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## **The Relationship of Self-Esteem and Body Satisfaction to Exercise Activity for Male and Female Elementary School, High School, and University Students**

*Jackie Frost and Stuart J. McKelvie*

*Department of Psychology*

*Bishop's University*

### **ABSTRACT**

One hundred and twenty seven male and female elementary school, high school, and university students who were classified as high or low exercisers completed questionnaires that measured global self-esteem, body satisfaction, and body build. For all participants combined, high exercisers reported greater self-esteem than low exercisers, showing that the positive relationship between exercise activity and self-esteem is robust across sex and age. High exercising male participants had a bigger body build than low exercising male participants, and they also reported greater satisfaction with specific aspects of their bodies (body-cathexis). Suggestions for future research are given.

### **Introduction**

To understand how people feel about themselves, researchers have examined self-esteem and body satisfaction. *Self-esteem* has been defined as the “level of global regard one has for the self” (Harter, 1993), or how well a person “prizes, values, approves, or likes” him or herself (Blascovich & Tomaka, 1991). Body satisfaction has been defined in various ways, particularly in terms of body cathexis, body image, and weight satisfaction. *Body-cathexis* reflects how satisfied people are with specific aspects of their bodies (Jourard & Secord, 1955), *body image* reflects how close a person’s actual shape is to their ideal shape (Furnham, Badmin, & Snead,

2002), and *weight satisfaction* reflects how close a person's actual weight is to their ideal weight (Furnham et al., 2002).

As part of their attempt to investigate the possible benefits of exercise, researchers have asked whether exercise activity might be related to self-esteem and to body satisfaction. Indeed, body satisfaction might mediate any relationship between exercise activity and self-esteem. That is, exercise might have physical effects that lead to greater body satisfaction which in turn leads to greater self-esteem. Although some studies showed no significance (Aine & Lester, 1995; Alfermann & Stoll, 2000; Iannos & Tiggemann, 1997; Lenart, Goldberg, Bailey, Dallal, & Koff, 1995), exercise is usually positively related to self-esteem (Vealey, 1992). This association holds for many kinds of athletic activity, such as playing a sport, taking a Taekwondo class, weight training, or running (Bosscher, 1993; Melnick & Mookerjee, 1991; Pascarella & Smart, 1991; Finkenber, 1990; Ford, Puckett, Reeve, & Lafavi, 1991), and for various populations, particularly male and female children, adolescents, and adults (Delaney & Lee, 1995; Kalliopuska, 1987; Smith, 1986; Vealey, 1992; Wilkins, Boland, & Albinson, 1988; Yeung & Hemsley, 1996). An exception to this pattern is a study by Tiggemann and Williamson (2000), who found that the relationship between exercise activity and self-esteem was positive for men, but not significant for women and even negative for young women under 21. In addition, another recent study found no significant relationship between exercise and global self-esteem for senior high school students (Bowker, Gadbois, & Cornock, 2003). In view of these somewhat conflicting findings, we re-examined the relationship between exercise and self-esteem. However, we included male and female elementary school students, high school students, and university students. This permits them to be directly compared under standardized testing conditions.

With regard to the relationship between exercise activity and body satisfaction, research has also been mixed. Some studies showed no significance (Lenart, et al., 1995; Tiggemann & Williamson, 2000), others have found a positive relationship (Joesting & Chance, 1979; Kavussanu & McAuley, 1995; Marsh, Hey, Roche, & Perry, 1997; Melnick & Mookerjee, 1991; Rao & Overman, 1986; Wilkins, Boland & Albinson, 1988), and one even showed a significant negative relationship for young women (Tiggemann & Williamson, 2000). There is also experimental evidence that body satisfaction increases with exercise (Ford et al., 1991; Salusso, Carol, & Schwarzkopf, 1991). However, in contrast to the findings for self-esteem, these results have only been obtained with male and female adolescents and adults; children have not been investigated. Notably, the relationship between exercise activity and *actual* body build as measured by the Body Mass Index is not significant (Dionne, Davis, Fox & Gurevich, 1995; Lenart, et al., 1995; Yeung & Hemsley, 1996), but most of the participants were women. Body build may vary with exercise activity for men, perhaps because they engage in sports that enhance physique. The second purpose of the present study was to investigate the relationships between exercise and body satisfaction, and exercise and actual body build with both sexes in all three age groups.

## Method

Data were gathered in the context of a larger-scale study of self-esteem and body satisfaction as a function of sex and of age (Frost & McKelvie, 2004). With the exception of the measurement of exercise activity, details of the method are only summarized here.

### *Participants*

Participants were 127 male and female elementary school students (Grades 4, 5, and 6), high school students Grades 10 and 11), and university students in Lennoxville, Québec, Canada. They were drawn from a larger sample of 227 and were classified as high or low exercisers as described below. Sample sizes in each condition are shown in Table 1, although they were smaller for some analyses because not all participants answered the questions about weight and height. Assuming that the relationship between exercise and the dependent variables was small to medium in size (standardized effect size  $d = 0.20$  to  $0.50$ , say,  $d = 0.35$ ), and that the power for detecting the effect is .50, the sample size for both high and low exercisers should be about 46 (Cohen, 1977, p. 30), giving a total of about 92.

Table 1. Sample Sizes in each Group of High and Low Exercisers

Sex of Participant	Elementary School	High School	University	All
Male				
High	10	13	16	39
Low	9	9	13	31
Female				
High	6	12	12	30
Low	5	12	10	27
All				
High	16	25	28	69
Low	14	21	23	58

### *Materials and Procedure*

Test materials were administered in counterbalanced orders. A *demographics questionnaire* asked questions about age, sex, height, weight, desired weight, and exercise activity. Self-esteem was measured with the *Culture-Free Self Esteem Inventory* (Battle, 1981). A higher score indicates better self esteem. Battle (1981, 1991) reports that test-retest reliability ranges from .70 to .92. Body satisfaction was measured with the *Body Cathexis Scale* (Secord & Jourard, 1953), in which body parts are rated, the *Nine-Figure Silhouette Scale* (Hallinan, Pierce, Evans, DeGrenier, & Andres, 1991), in which ideal and actual body shapes are selected, and the difference between actual and desired weight (actual – desired; *Weight Satisfaction*). In all three cases, a lower score indicates better body satisfaction. For the *Body Cathexis Scale*, Secord and Jourard report that split-half reliability is .81. Hallinan et al. do not report reliability estimates for the *Nine-Figure Silhouette Scale*. Actual body build was measured by the *Body Mass Index* (BMI

= height/weight<sup>2</sup>, height in metres, weight in kilograms). To correct for variations due to sex of participant and age (school), BMI was converted into a relative measure ( $z_{\text{BMI}}$ ) using the mean and standard deviation of BMI scores from the person's sex/school group.

Exercise activity was measured with questions about *sport activity* (e.g., soccer, basketball, skiing, swimming, volleyball) on one page and with questions about *other athletic activity* (e.g., aerobics, karate, ballet, horseback riding, fencing) on a second page. Participants indicated whether or not they were involved in each case, and if they were, how many days and how many hours each week they devoted to the sport or athletic endeavor, and for how long this had been occurring. Scoring was as follows: No involvement = 0 points; 0-1 days = 1 point, 2-4 days = 2 points, 5-7 days = 3 points; 0-4 hours = 1 point, 4-8 hours = 2 points, more than 8 hours = 3 points; past 2 months only = 1 point, past year = 2 points, 2 years or more = 3 points. The exercise score could range from 0 to 9 for sport activity and from 0 to 9 for other athletic activity, for a total of 0 to 18.

Unfortunately, some participants left the second page (other athletic activity) blank. A few stated that they had combined their other athletic activity with their general sports activity on the first page, but this meant that their maximum score was 9 not 18. In other cases, it was unclear whether people forgot the second page or whether they did not engage in other athletic activity. For those who simply forgot it, the total score may have underestimated their overall exercise involvement. Notably, all of the people who omitted the second page accumulated at least 6 out of a maximum of 8 points from the first page, indicating a high level of *sport* activity.

Although it had been planned to classify people as high or low exercisers on the basis of their total number of points, the problem with the second page on the questionnaire made it unreasonable to do so. Instead, they were classified as high exercisers if they spent 5 to 7 days per week on a sport or other activity, spent at least 4 hours per week on it, and had been doing this for at least the past 2 years. These criteria, which demanded at least 8 out of 18 points on the complete exercise activity scale, are consistent with other guidelines for regular exercise. For example, the American College of Sports Medicine states that psychological benefits accrue with 15 to 60-min periods of exercise three times per week at 60 to 90% of maximum heart rate (Iannos & Tiggemann, 1997). Delaney and Lee (1995) classified people as highly active if they exercised at least three times per week. Karussanu and McAuley (1995) classified people as moderately active at 2 to 3 times per week and as highly active at four or more times per week. The highest level on Young and Hemsley's (1996) physical activity scale was greater than 8 hours per week or more than 25 miles running. One study with higher criteria was that of Iannos and Tiggeman (1997) where high, moderate and low activity was indicated by at least 11 hours, 5 to 11 hours, and less than 5 hours per week respectively.

Corresponding absolute standards for low exercise activity were initially 0 to 1 days per week and 0 to 4 hours per week for the last 6 months or less (criteria that would demand an exercise activity score of 3 or less). However, very few people met these standards, particularly among elementary school students. To form the low group of exercisers, the number of people in each sex/school group who had been classified as high exercisers was matched by choosing a similar number of people who had the lowest exercise activity scores on the basis of completing *both* parts of the questionnaire. This procedure guaranteed that the scores for those who were

chosen did not underestimate their exercise activity, which supports the validity of their classification as low exercisers. Although exercise scores were not used to operationally define the high exercise group, their mean ( $M = 11.78$ ,  $SD = 3.23$ ) was significantly greater than the mean for the low exercisers ( $M = 4.28$ ,  $SD = 2.39$ ),  $t(125) = 14.64$ ,  $p < .001$ .

## Results

There were some variations in self-esteem and in body satisfaction as a function of sex of participant and of school level (Frost & McKelvie, 2003). The present analysis focused on exercise activity and its interactions with these variables.

Table 2. Mean Scores for Self-Esteem, Body Satisfaction, and Body Build for High and Low Exercisers

Sex of Participant	Elementary School	High School	University	All
Self-Esteem				
Male				
High	21.5	20.5	22.3	21.5
Low	21.1	17.3	20.6	19.8
Female				
High	20.8	18.6	20.4	19.8
Low	17.0	15.7	19.9	17.5
All				
High	21.2	19.6	21.5	20.8
Low	19.6	16.4	20.3	18.7
Cathexis				
Male				
High	35.9	44.6	45.2	42.6
Low	39.8	54.8	50.5	48.6
Female				
High	45.0	51.2	50.0	49.5
Low	34.2	52.2	50.1	48.1
All				
High	39.3	47.8	47.2	45.6
Low	37.8	53.3	50.3	48.4
Body Image				
Male				
High	1.1	0.9	0.5	0.8
Low	1.2	1.6	0.6	1.1
Female				
High	0.5	0.8	0.8	0.7
Low	0.8	1.2	0.8	0.9
All				
High	0.9	0.9	0.6	0.8
Low	0.9	1.3	0.7	1.0
Weight Difference (pounds)				
Male				
High	-5.2	-17.0	-2.4	-8.2
Low	1.8	-10.0	-2.8	-4.3
Female				
High	5.8	7.1	7.0	6.8
Low	0.0	11.4	12.2	11.1
All				
High	-1.2	-6.5	1.2	-2.2
Low	1.4	0.7	3.5	2.2
Standardized BMI Scores				
Male				
High	0.20	0.07	0.31	0.20
Low	-0.09	-0.46	-0.45	-0.38
Female				
High	1.00	-0.10	-0.11	0.09
Low	-0.73	0.20	-0.07	-0.08
All				
High	0.50	-0.01	0.13	0.15
Low	-0.37	-0.11	-0.28	-0.23

Note. Maximum scores = 25 (high self-esteem), 105 (high cathexis, very bad feelings about one's body), 8 (body image, bigger discrepancy between ideal and actual). Weight difference = actual weight - desired weight.

## *Multivariate ANOVA*

An initial 2 X 2 X 3 (Exercise Activity X Sex of Participant X School) multivariate ANOVA was conducted on the scores for self-esteem, body-cathexis, body image, weight difference, and body build as dependent variables. Note that the total sample size dropped from 127 to 96 because some participants did not answer the questions about weight and height, which were necessary for the calculation of weight difference and BMI. Note that the smaller sample size of 96 remains above the total of 92 required for an effect size of 0.35 and power of .50. There was a significant main effect of exercise activity,  $F(5, 81) = 3.14, p = .012$ , but exercise activity did not interact significantly with sex of participant or school ( $p's > .20$ ).

Significant multivariate effects are usually followed up with univariate analyses, which may be useful for showing which dependent variables are affected by the independent variables (Tabachnick & Fidell, 1996). However, this practice has been criticized because the dependent variables are not independent (Tabachnick & Fidell, 1996) and because Type I error is not properly controlled in the post hoc univariate tests (Kellow, 2000; Tabachnick & Fidell, 1996). Tabachnick and Fidell (1996) recommend using the stepwise procedure for separating dependent variables while controlling for Type I error.

We began with the standard procedure by conducting univariate analyses on each dependent variable because some of them (self-esteem, cathexis, body image) included the data from all participants ( $n = 127$ ). The greater sample size increased the power of the comparisons in these cases. However, we also conducted analyses with the stepwise procedure in which the dependent variables are ordered according to their theoretical or practical importance, and analyses of the later ones include the earlier ones as covariates. Furthermore, alpha is set at a value determined by the Bonferroni correction. In this case, to keep overall alpha at .05, each alpha was set at .01.

## *Univariate ANOVAS*

For self-esteem, the main effect of exercise activity was significant,  $F(1, 115) = 7.83, p = .006$  ( $MSe = 16.05$ ), and it did not interact with either of the other variables ( $p's > .45$ ). Self-esteem was higher for high exercisers than for low exercisers ( $Ms = 20.75, 18.72$ ). For body-cathexis, the interaction between exercise activity and sex of participant was significant,  $F(1, 115) = 4.14, p = .044$  ( $MSe = 161.78$ ). For male participants, scores were lower for high than for low exercisers ( $Ms = 42.6, 48.6$ ), whereas for female participants there was no significant difference ( $Ms = 49.5, 48.1$ ). For body image, and weight difference there were no significant effects of exercise.

For  $z_{BMI}$ , the effect of exercise activity was significant,  $F(1, 103) = 5.99, p = .016$  ( $MSe = 0.99$ ), and the effect of the three-way interaction was almost significant,  $F(2, 103) = 2.70, p = .072$  ( $MSe = 0.99$ ). Overall, body build scores were positive ( $M = 0.15$ , above average, where average = 0) for high exercisers and negative ( $M = -0.24$ , below average) for low exercisers. This pattern appeared in all sex/school groups except for female high school students and female university students. In the first case, scores were greater (and positive) for low than for high exercisers ( $Ms = 0.20, -0.10$ ), and in the second case, scores were very slightly greater for high

than for low exercisers, but both means were negative ( $M_s = -0.11, -0.07$ ).

### *Stepwise Procedure*

There were significant correlations between self-esteem and body-cathexis ( $-.396, p < .001$ ), between self-esteem and body image ( $-.261, p = .003$ ), between body-cathexis and body image ( $.339, p < .001$ ), and between weight difference and body build ( $.574, p < .001$ ). As noted above, alpha was set at .01 for the following analyses.

For self-esteem, the results were exactly the same as above because the analysis was identical. In particular, the effect of exercise was significant ( $p = .006$ ). For body-cathexis, where the ANOVA was run with self-esteem as a covariate, the interaction between exercise activity and sex of participant was almost significant,  $F(1, 114) = 5.65, p = .019$  ( $MSe = 139.09$ ). For male participants, scores were lower for high than for low exercisers, whereas for female participants there was no significant difference. For body image, the ANOVA was run with self-esteem and cathexis as covariates, but the results were the same as above – no significant effects of exercise. The ANOVA for weight difference was run the exact same way (no covariates) as the previous univariate analysis, because this variable was not correlated with self-esteem, body-cathexis, or body image. There were no significant effects of exercise.

Finally, for  $z_{BMI}$ , weight difference was included as a covariate because it was the only variable that was correlated with  $z_{BMI}$ . The effect of exercise activity was almost significant,  $F(1, 84) = 6.17, p = .015$  ( $MSe = 0.99$ ), and the effect of the interaction between exercise activity and sex of participant was almost significant,  $F(1, 84) = 5.29, p = .024$  ( $MSe = 0.59$ ). Overall, body build scores were positive for high exercisers and negative for low exercisers, but this only held for males: 0.20, -0.45. The two female scores were in the opposite direction (0.17, 0.25). The three-way interaction did not approach significance ( $p = .49$ ).

## **Discussion**

As explained in the Method, high exercisers were identified on the basis of specific performance criteria, whereas low exercisers were matched in number to the high exercisers but were identified on the basis of a lowest number of questionnaire points. This is not ideal, but we are confident that the two groups were clearly different in their amounts of exercise activity and that the high group met requirements demanded by other researchers.

It was found that global self-esteem was generally greater for high than for low exercisers. This result replicates previous findings with men and boys and with women and girls who attended elementary school, high school, and university (Bosscher, 1993; Delaney & Lee, 1995; Finkenber, 1990; Kalliopuska, 1987; Pascarella & Smart, 1991; Smith, 1986; Vealey, 1992; Wilkins. et al., 1996). However, it is the first time that these sex and age groups have been studied simultaneously. Thus, despite the concerns over the measurement of exercise activity, our findings consolidate the generality of the relationship between exercise activity and self-esteem, particularly because the groups were compared under standardized test conditions. Of particular interest, they demonstrate that the positive relationship between exercise activity and self-esteem

appeared in the youngest group, who were about 11 years of age.

Of course, we cannot conclude that exercise activity *causes* higher self-esteem, because the present study is not experimental. People who already have higher self-esteem for other reasons may be more motivated to exercise compared to those who have lower self-esteem. Nevertheless, the present relationship is robust. When the difference in self-esteem scores was converted to the standardized effect size *d*, it was 0.51, which is a medium effect (Cohen, 1977). Notably, while some experiments have shown that the effect of exercise on self-esteem is positive (e.g., McAuley, Blissmer, Katula, Duncan, & Mihalko, 2000), and others have shown no effect (e.g., Walters & Martin, 2000, notably with elementary school children), a recent meta-analysis of this literature (Spence, 2003) reported an overall effect size of 0.22, which is small. Given this evidence of a causal relationship between exercise and self-esteem, it is quite possible that the present association has a similar direction. Finally, although most research has considered self-esteem as a global concept, it has been argued that it should be decomposed into two dimensions: self-competence and self-liking, which respectively correspond to the instrumental and the intrinsic values of the self (Tafarodi & Milne, 2002). Given that self-competence reflects “abilities, skills, and talents” (Tafarodi & Milne, 2002), it might be more strongly associated with exercise activity than self-liking.

BMI scores (corrected for sex and for age) were also greater for high than for low exercisers. This was true for male participants in all three age groups and for female elementary school students, but not for female high school or female university students. The latter result is consistent with previous reports that there was no relationship between exercise activity and BMI for women (Lenart et al., 1995; Yeung & Hemsley, 1996), but they confirm our speculation that it might occur with male participants. Perhaps this occurred because men and boys tend to exercise and participate in sports such as weight-lifting that enhance physique, whereas women and girls participate in other sports such as running or swimming, which are not designed to build up muscle mass. Again, however, the results do not show that exercise activity *causes* a bigger body because people with bigger bodies may be more motivated to exercise than people with smaller bodies.

In addition, although there were no significant relationships between exercise activity and body image or between exercise activity and weight satisfaction, *body-cathexis* was better for high than for low exercising male participants. That is, the men and boys who exercised more gave more positive ratings about various parts of their bodies. One reason that exercise was related to body-cathexis but not to body image or to weight satisfaction may be that the latter two measures are very specific. Body-cathexis tapped people’s feelings about many aspects of their body, two of which were weight and shape. This is consistent with the fact that there was also a positive relationship between exercise activity and body build for male participants. The findings with body-cathexis also support previous reports of a positive relationship between exercise and body satisfaction with male adolescents and male adults (Joesting & Chance, 1979; Kavussanu & McAuley, 1995; Marsh, et al., 1997; Melnick & Mookerjee, 1991; Rao & Overman, 1986; Wilkins, et al., 1988), and they extend them to male children, who have not been studied before. Once again, we must be cautious about the direction of the association. There is experimental evidence that exercise enhances body satisfaction (Salusso, Carol, & Schwarzkopf, 1991; Williams & Cash, 2001), particularly in males (Ford et al., 1991), and particularly as measured by

body-cathexis (Ford et al., 1991; Salusso, et al., 1991). However, it is possible that the males in the present study who were already satisfied with their bodies were more likely to seek out exercise activity, perhaps to keep in shape. Because the body-cathexis scale has been shown to be multidimensional (Shim, Kotsiopulos, & Knoll, 1990; Theodorakis, Doganis, & Bagiatis, 1991; Tucker, 1981), future research might examine whether exercise activity is differentially related to the different factors on the scale.

However, unlike previous research, the present association between exercise activity and body-cathexis did not occur with female participants. One reason may be that the relationship is weaker for women and girls than for men and boys and that the present sample sizes, which ranged from 5 to 12 for female participants, were not sufficiently large to detect the effect. Inspection of the mean body-cathexis scores for high school girls shows that they are slightly lower (i.e., better) for high than for low exercisers. However, in the university students, they were almost identical and in the elementary school students, scores were higher for *low* than for high exercisers. Unfortunately, these last two groups had the smallest number of cases (5 and 6). Larger sample sizes might clarify the relationship between exercise activity and body-cathexis for female participants.

Finally, although our questionnaire on exercise activity had separate sections for competitive sport and noncompetitive exercise, we did not distinguish between them when measuring exercise activity. It might be useful to do so because, in a study of female adolescents involving sport participation, exercise participation, body dissatisfaction, and self-esteem, Tiggemann (2001) found that only sport participation predicted body dissatisfaction.

## Conclusion

Our main finding is that there was a positive relationship between exercise activity and the dependent variables considered together, but that it was only significant for self-esteem and body build, not for body image or weight satisfaction. If significance is interpreted leniently, there were sex differences in the relationship between exercise and body build and between exercise activity and body-cathexis.

More specifically, this study suggests that a higher level of exercise activity is associated with a higher level of self-esteem, and this relationship occurs for male and for female elementary school students, high school students, and university students. Although the nonexperimental design prohibits a causal interpretation of these results, they are consistent with the idea that exercise has a beneficial effect on how people feel about themselves. It was also found that men and boys who exercised more reported a more positive evaluation of different aspects of their bodies (body-cathexis) than those who exercised less. Although caution must also be exercised about the causal direction of this relationship, it is consistent with the possibility that exercise activity makes people feel better about their bodies. In turn, this may make them feel better about themselves.

A strength of our measure of exercise activity was that it covered both sport and recreational activities, and included questions about the length of time that they had been engaged in. Unfortunately, a questionnaire flaw meant that we could not take full advantage of the

information that was provided. Future research should ensure that there is a sound measure of exercise activity and should increase the sample sizes in the different groups of high and low exercisers. It might also examine whether exercise activity has different relationships to different dimensions of body-cathexis and to different dimensions of self-esteem.

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