

**The Effects of a Change in Perception of Physical Fitness Level on
State Self-Esteem, Body Image, and Body Satisfaction**

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INTRODUCTION

The link between physical activity and both mental and physical health is well supported in psychological and medical research. Today, it is common knowledge that exercise is good for one's health, with the incidence of heart disease, diabetes related complications, obesity, several types of cancer and cardiovascular diseases all decreasing as a person's physical fitness improves (Penedo, 2005). Continued research is also adding to the growing body of knowledge that shows a positive relationship between physical activity and mental health. Many studies have shown that physical activity improves mood and enhances wellbeing, as well as reduces anxiety and guards against the onset of depression (Penedo, 2005).

However, the reason for this link is not entirely understood. Some researchers propose a biological explanation. As a person exercises, their body temperature rises, neurotransmitters are released and people feel good with the increase of endorphins in their system (Plante, 2000). Others offer a psychological approach, asserting that exercise can serve as a distraction from the hassles of life, a time for meditation, a source of biofeedback, or a "psychological buffer" that results in better overall mental health (Plante, 2000).

In an effort to try and understand what actually underlies the connection between physical and mental health, several studies examined the role a person's perceived fitness has on their mental health. These studies have shown that perceived fitness, rather than actual aerobic fitness, was associated with an increase in positive mood and personality outcomes (such as reduced depression, increased self-esteem, and a better ability to cope with stress) (Plante, LeCaptain, & McLain, 2000). This research suggests that improvements in mental health experienced from exercise may be due in part to the perceived benefits of exercise and not only an increase in a person's fitness level.

One study by Plante et al. (2000) evaluated the association between perceived fitness and actual fitness in connection with a person's ability to handle stress. One hundred and thirty participants, ranging in age from 18 to 66 years old, wore a pedometer for seven consecutive days. At night, each participant was asked to record the number of steps they had taken and their perceived stress, coping and fitness levels. After the seven days were over, participant's actual fitness was assessed by recording their heart rate while having them run or walk on a treadmill. Results showed that a person's perceived fitness level better predicted coping with daily stress than both actual physical fitness and daily physical activity (Plante et al. 2000). Researchers concluded that beliefs about fitness could actually lead to "biopsychological changes" that could result in improved mental health. In a similar study by Plante et al. (2000), the perceived fitness, social desirability, self-esteem, hope, and perceived stress levels of one hundred and sixty college students were measured. Participant's physical activity was also measured for a week and they were asked to keep daily logs of how they were feeling. Again, Plante (2000) found that perceived fitness was reliably associated with coping, while actual physical activity was not.

The notion that a person's self-perception of their physical fitness could affect their psychological wellbeing begs the next question- how do people form perceptions of their own physical fitness? The most popular answer is through the sociocultural theoretical model. This theory suggests that people are exposed to unrealistic societal standards of thinness and beauty, and as result, feel worse about their own bodies (Tiggemann & Pickering, 1996). For example, the gap between the average women's body size and the 'ideal' portrayed by society is the largest it has ever been (Tiggemann & McGill, 2004). Studies have shown that women's attempts to attain this ideal figure result in lowered self-esteem, increased depression, excessive dieting and eating disorders (Tiggemann & Pickering, 1996). Because of its pervasiveness, mass

media is considered the most influential actor maintaining this image. There exists a positive correlation between fashion magazine and television consumption and body dissatisfaction (however, by no means causal- some researchers argue the relationship could go the opposite way). Even brief exposure to media images of female models can induce greater weight concerns, body dissatisfaction, self-consciousness, negative mood, and decreased perception of one's own attractiveness (Tiggemann & McGill, 2004).

However, people are affected differently when exposed to these societal pressures. Some people's self-perceptions are heavily reliant on what they see around them, while others have a more stable view of themselves. One explanation for this is based in Festinger's social comparison theory (Festinger, 1954). This theory states that people have an innate drive to compare themselves with others in order to learn about themselves (Heinberg & Thompson, 1992). The idea of body comparison follows Festinger's model and describes the process of comparing one's body with someone else's in order to gain knowledge about how a person feels about their own body (van der Berg et al, 2007). However, Festinger proposed that some individuals have a greater tendency to make comparisons, and that people are more likely to make comparisons on issues that are self-relevant. For example, heavy women who exist in a society that idolizes thinness are likely to internalize the importance of being thin, which could lead to increased body comparison (van der Berg et al. 2007). An increased tendency to compare oneself to others has been associated with increased levels of body dissatisfaction (Thompson et al., 1999).

Different factors also contribute to how people engage in social comparison. People first select targets that are either universalistic or particularistic by which to compare themselves too. Universalistic comparison occurs when a person compares themselves to a global target (i.e. the

average American) on a specific attribute, whereas particularistic approaches occur when a person compares themselves to someone they share a common bond with (i.e. someone in their immediate peer group) (Thompson et al., 1999). Comparisons can also be defined as either upward or downward. Downward comparisons refer to comparing oneself to a target that is inferior to oneself on a specific attribute, whereas upward comparison refers to comparing oneself to a target that is superior to oneself in a specific attribute (Kruglanski & Mayseless, 1990). Major, Testa & Bylsma (1991) found that upward comparison was associated with increased levels of emotional distress and decreases in self-esteem. They explained these results by saying that people are reminded of their own inferiority when confronted with other's superiority. J.V. Wood (1989) proposed that downward comparisons may serve as a type of self-enhancement, and therefore make people feel better about themselves.

One study by Ogden and Munday (1996) found that people's perceptions of themselves were affected by what types of images they were exposed too. Participants were shown images of stereotypically attractive (thin) and unattractive (overweight) individuals. After viewing pictures of thin individuals, typically an upward comparison, participants reported less body satisfaction, higher levels of unhappiness with their "body silhouettes" and overestimation of their own body size. However, after viewing pictures of overweight individuals, typically a downward comparison, participant's experienced improved body satisfaction.

Heinberg and Thompson (1992a) further examined the role of social comparison in body image perception when they directly manipulated the attribute, target of comparison, and type of feedback. Half the participants were lead to believe they were heavier than the average person, the other half, thinner than the average person. Additionally, half of each group was compared to other students at their university (particularistic), or the average American (universalistic).

Surprisingly, results showed that regardless of the direction of comparison (upward or downwards), individuals who engaged in particularistic comparison reported greater body image anxiety and dissatisfaction than the universalistic group. However, in a related study, Cattarin et al. (2000) found that female participants who were told to compare themselves to the attractive, thin females presented in several commercials experienced greater decreases in appearance satisfaction than did the female participants who were told to pay attention to the product being advertised, or who watched non-appearance-related commercials. These slightly contrasting findings suggest that although a tendency to compare oneself to others may result in lower satisfaction levels, who and what someone compares themselves to may influence the amount of transitory changes a person experiences (Thompson et al., 1999).

As research has shown, there exists a relationship between physical and/or perceived physical fitness and improved mental health. In another closely linked but not overlapping line of research, studies show that a person's perception of self can be formed by how they view themselves in comparison with others. This research has mainly focused on how images the media portrays can negatively affect people as they try to attain this figure for themselves. The present study seeks to combine the ideas of self-perception and social comparison theory to see if changing a person's perception of their own physical fitness by having them compare themselves to others will have an impact on their mental health. State self-esteem, body satisfaction, and body image were the constructs that were examined. Researchers hoped to alter participant's self-perception by manipulating who they compared themselves too. Researchers were interesting to see if comparing one's exercise habits to someone who either exercised more or less than they did would influence how one felt about themselves. To do this, participants were asked to fill out several surveys about their current self-esteem, body image, and body

satisfaction. They then read an article about the exercise habits of the average American. Half the participants read an article that exaggerated the amount of exercise the average American engages in, while the other half read an article that underestimated the amount of exercise the average American engages in.

Because social comparison theory dictates that people will feel the need to compare themselves based on how self-relevant something is, researchers hypothesized that people would be affected differently depending on their own fitness level. The hypothesis was that people who exercised less than the article indicated the average American does would have lower feelings of self-esteem, body image and body satisfaction, while people who exercised more than the article indicated the average American does would have increased levels of self-esteem, body image and body satisfaction. For the participants who read the exaggerated article, we expected to see greater decreases in satisfaction than the group that read the understated article because there would be less people who exercises as much as the article indicated was normal.

METHOD

Participants

Participants were 48 undergraduate American University students (35 female, 12 male) mean age 20. Students enrolled in psychology classes received extra credit for their participation. The study had a 100% participation rate.

Instruments

Participants completed a general demographics questionnaire (which contained the Lipid Research Clinics Prevalence Study Questionnaire), The State Self-Esteem Scale, Contour

Drawing Rating Scale, and the Physical Appearance State Anxiety Scale. Participants also read variations of the article, *Heavy Findings in Fitness, Weight Polls* by Miranda Hitti from WebMD.

General Demographics Questionnaire

Participants were asked to indicate their age, sex, year in school, height, and weight. Height and weight measurements were then used to compute BMI scores for each participant (body mass index is calculated by taking the weight in kilograms divided by the square of height in meters). For data analysis, these scores were used to assess a person's actual fitness level, categorizing participants as either underweight, normal weight, or overweight. The last two questions of the demographics questionnaire was the Lipid Research Clinics Prevalence Study Questionnaire. This measure is used to gauge a person's level of physical activity and consists of two questions: Do you regularly engage in strenuous or hard physical labor? Yes/no, and Do you exercise or engage in hard physical labor at least 3 times per week? Yes/no (Haskell et al., 1980). A yes response to the first question classifies a participant as highly active, a no response to the first question categorizes the participant as inactive, and a yes response to the first and a no response to the second classifies as person as moderately active. In data analysis, people were compared based on these exercise levels. This scale has a test-retest reliability of .93, and is convergent with VO2 max ($r=.49$). It has also been shown to be related to physical fitness and disease risk factors.

The State Self-Esteem Scale (Heatherton, T.F. & Polivy, J, 1991)

This scale is designed to measure a person's state self-esteem level. It was modified from the widely used Janis-Field Feelings of Inadequacy Scale and consists of twenty questions that assess how a person is feeling about him or herself at a specific moment. Participants are asked to rate how they feel about different elements of their self-esteem using a 5 point Likert scale from 1 (not at all) to 5 (extremely). Sample questions include: I feel satisfied with the way my body looks right now, and, I am dissatisfied with my weight. Previous research has shown that this scale displays concurrent and discriminant validity both in and out of a laboratory setting and is a psychometrically sound measure of a person's state self-esteem level.

Physical Appearance Trait Anxiety Scale (Reed et al., 1991)

This scale is designed to measure how anxious, tense, or nervous a person is feeling about a part of their body at the time they are answering the questions. The measure instructs participants to rate how anxious, tense, or nervous they feel at that moment about 16 different body parts, such as their thighs, hips, and stomach., on a Likert scale from 0 (not at all), to 4 (exceptionally so). This scale was found to be reliable, with .82-.92 internal consistency, and .87 test-retest reliability after two weeks.

Contour Drawing Rating Scale (Thompson, M.A. & Gray, J.J., 1995)

This scale is designed to assess body image dissatisfaction. Participants are presented with an 8" x 11" sheet of paper that has nine ordered male and female drawing of increasing weights marked "current." Participants are instructed to draw a mark on the appropriate sex figure that most accurately depicts their current body size. They are asked to place a mark on the opposite sex figure that most accurately depicts what they think the average body size is.

Participants are then presented with another 8" x 11" sheet marked "ideal." Participants are asked to mark what their ideal body size is, as well as what the ideal body size is for the opposite sex. Marks can be drawn anywhere on or between the figures. The discrepancy between the ideal and the current size is the index of body image dissatisfaction, which is measured in millimeters.

Previous studies have shown that this measure is reliable, with a reliability coefficient of $r = .78$, and a significance level of $p < .0005$. When testing for the validity of the measure, 98.9% and 98.7% of participants placed the figures in the correct sequencing for female and male drawings, respectively. It appears that the subtle differences between the contour drawings are easily identifiable. When testing the validity of the measure to assess perceived body size, the degree of correspondence between participant's weight and self ratings was examined. Appropriate drawing selections strongly correlated with actual weight, with $r = .71$, $p < .0005$. Similar validity tests were conducted using BMI and self ratings, with $r = .59$, $p < .0005$.

Heavy/Surprising Findings in fitness, Weight Poll article by Miranda Hitti

This article describes the fitness and exercise habits of the average American taken from a Gallup survey in 2006. The article was altered slightly to either exaggerate or understate how much exercise the average American engages in in an effort to manipulate participant's perception of their own fitness level in comparison to others. In the original article, it stated that only 28% of American were "seriously trying to lose weight." This statistic was kept the same for the understated article, but was increased to 59% for the exaggerated article. In the original article, it states that "The average American engages in moderate exercise three days a week, and 29% do so at least five days a week." In the understated article, it stated that the average

American engaged in moderate exercise only two days a week, with 29% doing so at least three days a week, whereas in the exaggerated article, it stated that the average American engaged in moderate exercise five days a week, and that 13% did so at least six days a week. In both articles, “frequent” exercise was defined as working out five or more days per week. In the understated article, it stated that nearly two-thirds did not meet that standard, while the exaggerated article stated that nearly two thirds of participants did meet that standard. Finally, the understated article stated that only 7% of Americans engaged in vigorous exercise five days a week, and that the average American engages in vigorous exercise less than two days per week, whereas the exaggerated article stated that 18% of Americans engage in vigorous exercise at least five days a week, and that the average American engages in it at least four days a week.

Because of the exploratory nature of the present study, no tests were conducted to see if the changes in the article were significant enough to illicit transient changes in self-perception.

Procedure

Students were recruited from two introductory psychology classes. Any student in the university could participate and some students who were not enrolled in either psychology class responded to posters announcing the study. All were voluntarily participating. Participants met at prearranged times and locations either individually or with other participants. Participants first signed an informed consent sheet that briefly summarized the purposes of the study. Participants were then given a packet of questionnaires to fill out. The first was the general demographics questionnaire, followed by the state self-esteem scale, the contour drawing rating scale, and the physical appearance trait anxiety scale. Participants were instructed to turn these over when they were finished and read the news article they had been given. Packets had been prearranged into

‘exaggerated’ and ‘understated’ before participants arrived. As participants arrived, they were randomly selected to receive either an exaggerated or understated packet.

After reading the article, participants re-filled out each of the measures again to get pre and post article results for state self-esteem, body image, and body satisfaction levels. They were instructed not to look at their previous answers. All the measures were collected when completed, and participants were given a debriefing form that explained why the original article had been altered, as well as provided information on where the student could seek further help if the study had disturbed them in anyway. Participants were also given a copy of the original article without any changes. If the participants had no further questions, their part in the study was complete.

RESULTS

Forty seven participants were included in data analysis. Means and standard deviations for base levels of state self-esteem and body satisfaction (pre-article), as well as changes in state self-esteem, body image and body satisfaction for the group as a whole are presented in table 1. Mean, standard deviation, and significance levels for differences in base state self-esteem and body satisfaction between groups 1 (given understated exercise habits article) and 2 (given exaggerated exercise habits article) are presented in table 2. The results showed that before reading the article, there were no significant difference between the participants in groups 1 and 2.

Table 1: Means and Standard Deviations for Measures

	Mean	Std. Deviation
Base State Self-Esteem	69.98	12.136
Change in State Self-Esteem	1.77	7.519
Body Image- Female Drawing	6.53	7.351
Body Image- Male Drawing	8.53	11.654
Base Body Satisfaction	15.04	10.283
Change in Body Satisfaction	0.3	2.978

Table 2: Mean, Std. Deviation, and Significance level of differences between groups 1 and 2 in Base SSE and Base BS.

		Mean	Std. Deviation	Sig.
Base State Self-Esteem	Group 1	69.68	12.882	.310
	Group 2	70.24	11.702	
Base Body Satisfaction	Group 1	16.00	10.538	.944
	Group 2	14.20	10.194	

Because of the nature of the Contour Drawing Rating Scale, base levels were not calculated. These results show there was no significant differences between the participants in group 1 and 2.

To test the hypothesis that people who exercised less than the article indicated the average American does would have lower feelings of self-esteem, body image and body satisfaction and that people who exercised more than the article indicated the average American does would have increased levels of self-esteem, body image and body satisfaction, a chi-square test was conducted. Results showed that for group 1 (participants who read that Americans exercise less than they actually do), exercise level (highly active, moderately active, inactive) did not predict a significant change in self-esteem or body satisfaction ($p=.754$, $p=.989$ respectively).

For group 2 (participants who read that American exercise more than they actually do), there was not a significant relationship between exercise level and self-esteem, with a p-value of .144. For group 2, there was a significant relationship between exercise level and body satisfaction, with a p value of .045. These results showed highly active people tending to have increased levels of body satisfaction than inactive people after reading the article.

To test the relationship between actual physical fitness level (as defined by a person's BMI) and a person's change in state-self esteem, body image, and body satisfaction, a chi square test was conducted. Results showed that for group 1, there was no significant relationships between BMI and change in state self-esteem, body image, and body satisfaction. For group 2, there was no significant relationship between BMI and state self-esteem, but there was for body satisfaction ($p = .015$). These results show that for participants in group 2, BMI and body satisfaction are not independent of one another.

For both groups, there was a significant difference in body image measurements after reading the articles. The difference between what a person marked as their current and ideal before reading the article and what they marked down as their current and ideal after reading the article increased in both groups ($p \approx .000$ for both groups).

DISCUSSION

The purpose of this study was to see if a person's perception of their own physical fitness level could be altered by comparing themselves to others, and if this change would have affects for their state self-esteem, body image, and body satisfaction levels. To do this, participants were surveyed before and after being exposed to either an upward or downward comparison. Because Festinger's (1954) social comparison theory states that people make comparisons that

are self-relevant and that some people are more prone to make comparisons than others, along with recent research that show that increased tendencies to compare oneself to others leads to decreased satisfaction levels (Thompson et al., 1999), we expected people to react differently to the articles.

We hypothesized that people who felt they exercised less than the average American would have decreased self-esteem, body image, and body satisfaction after reading the article, with the opposite true for those who exercised more. In the group that read the exaggerated article, we expected to see lower self-rating than in the group that read the understated article. As previous research has shown (Major, Testa, & Blysm, 1991), in the upward comparisons we expected a negative shift in positive emotion as participants were reminded of their own shortcomings, and a positive shift in emotion in a downward comparison as participants would consider themselves better off than others.

The most important findings of this study are: (a.) For group 1, there were no significant relationships between exercise level and self-esteem and body image after reading the article. People's perceptions of themselves did not change enough to alter their transient self-esteem and body satisfaction levels. (b.) For group 2, there was a significant relationship between both BMI and exercise level and body satisfaction (but not with self-esteem). Highly active people with normal BMI's tended to have increased levels of body satisfaction after reading the article. (c.) And, for both groups, there was a significant difference in body image measurements after reading the articles, with the discrepancy between current and ideal marks increasing after reading the articles.

Finding no significant relationships for group 1 was not predicted, but it is not entirely surprising. Results showed that perception's of moderately active and highly active participants

did not change even after learning they were exercising more than the average person. However, Heinberg and Thompson (1992a) had found that it was the source of feedback (particularistic vs. universalistic) rather than the direction of comparison that corresponded with changes in emotion levels. It could be that the universalistic comparison of the “average American” was not an effective enough target for people to relate to, and therefore, did not illicit an appropriately strong downward comparison to result in a transient change in self-perception. This study could be improved by having a particularistic target (like the student body) rather than a universalistic one.

Results for group 2 were also inconsistent with the hypothesis, but illustrate some interesting trends. Instead of showing that an upward comparison is harmful to a person’s self-perception, results showed that people actually felt better about their body satisfaction after learning about the positive health trends occurring around them. One explanation for this is that an upward comparison could motivate someone and encourage him or her to make improvements on themselves. J.V. Wood (1989) related it to an athlete comparing themselves to a professional in the sport in order to model their own training after.

In terms of body image, because both groups showed increased discrepancy scores between current and ideal marks after reading the articles, the change cannot be attributed to what the participant read. Instead, the difference could be due to a general increased awareness of body image after reading the articles.

This study is limited by several factors. The small sample size of the study makes drawing any substantial conclusions difficult. Because of the small number of participants in each category (group 1: highly active, moderately active, and inactive; group 2: highly active, moderately active, and inactive), running statistical tests that could legitimately show a

significant relationship was unlikely. In addition, because the majority of the sample was recruited from introductory psychology classes, there was an uneven representation of freshman and sophomores, making age or school year comparisons difficult. Also, there were many more female participants ($n=35$) than male ($n=13$), making comparisons based on sex difficult.

Another important limitation was the strength of the actual manipulation. Because of the restricted nature of the study, no prior exploratory tests were able to be done to test the effectiveness of the articles. It is possible that reading a single article about the general population's fitness level would not be strong enough to alter one's transient self-perception. In addition, the article did not take long to read, so the time between when participants filled out the first round of surveys until they re-filled them out again was very short. Because of this, participants could have just circled the same answers from memory instead of actually thinking about whether they felt different or not.

In terms of instruments, the BMI is a crude measure of someone's actual physical fitness level, and in future research, a more precise gauge should be used. Also, all the surveys were self-report measures, which can sometimes lead to conflicting or inaccurate results. Including a measure of social desirability may make the findings more meaningful. Also, assessing body image dissatisfaction using the Contour Drawing Rating Scale was difficult because of how the measure was scored. For each participant, the difference between where they marked their current body type and where they marked the ideal body type was used as a 'discrepancy score.' This measurement was taken before and after reading the articles, and the overall difference between the two was used to see if there was any overall difference in how people marked themselves before and after reading the articles. The results showed that for both groups, the amount of distance between the marks increased, but we do not know if this is because people

made their ideal marks heavier or thinner, or changed where they placed their ‘current’ marks. To get a more accurate response, the measure could be scored differently, using actual distances instead of just the differences between marks. Also, a completely different measure that assesses body image could also be used.

Most previous research has looked at people’s self-perceptions in terms of physical attractiveness, with an emphasis on thinness. The current study contributes to the field of study by looking instead at physical fitness level as a factor of someone’s self-perception. Additionally, the current study used a written article instead of a visual media source. Further research could look at the effect a more scholarly source of information has on someone’s self-perception of physical fitness, as opposed to an image displayed by the media. Although all the results were not consistent with expectations, it still seems likely that a person’s self-perception can be influenced by comparing themselves to others. Findings from this study show that people may actually benefit from upward comparison. This has implication for how society can help foster more positive self-images for adolescents, as well as adults who struggle with body dissatisfaction.

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