance.

Sports Competence

As was expected two principle components were identified for sport items accounting for a total of 68.9 percent of the total item variance. Again, oblique rotation was conducted. The correlation between the two factors was .61. Criteria for item scoring was at least .50. The first component consisted of three items representing evaluation of sports competence which accounted for 59.9 percent of the variance. Mean item loading for this component was .86 (SD=.09). The second component, acceptance of sports competence consisted of three items and accounted for 9 percent of the variance. Mean item loading for this component was .83 (SD=.06). Responses to the items were averaged to form two composite scores of Evaluation of Sport and Acceptance of Sport.

Descriptive Statistics

Table 5 provides descriptive statistics (means, standard deviations, skewness, kurtosis, Coefficient Alpha) for the combined sample on all composite variables and exercise frequency variables. It is important to keep in mind that high values for all variables are interpreted as high scores (e.g. 4=high self-esteem, 1=low self-esteem).

Insert Table 5 about here

Overall, the combined sample appeared to have: (1) high general self-esteem as measured by Rosenberg's SES (1965) and Harter's GSW (1986), (2) moderate levels of self-efficacy for strength and jogging, (3) moderate scores on the general physical evaluation scale, (4) high scores on the general physical acceptance scale, (5) moderate scores on specific evaluation scales, and (6) moderately high scores on specific acceptance scales (with the exception of the strength acceptance scale which is lower than the other acceptance scales). In addition, the sample reported moderately low amounts of exercise.

Multivariate Analysis of Variance

A one-way between-subjects MANOVA was conducted to examine differences between the two samples: fitness center members, and university students. Dependent variables

included: (1) General Self-Worth, (2) General Self-Esteem, (3) Self-Efficacy for Jogging, (4) Self-Efficacy for Strength, (5) General Physical Evaluation, (6) General Physical Acceptance, (7) five specific dimensions of Physical Evaluation, and (8) five specific dimensions of Physical Acceptance.

Results indicated that there were significant differences between samples (fitness center members and students) on the linear combination of dependent variables $F(16,509) = 4.37, p < .001$. T^2 indicated that 71.92 percent of the variance in the linear combination of dependent variables could be accounted for by differences between the two samples.

Followup univariate ANOVAs revealed that there was a significant difference between fitness center members and university students on five of the dependent variables: Efficacy for Jogging, Evaluation Fat, Evaluation Appearance, Evaluation Strength, and Evaluation Sport. Table 6 provides follow-up univariate ANOVAs for all dependent variables along with the means for each sample.

Insert Table 6 about here

The student sample reported higher Efficacy for Jogging ($m = 3.19$) than the fitness center sample ($m = 2.86$). Indicating that the student sample was more confident in

their ability to jog for several distances than the fitness center sample. Similarly, the student sample reported higher scores on Evaluation of Fat ($m = 2.57$) than fitness center members ($m = 2.38$) meaning that compared to a stated or implicit standard, students had more positive evaluations of their body fat than fitness center members. Students also reported higher scores on Evaluation of Sport than fitness center members ($m = 2.55$, $m = 2.39$ respectively) revealing that compared to a stated or implicit standard, students had more positive evaluations of their sports competence than fitness center members.

While students reported more positive evaluations for body fat and sport, fitness club members reported more positive evaluations for appearance ($m_{fit} = 2.76$, $m_{st} = 2.60$) and strength ($m_{fit} = 3.01$, $m_{st} = 2.75$). Compared to a stated or implicit standard, fitness center members evaluated their physical appearance more positively than students evaluated their physical appearance. Furthermore, compared to a stated or implicit standard, fitness center members had more positive evaluations of their strength than students. Possible explanations for the differences between samples are mentioned in the discussion section.

Confirmatory Factor Analysis

Structural Differences

Because it was necessary to combine the samples for

upcoming modeling analyses, CFA was used to compare the underlying structure of the general physical scales in each sample. Using Multiple Sample CFA, several models were examined to test whether components of the measurement model were invariant (i.e., equivalent) across the two samples (fitness center members and university students). The reason for choosing this particular measurement model to compare structural differences was that the model was small enough to render a reliable solution using a small number of participants (i.e. fitness center members). The measurement model was identical to Model G in the upcoming section. Model G hypothesized a two factor solution with three physical acceptance items loading on the first factor (General Physical Acceptance) and three physical evaluation items loading on the second factor (General Physical Evaluation).

As a prerequisite to the testing of hypotheses related to invariance, it is important to establish baseline models separately for each group under study (Bryne, 1994). Figure 6 presents the baseline measurement models for fitness center members and university students. For the fitness center sample, overall fit of the model to the data was excellent ($\chi^2(8) = 15.12$; CFI = .98; AASR = .03). Z-tests for the individual parameter estimates showed that each of the items loaded significantly ($p < .05$) on its respective factor. Using the student sample, overall fit of the model

to the data was slightly better ($\chi^2(8) = 5.96$; CFI = 1.0.; AASR = .01). It is likely that the differences in fit indices were due to unequal sample sizes (fitness center sample N = 154; student sample N = 372). Again, Z-tests for the individual parameter estimates showed that each of the items loaded significantly ($p < .05$) on its respective factor.

Insert Figure 6 about here

To formally test the equivalence of these models, four models were examined to test the equality of: (1) the factor loadings, (2) the factor variances and covariances, (3) the error variances, and (4) all parameters across groups. A final revised model was examined that released the equality constraints that did not hold (i.e. constraints that were statistically significant)

The first multiple sample model revealed an excellent fit of the model to the data ($\chi^2(20) = 27.91$; CFI = .99). In addition, both univariate and multivariate tests for the equality of the factor loadings revealed that there were no significant differences between the factor loadings across samples ($p > .05$).

The second multiple sample model also revealed an excellent fit of the model to the data ($\chi^2(19) = 29.21$; CFI = .99). Similarly, both univariate and multivariate

tests for the equality of the factor variances and covariances revealed that there were no significant differences between the factor variances and covariances across samples ($p > .05$).

As was the case with the previous models, the third multiple sample model also revealed an excellent fit of the model to the data ($\chi^2(22) = 34.38$; CFI = .99). Likewise, both univariate and multivariate tests for the equality of the error variances revealed that there were no significant differences between the error variances across samples ($p > .05$).

The fourth multiple sample model revealed excellent fit of the model to the data ($\chi^2(28) = 39.29$; CFI = .99). However, multivariate statistics revealed that four of the specified equality constraints did not hold (three error variance and one factor variance constraints). However, univariate statistics revealed that only one of the specified equality constraints did not hold (an error variance). To investigate these findings further, the model was respecified and reestimated with the four constraints (revealed by the multivariate statistics) released.

The revised multiple sample model revealed the best fit of the model to the data ($\chi^2(24) = 28.49$; CFI = 1.0). After releasing the slightly problematic cross-group constraints, both univariate and multivariate tests for the equality of the parameters revealed that there were no significant

differences between the parameters across samples ($p > .05$).

A set of Chi-Square difference tests were conducted to examine whether there were significant differences between a non-constrained multiple sample model and the five constrained models. Results revealed that the non-constrained model was not significantly different from any of the constrained models (χ^2_{diff} ranged from 1.54 to 12.92).

Given these findings it can be concluded that the general physical scales are operating in a similar manner for both samples. Based on the results of these analyses, the samples were combined for subsequent analyses.

General Physical Scales

To verify the factor structure obtained in the six-item PCA, three models were examined using Confirmatory Factor Analyses.

Insert Figure 7 about here

Model F postulated that all items loaded on a single factor. This factor could be viewed as a general physical-perceptions factor. Model F was used as a test of validity for the hypothesized model which was Model G.

Model G hypothesized a two factor solution with three physical acceptance items loading on the first factor (General Physical Acceptance) and three physical evaluation

items loading on the second factor (General Physical Evaluation). It was expected that the two factors would be moderately correlated, yet contribute unique variance to the solution. It was hypothesized that Model G would reveal the best overall fit.

Model H makes the assumption that both factors are perfectly correlated (covariance from factor 1 to factor 2 fixed at 1.0). Model H posits that the factors of General Physical Acceptance and General Physical Evaluation are not contributing unique variance to the solution but are better conceptualized as a single factor. Model H was also included as a test of validity for Model G.

As was expected, overall results for Model F revealed less than adequate fit of the model to the data ($\chi^2(9) = 302.36$; CFI = .75; AASR = .08). Z-tests for the individual parameter estimates showed that each of the items loaded significantly ($p < .05$) on the factor. However, results of the overall fit indices indicated that there was a moderate degree of model misspecification.

Fit indices for Model G revealed excellent fit of the model to the data ($\chi^2(8) = 14.43$; CFI = .99; AASR = .01). Again, Z-tests for the individual parameter estimates showed that each of the items loaded significantly ($p < .05$) on its respective factor. As was expected, the correlation between the two factors was moderately high ($r = .55$, $p < .05$). Also, as expected, a substantial percentage of variance

(almost 70 percent) was not shared, providing initial evidence that the two constructs are methodologically distinct. A complete list of items and their factor loadings is provided in Table 7.

Insert Table 7 about here

Finally, Model H exhibited poor overall fit of the model to the data (χ^2 (9) = 113.60; CFI = .91; AASR = .43). Once more, all items loaded significantly ($p < .05$) on its respective factor as revealed by Z-tests for individual parameter estimates.

Since both Model G and Model H were similar in nature, a Chi Squared difference test was conducted to examine whether there was a significant difference between the two models. Results revealed that the two models were significantly different ($\chi^2_{diff}(1) = 99.17$, $p < .001$) providing support for Model G. Thus, it can be concluded that General Physical Acceptance and General Physical Evaluation are related constructs that contribute unique variance to the factor solution.

Specific Physical Scales

Confirmatory Factor Analysis with maximum likelihood estimation was used to substantiate the factor structure obtained in the five 6-item PCAs on specific dimensions of

physical evaluation and physical acceptance. Two measurement models were examined to test the validity of a ten factor solution (see figures 8 and 9).

Model I hypothesized a ten factor solution with three items loading on each factor. Factors include:

(1) Evaluation Body Fat, (2) Evaluation Appearance, (3) Evaluation Strength, (4) Evaluation Fitness, (5) Evaluation Sport, (6) Acceptance Body Fat, (7) Acceptance Appearance, (8) Acceptance Strength, (9) Acceptance Fitness, and (10) Acceptance Sport. It was expected that all factors would be moderately correlated, yet contribute unique variance to the solution.

Insert Figure 8 about here

Model J examined a second order CFA model with ten first order factors (Evaluation Fat, Evaluation Appearance, Evaluation Strength, Evaluation Fitness, Evaluation Sport, Acceptance Fat, Acceptance Appearance, Acceptance Strength, Acceptance Fitness, Acceptance Sport) and two second order factors (labeled Physical Evaluation and Physical Acceptance). The purpose for testing Model J was to examine whether the ten first order factors could be explained by two higher order factors. This would provide support for the unique contribution of evaluation related items and acceptance related items to the measurement model. It was

hypothesized that the second order structures would be moderately correlated.

Insert Figure 9 about here

As was expected, overall results for Model I revealed good fit of the model to the data ($\chi^2(360) = 1031.38$; CFI = .93; AASR = .04). Z-tests for the individual parameter estimates showed that each of the items loaded significantly ($p < .05$) on the factor. Table 8 provides a complete list of items and factor loadings.

Insert Table 8 about here

Table 9 presents the intercorrelations among the ten factors. Factor intercorrelations were as low as .17 (Evaluation Fitness and Evaluation Appearance) and as high as .89 (Acceptance Appearance and Acceptance Fat).

Insert Table 9 about here

Model J revealed adequate, though not strong, fit of the model to the data ($\chi^2(394) = 1700.79$; CFI = .86; AASR = .07). Z-tests for the individual parameter estimates showed that each of the items loaded significantly

($p < .05$) on the first-order factors and each of the paths from the second-order factors to the first order factors were significant ($p < .05$). Path coefficients ranged from .91 (Physical Acceptance to Acceptance Fitness) to .50 (Physical Evaluation to Evaluation Fitness). Table 10 presents the parameter estimates (Beta) for each path from the second-order factors to the first order factors.

Insert Table 10 about here

Unexpectedly, the two higher order factors of physical evaluation and physical acceptance were almost perfectly correlated ($r = .99$) indicating that the ten first order factors might be better explained by a single higher order factor, rather than two higher order factors. To test this hypothesis, a second order CFA model with ten first order factors and one second order factor was examined. The overall model fit was somewhat worse than the original higher order CFA model ($\chi^2(396) = 1821.48$; CFI = .84; AASR = .09).

Unfortunately, Model J does not provide support for the unique contribution of evaluation and acceptance at the item level of the measurement model, whereas, this was shown at the more global construct level earlier. Since Model I showed good overall fit, all ten factors were included in exploratory Structural Modeling Analyses.

Structural Modeling Analyses

Several versions of the EXSEM were empirically tested using Structural Modeling analysis with maximum likelihood estimation (See Figures 3 and 4).

Model A has Physical Self-Efficacy (measured by Self-Efficacy for Jogging and Strength), predicting all specific evaluation and acceptance factors (Body Fat, Appearance, Strength, Fitness/Endurance, Sport). Since physical acceptance had not been examined in the context of the Exercise and Self-Esteem Model prior to the present study, the relationships between Physical Self-Efficacy and specific dimensions of Physical Acceptance and Physical Evaluation were of interest. Furthermore, five specific physical evaluation factors (Body Fat, Appearance, Strength, Endurance/Fitness, Sport) were expected to predict the general factor of Physical Evaluation, and five specific physical acceptance factors (Body Fat, Appearance, Strength, Endurance/Fitness, Sport) were expected to predict the general factor of Physical Acceptance. All evaluation and acceptance factors, both at the general and specific levels, were measured by three items for each factor (identified through CFA). It was anticipated that there would be some degree of overlap between the factors both at the specific dimension (e.g. Evaluation Fat and Acceptance Appearance) and the general dimension. Since structural modeling does

not allow for correlations among dependent variables:

(a) the disturbance terms associated with each of the ten specific factors were correlated, and (b) the disturbance terms associated with the two general factors were correlated. Lastly, Physical Evaluation and Physical Acceptance factors were expected to predict General Self-Esteem [as measured by General Self-Esteem (Rosenberg, 1965) and General Self-Worth (Harter, 1986)].

Models B, C, and D were used as a means of model comparison. In Model B, all specific paths lead to the general dimension of Physical Acceptance, testing the necessity of General Physical Evaluation to the model. Paths from Physical Self-Efficacy to specific factors of Physical Evaluation and Physical Acceptance remained unchanged. Model C, on the other hand, had all specific paths leading to General Physical Evaluation testing the necessity of a General Physical Acceptance factor. Again, paths from Physical Self-Efficacy to specific factors remained unchanged. Lastly, Model D had all paths from the specific factors of Evaluation and Acceptance leading to a General Self-Esteem factor examining the necessity of both the General Physical Evaluation and General Physical Acceptance dimensions to the model.

Overall results for Model A revealed good fit of the model to the data (χ^2 (672) = 1915.47; CFI = .90; AASR = .04). All items loaded significantly ($p < .05$) on

their respective factors as revealed by Z-tests for individual parameter estimates.

An examination of the Z-tests associated with the regressions revealed that all paths, with the exception of four, were significant ($p < .05$). Paths that were not significant included the path from: (1) Acceptance Fat to General Physical Acceptance (Beta = .02), (2) Strength Acceptance to General Physical Acceptance (Beta = -.03), (3) Fitness Acceptance to General Physical Acceptance (Beta = .05), and (4) Physical Self-Efficacy to Evaluation Appearance, (approached significance, Beta = .10, $p = 1.89$). Figure 10 presents Model A with the standardized parameter estimates for the hypothesized structural paths.

Insert Figure 10 About Here

In Model B, all specific paths from Physical Evaluation and Physical Acceptance factors led to the general factor of Physical Acceptance. Several attempts were made to analyze Model B. However, due to multicollinearity in the data ($r = .81$ for Acceptance Appearance and General Physical Acceptance) the results of this analysis were not reliable without the inclusion of General Physical Evaluation in the model. Therefore, Model B was not used in the present analyses.

In Model C, all specific paths from Physical Evaluation

and Physical Acceptance factors led to the general factor of Physical Evaluation. Fit indices for Model C revealed good overall model fit (χ^2 (563) = 1742.74; CFI = .90; AASR = .05). However, only three of the paths from the specific factors to the general factor of evaluation were significant ($p < .05$) including the path from: (1) Evaluation Appearance to General Physical Evaluation (Beta = .32), (2) Evaluation Strength to General Physical Evaluation (Beta = .17), and (3) Evaluation Sport to General Physical Evaluation (Beta = .43). Similar to Model A, all paths from Physical Self-Efficacy to the specific factors of Physical Evaluation and Physical Acceptance were significant ($p < .05$), with the exception of the path from Physical Self-Efficacy to Evaluation Appearance which approached significance (Beta = .10, $p = 1.92$). Figure 11 presents Model C with the standardized parameter estimates for the hypothesized structural paths.

 Insert Figure 11 About Here

In Model D all paths from the specific factors of Evaluation and Acceptance lead to General Self-Esteem. Model D provided the best overall fit of the model to the data (χ^2 (462) = 1342.01; CFI = .92; AASR = .04). However, only three of the paths from the specific factors of Physical Evaluation and Acceptance to General Self-Esteem

were significant ($p < .05$) including the path from:

(1) Evaluation Strength to General Self-Esteem (Beta = .26),
(2) Evaluation Fitness to General Self-Esteem (Beta = .20),
and (3) Acceptance Fitness to General Self-Esteem
(Beta = .30). As was the case in the previous models, all
paths from Physical Self-Efficacy to the specific factors of
Physical Evaluation and Physical Acceptance were significant
($p < .05$), with the exception of the path from Physical Self-
Efficacy to Evaluation Appearance which approached
significance (Beta = .10, $p = 1.94$). Figure 12 presents
Model D with the standardized parameter estimates for the
hypothesized structural paths.

Insert Figure 12 About Here

Lastly, the final version of the EXSEM, which included
a path from Exercise to Self-Efficacy, also revealed good
fit of the model to the data ($\chi^2 (701) = 1960.54$; CFI = .90;
AASR = .04). Z statistics associated with the structural
paths showed that all paths, with the exception of three,
were significant ($p < .05$) including the path from:

(1) Acceptance Fat to General Physical Acceptance
(Beta = .22), (2) Sport Acceptance to General Physical
Acceptance (Beta = -.25), (3) Fitness Acceptance to General
Physical Acceptance (Beta = -.12). Figure 13 presents the
standardized parameter estimates for the hypothesized

structural paths for the hypothesized model with the inclusion of exercise. It should be recognized that exercise is a measured variable rather than a latent variable.

Insert Figure 13 about here

Discussion

The broad focus of the present study was to examine the Exercise and Self-Esteem Model (EXSEM) (Sonstroem & Morgan, 1989) with the inclusion of perceived physical acceptance. Several breakthroughs have been made in the identification of the multi-dimensional nature and measurement of physical self-concept (Marsh, 1994; Fox & Corbin, 1989). However, self-concept research in the physical domain has thus far ignored or neglected issues of acceptance. The present investigation examined physical evaluation (previously labeled physical competence) and physical acceptance both at a specific dimension (body fat, physical appearance, strength, fitness/endurance, sport) and at a general dimension in the context of the Exercise and Self-Esteem Model.

Since physical acceptance has never been included in empirical tests of the EXSEM, it was necessary to:

- (1) provide a clear, operational definition of physical acceptance that differed from physical evaluation, and
- (2) develop a multi-dimensional measure of physical acceptance that was relatively independent from physical evaluation.

Physical acceptance was defined as one's feelings of acceptance, satisfaction or happiness with his/her physical qualities, abilities, or performances, whereas, physical evaluation was defined as an evaluation of one's physical qualities, abilities, or performances in comparison to a stated or implied standard.

While it is clear that additional work will be required to develop a psychometrically sound measure of physical acceptance, overall findings in the area of measurement development were encouraging. Confirmatory Factor Analyses revealed that general physical self-perception items could be separated into two distinct, yet related, factors of general physical evaluation and general physical acceptance. Comparison of three models confirmed that a two factor solution (allowing for the covariance between factors) was the best solution in terms of overall model fit and parameter estimation. A degree of caution should be maintained in the interpretation of these factors since the three items that loaded on the general physical evaluation

factor were all positively worded and the three items that loaded on the general acceptance factor were all negatively worded. Ideally, one would have liked to have an equal number of positively and negatively worded items loading on each factor. Since it was beyond the scope of this study to address this issue, future studies should strive to achieve a balance of positively and negatively worded items within a scale.

As was hypothesized, results of Confirmatory Factor Analyses revealed that five specific factors of physical evaluation and five specific factors of physical acceptance could be identified. Although these factors were in some instances highly related, they appeared to be contributing unique information to the measurement model. It should also be mentioned that three of the ten factors consisted of items that were all negatively worded (Strength Evaluation, Sport Acceptance, Acceptance Fat) and one factor consisted of items that were all positively worded (Sport Evaluation). Once more, this is of concern in that one would have liked to have an equal representation of both positive and negative items in all factors. On a more positive note, the sport related factors were the only factors that contained three positive items for the evaluation factor and three negative items for the acceptance factor. Repeatedly, this is an issue for future studies to address.

To further validate the hypothesized ten factor model,

a second-order CFA model with ten first order factors (Evaluation Fat, Evaluation Appearance, Evaluation Strength, Evaluation Fitness, Evaluation Sport, Acceptance Fat, Acceptance Appearance, Acceptance Strength, Acceptance Fitness, Acceptance Sport) and two second order factors (Physical evaluation and Physical Acceptance) was performed. Findings indicated that the paths from the second order factors to the first order factors were significant. However, the higher order structures labeled Evaluation and Acceptance were almost perfectly related ($r=.99$). This would seem to indicate that the ten first order factors might be better explained by a single higher order factor, rather than two higher order factors. However, in testing a model of this nature, it was revealed that overall model fit was somewhat worse than the original two factor higher order model. It should be recognized that all ten factors were included in exploratory Structural Modeling analyses. As a result, findings of Structural Modeling analyses should be interpreted with a degree of caution.

Mean differences between samples on the dependent variables were examined for descriptive purposes. Unexpectedly, significant differences between samples (fitness center members and students) were present for several dependent variables. First, students reported higher Efficacy for Jogging than fitness center members. Although this may seem counter-intuitive, this could be

explained by differences in age. The student sample was considerably younger (mean age = 18) than the fitness center sample (mean age = 38). Younger individuals may be more confident in their abilities to jog for several distances (up to eight miles) compared to older individuals.

Second, the student sample reported higher evaluations of their body fat than fitness center members indicating that compared to a stated or implied standard, students evaluated themselves as having less body fat than fitness center members. Again, this finding might be explained by differences in age, as a person gets older they tend to carry more body fat. Furthermore, this finding may not have held true if gender was included as another grouping variable. Future research should examine possible gender differences. It was interesting to note that even though fitness center members perceived themselves as having more body fat compared to student perceptions, there were no significant differences between the groups for acceptance of body fat. Perhaps it is the case that issues of evaluation and acceptance contribute differently to an individuals self-concept or self-esteem.

Third, students reported higher evaluations of their sport abilities than fitness center members. Again, this difference could be explained by differences in age. It is possible that younger individuals (who attend a university): (a) engage in sports activities more frequently than older

individuals, and (b) are more successful at sports activities than older individuals. This may account for the differences in evaluation for sport abilities. As was the case with body fat, there was no significant difference between fitness center members and students on sport acceptance.

Fourth, compared to a stated or implied standard, fitness center members evaluated their physical appearance higher than students evaluated their physical appearance. And, fitness center members reported higher evaluations for strength compared to students. These differences may be due to the fact that 83.6 percent of fitness center members engaged in non-aerobic exercise (e.g. weight training, toning exercises) at least three times per/week whereas, only 28 percent of students engaged in non-aerobic exercise at least 3 times per/week (see tables 3 and 4). Non-aerobic exercise is a form of exercise that strengthens and tones the muscles. Therefore it stands to reason that individuals who engage in regular non-aerobic exercise may view themselves as stronger and better looking than those who do not engage in non-aerobic exercise. Again, it is interesting to note that there were no significant differences between fitness center members and students on acceptance of strength or acceptance of appearance.

The presents study examined four Structural Equation Models to test the expansion of the EXSEM to include two

levels of Physical Evaluation and Physical Acceptance as operationalized by the PSDQ (Marsh, 1993) and a study developed measure of Physical Acceptance. Although the nature of these analyses should be considered exploratory, some interesting findings were obtained.

Three models were examined to test the validity of a modified version of the EXSEM with the inclusion of Physical Acceptance. Contrary to hypotheses, all three models showed good overall fit (CFI ranged from .90 to .92; AASR ranged from .04 to .05), with Model D showing the best overall fit (in Model D all paths from the specific factors of physical evaluation and physical acceptance lead to General Self-Esteem). However, in Model D only three of the paths were significant.

An examination of the structural paths across all three models showed that the hypothesized model (Model A), that included two levels of physical evaluation and physical acceptance, had substantially more significant paths than Models C and D (Model C did not include the general dimension of physical acceptance). Based on overall model fit, number of significant structural paths, and theoretical soundness, Model A was deemed the best model. A discussion of hypotheses specific to Model A will follow.

Consistent with hypotheses, general physical evaluation and general physical acceptance significantly predicted general self-esteem. Furthermore, support was provided for

the hypothesis that physical acceptance would be a better predictor of general self-esteem than physical evaluation. As was previously mentioned, most general self-esteem measures are believed to be measuring self-acceptance rather than self-evaluation. Thus, it makes practical sense that physical acceptance would be a better predictor of general self-esteem than physical evaluation. These findings provide support for the necessity of including a general dimension of physical acceptance in the model as a mediator between specific dimensions of acceptance and general self-esteem.

As was expected, specific dimensions of physical evaluation (sports competence, strength, endurance/fitness, physical appearance, body fat) significantly predicted the general dimension of physical evaluation. However, only two of the five specific factors measuring physical acceptance (appearance and sport) predicted the general dimension of physical acceptance.

An examination of the standardized structure coefficients in Model A revealed that the regression coefficient associated with the path from acceptance of appearance to general physical acceptance was extremely high (Beta = .89). Furthermore, an examination of the correlations among model constructs revealed a strong positive correlation between the constructs of acceptance of appearance and general physical acceptance ($r = .81$). It can

be concluded that a large degree of overlap between acceptance of appearance and general physical acceptance is present. A similar observation was made by Sonstroem et al. (1994) in the application of the Physical Self-Perception Profile (PSPP: Fox & Corbin, 1989) to the Exercise and Self-Esteem Model. In their study, the attractive body scale and the physical self-worth scale possessed a large degree of overlap. These researchers suggested that "scale overlap may not represent a problem of measurement development but may be caused by a synonymity of terms in people's minds" (Sonstroem et al., 1994, p.40). In the present study a similar phenomena may be occurring. In their minds, people may equivocate acceptance of their physical appearance with an overall acceptance of their physical selves (general physical acceptance). Given that American society places an inordinate amount of emphasis on physical appearance, it is perfectly logical that individuals might gage their overall sense of physical acceptance on nothing more than their happiness or satisfaction with their physical appearance.

Finally, as was expected, all structural paths from physical self-efficacy to the specific dimensions of physical evaluation and physical acceptance were significant with the exception of the path from self-efficacy to evaluation of appearance, which approached significance. It is interesting to note that the mean regression coefficient from efficacy to the five specific evaluation domains was

greater than the mean regression coefficient from efficacy to the five specific acceptance domains. Although this was not included in apriori predictions, self-efficacy appears to be a better predictor of a persons physical evaluations than a persons physical acceptance. Future work should further examine this issue.

A final version of the EXSEM was tested that included a path from exercise to physical self-efficacy (Model E). This model was similar to Model A in all other aspects. As was expected, results revealed good overall fit of the model to the data. As was mentioned earlier, previous studies of the EXSEM have tested models with the inclusion of exercise (e.g. Sonstroem et al, 1994). However, these investigations have approached this by utilizing a top-down model with physical competence and physical self-efficacy predicting exercise, rather than a bottom-up model with exercise predicting physical self-efficacy. Since "pertinent theory suggests that exercise should be most closely allied with the level of self-perception most specific and congruent with itself" (i.e. physical self-efficacy: Sonstroem, 1994, p.33), the present investigation examined a model of this nature and provided support for the hypothesis that exercise would be able predict self-efficacy, as well as, be predicted by self-efficacy (Sonstroem et al., 1994)

Although the present investigation should be considered an initial attempt to both measure and include physical

acceptance in tests of the EXSEM, the findings of this study may be of great theoretical and practical importance. For many years now researchers have speculated about the distinct contribution of evaluation/competence and acceptance to one's overall sense of self-esteem or self-worth (e.g. Wells and Marwell, 1976). However, empirical support for the separateness of these constructs is virtually non-existent. It is hoped that this work will serve as a model to stimulate further research in the field.

In addition, the present study may be of practical importance to health and fitness professionals. Many of the popular health and fitness programs emphasize and strive for improvements in self-evaluation as opposed to self-acceptance. To state it another way, many programs seek to improve an individuals evaluation of their physical qualities, abilities, or performances, rather than attempting to improve an individuals acceptance, satisfaction, or happiness with their physical self. It may be that in order to successfully improve a persons sense of self (whether it be in a physical domain or a scholastic domain), both issues of self-evaluation and self-acceptance must be addressed. This is not to say that individuals should not strive to improve themselves physically (both for health and aesthetic reasons) but it is just as important (if not more important) that an individual learn to be happy with and accepting of their physical qualities and abilities

as they are. Few individuals have the genetic disposition to meet societies criteria for fitness and/or beauty. Striving to meet these, virtually unattainable, standards may prove to be more detrimental than beneficial to a persons overall sense of self-esteem or self-worth.

To conclude, without further replication of this research in other samples, it may be premature to suggest altering the EXSEM to include the two levels of physical evaluation (competence) and physical acceptance. However, several findings of this research suggest that inclusion of physical acceptance may serve to increase our understanding of self-esteem in the physical domain. It is clear that much additional work will be required before a complete understanding of these issues can be reached.

References

- American College of Sports Medicine (1978). Position on the recommended quantity and quality of exercise for developing and maintaining fitness in healthy adults. Medicine and Science in Sports, 10, vii-x.
- American College of Sports Medicine (1990). The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. Medicine and Science in Sports & Exercise, 22, 265-274.
- Bachman, J. (1970). Youth in Transition: The Impact of Family Background and Intelligence on Tenth Grade Boys (Vol.2). Ann Arbor, MI: Institute for Social Research.
- Beck, A.T. (1978). Beck Depression Inventory. Philadelphia, PA: Center for Cognitive Therapy.
- Ben-Shlomo, L.S., Short, M.A. (1986). The effects of physical conditioning on selected dimensions of physical conditioning on self-concept in sedentary females. Occupational Therapy in Mental Health, 5, 27-46.
- Bentler, P.M. (1989). EQS: Structural equations program manual. Los Angeles: BMDP Statistical Software.

- Bentler, P.M. (1990). Comparative fit indices in structural models. Psychological Bulletin, 107, 238-246.
- Blair, S.N., Goodyear, N.N., Gibbons, L.W., Cooper, K.H. (1984). Physical fitness and incidence of hypertension in healthy normotensive men and women. Journal of the American Medical Association, 252, 487-490.
- Blair, S.N., Kohl, H.W.III, Paffenbarger, R.S., Clark, D.G., Cooper, K.H., Gibbons, L.W. (1989). Physical fitness and all-cause mortality. Journal of the American Medical Association, 262, 2395-2401.
- Blascovich, J., Tomaka, J. (1991). Measures of Self-Esteem. In Measures of Personality and Social Psychological Attitudes. New York: Academic Press.
- Bonheur, B., Young, S.W. (1991). Exercise as a health-promoting lifestyle choice. Applied Nursing Research, 2-6.
- Bray, G.A. (1990). Exercise and obesity. In C. Bourchard, R.J. Shepard, T. Stevens, J.R. Sutton, & B.D. McPherson (Eds.), Exercise, Fitness, and Health: A Consensus of Current Knowledge. Champaign, IL: Human Kinetics.
- Brooke, S.T., Long, B.C. (1987). Efficiency of coping with a real life stressor: A multimodal comparison of aerobic fitness. Psychophysiology, 24, 173-180.

- Byrne, B. (1994). Structural Equation Modeling with EQS and EQS Windows: Basic Concepts, Applications, and Programming. Thousand Oaks, CA: Sage Publications.
- Cantril, H. (1965). The Pattern of Human Concerns. New Brunswick: Rutgers University Press.
- Coopersmith, S. (1981). Self-Esteem Inventory Test Manual. Palo Alto, CA: Consulting Psychologists Press.
- DeBusk, R.F., Stenestrand, U., Sheehan, M., Haskell, W.L. (1990). Training effects of long versus short bouts of exercise in healthy subjects. American Journal of Cardiology, 65, 1010-1013.
- Deyo, R.A., Walsh, N.E., Martin, D.C., Schoenfield, L.S., Ramamurthy, S. (1990). A controlled trial of transcutaneous electrical nerve stimulation (TENS) and exercise for lower back pain. New England Journal of Medicine, 322, 1627-1634.
- Dishman, R.K. (1985). Medical psychology in exercise and sport. Medical Clinics of North America, 69, 123-143.
- Dishman, R.K. (1986). Mental Health. In V. Seefeldt (Ed.), Physical Activity and Wellbeing. Reston, VA: American Alliance of Health, PE, Recreation, and Dance.
- Dixon (1990). BMDP Statistical Software Manual. Los Angeles: University of California Press.
- Dubbert, P.M. (1992). Exercise in behavioral medicine. Journal of Consulting and Clinical Psychology, 60, 613-618.

- Ellis, A. (1971). 22 ways to stop putting yourself down. Rational Living, 6, 8-15.
- Ellis, A. (1973). Humanistic psychotherapy. New York: Julian.
- Finkenberg, M.E., Teper, L. (1991). Self-concept profiles of bodybuilders. Perceptual and Motor Skills, 72, 1039-1043.
- Fitts, W.H. (1965). Manual: Tennessee Self-Concept Nashville, TN: Counselor Recordings and Tests.
- Flemming, J.S., Courtney, B.E. (1984). The dimensionality of self-esteem: II: Hierarchical facet model for revised measurement scales. Journal of Personality & Social Psychology, 46, 404-421.
- Folkins, C.H. (1976). Effects of physical training on mood. Journal of Clinical Psychology, 32, 385-388.
- Ford, H.T. Jr., Puckett, J.R., Blessing, D.L., Tucker, L.A. (1989). Effects of selected physical activities on health-related fitness and psychological well-being. Psychological Reports, 64, 203-208.
- Gergen, K.J. (1971). The Concept of Self. New York: Holt.
- Gillis, A., Perry, A. (1991). The relationships between physical activity and health-promoting behaviors in mid-life women. Journal of Advanced Nursing, 16, 299-310.

- Harlow, L.L. (1985). Behavior of some elliptical theory estimators with normal data in a covariance structures framework. Unpublished doctoral dissertation, University of California, Los Angeles.
- Harlow, L.L. (1990). Psychometric investigation of a demoralization scale. Paper presented at the annual meeting of the American Psychological Association, Boston MA.
- Harris, S.S., Caspersen, C.J., DeFries, G.H., Estes, E.H. Jr. (1989). Physical activity counseling for healthy adults as a primary preventive intervention in the clinical settings. Journal of the American Medical Association, 261, 3590-3598.
- Harter, S. (1982). The perceived competence scale for children. Child Development, 53, 87-97.
- Harter, S. (1984). The Self-Perception Profile for Children: Revision of the Perceived Competence Scale for children. Unpublished Manuscript: University of Denver, CO.
- Harter, S. (1986). Processes underlying the construction, maintenance, and enhancement of the self-concept in children. In Suls, J. & Greenwald, A.G. (Eds.) Psychological Perspectives of the Self, (pp.137-181). New Jersey: Lawrence Erlbaum Associates.

- Helmrich, S.P., Ragland, D.R., Leung, R.W., Paffenbarger, R.S. Jr. (1991). Physical activity and reduced occurrence of non-insulin-dependent diabetes mellitus. New England Journal of Medicine, 325, 147-152.
- Huba, G.J. & Harlow, L.L. (1987). Robust structural equation models: Implications for developmental psychology. Child Development, 58, 147-166.
- I-Min, L., Paffenbarger, R.S.Jr., Hsieh, C. (1991). Physical activity and risk of developing colorectal cancer among college alumni. Journal of the National Cancer Institute, 83, 1324-1329.
- Imm, P.S. (1990). Perceived benefits of participants in an employees' aerobic fitness program. Perceptual and Motor Skills, 71, 753-754.
- James, L.R. Mulaik, S.A., Brett, J.M. (1982). Causal Analysis: Assumption, models, and data. Beverly Hills, California: Sage.
- Johnson, L.C. (1956). Body cathexis as a factor in somatic complaints. Journal of Consulting Psychology, 20, 145-149.
- Jourard, S.M., Secord, P.F. (1955). Body-cathexis and the ideal female figure. Journal of Abnormal and Social Psychology, 50, 243-246.
- Kaplan, H.B., Pokorny, A.D. (1969). Self-derogation and psycho-social adjustment. Journal of Nervous and Mental Disease, 149, 421-434.

- Kohl, H.W., LaPorte, R.E., Blair, S.N. (1988). Physical activity and cancer. Sports Medicine, 6, 222-237.
- Leon, A.S., Connett, J., Jacobs, D.R., Rauramaa, R. (1987). Leisuretime Physical activity among community participants. Journal of the American Medical Association, 258, 2388-2395.
- Leveille, C. (1992). Self-regard components and eating behaviors of adult female exercisers. Unpublished Masters Thesis, University of Rhode Island.
- Lubin, B. (1965). Adjective checklists for measurement of depression. Archives of General Psychiatry, 12, 57-62.
- Luck, P.W., Heiss, J. (1972). Social determinants of self-esteem in adult males. Sociology and Social Research, 57, 69-84.
- Marsh, H.W. (1990). A multi-dimensional, hierarchical self-concept: Theoretical and empirical justification. Educational Psychology Review, 2, 77-171.
- Marsh, H.W. (1992). The Self-Description Questionnaire II: Manual. Publication Unit, Faculty of Education, University of Western Sydney, Macarthur.
- Marsh, H.W., Redmayne, R.S. (1994). A multi-dimensional 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., Johnson, S., Tremayne, P.
(1993). Physical Self Description Questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments.
Unpublished Manuscript. University of Western Sydney, Macarthur.
- Marsh, H.W., Shavelson, R.J. (1985). Self-concept: Its multifaceted hierarchical structure. Educational Psychologist, 20, 107-125.
- Martin, J.E., Dubbert, P.M., Cushman, W.C. (1990).
Controlled trial of aerobic exercise in hypertension. Circulation, 81, 1560-1567.
- Maslow, A.H. (1968). Toward a psychology of being.
Princeton, NJ: Van Nostrand.
- Melnick, M.J., Mookerjee, S. (1991). Effects of advanced weight training on body-cathexis and self-esteem. Perceptual and Motor Skills, 72, 1335-1345.
- Messer, B., Harter, S.V. (1986). Manual for the Adult Self-Perception Profile. Denver: University of Denver Press.
- Minor, M.A. (1991). Physical activity and management of arthritis. Annals of Behavioral Medicine, 13, 117-124.
- Netz, Y., Tennenbaum, G., Sagiv, M. (1988). Pattern of psychological fitness as related to pattern of physical fitness among older adults. Perceptual and Motor Skills, 67, 647-655.

- Pavett, C.M., Butler, M., Marcinik, E.J., Hodgdon, J.A.
(1987). Exercise as a buffer against organizational stress. Stress Medicine, 3, 87-92.
- Pender, N.J. (1987). Health Promotion in Nursing Practice. Norwalk, CT: Appleton Lange.
- Plummer, O.K., Koh, Y.O. (1987). Effects of "aerobics" on self-concepts in college women. Perceptual and Motor Skills, 65, 271-275.
- Powell, K.E., Caspersen, C.J., Koplan, J.P., Ford, J.S.
(1989). Physical activity and the incidence of coronary heart disease. American Journal of Clinical Nutrition, 49, 999-1006.
- Powell, K.E., Thompson, P.D., Caspersen, C.J., Kendrick, J.S. (1987). Physical activity and the incidence of coronary heart disease. Annual Review of Public Health, 8, 253-287.
- Richards, G.E. (1988). Physical Self-Concept Scale. Sydney: Australian Outward Bound Foundation.
- Rogers, C.R. (1942). Counseling and psychotherapy: Newer concepts in practice. Boston: Houghton Mifflin.
- Rogers, C.R. (1951). Client Centered Therapy: Its current practice, implications, and theory. Boston: Houghton Mifflin. Psychological Assessment, 3, 32-37.
- Rose, J. (1994). Exercise Relapse: Review, Psychometrics, Classification, and Prediction. Unpublished Doctoral Dissertation. University of Rhode Island, Kingston, RI.

- Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, NJ: Princeton University Press.
- Rosenberg, M. (1979). Conceiving the Self, New York: Basic Books.
- Rosenberg, M. (1985). Self-concept and psychological well-being in adolescence. In R. Leahy (Ed.) The Development of the Self-Concept, (pp.205-246). New York: Academic Press.
- Rosenberg, M. (1986). Self-concept from middle childhood through adolescence. In Suls, J. & Greenwald, A.G. (Eds.) Psychological Perspectives of the Self, (pp.107-136). New Jersey: Lawrence Erlbaum Associates.
- Secord, P.F., Jourard, S.M. (1953). The appraisal of body cathexis: Body-cathexis and the self. Journal of Consulting Psychology, 17, 343-347.
- Segal, K.R., Pi-Sunyer, F.X. (1989). Exercise and obesity. Medical Clinics of North America, 73, 217-236.
- Shavelson, R.J., Hubner J.J., Stanton, G.C. (1976). Self-concept: Validation of construct interpretations. Review of Educational Research, 46, 407-441.
- Sonstroem, R.J. (1984). Exercise and self-esteem. Exercise and Sport Science Reviews, 12 123-155.

- 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.
- 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, 29-42.
- Sonstroem, R.J., Harlow, L.L., Salisbury, K.S. (in press). Path analysis of a self-esteem model across a competitive swim season.
- Sonstroem, R.J., Morgan, W.P. (1989). Exercise and self-esteem: Rationale and model. Medicine and Science in Sports and Exercise, 21, 329-337.
- Stein, P.N., Motta, R.W. (1992). Effects of aerobic exercise on depression and self-concept. Perceptual and Motor Skills, 74, 79-89.
- Tucker, L.A. (1983). Weight training: A tool for the improvement of self and body concepts of males. Journal of Human Movement Studies, 9, 31-37.
- Tucker, L.A., Maxwell, K. (1992). Effects of weight training on the emotional well-being and body image of females: Predictors of greatest benefit. American Journal of Health Promotion, 6, 338-344.

- Walker, S.N., Sechrist, K.R., Pender, N.J. (1987). The promoting lifestyle profile: Development and psychometric characteristics. Nursing Research, 36, 76-81.
- Walston, K.A., Wallston, B.S., Kaplan, G.D., Maides, S. (1976). Health-related information seeking as a function of health-related locus of control and health value. Journal of Research in Personality, 10, 215-222.
- Ware, J.F. (1979). Health Perceptions Questionnaire (HPQ). In Instruments for Measuring Nursing Practice and Other Health Care Variables, vol 1. (Wood, W. & Lindeman, C. Eds). DHEW Publication No. HRA 78-53. Washington DC: US Government Printing Office.

Appendix

THIS SURVEY IS ANONYMOUS AND VOLUNTARY. PLEASE TAKE YOUR TIME AND ANSWER ALL QUESTIONS. PLEASE PLACE YOUR ANSWER ON THE COMPUTER ANSWER SHEET.

1. How old are you? _____
2. What sex (gender) are you?
 - a. Male
 - b. Female
3. What is your education?
 - a. Some High School
 - b. High School Graduate
 - c. Some College
 - d. College Graduate
 - e. Graduate or Professional Training
4. What is the ethnic background that you most closely identify with?
 - a. White
 - b. Hispanic
 - c. African-American or Black
 - d. Native American
 - e. Other
5. What religion are you?
 - a. Catholic
 - b. Protestant
 - c. Jewish
 - d. Other
 - e. None

Exercise Behavior

6. On the average, how many times per week do you participate in cardiovascular (aerobic) exercise activities such as aerobic classes, jogging, road races, recreational walking, stair climbing, biking, or rowing.
 - a. 0
 - b. 1-2
 - c. 3-4
 - d. 4-5
 - e. More than 5
8. On the average, how much time do you spend at each cardiovascular session on the days that you participate.
 - a. less than 10 minutes
 - b. 15 to 20 minutes
 - c. 25 to 30 minutes
 - d. 35 to 40 minutes
 - e. 45 minutes or more
9. Other than cardiovascular exercise activities, how many times per week do you engage in body toning activities, such as weight training and calisthenics.
 - a. 0
 - b. 1-2
 - c. 3-4
 - d. 4-5
 - e. More than 5
10. On the average, how much time do you spend at each body toning (weight lifting or calisthenic) session on the days that you participate.
 - a. than 10 minutes
 - b. 15 to 20 minutes
 - c. 25 to 30 minutes
 - d. 35 to 40 minutes
 - e. 45 minutes or more

Listed below are several reasons people engage in exercise. Please indicate how important each reason is to you by using the following response scale.

A	B	C	D
NOT	SOMEWHAT	IMPORTANT	VERY
IMPORTANT	IMPORTANT		IMPORTANT

11. To see improvements in physical health
12. To improve physical appearance
13. To increase one's physical fitness level
14. To relieve daily stress
15. To socialize with others

Physical Self-Efficacy

This portion of the survey asks how confident you are that you could perform very specific tasks. Activities are listed on the pages that follow. You are asked to indicate how confident you are that you could do each activity **RIGHT NOW** by using the following response scale:

A = Definitely can not

B = Probably can not

C = Maybe

D = Probably can

E = Definitely can

16. Jog 200 yards without stopping.
17. Jog 1/4 mile without stopping.
18. Jog 1/2 mile without stopping.
19. Jog 1 mile without stopping.
20. Jog 1.5 miles without stopping.
21. Jog 2 miles without stopping.
22. Jog 2.5 miles without stopping.
23. Jog 3 miles without stopping.
24. Jog 4 miles without stopping.
25. Jog 5 miles without stopping.
26. Jog 6 miles without stopping.
27. Jog 8 miles without stopping.
28. Lift 20 pounds over my head 6 times.
29. Lift 40 pounds over my head 6 times.
30. Lift 60 pounds over my head 6 times.
31. Lift 80 pounds over my head 6 times.
32. Lift 100 pounds over my head 6 times.
33. Lift 120 pounds over my head 6 times.
34. Lift 140 pounds over my head 6 times.
35. Lift 160 pounds over my head 6 times.
36. Lift more than 160 pounds over my head 6 times.

The General Self-Worth Scale and Self-Esteem Scale

For questions 37-52 please use the following response scale. Remember to record your answers on the COMPUTER ANSWER SHEET.

A
STRONGLY
AGREE

B
AGREE

C
DISAGREE

D
STRONGLY
DISAGREE

37. I do not like the way I am leading my life. (R)
38. I am very happy the way I am.
39. I feel that I am not a worthwhile person. (R)
40. I am quite pleased with myself.
41. I am dissatisfied with myself. (R)
42. I like the kind of person I am.
43. I feel that I am a person of worth, at least on an equal basis with others.
44. I feel that I have a number of good qualities.
45. All in all, I am inclined to feel that I am a failure. (R)
46. I am able to do things as well as most other people.
47. I feel I do not have much to be proud of. (R)
48. I take a positive attitude toward myself.
49. On the whole, I am satisfied with myself.
50. I wish I could have more respect for myself. (R)
51. I certainly feel useless at times. (R)
52. At times I think I am no good at all. (R)

Note: Items that will be reversed scored, before forming subscale averages, are indicated by (R).

Physical Evaluation

For questions 53-89 please use the following response scale.

- A = Strongly Agree
- B = Agree
- C = Don't Know
- D = Disagree
- E = Strongly Disagree

General Physical Evaluation

- 53. I do not see myself as having good physical attributes. (R)
- 54. Most people think I am gifted physically.
- 55. I have excellent physical attributes.
- 56. I have inferior physical qualities. (R)
- 57. Most people think I have poor physical qualities. (R)
- 58. I see myself as having great physical characteristics.

Sports Ability (Marsh, et al., 1993)

- 59. Others do not think I am good at sports. (R)
- 60. I am good at most sports.
- 61. Most sports are difficult for me. (R)
- 62. I play sports well.
- 63. I do not have good sports skills. (R)
- 64. I am better at sports than most of my friends.

Strength (Marsh, et al., 1993)

- 65. I am a physically strong person.
- 66. I do not have a lot of power in my body. (R)
- 67. I am stronger than most people my age.
- 68. I am weak and have no muscles. (R)
- 69. I would do well in a test of strength.
- 70. I am not good at lifting heavy objects. (R)

Fitness/Endurance (Marsh, et al., 1993)

- 71. I would not do well in a test of physical endurance and stamina. (R)
- 72. I can run a long way without stopping.
- 73. I could jog 3 miles without stopping.
- 74. I cannot run a long way without getting tired. (R)
- 75. I can be physically active for a long period of time without getting tired.
- 76. I am not good at endurance activities like distance running, aerobics, bicycling, swimming, or cross-country skiing. (R)

Appearance (Marsh, et al., 1993)

- 77. I am attractive for my age.
- 78. I have a nice looking face.
- 79. My friends are all better looking than I am. (R)
- 80. I am ugly. (R)
- 81. I am good looking.
- 82. Nobody thinks that I am good looking. (R)

Body Fat (Marsh, et al., 1993)

- 83. I am not fat. (R)
- 84. My waist is too large.
- 85. I do not have too much fat on my body. (R)
- 87. I am not overweight. (R)
- 88. My stomach is too big.
- 89. Other people think I am fat.

Note: Items that will be reversed scored, before forming subscale averages, are indicated by (R).

Physical Acceptance

For questions 90-104 please use the following response scale.

- A = Strongly Agree
- B = Agree
- C = Don't Know
- D = Disagree
- E = Strongly Disagree

General Physical Acceptance (Marsh, et al. 1993)

- 90. I am satisfied with the kind of person I am physically.
- 91. Physically, I am not happy with myself. (R)
- 92. Physically, I find it hard to accept myself. (R)
- 93. Physically, I feel good about myself.
- 94. I feel good about who I am physically.
- 95. I wish were physically different. (R)

Sports Ability

- 96. I feel good about my ability to play sports.
- 97. I feel inadequate when it comes to playing sports. (R)
- 98. I am satisfied with my sports ability.
- 99. I am embarrassed about my sports abilities. (R)
- 100. I feel like a failure when it comes to playing sports.
(R)
- 101. I am pleased with my performance in sports activities.

Strength

- 102. I am dissatisfied with my physical strength. (R)
- 103. I feel good about my ability to lift heavy objects.
- 104. I am embarrassed about my physical strength. (R)
- 105. I am unhappy with my physical strength. (R)
- 106. I am pleased with my physical strength.
- 85. I feel satisfied with my physical strength.

Fitness/Endurance

- 107. I am happy with my fitness/endurance level.
- 108. I have strong negative feelings about my level of physical fitness. (R)
- 109. I am dissatisfied with my level of fitness/endurance. (R)
- 110. I feel good about my level of fitness/endurance.
- 111. I am content with my level of fitness/endurance.
- 112. I am often disturbed about my level of fitness/endurance. (R)

Physical Appearance

- 113. I feel good about my physical appearance.
- 114. Because of my physical appearance, I often feel troubled. (R)
- 115. I am satisfied with my looks.
- 116. My physical appearance is disturbing to me. (R)
- 117. I have strong negative feelings about my looks. (R)
- 118. I am happy with the way I look.

Body Fat

- 119. I feel at ease with my weight.
- 120. I am dissatisfied with my weight. (R)
- 121. I am happy with my weight.
- 122. I often feel upset about my body fat. (R)
- 123. I am content with my body fat.
- 124. I have strong negative feelings about my weight. (R)

Note: Items that will be reversed scored, before forming subscale averages, are indicated by (R).

Demoralization

- A = Never
- B = Rarely
- C = Sometimes
- D = Often
- E = Always

- 125. I know what to do when I'm having troubles with the physical aspects of my life (for example, problems with appearance, weight, sports ability, fitness, strength).
- 126. I feel confused about the kind of person I am physically.
- 127. When it comes to the physical aspects of my life (appearance, sports ability, fitness, weight, strength), I can cope with all my problems.
- 128. The physical aspects of my life (sports ability, fitness, strength, weight, appearance) are too complicated.
- 129. It takes most of my energy to keep up with the physical aspects of my life.
- 130. Physically, I always let myself down.
- 131. I can manage the physical aspects of my life (sports ability, fitness, strength, weight, appearance) when I am stressed-out.
- 132. The physical aspects of my life (sports ability, fitness, strength, weight, appearance) are threatening to me.
- 133. I can fix a problem having to do with the physical aspects of my life when I have to.

Please indicate the number of times per week that you engage in each activity below and the number of minutes you spend at each session. Include information only for those activities that you generally engage in. If activities overlap, complete only one of the categories.

	Number of Sessions Per Week	Minutes Per Session
Bicycling	_____	_____
Ice Hockey	_____	_____
Basketball	_____	_____
Recreational Walking	_____	_____
Jogging	_____	_____
Aerobic Dancing or Step Reebok	_____	_____
Weight Training	_____	_____
Calisthenics	_____	_____
Skiing	_____	_____
Tennis	_____	_____
Others (Please Indicate)	_____	_____
	_____	_____

The Exercise and Self-Esteem Model: Inclusion of Physical Acceptance in Tests of Model Constructs

Principal Investigator: Raquel D. Pino

Major Professor: Lisa L. Harlow

Summary

During the past ten years, researchers have begun to discover exciting new information with respect to physical activity and health. For example, physical activity has been associated with: (1) a decreased risk for the development of coronary heart disease (CHD), (2) a decreased risk for development of hypertension, (3) the prevention and treatment of obesity, (4) the prevention and treatment of adult onset diabetes, (5) a lower risk for certain reproductive cancers in women and colon cancer in men, (6) the prevention of osteoporosis in post-menopausal women, and (7) the prevention and treatment of chronic pain. Furthermore, physical activity has been associated with improved mental health specifically: (1) decreases in anxiety and depression, (2) improved reactivity to stress, and (3) increases in self-esteem.

The purpose of the present study is to: (1) further examine the relationship between exercise and self-esteem in the context of the Exercise and Self-Esteem Model (EXSEM) (Sonstroem & Morgan, 1989), (2) provide a clear, operational definition of the construct of Physical Acceptance, as it applies to the EXSEM, (3) develop a multi-dimensional measure of physical acceptance that is independent from physical evaluation, (4) utilize several scales of the Physical Self-Description Questionnaire (PSDQ) (Marsh, Richards, Johnson, & Tremayne, 1993) in the definition and measurement of several model constructs, (5) apply structural modeling techniques in an exploratory manner to examine relationships among model constructs.

Recruitment

A total of 200 subjects representing two subgroups of the population in the Rhode Island area will be asked to participate in the present study including: (1) fitness center members, and (2) university students. The sample will be comprised of approximately equal numbers of males and females representing various age groups (18 years and older) and ethnic backgrounds. Human subjects guidelines of the University of Rhode Island will be followed.

All participation will be voluntary and subjects may withdraw at any time. Data will be collected confidentially and anonymously. The findings will be presented with statements about groups of subjects and no specific information on any individuals will be used.

Participation

The 200 participants will be asked to fill in an 133 item questionnaire (see enclosed proposal). All subject participation will be carefully supervised by Raquel D. Pino from the department of psychology at the University of Rhode Island and will be in accordance with human subjects guidelines.

The University of Rhode Island
Department of Psychology
Kingston, RI 02881

CONSENT FORM FOR RESEARCH

I have been asked to take part in a research project described below. The researcher will explain the project to me in detail. I should feel free to ask any questions. If I have more questions later, Raquel Pino (phone #(719) 948-3573 or (401) 782-8887), the person mainly responsible for this study, will discuss them with me.

I have been asked to take part in a study looking at how people feel about exercise and how they feel about themselves. There are no right or wrong answers.

If I decide to take part in this study, I will be asked to complete a questionnaire on how people feel about exercise and how people feel about themselves. There are few, if any, risks or discomforts from this study.

My part in this study is confidential and anonymous. In no way will my answers on the questionnaire be linked back to me. My answers will NEVER have my name attached to them.

The decision to take part in the study is up to me. I will not be forced to participate in the study, and I may quit the study at any time.

The benefits from this study for me are: (1) to increase my awareness of my feelings towards myself, and (2) to increase my awareness of my exercise behavior.

Participation in this study is not expected to be harmful or dangerous to me. If this study causes me any harm, I should write or call the University of Rhode Island's Director of research, 70 Lower Road, University of Rhode Island, Kingston, RI 02881, telephone: (401) 792-2635.

If I am not satisfied with the way this study is performed, I may also discuss my complaints with Raquel Pino (719) 948-3573 anonymously, if I choose.

I have read the Consent Form. My questions have been answered. My signature on this form means that I understand the information and I agree to participate in this study.

Signature of Participant & Date

Typed/Printed Name

Signature of Researcher & Date

Typed/Printed Name

Table 1. Exercise and Self-Esteem Studies 1983 to 1992

AUTHOR	DESIGN	PARTICIPANTS	DEPENDENT VARIABLE	RESULTS	MODE OF EXERCISE
Tucker (1983)	Q	272 College (m)	Self-concept Muscular strength	+ +	Weight Training
Ben-Shlomo & Short (1986)	Q	15 Sedentary (w)	Personal Self Physical Self Self-Satisfaction	- + +	---
Pavett, Butler, Marcinik, & Hodgdon (1987)	Q	245 Naval/Marine (m)	Work Attitudes Self-Perception	+ -	Circuit Training
Plummer & Koh (1987)	Q	116 College (w)	Physical Self Moral Ethical Self Personal Self Family Self Social Self Self-Criticism Body Cathexis	+ - + + + - -	Aerobic Dance
Netz, Tenenbaum Sagiv (1988)	P	24 Adults (aged 50-64)	Anthropometric Measures Graded Treadmill Self-Concept Anxiety Well-Being	+ + - - -	Calisthenics Jogging Brisk Walking
Ford, Puckett, Blessing & Tucker (1989)	Q	108 College (w)	Self-esteem Body cathexis Health Related Fitness scores	- - -	Aerobic Dance Jogging Weight Training Swimming Life Saving

Table 1 Exercise and Self-esteem Studies 1983 to 1992 (continued)

AUTHOR	DESIGN	PARTICIPANTS	DEPENDENT VARIABLE	RESULTS	MODE OF EXERCISE
Imm (1990)	P	29 Adults	Psychological Physiological	+ +	Aerobic Dancing
Bonheur & Young (1991)	Q	105 College	Self-Esteem Perceived Barriers Perceived Benefits	+ + +	---
Finkenberg & Temper (1991)	P	52 Bodybuilders 29 (m) 23 (w)	Personal Self Social Self Satisfaction Moral-Ethical Self-Criticism Total Positive	(m)+ (w)+ (m)+ (w)+ (m)+ (w)+ (m)- (w)+ (m)- (w)- (m)- (w)+	Weight Training
Gillis & Perry (1991)	Q	92 (w) (aged 35-65)	Well-Being Self-Esteem Locus of Control Healthy Lifestyle Health Perceptions	+ - - + -	Choreographed Dance
Stein & Motta (1992)	Q	89 College	Depression Self-Concept	+ +	---

Table 2. Demographics for Combined Sample (N=526)

Gender

Males = 49.2% (259)
Females = 50.8% (267)

Ethnicity

White = 87.3% (459)
Hispanic = 5.9% (31)
African American = 1.5% (8)
Native American = 0.9% (5)
Other = 4.4% (23)

Education

Some High School = 0.2% (1)
H.S. Grad = 16.5% (87)
Some College = 65.8% (346)
College Grad = 10.6% (56)
Grad or Profess = 6.8% (36)

Religion

Catholic = 56.3% (296)
Protestant = 15.6% (82)
Jewish = 5.5% (29)
Other = 10.5% (55)
None = 12.2% (64)

Average Frequency of
Aerobic Exercise Per/Wk

0 = 8.9% (47)
1-2 = 31.0% (163)
3-4 = 30.4% (160)
4-5 = 15.6% (82)
> 5 = 14.1% (74)

Average Duration of
Aerobic Exercise Per/Wk

Less than 10 min = 11.2% (59)
15 to 20 min = 21.3% (112)
25 to 30 min = 23.0% (121)
35 to 40 min = 13.7% (72)
45 min or more = 30.8% (162)

Average Frequency of
Non-Aerobic Exercise
Per/Week

0 = 31.7% (167)
1-2 = 28.9% (152)
3-4 = 21.9% (115)
4-5 = 12.2% (64)
> 5 = 5.3% (28)

Average Duration of
Non-Aerobic Exercise
Per Week

Less than 10 min = 30.2% (159)
15 to 20 min = 16.5% (87)
25 to 30 min = 15.2% (80)
35 to 40 min = 8.6% (45)
45 min or more = 29.5% (155)

Table 3. Demographics for Student Sample (N=372)

Gender

Males = 46.7% (174)
Females = 53.3% (198)

Ethnicity

White = 89.8% (334)
Hispanic = 3.2% (12)
African American = 1.6% (6)
Native American = 0.6% (2)
Other = 4.8% (18)

Education

Some High School = 0
H.S. Grad = 19.1% (71)
Some College = 79% (294)
College Grad = 1.4% (5)
Grad or Profess = 0.5% (2)

Religion

Catholic = 59.1% (220)
Protestant = 13.2% (49)
Jewish = 7.3% (27)
Other = 8.3% (31)
None = 12.1% (45)

Average Frequency of
Aerobic Exercise Per/Wk

0 = 9.7% (36)
1-2 = 37.1% (138)
3-4 = 25.3% (94)
4-5 = 12.6% (47)
> 5 = 15.3% (57)

Average Duration of
Aerobic Exercise Per/Wk

Less than 10 min = 13.2% (49)
15 to 20 min = 23.9% (89)
25 to 30 min = 23.1% (86)
35 to 40 min = 12.4% (46)
45 min or more = 27.4% (102)

Average Frequency of
Non-Aerobic Exercise
Per/Week

0 = 40% (167)
1-2 = 32% (119)
3-4 = 15.9% (59)
4-5 = 7.5% (28)
> 5 = 4.6% (17)

Average Duration of
Non-Aerobic Exercise
Per Week

Less than 10 min = 39.2% (146)
15 to 20 min = 16.2% (60)
25 to 30 min = 14.5% (54)
35 to 40 min = 7.5% (28)
45 min or more = 22.6% (84)

Table 4. Demographics for Fitness Center Sample(N=154)

Gender

Males = 55.2% (85)
Females = 44.8% (69)

Ethnicity

White = 81.2% (125)
Hispanic = 12.3% (19)
African American = 1.3% (2)
Native American = 2% (3)
Other = 3.2% (5)

Education

Some High School = 0.6% (1)
H.S. Grad = 10.4% (16)
Some College = 33.8% (52)
College Grad = 33.1% (51)
Grad or Profess = 22.1% (34)

Religion

Catholic = 49.4% (76)
Protestant = 21.4% (33)
Jewish = 1.3% (2)
Other = 15.6% (24)
None = 12.3% (19)

**Average Frequency of
Aerobic Exercise Per/Wk**

0 = 7.1% (11)
1-2 = 16.2% (25)
3-4 = 42.9% (66)
4-5 = 22.8% (35)
> 5 = 11% (17)

**Average Duration of
Aerobic Exercise Per/Wk**

Less than 10 min = 6.5% (10)
15 to 20 min = 14.9% (23)
25 to 30 min = 22.7% (35)
35 to 40 min = 16.9% (26)
45 min or more = 39% (60)

**Average Frequency of
Non-Aerobic Exercise
Per/Week**

0 = 6.5% (10)
1-2 = 14.9% (23)
3-4 = 22.7% (35)
4-5 = 16.9% (26)
> 5 = 39% (60)

**Average Duration of
Non-Aerobic Exercise
Per Week**

Less than 10 min = 8.4% (13)
15 to 20 min = 17.6% (27)
25 to 30 min = 16.9% (26)
35 to 40 min = 11% (17)
45 min or more = 46.1% (71)

**Table 5. Descriptive Statistics on the Combined Sample
(N = 526)**

	X	SD	SKEW KURT	RANGE	COEFF ALPHA
GSE (Rosenberg)	3.24	0.52	-0.61 0.43	1.00-4.00	.90
GSW (Harter)	3.08	0.57	-0.46 0.35	1.00-4.00	.84
Efficacy Jogging	3.10	1.18	-0.02 -1.13	1.00-5.00	.98
Efficacy Strength	2.41	1.24	0.62 -0.80	1.00-5.00	.95
Physical Evaluation	2.12	0.76	0.26 -0.50	1.00-4.00	.81
Physical Acceptance	3.34	0.83	-1.18 0.35	1.00-4.00	.80
Evaluation Sport	2.50	0.85	-0.23 -0.85	1.00-4.00	.83
Acceptance Sport	3.55	0.73	-1.63 1.82	1.00-4.00	.82
Evaluation Fitness	2.27	0.96	0.20 -1.14	1.00-4.00	.82
Acceptance Fitness	3.02	0.82	-0.63 -0.70	1.00-4.00	.79
Evaluation Strength	2.83	0.76	-0.57 -0.12	1.00-4.00	.76
Acceptance Strength	2.78	0.87	-0.52 -0.92	1.00-4.00	.86
Evaluation Appearance	2.65	0.73	-0.24 -0.29	1.00-4.00	.86
Acceptance Appearance	3.14	0.83	-1.11 0.09	1.00-4.00	.83

Note: Higher values = higher scores

Table 5. Descriptive Statistics on the Combined Sample
(Continued: N = 526)

	X	SD	SKEW KURT	RANGE	COEFF ALPHA
Evaluation Fat	2.52	1.01	-0.16 -1.23	1.00-4.00	.84
Acceptance Fat	3.15	0.96	-0.88 -0.46	1.00-4.00	.84
Exercise	18.26	10.86	0.61 -0.13	2.00-50.00	---

Note: Higher values = higher scores

Table 6. Follow-up ANOVAs Examining Mean Differences Between Samples (Students and Fitness Center Members).

	<u>df</u>	<u>F</u>	<u>xst</u> <u>xfit</u>
GSE	1,524	3.56	3.20 3.30
GSW	1,524	.00	3.08 3.08
Efficacy Jog	1,524	8.65	3.19* 2.86
Efficacy Strength	1,524	.07	2.38 2.48
Evaluation	1,524	.75	2.10 2.17
Acceptance	1,524	.10	3.34 3.36
Evaluation Fat	1,524	4.03	2.57* 2.38
Acceptance Fat	1,524	.77	3.15 3.18
Evaluation Appearance	1,524	5.12	2.60* 2.76
Acceptance Appearance	1,524	.33	3.12 3.17
Evaluation Strength	1,524	12.77	2.75* 3.01
Acceptance Strength	1,524	.80	2.76 2.84
Evaluation Fitness	1,524	3.43	2.32 2.15
Acceptance Fitness	1,524	.80	2.76 2.84

Note: ST=Student Sample; FIT=Fitness Sample;
* = significant at $p < .05$

Table 6. Follow-up ANOVAs Examining Mean Differences
Between Samples (Continued).

	<u>df</u>	<u>F</u>	<u>xst</u> <u>xfit</u>
Evaluation Sport	1,524	4.08	2.55* 2.39
Acceptance Sport	1,524	.16	3.55 3.57

Note: ST=Student Sample; FIT=Fitness Sample;
* = significant mean differences

Table 7. Maximum Likelihood CFA Factor Pattern for General Physical Evaluation and Physical Acceptance 3-item Scales

<u>Item</u>	<u>Factors</u>	
	1	2
Physically, I find it hard to accept myself.	-.781	
Physically, I am not happy with myself.	-.771	
I wish I were physically different.	-.719	
I have excellent physical attributes.		.840
I see myself as having great physical characteristics.		.816
Most people think I am gifted physically.		.648

Note: Factor 1 = General Physical Acceptance
 Factor 2 = General Physical Evaluation

Table 8. Maximum Likelihood CFA Factor Pattern for Specific Physical Evaluation and Specific Physical Acceptance 3-Item Scales

Item	1	2	Factor		
			3	4	5
My waist is too large.	-.863				
I am not overweight.	.794				
My stomach is too big.	-.760				
I am good looking.		.930			
I have a nice looking face.		.777			
Nobody thinks that I am good looking.		-.602			
I am weak and have no muscles.			-.772		
I do not have a lot of power in my body.			-.740		
I am not good at lifting heavy objects.			-.619		
I can run a long way without stopping.				.856	
I could jog three miles without stopping.				.794	
I cannot run a long way without getting tired.				-.733	
I am good at most sports.					.872
I play sports well.					.844
I am better at sports than most of my friends.					.635

Note: Factor 1 = Evaluation Fat; Factor 2 = Evaluation Appearance;

Factor 3 = Evaluation Strength; Factor 4 = Evaluation Fitness/Endurance;

Factor 5 = Evaluation Sport;

Table 8. Maximum Likelihood CFA Factor Pattern for Specific Physical Evaluation and Specific Physical Acceptance 3-Item Scales (Continued)

Item	Factor			
	6	7	8	10
I am dissatisfied with my weight.	-.818			
I often feel upset about my body fat.	-.815			
My stomach is too big.	-.803			
I feel good about my physical appearance.		.783		
My physical appearance is disturbing to me.		-.807		
Because of my physical appearance I often feel troubled.		-.772		
I am pleased with my physical strength.			.854	
I feel satisfied with my physical strength.			.870	
I am dissatisfied with my physical strength.			-.733	

Note: Factor 6 = Acceptance Fat; Factor 7 = Acceptance Appearance; Factor 8 = Acceptance Strength; Factor 9 = Acceptance Fitness/Endurance; Factor 10 = Acceptance Sport;

Table 8. Maximum Likelihood CFA Factor Pattern for Specific Physical Evaluation and Specific Physical Acceptance 3-Item Scales (Continued)

Item	6	7	Factor	
			8	10
I am happy with my fitness/ endurance level.			.820	
I am dissatisfied with my fitness/endurance level.			-.797	
I have strong negative feelings about my level of physical fitness.			-.609	
I feel like a failure when it comes to playing sports.				-.847
I feel inadequate when it comes to playing sports.				-.784
I am embarrassed about my sports abilities.				-.745

Note: Factor 6 = Acceptance Fat; Factor 7 = Acceptance Appearance;
Factor 8 = Acceptance Strength; Factor 9 = Acceptance Fitness/Endurance;
Factor 10 = Acceptance Sport;

Table 9. CFA for Specific Dimensions of Physical Evaluation & Physical Acceptance: Correlations Among Factors

	EFAT	AFAT	EAPP	AAPP	ESTR	ASTR	EFIT	AFIT	ESPO	ASPO
EFAT	1.000									
AFAT	.777	1.000								
EAPP	.321	.364	1.000							
AAPP	.595	.892	.605	1.000						
ESTR	.177	.249	.381	.364	1.000					
ASTR	.298	.400	.474	.579	.684	1.000				
EFIT	.396	.361	.172	.335	.264	.293	1.000			
AFIT	.600	.710	.422	.760	.507	.717	.574	1.000		
ESPO	.319	.334	.313	.434	.458	.518	.510	.547	1.000	
ASPO	.236	.430	.336	.550	.561	.483	.306	.549	.676	1.000

Note: EFAT= Evaluation Fat; AFAT= Acceptance Fat; EAPP= Evaluation Appearance;

AAPP= Acceptance Appearance; ESTR= Evaluation Strength; ASTR = Acceptance Strength;

EFIT = Evaluation Fitness; AFIT = Acceptance Fitness; ESPO = Evaluation Sport;

ASPO = Acceptance Sport

**Table 10. CFA Second Order Model: Regression Coefficients
Between Second-Order Factors and First-Order Factors**

First Order Factors	Second Order Factors	
	<u>Factor1</u>	<u>Factor2</u>
Evaluation Fat	.648	
Evaluation Appearance	.553	
Evaluation Strength	.543	
Evaluation Fitness	.503	
Evaluation Sport	.600	
Acceptance Fat		.816
Acceptance Appearance		.900
Acceptance Strength		.694
Acceptance Fitness		.910
Acceptance Sport		.635

Note: Factor 1 = Physical Evaluation;
Factor 2 = Physical Acceptance.

Figure 1. The Original EXSEM Model (Sonstroem & Morgan, 1989)

Figure 2. The Modified EXSEM (Sonstroem et al., 1994)

Figure 3. The EXSEM: Inclusion of Physical Acceptance

Figure 4. Three Versions of the EXSEM Used in Model Comparisons

Figure 4. Three Versions of the EXSEM Used in Model Comparisons
(Continued)

Figure 5. The EXSEM: Inclusion of Exercise

Figure 6. Measurement Models used to Examine the Structural Differences Between Two Samples (Fitness Center Sample and Student Sample)

Figure 7. CFA Hypothesized Models for General Physical Evaluation and Physical Acceptance Scales

Figure 8. CFA Hypothesized Model for Specific Evaluation and Specific Acceptance Scales

Figure 9. Second Order CFA Model: Specific Evaluation and Acceptance Scales

Figure 10. Model A: Hypothesized Model

Note: * = significant paths $p < .05$ or less;
values in parentheses = R^2 .

Figure 11. Model C: Specific Paths Predicting Physical Evaluation

Note: $*$ = significant paths $p < .05$ or less;
values in parentheses = R^2 .

Figure 12. Model D: Specific Paths Predicting General Self-Esteem

Note: * = significant paths $p < .05$ or less;
values in parentheses = R^2 .

Figure 13. The EXSEM: Inclusion of Exercise

Note: * = significant paths $p < .05$ or less;
 values in parentheses = R^2 .

Bibliography

- American College of Sports Medicine (1978). Position on the recommended quantity and quality of exercise for developing and maintaining fitness in healthy adults. Medicine and Science in Sports, 10, vii-x.
- American College of Sports Medicine (1990). The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. Medicine and Science in Sports & Exercise, 22, 265-274.
- Bachman, J. (1970). Youth in Transition: The Impact of Family Background and Intelligence on Tenth Grade Boys (Vol.2). Ann Arbor, MI: Institute for Social Research.
- Beck, A.T. (1978). Beck Depression Inventory. Philadelphia, PA: Center for Cognitive Therapy.
- Ben-Shlomo, L.S., Short, M.A. (1986). The effects of physical conditioning on selected dimensions of physical conditioning on self-concept in sedentary females. Occupational Therapy in Mental Health, 5, 27-46.
- Bentler, P.M. (1989). EQS: Structural equations program manual. Los Angeles: BMDP Statistical Software.

- Bentler, P.M. (1990). Comparative fit indices in structural models. Psychological Bulletin, 107, 238-246.
- Blair, S.N., Goodyear, N.N., Gibbons, L.W., Cooper, K.H. (1984). Physical fitness and incidence of hypertension in healthy normotensive men and women. Journal of the American Medical Association, 252, 487-490.
- Blair, S.N., Kohl, H.W.III, Paffenbarger, R.S., Clark, D.G., Cooper, K.H., Gibbons, L.W. (1989). Physical fitness and all-cause mortality. Journal of the American Medical Association, 262, 2395-2401.
- Blascovich, J., Tomaka, J. (1991). Measures of Self-Esteem. In Measures of Personality and Social Psychological Attitudes. New York: Academic Press.
- Bonheur, B., Young, S.W. (1991). Exercise as a health-promoting lifestyle choice. Applied Nursing Research, 2-6.
- Bray, G.A. (1990). Exercise and obesity. In C. Bourchard, R.J. Shepard, T. Stevens, J.R. Sutton, & B.D. McPherson (Eds.), Exercise, Fitness, and Health: A Consensus of Current Knowledge. Champaign, IL: Human Kinetics.
- Brooke, S.T., Long, B.C. (1987). Efficiency of coping with a real life stressor: A multimodal comparison of aerobic fitness. Psychophysiology, 24, 173-180.

- Byrne, B. (1994). Structural Equation Modeling with EQS and EQS Windows: Basic Concepts, Applications, and Programming. Thousand Oaks, CA: Sage Publications.
- Cantril, H. (1965). The Pattern of Human Concerns. New Brunswick: Rutgers University Press.
- Coopersmith, S. (1981). Self-Esteem Inventory Test Manual. Palo Alto, CA: Consulting Psychologists Press.
- DeBusk, R.F., Stenestrand, U., Sheehan, M., Haskell, W.L. (1990). Training effects of long versus short bouts of exercise in healthy subjects. American Journal of Cardiology, 65, 1010-1013.
- Deyo, R.A., Walsh, N.E., Martin, D.C., Schoenfield, L.S., Ramamurthy, S. (1990). A controlled trial of transcutaneous electrical nerve stimulation (TENS) and exercise for lower back pain. New England Journal of Medicine, 322, 1627-1634.
- Dishman, R.K. (1985). Medical psychology in exercise and sport. Medical Clinics of North America, 69, 123-143.
- Dishman, R.K. (1986). Mental Health. In V. Seefeldt (Ed.), Physical Activity and Wellbeing. Reston, VA: American Alliance of Health, PE, Recreation, and Dance.
- Dixon (1990). BMDP Statistical Software Manual. Los Angeles: University of California Press.
- Dubbert, P.M. (1992). Exercise in behavioral medicine. Journal of Consulting and Clinical Psychology, 60, 613-618.

- Ellis, A. (1971). 22 ways to stop putting yourself down. Rational Living, 6, 8-15.
- Ellis, A. (1973). Humanistic psychotherapy. New York: Julian.
- Finkenberg, M.E., Teper, L. (1991). Self-concept profiles of bodybuilders. Perceptual and Motor Skills, 72, 1039-1043.
- Fitts, W.H. (1965). Manual: Tennessee Self-Concept Nashville, TN: Counselor Recordings and Tests.
- Flemming, J.S., Courtney, B.E. (1984). The dimensionality of self-esteem: II: Hierarchical facet model for revised measurement scales. Journal of Personality & Social Psychology, 46, 404-421.
- Folkins, C.H. (1976). Effects of physical training on mood. Journal of Clinical Psychology, 32, 385-388.
- Ford, H.T. Jr., Puckett, J.R., Blessing, D.L., Tucker, L.A. (1989). Effects of selected physical activities on health-related fitness and psychological well-being. Psychological Reports, 64, 203-208.
- Gergen, K.J. (1971). The Concept of Self. New York: Holt.
- Gillis, A., Perry, A. (1991). The relationships between physical activity and health-promoting behaviors in mid-life women. Journal of Advanced Nursing, 16, 299-310.

- Harlow, L.L. (1985). Behavior of some elliptical theory estimators with normal data in a covariance structures framework. Unpublished doctoral dissertation, University of California, Los Angeles.
- Harlow, L.L. (1990). Psychometric investigation of a demoralization scale. Paper presented at the annual meeting of the American Psychological Association, Boston MA.
- Harris, S.S., Caspersen, C.J., DeFries, G.H., Estes, E.H. Jr. (1989). Physical activity counseling for healthy adults as a primary preventive intervention in the clinical settings. Journal of the American Medical Association, 261, 3590-3598.
- Harter, S. (1982). The perceived competence scale for children. Child Development, 53, 87-97.
- Harter, S. (1984). The Self-Perception Profile for Children: Revision of the Perceived Competence Scale for children. Unpublished Manuscript: University of Denver, CO.
- Harter, S. (1986). Processes underlying the construction, maintenance, and enhancement of the self-concept in children. In Suls, J. & Greenwald, A.G. (Eds.) Psychological Perspectives of the Self, (pp.137-181). New Jersey: Lawrence Erlbaum Associates.

- Helmrich, S.P., Ragland, D.R., Leung, R.W., Paffenbarger, R.S. Jr. (1991). Physical activity and reduced occurrence of non-insulin-dependent diabetes mellitus. New England Journal of Medicine, 325, 147-152.
- Huba, G.J. & Harlow, L.L. (1987). Robust structural equation models: Implications for developmental psychology. Child Development, 58, 147-166.
- I-Min, L., Paffenbarger, R.S.Jr., Hsieh, C. (1991). Physical activity and risk of developing colorectal cancer among college alumni. Journal of the National Cancer Institute, 83, 1324-1329.
- Imm, P.S. (1990). Perceived benefits of participants in an employees' aerobic fitness program. Perceptual and Motor Skills, 71, 753-754.
- James, L.R. Mulaik, S.A., Brett, J.M. (1982). Causal Analysis: Assumption, models, and data. Beverly Hills, California: Sage.
- Johnson, L.C. (1956). Body cathexis as a factor in somatic complaints. Journal of Consulting Psychology, 20, 145-149.
- Jourard, S.M., Secord, P.F. (1955). Body-cathexis and the ideal female figure. Journal of Abnormal and Social Psychology, 50, 243-246.
- Kaplan, H.B., Pokorny, A.D. (1969). Self-derogation and psycho-social adjustment. Journal of Nervous and Mental Disease, 149, 421-434.

- Kohl, H.W., LaPorte, R.E., Blair, S.N. (1988). Physical activity and cancer. Sports Medicine, 6, 222-237.
- Leon, A.S., Connett, J., Jacobs, D.R., Rauramaa, R. (1987). Leisuretime Physical activity among community participants. Journal of the American Medical Association, 258, 2388-2395.
- Leveille, C. (1992). Self-regard components and eating behaviors of adult female exercisers. Unpublished Masters Thesis, University of Rhode Island.
- Lubin, B. (1965). Adjective checklists for measurement of depression. Archives of General Psychiatry, 12, 57-62.
- Luck, P.W., Heiss, J. (1972). Social determinants of self-esteem in adult males. Sociology and Social Research, 57, 69-84.
- Marsh, H.W. (1990). A multi-dimensional, hierarchical self-concept: Theoretical and empirical justification. Educational Psychology Review, 2, 77-171.
- Marsh, H.W. (1992). The Self-Description Questionnaire II: Manual. Publication Unit, Faculty of Education, University of Western Sydney, Macarthur.
- Marsh, H.W., Redmayne, R.S. (1994). A multi-dimensional 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., Johnson, S., Tremayne, P.
(1993). Physical Self Description Questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments.
Unpublished Manuscript. University of Western Sydney, Macarthur.
- Marsh, H.W., Shavelson, R.J. (1985). Self-concept: Its multifaceted hierarchical structure. Educational Psychologist, 20, 107-125.
- Martin, J.E., Dubbert, P.M., Cushman, W.C. (1990).
Controlled trial of aerobic exercise in hypertension. Circulation, 81, 1560-1567.
- Maslow, A.H. (1968). Toward a psychology of being.
Princeton, NJ: Van Nostrand.
- Melnick, M.J., Mookerjee, S. (1991). Effects of advanced weight training on body-cathexis and self-esteem. Perceptual and Motor Skills, 72, 1335-1345.
- Messer, B., Harter, S.V. (1986). Manual for the Adult Self-Perception Profile. Denver: University of Denver Press.
- Minor, M.A. (1991). Physical activity and management of arthritis. Annals of Behavioral Medicine, 13, 117-124.
- Netz, Y., Tennenbaum, G., Sagiv, M. (1988). Pattern of psychological fitness as related to pattern of physical fitness among older adults. Perceptual and Motor Skills, 67, 647-655.

- Pavett, C.M., Butler, M., Marcinik, E.J., Hodgdon, J.A.
(1987). Exercise as a buffer against organizational stress. Stress Medicine, 3, 87-92.
- Pender, N.J. (1987). Health Promotion in Nursing Practice. Norwalk, CT: Appleton Lange.
- Plummer, O.K., Koh, Y.O. (1987). Effects of "aerobics" on self-concepts in college women. Perceptual and Motor Skills, 65, 271-275.
- Powell, K.E., Caspersen, C.J., Koplan, J.P., Ford, J.S.
(1989). Physical activity and the incidence of coronary heart disease. American Journal of Clinical Nutrition, 49, 999-1006.
- Powell, K.E., Thompson, P.D., Caspersen, C.J., Kendrick, J.S. (1987). Physical activity and the incidence of coronary heart disease. Annual Review of Public Health, 8, 253-287.
- Richards, G.E. (1988). Physical Self-Concept Scale. Sydney: Australian Outward Bound Foundation.
- Rogers, C.R. (1942). Counseling and psychotherapy: Newer concepts in practice. Boston: Houghton Mifflin.
- Rogers, C.R. (1951). Client Centered Therapy: Its current practice, implications, and theory. Boston: Houghton Mifflin. Psychological Assessment, 3, 32-37.
- Rose, J. (1994). Exercise Relapse: Review, Psychometrics, Classification, and Prediction. Unpublished Doctoral Dissertation. University of Rhode Island, Kingston, RI.

- Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, NJ: Princeton University Press.
- Rosenberg, M. (1979). Conceiving the Self, New York: Basic Books.
- Rosenberg, M. (1985). Self-concept and psychological well-being in adolescence. In R. Leahy (Ed.) The Development of the Self-Concept, (pp.205-246). New York: Academic Press.
- Rosenberg, M. (1986). Self-concept from middle childhood through adolescence. In Suls, J. & Greenwald, A.G. (Eds.) Psychological Perspectives of the Self, (pp.107-136). New Jersey: Lawrence Erlbaum Associates.
- Secord, P.F., Jourard, S.M. (1953). The appraisal of body cathexis: Body-cathexis and the self. Journal of Consulting Psychology, 17, 343-347.
- Segal, K.R., Pi-Sunyer, F.X. (1989). Exercise and obesity. Medical Clinics of North America, 73, 217-236.
- Shavelson, R.J., Hubner J.J., Stanton, G.C. (1976). Self-concept: Validation of construct interpretations. Review of Educational Research, 46, 407-441.
- Sonstroem, R.J. (1984). Exercise and self-esteem. Exercise and Sport Science Reviews, 12 123-155.
- 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.

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, 29-42.

Sonstroem, R.J., Harlow, L.L., Salisbury, K.S. (in press).

Path analysis of a self-esteem model across a competitive swim season.

Sonstroem, R.J., Morgan, W.P. (1989). Exercise and self-esteem: Rationale and model. Medicine and Science in Sports and Exercise, 21, 329-337.

Stein, P.N., Motta, R.W. (1992). Effects of aerobic exercise on depression and self-concept. Perceptual and Motor Skills, 74, 79-89.

Tucker, L.A. (1983). Weight training: A tool for the improvement of self and body concepts of males. Journal of Human Movement Studies, 9, 31-37.

Tucker, L.A., Maxwell, K. (1992). Effects of weight training on the emotional well-being and body image of females: Predictors of greatest benefit. American Journal of Health Promotion, 6, 338-344.

Walker, S.N., Sechrist, K.R., Pender, N.J. (1987). The promoting lifestyle profile: Development and psychometric characteristics. Nursing Research, 36, 76-81.

Walston, K.A., Wallston, B.S., Kaplan, G.D., Maides, S.

(1976). Health-related information seeking as a function of health-related locus of control and health value. Journal of Research in Personality, 10, 215-222.

Ware, J.F. (1979). Health Perceptions Questionnaire (HPQ). In Instruments for Measuring Nursing Practice and Other Health Care Variables, vol 1. (Wood, W. & Lindeman, C. Eds). DHEW Publication No. HRA 78-53. Washington DC: US Government Printing Office.