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THE EFFECTS OF AEROBICS AND WALKING ON SOCIAL PHYSIQUE ANXIETY AND SELF-ESTEEM OF FEMALE COLLEGE STUDENTS

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The Effects of Aerobics and Walking on Social Physique Anxiety and Self-Esteem of Female College Students

by

Jessica L. Lloyd

A Thesis Submitted to the Faculty

of the College of Graduate Studies

at Georgia Southern University

in Partial Fulfillment of the

Requirement for the Degree of

Master of Science

in the Department of Health and Kinesiology

Statesboro, Georgia

November 1998

The Effects of Aerobics and Walking on Social Physique Anxiety

and Self-Esteem of Female College Students

by

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Dedication

I would like to dedicate this work to my loving family who not only gave me support, love, and inspiration, but the desire to push on when things got almost unbearable. My dad, Chuck, is the strongest person I know. He has shown me what real strength and determinations are and what they can do for me. My mom, Marylee, has taught me that when life knocks you down, pick your self up, and start anew. Life may be tough, but you can get through it. She holds a very special place in my heart. Now for my sisters... Molly, the youngest of three, is a true dreamer. I suspect in about ten years she will be receiving awards for one of her many screen plays, children's books, or what have you. I wish I had a little of her talent. And last but not least, for my twin, Jody- what is there to say? She probably already knows what I want to write or what I am thinking. (It is a twin thing-you wound not understand).

I would also like to thank Mr. C. Michael Houze. He is a very special person to me. I should know. We have been together for more than six years. Boy, time flies when you are having fun! I would just like to thank him for all of his support and love.

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I would also like to send out a few other special thank yous. I would like to thank Dr. Kent Guion for allowing me to use the equipment in the Human Performance Lab. A big thanks goes to Ashley Carter for her assistance with the organization and assistance of my data. I would like to thank all of my friends and fellow graduate assistance for their support and guidance through the thesis process as well as my entire graduate career. I would just like to mention a few names: Jay Bailey, Elaine Bryan, Ashley Carter, Dan Czech, Edie Ferguson, Jenn Gordon, Michael Houze, Jody Lloyd, and Matt Wilson.

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Abstract

The purpose of this investigation was to explore the effectiveness of walking and aerobics as a way of modifying body image apprehension and self-esteem of female college students. Participants from this study comprised 88 (25 African Americans and 63 Caucasians) students from a Southeastern university. The participants were administered the 9-item Social Physique Anxiety Scale (SPAS) (Martin, Rejeski, Leary, McAuley, & Bane, 1997) and the Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1979). Body composition, body weight, body height, and body mass index (BMI) were also evaluated. The participants performed in a 9-week walking or aerobics physical activity class. At the completion of the 9-weeks of activity were completed, the participants were re-evaluated on the questionnaires and anthropometric measures. Two way ANOVAs with repeated measures were used to analyze the information in order to assess the effects the two forms of exercise, race, and room position had on the pre-test and post-test evaluations of body weight, body height, body composition, the social physique anxiety, and self-esteem. The alpha level was set at $p=.05$. Results revealed no significant differences between class on the physiological or psychological variables. Additionally, race and aerobic room position analyzes did not show any significant differences with the physiological or psychological variables. However, there were main effects with the SPAS and RSES between the physical activity classes, race, and aerobics room positions. The participants' scores did decrease, even without the presence of physiological changes. In conclusion,

psychological variables can decrease without the positive changes of any physiological changes, such as a decrease in body weight, BMI, or body composition.

The Effects of Aerobics and Walking on Social Physique Anxiety and Self-Esteem of Female College Students

The world is shaped more and more by the images that surround us. The mass media has bombarded the public with the vision of the perfect body. This vision represents a slim, shapely looking individual. The media values thinness as an ideal body shape (Frederick & Shaw, 1994). The media is giving the public a representation of what it wants to see. With some individuals, it is unrealistic to conform to these standards. Individuals may experience pressure to achieve this thin body. Those who are unable to measure up to the standards may develop body image apprehensions and lower self-esteem (Fallon & Rozin, 1985). The pressure to adapt to this thin body appears to have a powerful impact on a person.

The researchers who initiated the work in body image were Secord and Jourard (1953). They believed that body image (how we picture our body) was related to an individual's attitude/esteem (positive or negative feelings). Their major conclusion was that there is a significant relationship between attitudes about the body and attitudes about the self, and that how we value our body is similar to how we see our self. They also concluded that low body image is associated with anxiety and insecurity.

Further research on body image by Tucker and Maxwell (1992) found that participation in different modes of physical activity was an effective way to enhance the feelings about the body. Balogun (1987) found there were improvements in female body

image after subjects were provided with feedback on their fitness level after performing fitness tests. Because physical conditioning could not have accounted for this result, it appears that information that reinforces one's capacities may influence body satisfaction.

Physical activity is also beneficial to the body and well-being of a person (Frederick & Shaw, 1994). However, physical activity is often performed in a setting where there are other participants or spectators. Within these settings, certain types of clothing are required, such as tights and leotards in aerobics classes. Individuals may feel uncomfortable in the tight-fitting clothes (Crawford & Eklund, 1994). Also, because of the settings and evaluations, individuals may feel more at ease exercising in the back of the aerobics room. The person may feel his/her body is not on display if exercising in the back of the room (Belling, 1993). This setting and clothing can provide for evaluation by others. Schlenker and Leary (1982) proposed that the inability to deal successfully with these evaluation situations in a social setting is a condition known as social anxiety.

Within these physical activity settings, the body can be scrutinized. A form of social anxiety, social physique anxiety (SPA), may develop. Social physique anxiety is the fear of negative evaluation of the body by others (Hart, Leary, and Rejeski,1989). The Social Physique Anxiety Scale (SPAS) was developed by Hart and colleagues (1989) to measure and quantify the degree of SPA. The researchers believed that body-related perception both promotes and discourages individuals from exercising due to the individual's lower self-esteem.

Lower self-esteem can affect the way individuals feel about their body, and more specifically, about themselves. Those with lower self-esteem are vulnerable to unfavorable

opinions. They have a greater likelihood to describe themselves as shy, less outgoing than those with high self-esteem. These individuals need self-enhancement (Rosenberg, 1989).

One way to acquire self-enhancement is through exercise. Exercise is often recommended for promoting enriched psychological health, such as raising self-esteem and lessening depression, tension, and anxieties (Brown, Wang, Ward, Ebbeling, Puleo, Benson, & Rippe, 1995; Lindeman, 1994). High self-esteem is important not only for an individual's well-being, but also for the overall quality of life.

Through the years researchers have tried to develop ways of identifying those with low self-esteem. Researchers have identified factors affecting self-esteem, such as race, gender, and age. Generally, African Americans, women, and younger individuals have lower levels of self-esteem than their counter parts (Lindeman, 1994; Middleton, 1972; & Rosenberg, 1989). Rosenberg (1989) tested the idea of self-esteem and applied it to social settings. He developed a scale to measure self-esteem known as the Rosenberg Self-Esteem Scale (RSES).

Low self-esteem and physical anxiety have been identified as problems in society. It may be beneficial to decrease body weight and body fat (Butts & Price, 1994) to reduce these problems of psyche. Perhaps one way to improve self-esteem and lower SPA is through the use of exercise (Bartlewski, Van Raalte, & Brewer, 1996). Exercise is be able to influence body image and self-esteem in a positive way.

It is apparent that research must be directed toward reducing the negative effects of SPA and improving self-esteem. Because exercise has been shown to improve both body image and self-esteem, it would seem beneficial to use two popular exercise

activities, walking and aerobics, as means of decreasing SPA and increasing self-esteem. It was the purpose of this experiment to explore the effectiveness of two forms of exercise as a way modifying body image apprehension and self-esteem of female college students.

Methods

Participants

Participants for this study comprised of 88 (25 African Americans and 63 Caucasians) students from a Southeastern university. The participants ranged in age from 18 to 27 years with a mean age of 20.45 (SD=±1.59). Forty-seven subjects participated in aerobics physical activity classes and 41 participated in walking physical activity classes. Prior to participation, informed consent was obtained from each participant. All procedures were approved by the University Institutional Review Board (IRB).

Instruments

Social Physique Anxiety Scale (SPAS)

The SPAS was developed as a 12-item inventory to assess the degree with which people are comfortable or uncomfortable when others evaluate their bodies (Hart, Leary, & Rejeski, 1989). Recently, questions have arisen whether the scale is unidimensional or multidimensional. Hence, 12-item inventory was reduced to a 9-item, unidimensional scale.

Hart and colleagues' original version of the SPAS was found to be a reliable and valid measure of SPA (McAuley & Burman, 1993). The SPAS registered high internal consistency with an alpha coefficient of .90. Test-retest reliability was shown to be r =.82 after eight weeks. McAuley and Burman (1993) established the validity of .87.

The new 9-item model of the SPAS has omitted three questions (questions 1, 2 , and 5) from the original scale. Researchers believed those three questions were the catalyst for proposing a misdirected multidimensional scale. The new model produced fit indices that reached conventional levels of acceptability. The researchers stated that elimination of the items did not compromise the reliability and validity of the measure. The internal consistency was established with an alpha of 0.89. The validity remained the same 0.87. The correlation between the original 12-item and the new 9-item scale was r = 0.98 (Martin, Rejeski, Leary, McAuley, & Bane, 1997). The participants are asked to indicate on a Likert-type scale how they categorize their feelings from 1 to 5, one representing very low SPA and 5 representing very high SPA. The scores are summed with higher scores indicating a higher level of SPA (See Appendix D).

Rosenberg Self-Esteem Scale (RSES)

The RSES is a global measure of self-esteem. The RSES assesses global self-esteem apart from specific contexts or dimensions, with the understanding that various evaluations of one's life are taken into account separately and weighed individually (Raymore, Godbey, & Crawford 1994).

The RSES is a 10-item scale, with five positive items and five negative items intermixed in order to avoid response bias. Participants rate each item on a four point scale (one is strongly agree and four is strongly disagree). A higher score indicates a more negative sense of self. The test-retest reported a range from .63 to .85 (Wylie, 1989; 1974). The internal consistency ranges from .72 to .87 was rated high with an alpha of .80

(Wylie, 1989; 1974). The validity was established at .90 (Wylie, 1989; 1974). (See Appendix D).

Anthropometric Measurements

Body Composition

The 3-site skinfold method was used to determine body composition of the Caucasian subjects. The anatomical landmarks for these sites are as follows: the tricep, the suprailiac, and the thigh. The $\sum 3$ sites was used to determine BD in Caucasian female participants (Jackson, Pollack, & Ward, 1980). The SkinGrabber Body Fat Program (V1.00 Fritz Bros. Inc., 1996) computer program aided the calculation of determining percent body fat for the Caucasian participants. The 7-site skinfold test was utilized to estimate the body composition of the African American particiants (Irwin, Ainsworth, Stolarczyk, & Heyward, 1998). The seven sites were as follows: the chest, subscapula, midaxilliary, suprailiac, abdomen, tricep, and the thigh. The $\sum 7$ site equation (Jackson et al., 1980) was used to predict body density (BD) and percent body fat/body composition for the African American participants.

The same experienced investigator took all measures were taken on the right side of the body. A minimum of two measurements, in circuit fashion, were taken at each site. If repeated measures varied by more than one mm, a third measure was taken. Harpenden skinfold calipers (County Technology, Inc., Gays Mills, WI) were used to measure the individual skinfolds (Hewyard & Stolarczyk, 1996).

Body Height

Body height was taken using a stadiometer. Each participant was instructed to remove her shoes and stand on the stadiometer's platform. The participant was to stand motionless, in order for the body weight to be evenly distributed between both feet. The arms hung down by the side with palms facing thighs. The participant had the heels together, touching the vertical board of the stadiometer. The feet were at a 60 degree angle to each other. The head was erect with eyes focused straight ahead. The researcher directed the participant to inhale deeply while the horizontal board of the stadiometer was lowered to the superior point of the head, compressing the hair. The measure was recorded to the nearest 1 cm (Heyward & Stolarczyk, 1996).

Body Weight

Body weight was determined using an electrical platform scale with participants in athletic shorts, t-shirt, and no shoes. The participant stood on the platform of the scale with body weight evenly distributed between the feet. The measurements were recorded to the nearest 0.1 kg (Heyward & Stolarczyk, 1996).

Body Mass Index (BMI)

Body Mass Index (BMI) was used as another means of comparing body composition. Body Mass Index is the ratio of body weight to height squared: BMI =kg/m^2. To calculate BMI, body weight was measured in kilograms and height was converted from centimeters to meters (Heyward & Stolarczyk, 1996).

Procedures

Recruitment

Participants were recruited by flyers (See Appendix G) randomly placed throughout the university. The participants were also recruited on the first day of physical activity classes. The instructor asked for female volunteers to participate in a study, which would evaluate the effects exercise has on self-esteem and body image apprehensions. Phone numbers of those who were willing to participate in the study, were obtained at that time. During the subsequent phone conversation, a meeting was arranged and the student was instructed to wear a t-shirt and athletic shorts and meet at the researchers' office.

Orientation

The first meeting began with a general overview/purpose of the study. The participant was again told about the requirements of her respective physical activity class. University attendance policy states that students must attend 80 percent of the class or they could miss only four days of class. If the participant was absent more than the required four classes, she was not allowed to participate in the study. Students were also informed of the proper attire for the activity class. The walking physical activity group was instructed to wear athletic shorts and t-shirts. The aerobics physical activity group was advised to wear spandex leotards, tank tops, etc. If the student did not dress appropriately for the class, the student would receive in absence for that day of class. Informed consent forms were signed at this time (See Appendix F). The RSES and the SPAS were then administered. Following the completion of the inventories, body composition, body weight, and body height were taken.

Training Program

Each physical activity class lasted for a duration of nine weeks and met two times per week. The walking physical activity classes consisted of approximately three to five minutes of slow paced walking for warming up followed by five minutes of static stretching. Each static stretch was held for fifteen seconds. The muscles stretched were the gastrocnemius, hamstring, quadriceps, soleus, tibialis anterior, inner thigh muscles, deltoids, biceps, and triceps (in random order). Each workout consisted of continuous aerobic walking exercise lasting 25 to 30 minutes. The workout was followed by a cool-down. The cool-down consisted of low intensity walking for a minimum of 2 minutes. The final step was repeating the preexercise stretches. Target heart rates were checked periodically to identify the intensity level of the participants. The participants were instructed to maintain 70-85 percent of their age predicted maximum heart rate.

The aerobics physical activity classes incorporated a brief warm up with light aerobic activity. The instructor began with lower and upper back stretches. From there, the instructor went to light aerobic dance steps, including step touches, grapevines, and heel curls. The stretching routine consisted of the inner thigh stretch, gastrocnemius stretch, standing quadriceps stretch, hamstring stretch, and a lower back stretch. The workout consisted of twenty five minutes of low to high aerobics, toning, or step. The cool-down consisted of doing lying hamstring stretches, outer thigh stretches, low back stretches, roll-ups, seated inner thigh stretch, cat back, standing lateral stretch, standing deltoid stretch, and finish with an inhalation and an exhalation. Target heart rates were

checked periodically to identify the intensity level of the participants. The participants were instructed to maintain 70-85 percent of their age predicted maximum heart rate.

Post-testing

After the last training session, the participant was required to arrange another appointment to record post test data. The RSES and SPAS were readministered. Once the inventories were completed, body composition, body weight, and body height were retaken. During this meeting, the participants were asked (in the aerobics class) if they preferred to be in the front of the room or in the back of the room. Each participant was thanked for participating in the study.

Statistical Analysis

Data analysis was conducted using Statistical Products and Service Solutions (SPSS) and JMP Statistical Discovery Software. Data were analyzed using descriptive statistics and 2-way ANOVAs with repeated measures, and Pearson correlations. Two way ANOVAs with repeated measures were used to analyze the information in order to assess the effects exercise, race, and room position had on the pre-test and post-test evaluations of weight, BMI, body composition, SPAS, and RSES. Pearson correlations were used to evaluate relationships between the variables. The alpha level was set at $p=.05$.

Results

For all statistical data, the alpha level was established at $p=.05$. Table 1 represents the physiological and psychological data for the walking and aerobics physical activity classes. More specifically, the tables summarize the means and standard deviations of the physical activity classes. A 2-way ANOVA with repeated measured was performed to analyze the information in order to assess the effects class had on the pre and post variables of body weight, BMI, body composition, SPAS, and RSES. The 2-way ANOVA demonstrated there was no interaction with both time and class. However, there was a time effect. Across both classes, there was a significant difference from pre to post SPAS and pre and post RSES ($p<.05$). The post SPAS and RSES scores decreased significantly. However, there was no significant difference with the physiological data: body composition, body weight, and BMI variables ($p>.05$).

Table 2 represents the means and standard deviations of the Caucasian's and African American's physiological and psychological data. The 2-way ANOVAs with repeated measures did not reveal any interactions between pre and post BMI with the two races. There was a time effect. Across the races, there was a decrease in BMI ($p<.05$). There was no presence of an interaction with races on body weight. However, there was a time effect ($p<.05$). Both races decreased in body weight. The test also revealed no interaction between the psychological data and races. There was a race effect on the

RSES and SPAS. The African Americans scored significantly lower on the SPAS and RSES.

Table 3 represent the means and standard deviations of the physiological and psychological data of the back and front position in the aerobics classes. A 2-way ANOVA with repeated measures was performed on the analyzes for the positions in the aerobics physical activity classes. There was no interaction between the positions and the tests. However, there was a time effect with the positions on the RSES ($p<.05$). The room positions had a slightly lower post scores on the RSES. There was also a time effect with room position and SPAS ($p<.05$). When comparing the pre and post SPAS there was a decrease in value with post SPAS on the positions of participation. There was no significance with the positions on body composition, body weight, and BMI ($p>0.05$).

There were a few significant correlations observed in the present study. The physiological variables of the physical activity classes were found to have high correlations (See Tables 4 and 5). Within the races, physiological variables were found to have high positive correlations (See Tables 6 and 7). The correlations of the aerobics room position was also evaluated (See Tables 8 and 9). The aerobics room position data had high positive correlations with the physiological variables. All other correlations were not found to be highly related.

Discussion

The purpose of this study was to explore the effectiveness of two forms of exercise as a way of modifying body image apprehension or low self-esteem of female college students. The results of this study did not fully support the research questions. It was hypothesized that the aerobics physical activity group would initially have higher scores on the psychological variables due to the tighter fitting clothing required for the class. Walking and aerobics physical activity classes were compared because the walking group was not required to wear tight fitting clothing to participate. Within the study, the walking physical activity group initially had a slightly higher score, however not significant, on the RSES and the SPAS than the aerobics physical activity group. These findings do not support the past research. Crawford and Eklund (1994) found participants preferred to exercise in an environment that de-emphasized the body (wearing t-shirts and shorts) rather than performing in an environment that emphasized the body (wearing tights and thong leotards). One such possible reason for the aerobics physical activity classes lower initial SPAS scores could be explained by Belling (1993). Belling indicated that high SPA females who participated in aerobics experienced greater enjoyment with exercise if they had less body weight, lower BMI, and preferred to participate more in group type activities. This could help to explain why the aerobics physical activity group SPAS scores were not significantly higher than the walking physical activity group. The aerobics physical activity group may have felt comfortable in the exercise setting. Also, the participants may have been satisfied with their body sizes (Crawford & Eklund, 1994).

A study by Eickhoff, Thorland, and Ansorge (1983) supports this reasoning. The researchers found evidence to suggest a change in the psychological scores may not occur between pre and post test. The researchers believed the lack of improvement or change following exercise may have been attributed to the relatively desirable psychological characteristics the participants displayed before the experiment began.

When comparing the initial RSES scores between the classes, there seemed to be similar type of findings discovered with the initial SPAS results. The mean scores of the walking physical activity class were slightly higher than the aerobics physical activity group. The hypothesis that the aerobics group would have initially higher RSES scores was not true. Research has shown a relationship between self-esteem and body image (Caruso& Gill, 1992). A reason to explain this could have been the comfort felt exercising in the physical activity class. The females in the aerobics physical activity group may have felt comfortable in the exercise environment and may have enjoyed the activity, which may have increased their self-esteem. Kamal and Blais (1995) confirmed a positive psychological response to exercise. The researchers found aerobics provides a supportive environment (nonthreatening or noncompetitive) but also builds on flexible and creative abilities i.e., the ability to move and to respond to music. They concluded that the aerobic environment may have offered a sufficient opportunity for the participant to feel better about themselves.

As stated previously, the aerobics and walking physical activity groups did not differ significantly in their psychological data. They also did not differ greatly in their physiological values. The means for the groups were very similar. It was believed that

those scoring higher on the psychological questionnaires would have higher physiological values. Past studies have indicated those individuals with greater amounts of weight and body composition were shown to have lower self-esteem and higher body image apprehensions than those with less amounts of body fat (Bartlewski et al., 1996; Caruso & Gill, 1992).

When comparing the SPAS scores, there was no significant difference found between the physical activity classes and SPA. It was hypothesized, in Research Questions 2 and 3, there would be a decrease in the SPAS after participating in both physical activity classes, and there would be a significant decrease in the SPAS with the aerobic physical activity classes. Both physical activity classes decreased their scores, however, the test could not verify which physical activity class decreased more significantly. One feasible reason could be that both physical activity groups could have felt comfortable in their physical activity classes. This reasoning is similar to the findings that were shown with the first research question. Perhaps, there were no feelings of competitiveness within the classes and each person participated to make themselves feel better (Frederick & Shaw, 1994).

Another possible reason there might not have been a significant change in the aerobics physical activity's SPAS scores may have been due to the intensity and the duration of the different physical activity classes. Past studies have shown that the amount of energy expended during exercise depends upon the intensity of the routine (Eickhoff et al., 1983). Some participants may not have reached their maximum heart rates (70 to 85% of age predicted maximum heart rate). The other reason could have been due to the

duration of the study. Other studies examining aerobics and walking programs have been longer in duration. Sheales' (1987) aerobic dance study was conducted over a 13-week period. Stoughton's (1992) walking study had the participants in a walking program for twelve weeks. Due to the shorter amount of time spent exercising, the participants may not have had the proper amount of time to see any psychological benefits between the two physical activity classes.

The present research findings are in contrast with past researchers discoveries. Bartlewski and colleagues (1996) found that females SPAS scores decreased when they were enrolled in physical activity classes. Evans (1983) also found exercise to help those with body image apprehensions.

When analyzing RSES scores, there was no significant difference found between the aerobics and walking physical activity group and RSES scores. It was hypothesized that there would be a decrease in the RSES scores after participating in the physical activity classes and there would be a significant decrease in the aerobic group's RSES scores compared to the walking physical activity group. Both physical activity classes did decrease their RSES scores. However, there was no statistically significant difference among the physical activity group's scores. Again, one possible explanation could be the differences in intensity level of the classes. The physical activity participants may not have been participating at the same intensity level (Caruso & Gill, 1992; Eickhoff et al., 1983). Although, each participant was asked to check her target heart rate, throughout the activity, this may not have been done properly. By exercising at their predicted target

heart rate, the physical activity classes should have been similar in nature with intensity levels.

Another feasible question which may help to explain the non-significance of the findings could again have been related to the duration of the study. Many researchers studying exercise and self-esteem have had studies lasting longer in duration than nine weeks. Brown et al. (1995) conducted a 16 week walking study . Bartlewski et al. (1995) performed an aerobics study that was 13 weeks. In contrast to these previous studies and the present study, two shorter duration studies did find significant improvement in self-esteem (Hilyer & Mitchell, 1979; Kamal & Blais, 1995). Kamal and Blais discovered that four weeks of aerobic dance did improve the participant's self-esteem. Hilyer and Mitchell's study only lasted for a total of 10 weeks, and the participants did see an improvement in global self-esteem.

Another theory may explain the lack of significant findings among the physical activity classes with RSES. Hilyer and Mitchell's (1979) stated that self-esteem enhancements may be experienced only by participants originally having lower self-esteem. Rosenberg (1989) also supported this statement.

Another explanation for the lack of significance was, perhaps, due to the lack of significant changes in physiological data. Body composition, body weight, and BMI values did not show a significant decrease in the physical activity groups. Trujillo (1983) had 35 college females involved in a 16-week running program, weight lifting program, or a control group (swimming, racquetball, and ice skating progams). Trujillo indicated both experimental groups showed significant increases in self-esteem. However, the control

group decreased in self-esteem. The researcher concluded the difference between the groups was due to the change in physiological variables. He suggested the decrease in self-esteem shown by the control group was due to lack of change in physiological values. The change would have suggested success.

The results of the present study also revealed no significant decrease in body composition, body weight, or BMI for both the aerobic and walking physical activity classes. It was hypothesized that there would be a decrease in body composition, BMI, and body weight for both physical activity groups. Again, the shorter duration of the present study could have resulted in a minimal amount of body composition, body weight, or BMI loss. The results are contradictory of past research. Palmer (1995) found a significant decrease in physiological values which were after an eight week walking program. During the first two weeks, participants walked for 20 minutes each session. Each week, thereafter, walking sessions increased by five minutes. Palmer believed the changes were most likely the direct result of a regular walking program.

The present study supported some of past research. Blessing and colleagues (1987) did not find any significant changes in body weight or body composition of females students participating in aerobic dance program. Longer duration studies showed better responses with change in physiological data. Williams and Morton (1986) revealed a significant change in body composition following 12 weeks of aerobics. Schimmoeller's (1990) 17 week walking study also showed a longer duration study had improvements in

the physiological data. The participants had a significant decrease in body weight and body composition in the obese females.

Although these results did not support the research questions, many interesting significant findings emerged. Another variable, race was added (African Americans and Caucasians). Initially, the African Americans had lower scores, however not significant, on both the pre SPAS and RSES. The African Americans also had decreased the RSES and SPAS scores indicating they had higher self-esteem and less SPA.

It has been assumed for many decades that African Americans have lower self-esteem than Caucasians (Rosenberg, 1979) because of past disadvantageous social conditions. The facts, however, are otherwise, at least among school populations. Researchers have found African Americans to have higher self-esteem (Powel & Fuller, 1973). The researchers concluded African Americans had higher self-esteem and differed usually when class, IQ, and family structure were controlled. Middleton (1972) showed adult African American's self-esteem to be lower than Caucasians, but when socioeconomic variables were controlled, to be significantly higher. More research is needed concerning the SPA.

The physiological data (body composition, body weight, and BMI) did show some significant differences between the races. The data showed the African Americans did have higher percentage of body fat, body weight, and BMI. As past research has shown, physiological values are seen differently with the races. African Americans have greater

amounts body fat due to the greater skeletal muscle mass, bone mineral mass, and bone density than Caucasians (Nelson et al., 1991).

An additional factor analyzed was the preference of room position in the aerobics physical activity class. The analyzes looked at the significance of the room position compared with the physiological and psychological variables. In the present study, there was no statistical significance with room position and all variables. These findings conflict with the research of Belling. Belling (1993) performed a study investigating SPA, body weight, BMI, and room position preference. The researcher concluded the females with higher SPA experienced less enjoyment in the physical activity class, had higher body weight, and higher BMI. Also, these participants preferred to participate in solo type activities and wanted to participate in the back of the room. The higher scoring SPAS females felt more comfortable in the back of the room where their bodies had less of an opportunity to be evaluated by others. It would seem logical that those individuals with higher scoring SPAS and RSES or greater body weight would have wanted to participate in the back of the room. However, this was not the case in the present study.

For each class, low positive correlations were found between SPAS scores and the physiological variables. This was also true for the RSES scores and the physiological variables. These findings are in conflict with past correlation research with SPAS and RSES. Crawford and Eklund (1994) found that, similar to Hart et al. (1989), SPA was positively associated with body composition. Wright and Whitehead (1987) proposed that negative perceptions related to weight are closely tied to both the body and self-esteem. Secord and Jourard (1953) found those individuals satisfied with their bodies tended to

have higher self-esteem than those who were dissatisfied with their bodies. Secord and Jourard's conclusion had a relation in the present study. With both physical activity classes, the RSES and SPAS scores had moderate to high correlation. The physiological data also had high correlations with the classes.

Race correlations had similar results to the class correlations. The African American and Caucasians had low positive correlations with the physiological variables. There is conflicting evidence stating who has higher levels of self-esteem. For all races, the physiological data had high positive correlation with the other physiological data and the psychological variables were highly correlated with one another.

Results on room position were interesting. The back of the room position had high positive correlations with physiological variables, SPAS scores, and RSES scores. Belling (1994) discovered those who felt uncomfortable with their body preferred to exercise in the back of the aerobics room. The psychological variables had a moderate to positive relationship. The front of the room position had low positive correlations with RSES and SPAS scores.

Evidence suggest that psychological changes accompanying regular physical activity may be as important to well-being as physiological changes in bodily functions. No matter the length of time, physical activity is important. Short-term exercise has resulted in a decrease in state anxiety in both high and low anxious people (Morgan, 1976). State anxiety refers to the anxiety at a particular moment ("how I feel at this moment") (Speilberg, 1966) . The reduction in this anxiety has been consistently observed for those scoring low to high on anxiety scales. These reductions have usually been

brief/acute and the effects are seen for two to five hours (Morgan, 1985). Evidence suggests that exercise reduces state anxiety because it may distract the attention from the anxiety-provoking thoughts or it may compete with the perception of anxiety symptoms (Dishman, 1986; Morgan, 1976).

It has also been discovered that chronic physical activity, which lasts 6 to 12 weeks, tends to decrease trait anxiety (Morgan, 1985). Trait anxiety is described as the response to a situation with different levels of state anxiety due to a predisposition about the situation (Speilberg, 1966). Trait anxiety can best be described as "how I feel in general." Studies of the acute exercise effects on self-esteem are too limited (Sonstroem, 1984), but it appears self-esteem is relatively stable rather than momentary. Thus, measurable changes with exercise are likely to be seen after prolonged bouts of exercise. Perhaps both short-term and long-term physical activity can help decrease body image anxieties and improve self-esteem. Research suggests that regular exercise can have a positive effect on all aspects of life-physical and psychological.

There is a negative aspect to exercise, especially for those with low self-esteem and body image problems. Eating disorders are becoming increasing common in exercise settings (Frederick & Shaw, 1994). The fear of negative evaluation can become so overwhelming that it can create high levels of anxiety or feelings of low self-esteem. When these problems involve the personal judgement of the body and feelings of inadequacy can develop. These feelings of inadequacy can lead to body distortions, such as anorexia and bulimia. Johnson, Diehl, Petrie, and Rogers (1995) found SPA was associated with eating disorders. Another group of researchers (Cox, Lantz, & Mayhew,

1997) wanted to investigate the degree gender, family history, and athletic status could predict eating disorder behavior. When comparing the eating behavior of athletes and non-athletes, the researchers concluded that there was no significant difference between the two groups.

Another study of eating disorders was performed by Frederick and Morrison (1998). These researchers found that eating disorders may begin with high scores on the SPAS. They believed that further research is need to identify early symptoms and later eating disorders.

Another well-recognized trait of those with eating disorders is low self-esteem. These individuals may have a heightened self-awareness and experience dissatisfaction with the body (Lindeman, 1994). One such study investigated exercise with self-esteem and eating disorders (Guthrie, 1997). The researcher's participants performed seido karate, and due to the participation in the activity, the participants saw improvements in self-esteem. The martial arts class was seen as a way to recover from eating disorders. Petrie (1994) studied gymnasts and their likelihood of developing eating disorders. Gymnasts with low self-esteem were found to more likely experience eating disorders.

Since research of SPA and physical activity is only in the early stages, there are many areas of investigation needed. For example, future research could focus on the 9-item SPAS in relation to the 12-item SPAS. Research could further question the validity and reliability of the newly formed 9-item questionnaire. Questions were raised with the 9-item scale because several participants in the present study showed some confusion about the meaning of some of the questions. The participants needed further instructions

from the researcher. Researchers could inquire whether the questions should have been discarded or should the questionnaire be completely reexamined.

Future research with the SPAS should deal with an investigation of the relationship between the variables, race and age, and SPAS. Currently, there is no data suggesting which race experiences more SPA. Also, there is very limited research has examined the effect age has on SPA. Lantz et al. (1997) found older individuals to experience less SPA than younger, less experienced individuals.

Future researcher may also want to investigate a means of identifying individuals in physical activity classes with high levels of SPA and low self-esteem and try to implement a series of interventions. Fortunately, a way to help those with eating disorders has been shown with the karate class (Gutherie, 1997). However, some areas are lacking--many universities and colleges have not implemented eating disorder sessions within the physical activity protocols. Past studies have shown those with high SPA or low self-esteem are more likely to develop eating disorders or show tendencies than those who do not experiences low self-esteem or high SPA (Cox et al., 1997; Diehl et al., 1998; & Frederick & Morrison, 1998). A powerful means of intervention could be implementing eating disorder intervention into the physical activity curriculum. These sessions may be a deterrent of this ill-fated behavior. Again, the mere physical movement of exercise has been repeatedly shown to increase self-esteem and decrease SPA. The lower the SPA and the higher the self-esteem, the "better off" an individual is in life.

In conclusion, it was the purpose of the study to explore the effectiveness of exercise in modifying body image apprehensions and problems in self-esteem of college-

aged females. Unfortunately, many of the research questions did not stand true. However, the current study did have some interesting findings. There were no interactions with the psychological or physiological variables, but there were some main effects. Overall, the physical activity groups' and races' SPA and self-esteem improved without the presence of significant physiological changes.

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Table 1

Means and Standard Deviations (SD) Data for the Physical Activity Classes

	Walking (N=41)		Aerobics (N=47)	
	Pre test	**Post test**	**Pre test**	**Post test**
Type of Test	**M(±SD)**	**M(±SD)**	**M(±SD)**	**M(±SD)**
BC[1]	23.50(±6.03)	23.41(±5.77)	23.30(±6.00)	22.26(±6.18)
BW[2]	63.60(±12.43)	63.50(±12.43)	62.80(±14.75)	63.12(±14.81)
BMI[3]	23.74(±4.54)	23.71(±4.57)	23.58(±5.50)	23.71(±5.25)
BH[4]	163.24(±5.96)	163.24(±5.96)	163.76(±6.82)	163.76(±6.82)
SPAS[5]	27.15(±8.20)	25.29(±7.56)	26.49(±8.39)	23.98(±7.88)
RSES[6]	18.12(±4.23)	17.20(±4.88)	17.46(±4.29)	16.00(±4.66)

Note: 1 = Body Composition (%)
2 = Body weight (kg)

3 = Body Mass Index (kg/m^2)

4 = Body Height (cm)

5 = Social Physique Anxiety Scale (points)

6 = Rosenberg Self-esteem Scale (points)

Table 2

Means and Standard Deviations (SD) Data for Race

	Caucasians (N=63)		African American (N=25)	
	Pre test	Post test	Pre test	Post test
Type of Test	**M(±SD)**	**M(±SD)**	**M(±SD)**	**M(±SD)**
BC_1	22.12(±5.41)	22.11(±5.54)	24.76(±7.25)	24.58(±6.95)
BW_2	60.58(±18.84)	60.76(±10.33)	70.13(±18.84)	70.04(±18.84)
BMI_3	22.63(±3.78)	22.70(±3.87)	26.26(±6.88)	26.22(±6.87)
BH_4	163.72(±6.13)	163.72(±6.13)	163.88(±6.95)	163.88(±6.95)
$SPAS_4$	27.49(±7.29)	25.22(±7.18)	25.21(±10.48)	23.13(±9.05)
$RSES_5$	18.67(±3.96)	17.47(±4.78)	15.41(±4.22)	14.13(±4.03)

Note: 1 = Body Composition (%)
2 = Body weight (kg)

3 = Body Mass Index (kg/m^2)

4 = Body Height (cm)

5 = Social Physique Anxiety Scale (points)

6 = Rosenberg Self-esteem Scale (points)

Table 3
Means and Standard Deviations (SD) Data for Room Position in the Aerobics Physical Activity Class

	Back of the Room (N=11)		Front of the Room (N=36)	
	Pre test	**Post test**	**Pre test**	**Post test**
Type of Test	**M(±SD)**	**M(±SD)**	**M(±SD)**	**M(±SD)**
BC_1	25.67(±5.76)	24.99(±5.57)	21.27(±5.76)	21.43(±6.18)
BW_2	67.88(±16.52)	68.07(±15.89)	61.24(±14.04)	61.61(±14.35)
BMI_3	25.57(±6.37)	25.65(±6.15)	22.98(±5.18)	23.11(±5.27)
BH_4	163.00(±4.32	163.00(±4.32)	163.32(±6.43)	163.32(±6.43)
$SPAS_4$	28.64(±8.20)	25.00(±9.40)	25.83(±8.45)	23.67(±7.48)
$RSES_5$	19.00(±5.39)	18.73(±6.90)	16.92(±3.85)	15.17(±3.44)

Note: 1 = Body Composition (%)
2 = Body weight (kg)

3 = Body Mass Index (kg/m^2)

4 = Body Height (cm)

5 = Social Physique Anxiety Scale (points)

6 = Rosenberg Self-esteem Scale (points)

Table 4

Correlations of the Aerobics Physical Activity Classes

	PreBC	PostBC	PreBW	PostBW	PreBMI	PostBMI	PreSPAS	PostSPAS	PreRSES	PostRSES
PreBC	1.00	.974	.868	.859	.941	.904	.475	.376	.146	.059
PostBC	.974	1.00	.840	.833	.894	.887	.458	.374	.165	.070
PreBW	.868	.840	1.00	.966	.950	.946	*.367	*.340	.077	-.001
Post BW	.859	.833	.996	1.00	.946	.950	.377	*.350	.106	.015
PreBMI	.914	.894	.950	.946	1.00	.996	.442	.429	.088	.032
PostBMI	.904	.887	.946	.950	.996	1.00	.452	.438	.116	.047
PreSPAS	.475	.458	*.367	.377	.442	.452	1.00	.823	.625	.495
PostSPAS	.376	.374	*.340	*.350	.429	.438	.823	1.00	1.00	.523
PreRSES	.146	.165	.077	.106	.088	.116	.625	.626	1.00	.751
PostRSES	.059	.070	-.001	.015	.032	.047	.495	.523	.751	1.00

Note: * significant at $p<.05$

Table 5

Correlations of the Walking Physical Activity Classes

	PreBC	PostBC	PreBW	PostBW	PreBMI	PostBMI	PreSPAS	PostSPAS	PreRSES	PostRSES
PreBC	1.00	.966	.818	.817	.836	.822	.277	.256	.016	-.061
PostBC	.966	1.00	.822	.818	.811	.792	.307	.303	.056	-.027
PreBW	.818	.822	1.00	.995	.903	.901	.486	.483	.106	.109
Post BW	.817	.818	.995	1.00	.903	.910	.463	.459	.104	.101
PreBMI	.836	.811	.903	.903	1.00	.992	.272	.244	-.089	-.118
PostBMI	.822	.792	.901	.910	.992	1.00	.265	.244	.084	-.115
PreSPAS	.277	.307	.486	.463	.272	.265	1.00	.812	.536	.480
PostSPAS	.256	.303	.483	.459	.244	.244	.812	1.00	.612	.663
PreRSES	.016	.056	.106	.104	-.089	-.084	.536	.612	1.00	.813
PostRSES	-.061	-.027	.109	.101	-.118	-.115	.480	.663	.813	1.00

Note: * significant at $p<.05$

Table 6

Correlations of the Caucasians

	PreBC	PostBC	PreBW	PostBW	PreBMI	PostBMI	PreSPAS	PostSPAS	PreRSES	PostRSES
PreBC	1.00	.962	.822	.818	.859	.852	.521	.374	.275	.095
PostBC	.962	1.00	.815	.807	.846	.835	.560	.446	.305	.135
PreBW	.822	.815	1.00	.994	.892	.883	.576	.502	.278	.178
PostBW	.818	.807	.994	1.00	.891	.895	.549	.479	.273	.174
PreBMI	.859	.846	.892	.891	1.00	.994	.553	.447	.214	.078
PostBMI	.852	.835	.883	.895	.994	1.00	.526	.424	.209	.075
PreSPAS	.521	.560	.576	.549	.553	.526	1.00	.775	.537	.400
PostSPAS	.374	.446	.502	.479	.447	.424	.775	1.00	.595	.531
PreRSES	.275	.305	.278	.273	.214	.209	.537	.595	1.00	.789
PostRSES	.095	.135	.178	.174	.078	.075	.400	.531	.789	1.00

Note: * significant at $p<.05$

Table 7

Correlations of the African Americans

	PreBC	PostBC	PreBW	PostBW	PreBMI	PostBMI	PreSPAS	PostSPAS	PreRSES	PostRSES
PreBC	1.00	.981	.878	.863	.912	.893	.290	.346	-.006	.051
PostBC	.981	1.00	.875	.865	.902	.885	.235	.273	.002	.017
PreBW	.878	.875	1.00	.996	.951	.950	*.400	*.441	.162	.154
PostBW	.863	.865	.996	1.00	.948	.954	*.411	*.448	.198	.162
PreBMI	.912	.902	.951	.948	1.00	.993	.335	*.407	.065	.092
PostBMI	.893	.885	.950	.954	.993	1.00	.364	*.440	.010	.116
PreSPAS	.290	.235	*.400	*.411	.335	.364	1.00	.878	.670	.682
PostSPAS	.346	.273	*.441	*.448	*.407	*.440	.878	1.00	.677	.751
PreRSES	-.006	.002	.162	.198	.065	.110	.670	.677	1.00	.872
PostRSES	.051	.017	.154	.162	.092	.116	.682	.751	.672	1.00

Note: * significant at $p<.05$

Table 8

Correlations for the Back of the Room Position in the Aerobics Physical Activity Classes

	PreBC	PostBC	PreBW	PostBW	PreBMI	PostBMI	PreSPAS	PostSPAS	PreRSES	PostRSES
PreBC	1.00	.960	.972	.973	.970	.967	.413	.436	.051	.024
PostBC	.960	1.00	.947	.966	.927	.942	.364	.399	.137	.068
PreBW	.972	.947	1.00	.997	.980	.973	.341	.362	.027	.002
PostBW	.973	.966	.997	1.00	.979	.978	.341	.373	.059	.031
PreBMI	.970	.927	.980	.979	1.00	.997	.361	.403	-.019	.044
PostBMI	.967	.942	.973	.978	.997	1.00	.361	.414	.009	.075
PreSPAS	.413	.364	.341	.341	.361	.361	1.00	.910	*.616	*.689
PostSPAS	.436	.399	.362	.373	.403	.414	.910	1.00	*.693	.778
PreRSES	.051	.137	.027	.059	-.019	.009	*.616	*.693	1.00	.834
PostRSES	.024	.068	.002	.031	.044	.075	*.689	.778	.834	1.00

Note: * significant at $p<.05$

Table 9

Correlations for the Front of the Room Position in the Aerobics Physical Activity Classes

	PreBC	PostBC	PreBW	PostBW	PreBMI	PostBMI	PreSPAS	PostSPAS	PreRSES	PostRSES
PreBC	1.00	.979	.835	.823	.900	.877	.471	* .353	.103	-.094
PostBC	.979	1.00	.806	.791	.888	.872	.460	*.364	.117	-.054
PreBW	.835	.806	1.00	.996	.935	.932	*.354	.322	.044	-.121
PostBW	.823	.791	.996	1.00	.931	.937	.368	.332	.075	-.104
PreBMI	.900	.888	.935	.931	1.00	.996	.452	.434	.081	-.096
PostBMI	.887	.872	.932	.937	.996	1.00	.463	.442	.111	-.082
PreSPAS	.471	.460	*.354	*.368	.452	.463	1.00	.800	.626	*.408
PostSPAS	*.353	*.364	.322	*.332	.434	.442	.800	1.00	.593	* .376
PreRSES	.103	.117	.044	.075	.081	.111	.626	.593	1.00	.684
PostRSES	-.094	-.054	-.121	-.104	-.096	-.082	.408	.376	.684	1.00

Note: * significant at $p<.05$

APPENDICES

A: Research Questions

B: Delimitations, Limitations, and Assumptions

C: Definition of Terms

D: Instruments

E: Extended Review of Literature

F: Informed Consent

G: Flyer

Appendix A : Research Questions

Statement of the Purpose

The purpose of this study was to explore the effectiveness of two forms of exercise in modifying body image apprehension and self-esteem of female college students. It was important to establish if there was a significant relationship between psychological and physiological changes. These psychological changes allowed the researcher to verify if the participant possessed any apprehension concerning other people's perception of the participant's body. The other psychological changes examined were done in order to determine if the individual experiences low or high self-esteem. In physiological changes, the differences were determined if the participant had a reduction in body weight, body composition, or BMI due to the physical activity.

Research Questions

1. The aerobics group will initially have higher levels of SPA and RSES due to the required tighter fitting apparel.

2. There will be a decrease in SPAS scores after participating in the aerobics and walking physical activity classes.

3. There will be a significant decrease in the post SPAS scores among the aerobics group as compared to the walking group.

4. There will be a decrease in the RSES scores after participating in the aerobics and walking physical activity classes.

5. There will be a significant decrease in the post RSES scores among the aerobics group as compared to the walking group.

6. There will be a decrease in body composition among the groups after participating in the walking and aerobics activity classes.

7. There will be a decrease in weight among the groups after participating in the walking or aerobics activity classes.

8. There will be a decrease in BMI among the groups after participating in the walking or aerobics activity classes.

Significance of the Study

Body image, dieting, and weight are major concerns for many female college aged students. The fear of negative evaluation by others may become an overwhelming obstacle, which can create a high level of anxiety or lower feelings of self-worth. When these problems involve personal judgements of one's body, SPA and a decrease in self-esteem can be the results and may lead to feelings of inadequacy, failure, or worthlessness. These inadequacies can lead to distortions of the body image, such as anorexia and bulimia. Hopefully, by showing to an individual that it is natural to have apprehension about the body, they will understand there is little difference from the average person.

Appendix B: Delimitations, Limitations, and Assumptions

Delimitations

1. The female sample was college ages subjects.

2. The sample was from only one southeastern university.

3. There was only a 9-weeks training period.

4. Self-esteem changes were measured by RSES.

5. Body image changes were assessed by the SPAS.

Limitations

1. There were no strict control over dietary or physical activity levels except to the request that they maintain their normal regimes.

2. With using the skinfold method, there is always a three to five percent error rate with the procedure.

3. The results of the study may be generalized only to women of the same age groups and races as those who were assessed.

4. Participants monitoring their own target heart rates (intensity).

5. There was no control for socioeconomic status of the participants.

6. There was no randomization.

Assumptions

1. It was assumed that all participants would give maximum effort in the activity classes.

2. It was assumed that all participants will answer truthfully on the SPAS and RSES.

Appendix C: Definition of Terms

Definition of Terms

1. Body image- The picture of our body which we have developed in out mind (Schilder, 1935).

2. Self-esteem- A reference to an individual's position and feelings about oneself (Caruso & Gill, 1992). Self-esteem can be characterized as "how I feel about how I see myself."

3. Social anxiety- The anxiety one may experience when people doubt their ability to make desired impressions on others (Schlenker & leary, 1982).

4. Social physique anxiety- The anxiety people experience in response to others evaluations of their body (Hart et al., 1989).

5. State anxiety- It is a temporary emotional state characterized by apprehensions and tension at a particular moment. State anxiety can be characterized as "how I feel at this moment," (Speilberger, 1966).

6. Trait anxiety- It is a response to a situation with different levels of state anxiety due to a predisposition about the situation. Trait anxiety can be characterized as "how I feel in general," (Speilberger, 1966).

Appendix D: Instrumentations

The Social Physique Anxiety Scale

Please read each item and then circle the number which best characterizes you.

1. I wish I were not so uptight about my body.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

2. There are times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

3. Unattractive features of my physique/figure make me nervous in certain social settings.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

4. In the presence of others, I feel apprehensive about my physique/figure.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

5. I am comfortable with how fit my body appears to others.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

6. It would make me uncomfortable to know others were evaluating my physique/figure.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

7. When it comes to displaying my physique/figure to others, I am a shy person.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

8. I usually feel relaxed when it is obvious that others are looking at my physique/figure.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

9. When in a bathing suit, I often feel nervous about the shape of my body.
   1-Not at all
   2-Slightly
   3-Moderately
   4-Very
   5-Extremely

The Rosenberg Self-Esteem Scale

Please read each item and then circle the number which best characterizes you.

1. I feel that I am a person of worth, at least on an equal plane with others.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

2. I feel that I have a number of good qualities.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

3. All in all, I am incline to feel that I am a failure.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

4. I am able to do things as well as most other people.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

5. I feel that I do not have much to be proud of.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

6. I take a positive attitude about myself.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

7. On the whole I am satisfied with myself.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

8. I wish I could have more respect for myself.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

9. I certainly feel useless at times.
   1-Strongly agree
   2-Agree
   3-Disagree
   4-Strongly disagree

10. At times, I think I am no good at all.
    1-Strongly agree
    2-Agree
    3-Disagree
    4-Strongly disagree

Appendix E: Extended Review of Literature

Social Physique Anxiety

Social Physique Anxiety (SPA) was defined by Hart et al. (1989) as anxiety that people experience in response to others evaluations of their body. Through the evolution of SPA, Hart et al. (1989) developed a unidimensional, 12-item scale. The scale designed was the Social Physique Anxiety Scale (SPAS). The SPAS scores are correlated with measure of social anxiety and self-esteem. The researchers discovered that women who scored high on the SPAS experience more distress when confronted within a fitness-related evaluation than those who scored lower on the questionnaire. These women reported more negative thoughts about their body during testing. The researchers also discovered SPA was positively related to percent body fat. Those who scored low on the SPAS felt little discomfort in evaluation (Hart et el.).

McAuley and Burman (1993) demonstrated the construct validity by a significant inverse relationship between two aspects of physical efficacy (perceived physical ability and physical self-presentation confidence) and the degree of SPA. Criterion validity was confirmed by the reaction of the female who recorded their feelings during the fitness evaluation. Those who scored high on the SPA reported more negative thoughts about their body's appearance as compared to those who scored low on SPAS. The 12-item questionnaire proved to be a measure worthy of use within the sport world. McAuley and Burman (1993) also wanted to test the validity of the 12-item questionnaire. They cross validated the SPAS with adolescent female gymnasts using perceived physical ability and physical self-presentation confidence. The type of clothing an individual wears, the environment one works in, the time of the work out, or whether an individual works solo

or with a group were all factors, which contributed to presenting a positive image to others. On the average, these gymnasts had moderate levels of SPAS, higher perceived physical ability, moderate physical self-presentation, and had higher levels of SPA than those not at elite levels.

Reel and Gill (1996) examined the effect cheerleading had on SPA and eating disorders using the SPAS and the Eating Disorder Inventory (EDI). Their findings suggested that the cheerleaders were expected to perform under pressures in revealing team uniforms with certain weight restrictions and were more likely to develop eating disorders. The study revealed a strong relationship between the SPAS and body dissatisfaction scores and eating behaviors. This suggested that body apprehension was an important predictor of exhibiting eating disorders. The research also suggested in general cheerleaders had high levels of SPA because of body image concerns and keeping up with expected criteria of cheerleaders.

The SPAS has been useful in a number of research areas in physical activity settings. Spink (1992) examined the relationship of SPA to location of participating in physical activity. The result indicated that higher scores on the SPAS were reported by individuals who preferred to exercise in private rather than publically. Likewise, those in the lower scoring group showed an interest in participating in public rather than participating in private. The research showed that perhaps those with high SPA preferred exercise settings that provided less opportunity for their physique to be evaluated.

Further research concerning exercise settings was performed by Crawford and Eklund (1994). They investigated how SPA may be associate with reasons to exercise and

attitudes toward exercise settings. Female college students were asked to view two videos. One video emphasized tight fitting attire (tights and thong leotards) and the other video de-emphasized the physique (shorts and t-shirts). The participants then completed the SPAS, body satisfaction and weight satisfaction instruments, a reason for exercise inventory, and an inventory that discusses the exercise setting. The results revealed that the average participant thought her ideal size was two sizes smaller than their current size, would like to lose 9% of their body weight, and preferred to exercise in an environment that de-emphasized the body. The researchers also indicated that SPA was negatively associated with the setting emphasizing the body and positively related the setting minimizing the body. The most common reasons stated for exercising were concerned with body tone, fitness, and physical attractiveness, which were significant predictors of SPA. The females were more interested in self-presentation than with their own health, enjoyment, mood enhancement, or fitness. Crawford and Eklund (1994) concluded that exercise attire and self presentation may be useful in future research in helping understand exercise behaviors and habits.

Frederick and Morrison (1996) performed an experiment on 326 university fitness-center participants who self-reported their exercise habits. The findings indicated that scores on the SPAS were related to various characteristics of participants' measures of exercise adherence, motivation, personality, and emotion. The SPAS scores were higher for females. The females were drawn to specific types of activities involving fitness rather than individual or team sports. The researchers drew several conclusions, including, individuals with high anxiety scores adhered to exercise more than the lower scoring

SPAS individuals (based on the numbers of days per week spent exercising). Also, individuals with high SPAS scores reported higher extrinsic motivation (pressure from others, fitness, and appearance motives) than those with lower scores. These individuals were more focused on appearance motives and placed a great deal of external pressure on themselves to engage in exercise. Another conclusion was that individuals with high scores were very conscious of their bodies, related to this were lower scores on physical competence. Combined, these variables could easily create a heightened state of anxiety about one's self. Overall, having a high score on the SPAS represented a less than optimal state for exercise participation. The individuals engaged in activity because of extrinsic reason and were overly concerned with their body's appearance.

Another study looking at predictors of SPA was by Martin, Engels, Wirth, and Smith (1997). Self-esteem, body esteem, public body consciousness, and percent body fat were assessed with figure skating, soccer, and gymnastics. Self-esteem was found to be the best predictor. Percent body fat did not significantly contribute to SPA, as was expected.

This same idea was also explored by Lantz, Hardy, Ainsworth, and Barbara (1997). Their goal was to determine the relationship between SPA and exercise behaviors and to determine the moderating effects of gender, age, and depression on SPA. The findings showed that there may be an influence between SPA and exercise behavior, whereby individuals with high levels of SPA may be less likely to engage in physical activity in situations where their bodies may be evaluated negatively. The individuals who did not become uncomfortable with the evaluation appeared not to be concerned with

their bodies being scrutinized. However, those who were uncomfortable with having their bodies evaluated may not have been interested in exercising in that environment. The participants did not want to present a negative self-image. Exercise behaviors were the lowest in older females with higher levels of SPA.

Other results indicated that females do suffer from higher levels of SPA (Belling, 1993). The study indicated that high SPA females experienced less enjoyment with physical activity, had higher body weight, higher body mass index (BMI), and weight discrepancy scores, and had preference for and participated more in solo type activities. The researcher theorized that these female subjects were dissatisfied with their body size and were intimidated about being viewed for their appearance. With regard to exercise position within aerobics class, high SPA females preferred a position in the back of the room while 20% of low SPA females preferred a position up front near the instructor.

Social Physique Anxiety Scale research also has been useful in finding means to decrease SPA. In one of two studies which explored the effects exercise has on SPA, Bartlewski et al. (1996) researched the effectiveness of exercise in reducing body anxiety concerns. Two types of groups were analyzed: an aerobic exercise course at a university and a social psychology course at the same university. The females reported their SPA and body esteem. For the females in the aerobic class, SPA decreased and body esteem increased. Social Physique Anxiety and body-esteem did not change significantly in the social psychology class. Due to the familiarity of the exercise setting, the females in the physical activity classes may have a had a positive change in SPA and self-esteem. These changes may have led to alterations in the individual's body concerns regardless of her

body shape. The researchers believed that the familiarity with the exercise setting was one of the main components in reducing exercise anxiety.

Another possibility could have been that the changes in SPA and body esteem occurred mainly as a result of changes in various body measurements. McAuley, Bane, Rudolph, and Lox (1995) found involvement in exercise classes to be associated with changes in body shape and SPA. However, Blessing, Wilson, Puckett, and Ford (1987) did not find any significant changes in the body weight or body composition of female students participating in aerobic classes.

Finally, the SPAS may act as a tool for fitness leaders to identify individuals with SPA. Belling's (1992) research indicated that females with high SPA were not as likely to withdraw from exercise as high SPA males. Males demonstrated that they were more positively motivated to become physically active for the self-presentation (body tone, weight control, and physical attractiveness) in order to be attractive to the opposite sex. In their desire to attain their goal, the females were less likely to experience the same levels of enjoyment during activity than the low scoring SPA group. The females experienced anxiety over body dissatisfaction and were more likely to exercise in the back of the room. This may have had implications for exercise adherence.

Recently, however, the psychometric integrity of the SPA has been under question. Eklund, Mack, and Hurt (1996) proposed that the SPAS was a multidimensional scale. Eklund and his colleagues argued that the SPAS consisted of a hierarchal, 2-factor model. The first factor represented the construct of physique presentation comfort (PC) and the second factor represented expectations of negative physique evaluation (NE). Petrie,

Diehl, Rogers, and Johnson (1996) presented data of the construct validity of this 2-factor, multidimensional model and the original version of the 12-item, unidimensional version of the SPAS in the context of concerns about body shape, physical self-esteem, and body mass index.

In 1997, Martin, Rejeski, Leary, McAulley, and Bane argued the cases of Eklund et al (1996) and Petrie et al. (1996). Martin et al. (1996) contested the ideas of a multidimensional hierarchal model and believed the SPAS was designed only as a unidimensional model. Eklund et. (1996) and Petrie et al. (1996) studies based their findings on the information discussed by McAuley and Burman (1993). Eklund et al. (1996) and Petrie et al. believed the 12-item unidimensional model could be improved by adding or deleting scale items. Misdirected hierarchal models were proposed. Eklund et al. (1996) failed to demonstrate the content validity of the PC dimension. He and his colleagues failed to report the cross-loadings of the PC items with the NE items. They also failed to demonstrate validity for the 2-dimensional model. They reported that the two factors were substantially correlated. However, the site of the correlation was not stated. Petrie et al. (1996) did present data on the construct validity of their thoughts of the 2-dimensional model and the original version of the 12-item model scale. Statistically, the data presented did not actually suggest discrimitive validity of the two factors. Without discrimitive validity of the 2-dimensional model, an unidimensional approach should be preferred.

Martin et al. (1997) study discovered that the SPAS could cross-load scale items and maintain reliability and validity of the SPAS. The reduction of the SPAS to nine items

enhanced the psychometric appearance of the scale (Questions 1, 2, and 5 were deleted). The correlation between the 9-item and the 12-item scale was shown to be .98. The unidimensional model produced fit indices, which had acceptable levels greater than .90 across a variety of samples. Martin et al. (1997) expressed the close relationship between the 9-item and the 12-item was closely related to the concept of the SPAS and the scale was more clearly unidimensional.

Social Physique Anxiety and Self-Esteem

Researchers have long explored the relationship between the physique and the self (Martin et al., 1997; Collingwood & Willett, 1971; & Rosen & Ross, 1968). Studies have identified self-esteem as the psychological variable with the most potential to reflect psychological improvements as a result of regular exercise. Self-esteem is considered the evaluative component of self-concept and refers to an individual's positive and negative feelings about oneself (Caruso & Gill, 1992). Self-concept can be characterized by the statement "how I see myself," whereas self-esteem is "how I feel about how I see myself."

There have been two types of self-esteem studied--high self-esteem and low self-esteem. Those individuals with high self-esteem have self-respect, feel they are a person of worth, recognize their faults, and hope and expect to overcome these faults. The people with low self-esteem lack self-respect, believe they are unworthy or inadequate, and picture themselves disagreeable. They want to change but with no means on how to change (Rosenberg, 1979). Self-esteem is affected by both the world that exists and the world that is perceived (Raymore, Godbey, & Crawford, 1994).

Self-esteem also has been analyzed between the sexes, ages, and races. Gender appears to be related to self-esteem (Rosenberg, 1989). Females have lower levels of self-esteem than do their male counterparts (Kamal & Blais, 1995). Furnham and Greaves (1994) found women to have lower self-esteem, which was associated with poor body image satisfaction. Theories to support this finding include social stress for females (salary), socialization of females (females are bred to be powerless and dependent), and social structure (different roles for females and males) (Lindeman, 1994).

Age also has been found to be related to self-esteem. Lindeman's study (1994) demonstrated older more experienced individuals (23-29 and 30-40 years of age) had significantly higher self-esteem than the younger group (17-22 years of age). One explanation for this discovery is that older individuals may tend to view life's events more positively than do younger individuals. As a person ages, he/she begins to develop strategies to handle life's events.

Race also has been found to be associated to self-esteem. The data showed adult African Americans self-esteem to be lower than Caucasian's self-esteem. However, when socioeconomic variables are controlled the African American's had higher self-esteem. Prevailing theory suggested this was because of social disadvantage (Middleton, 1972).

The idea of the self has been applied to physical activity. The attitude towards onself has been shown to have a positive relationship with physical activity. Physical activity has been demonstrated to enhance psychological well-being (Brown et al., 1995). The researchers explored the effectiveness of a walking program on a cognitive component. Their study concluded that physical activity with a cognitive component

resulted in some psychological benefit. Sonstroem, Harlow, and Joseph (1994) had similar results. The researchers showed how aerobics had a positive effect on self-esteem. Skrimar, Bullen, Check, McArthur, and Vaughn (1986); Plummer and Young (1987), and Labbe, Welsh, and Delaney (1988) also had similar results.

The attitude towards oneself has been shown to have a relationship with one's body image. Researchers have established a relationship between body image and self-esteem in exercise settings. A study mentioned previously, Bartlweski et al (1996), has tried to make a comparison of two concepts. They stated that changes in SPA and body esteem can occur mainly as a result of changes in various body measurements, such as body weight, body fat, and body size. McInman and Berger (1993) found exercisers with high and low SPA differed in self-concept and self-esteem. The changes were thought to have occurred with concomitant changes in SPA.

Another study that looked at the relationship between physique anxiety and body-esteem was complete by Schwerin, Corcoran, Fisher, Patterson, Askew, Olrich, and Shanks (1996). Their study looked at anabolic steroid and non-anabolic steroid use with SPA and body-esteem. The researchers found body builders to have greater body-esteem concerning body parts, due to their greater body strength. Those with the greater body strength self-reported more anabolic steroid use than the non-users. Results also suggested that when the physical outcomes of steroid use were no longer present, positive body image also disappeared.

To get a better understanding of the implications self-esteem has on an individual, an inventory was created to study this idea of self-esteem. This inventory was the

Rosenberg Self-Esteem Scale (Rosenberg, 1979). The Rosenberg Self-Esteem Scale (RSES) is a global or multi-faceted measure of self-esteem. It assesses global self-esteem apart from specific contexts or dimensions, with the understanding that various evaluations of one's life are taken into account. The RSES was constructed to be used specifically with adolescents, however, the scale is now used with adults and children.

Martin et al. (1997) wanted to look at the predictors of self-esteem (using the RSES), SPA, body-esteem, public body consciousness, and percent body fat. The researchers found those with higher scores on the RSES had higher scores on the SPAS. Martin and colleagues found self-esteem to be the greatest predictor contributing to SPA. Percent body fat was found to be a good predictor of SPA, contrary to previous research.

Another such study that used the RSES was performed by Raymore et al. (1994). The researchers looked at the self-esteem and gender to establish a relationship among the adolescents. The data was collected from three high schools using different inventories measuring self-esteem (one scale was the Rosenberg Self-Esteem Scale) and a perceived measure of leisure. The researchers reported that the subjects with low self-esteem had constraints on leisure and did not feel comfortable performing activity. These individuals were found to have greater constraints in the beginning of new leisure activities than individuals with moderate or high self-esteem. They concluded that males and females were significantly different in their levels of self-esteem with females displaying lower levels of self-esteem than males. Females who reported lower levels of self-esteem had a higher level of constraint on leisure.

Caruso and Gill (1992) also wanted to explore the effects the relationship between self-esteem and exercise by using the RSES. The researchers wanted to determine if psychological variables (physical self-perceptions/self-esteem and body satisfaction) change in college-aged individuals as a result of participation in a weight training program. The participants were placed into a weight training program, aerobics exercise program, or a activity control group. Participants in the activity group experienced positive changes in strength and body composition. A relationship among the various measures revealed that overall self-perceptions were related to overall physical self-worth, self-esteem, and body satisfaction.

Palmer (1995) followed along the same lines as Caruso and Gill. Palmer wanted to measure the effects an 8-week walking program on the participants. The participants were female volunteers randomly assigned to a walking group or a nonwalking group. The subjects answered psychological questionnaires (one questionnaire was the RSES). The researcher concluded a significant improvement in self for those participants in the walking group.

Self-esteem is a component of self-concept and can be defined as our level of satisfaction or dissatisfaction with our own perceptions of ourselves. Factors which may affect self-esteem are race, age, and gender. The RSES was, therefore, selected for the

present study on the tests acceptable level of use and trusted means of measuring self-esteem.

Effects of Aerobics on SPA and Self-Esteem

The psychological benefits of exercise have been well documented. Regular exercise has been associated with weight loss, better health, enhanced moods, and better overall feelings of onself (Caruso & Gill, 1992). Nonetheless, the majority of people who start an exercise program drop-out within the first six months (Leary, 1992). Leary speculated that one reason for the high drop-out rate was that these people were self-conscious and anxious about how people evaluated their bodies.

Bartlewski and colleagues (1996) experiment followed along the same lines as Leary's experiment. They recruited students from aerobics classes and social psychology classes to measure self-esteem and SPA. The aerobics class group performed a warm-up, a high impact aerobic dance to music, and a cool-down. The social psychology class sessions involved listening to social psychology lectures. SPA decreased significantly and self-esteem increased slightly with the aerobics class group compared to the educational group. The researchers thought, perhaps, a reason for the change was that the females felt better about themselves once they began to exercise. There was no significant change observed in SPA or self-esteem among the social psychology group.

On a more negative note, aerobics classes, may have an emphasis on weight and shape control. This can reinforce the notion of the perfect, ideal body (Tinning, 1989). Researchers have readily accepted aerobic program for its physical merits, but the

potential psychological damage it may do to individuals has been ignored (Mitchell, 1987). A study by Frederick and Shaw (1994) designed a study to explore young females' motivation towards and experiences of aerobic classes. The purpose of the study was to determine if body image was a constraint on participation or if a concern about appearance was in fact a motivation for participation. The researchers discovered a considerable amount of dissatisfaction with body weight (greater than 1/3 of the female). They also found that body weight was more likely to be considered important than unimportant (about 2/3 of the female). They also discovered the primary set of reasons given by the subjects for participation in the classes was for the body weight loss, body toning, or body improvement.

Still further exploration of Frederick and Shaw's research showed that although body image concerns did not directly affect the level of participation it did, however, indirectly affect enjoyment of the activity. The two main reasons affecting enjoyment were aerobics clothing and competition. The researchers found that traditional aerobics attire (form fitting spandex and leotards) decrease enjoyment for the females. The females stated the clothing was intimidating. Another negative aspect was the competition within the classes and how it lowered enjoyment. The females worried how they would measure up to the other females in the class. Body image apprehension did prevent some of the women from participating.

Frederick and Shaw's study did have a positive note for aerobics. Those that remained in the class found that they had a slight increase in their body image evaluation and self-esteem. Also, Sonstoem and Potts (1996) study provided data that perception of

sports competence produce general feelings of high self-esteem. The females within the study showed lower levels of self-esteem than the males.

Thus, aerobics has been found to be beneficial in helping those with psychological problems. The research has shown that the effects of aerobics on the participant is helpful in increasing self-esteem or lessening body image apprehensions.

Effects of Walking on SPAS and Self-Esteem

Exercise is often recommended for promoting enhanced psychological health. Walking type activities have been shown to be effective in improving moods, decreasing tension and anxieties, and increasing self-esteem. A study whose purpose was to determine whether a walking regiment enhanced psychological factors was performed by Brown, Wang, Ward, Ebbeling, Fortlage, Puleo, Benson, and Rippe (1995). Their study showed that there were improvements in mood and self-esteem among both females and males. Females did show a slight increase in self-esteem and a decrease in body image apprehension. The male's self-esteem remained the same.

Palmer's study (1995) also determined there was enhanced self-esteem with a walking program. The study measured the effects of an eight-week walking program on nonclinical, premenopausal females. The walking group showed significant improvements in rated self-esteem (using the RSES), in the timed mile walk, and diastolic blood pressure. The researcher stated that a number of variables associated with the walking program may have improved self-esteem, such as acquisition of a new skill, increased social contact, attention from the research team, and completion of a challenging program.

Unfortunately, there has been limited research on walking and the effects the activity has on an individual's psyche. The existing research strongly suggests that walking will enhance self-esteem and decrease body image apprehensions. Hopefully, future research will look further into the beneficial effects of walking.

Physiological Changes with Aerobics

Exercise training has been shown to be a safe and popular means of enhancing cardiovascular endurance and promoting overall good health (Frederick & Shaw, 1994). Typical changes induced by the activity are decreases in percent body fat, slight increases in lean body mass, and small decreases in total body weight (Moody, Kollias, & Buskirk, 1969). Kravitz, Cisar, Christensen, and Setterlund's (1993) aerobics study consisted of an eight week training period. Each session lasted 50 minutes and began with a seven minute warm-up, followed by 30 minutes of aerobics, and ending with a five minute cool-down. The researchers reported a eight to nine percent decrease in body fat and fat mass. There was a significant improvement in VO_2 (38.29 ± 1.05 to 41.32 ± 0.95 ml/kg/min). In addition to the observed changes in body composition, body build characteristics were favorably modified. Results revealed a significant decrease in endomorphic somatotype ratings and an increase in mesomorphic somatotype ratings. The researchers reported characteristics of reduced body fat and enhanced muscularity. These changes were reflective of improved fitness and endurance performance capabilities.

Garber, McKinney, and Carleton's (1992) study compared the effects aerobics had on the body. The study demonstrated that aerobics can elicit similar benefits to those of walking and running. The exercise training of the aerobics and walk-jog group followed

the guidelines established by the American College of Sports Medicine. Each group met for 50 minutes on three alternative days per week for eight weeks. The exercise sessions consisted of ten minutes of warm-up, fifteen minutes of aerobics and walking-jogging, and a five minute cool-down. The walk-jog group increased their VO_2 by 11% and the aerobics group increased their VO_2 by 10%. A decrease in peak heart rate was seen in both the aerobics and walk-jog group. This decrease was four beats/minute for the aerobics group and three beats/minute for the walk-jog group. The researchers' study showed that aerobics was a safe, effective means of exercise for improving cardiovascular endurance and was recommended as an alternative to walking and jogging.

A few other studies showed a decrease in body composition. Johnson, Berg, and Latin (1984) revealed a significant changed in body composition as a result of aerobics. Body fat decreased from 36 to 34% with those who performed aerobics 2-days/week and 29 to 26% with the 3-day/week group. Also, Blessing, Wilson, Creel, and Word (1987), Blessing, Wilson, Puckett, and Ford (1987), and Eickhoff et al. (1983) reported a significant change in body fat (24.3 to 23%). The training program was 10-weeks in duration and was performed for approximately 30 minutes for 3-days/week. Williams and Morton's study (1986) revealed they too had a significant decrease in body fat (28.3 to 27.3%) following 12-weeks of aerobics.

Aerobics is a popular means of exercise. This activity has been shown to be one that helps decrease body fat and resting heart rate. Aerobics has also improved individual's VO_2 and cardiorespiratory endurance.

Physiological Effects of Walking

Another form of activity, walking, has been shown to be valuable form of exercise (Duncan, Gordon, & Scott, 1991). Jette, Sidney, and Campbell (1988) measured the effects a 12-week walking program on maximal and submaximal workout. The participants were 26 middle-aged males and females. Both males and females in the experimental walking group had significant improvements in maximum oxygen uptake and a reduction in submaximum training heart rate. The study by Palmer (1995) demonstrated the walking program decreased heart rate (from 80.9 beats/minute to 73.2 beats/minute) and increased VO_2 (from 26.8 ml/kg/min to 31.7 ml/kg/min). Tucker's study (1993) had similar results with a walking and weight lifting study. The researcher concluded that the walking group had greater gains in cardiorespiratory endurance across the 3-month training period than the weight lifting group. Kashiwa and Rippe (1987) advocated fitness walking for females and listed the benefits of such a program as weight loss, fitness during pregnancy, general aerobic conditioning, muscle toning, and stress reduction.

The study mentioned previously by Garber et al. (1992) compared the effects of aerobics and walk-jog training sessions on individuals. The walk-jog groups increased their VO_2 and decreased their peak heart rate. Another study a few years earlier by Milburn and Butts (1983) produced the same type of results. The walking group's VO_2 increased by 11%. A slight decrease of body fat was also evident.

Thus walking has been found to be an effect means of training for individuals, especially women. Walking can elicit decreases in heart rate, increases in VO_2, and

increases in cardiorespiratory endurance. Also, those who walk may see a slight decrease in body fat.

Sum of Skinfold Method

Over the years, the sum of skinfold has been a method of measuring body composition. It is easy to administer, at a relatively low cost, to a large number of people in a short amount of time. Skinfold measurements indirectly quantify the thickness of subcutaneous adipose tissue (Hewyard & Stolarczyk, 1996).

A relationship exists between subcutaneous fat and total body fat. Research has established that skinfold thickness at multiple sites measure a common body factor (Jackson & Pollack, 1976; Quatrochi, Hicks, Heyward, Colville, Cook, Jenkins, & Wilson, 1992). It has been assumed that approximately one third of the total fat is located subcutaneously in males and females. However, there is considerable biological variation within the sexes in subcutaneous, intramuscular, intermuscular, and internal organ fat deposits, as well as essential lipids in bone marrow and the central nervous system. Biological variation in fat distribution is affected by age, gender, and degree of fatness (Lohman, 1981).

Prediction equations have been developed for age, gender, and degree of fatness in order to estimate relative body fatness or percent body fat. The skinfold equations used in the present study were developed using linear regression models. These equations were developed for relatively homogeneous populations and are assumed to be valid only for individuals having similar characteristics, such as age, gender, and ethnicity (Heyward & Stolarczyk, 1996). The prediction equation uses the sum of skinfold from two to seven

sites to predict body density. The body density is then converted to percent body fat using the appropriate population-specific conversion formula.

Population-specific equations have been developed for some ethnic groups. African Americans, Caucasians, American Indians, Hispanics, and Orientals have had specific equations developed in order to establish percent body fat. Research demonstrates that the body composition of African Americans differs considerably from that of Caucasians. African American males and females have greater skeletal muscle mass, bone mineral mass, and bone density than Caucasian males and females (Nelson, Feingold, Bolin, & Parfitt, 1991).

The skinfold method has been standardized for various ethnic groups and age. It has been found to be reliable and a valid method of evaluating body composition. This method was, therefore, selected for the present study on its ease of use and administering when working with a large population.

Participation in physical activity and exercise is linked to improvements in psychological and physiological well-being. As a result of physical activity, an individual may experience positive changes in cardiovascular fitness and body composition. Psychological benefits of exercise may include decreased anxiety and increased self-esteem. Therefore, it was the purpose of the review of literature to establish a relationship between SPA and self-esteem in order to determine the effects physical activity has on an individual.

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Appendix F: Informed Consent Form

Informed Consent Form

Georgia Southern University
Department of Health and Kinesiology
College of Health and Professional Studies

Consent to Participate In A Research Project Form

I understand that the investigation I am about to participate in is part of a research project entitled "The Effect of Aerobic Exercise and Walking on Social Physique Anxiety and Self-Esteem of Female College Students", conducted by Jessica Lloyd/(912)871-1990 under the supervision of Dr. James McMillan/(912)681-0495. This investigation is to study if changes in body image perception and self-esteem occur when enrolled in a fitness walking or aerobic activity class. The researcher will conduct an evaluation through a series of questionnaires aimed to discover if I have any apprehensions toward my body image or if I possess low self-esteem. Body composition, height, and weight measures will also be administered. These evaluations will take place at the first and last week of the experiment. By signing below, I am agreeing to allow Jessica Lloyd and Dr. James McMillan, to use the information I provide in presentations and publications.

I understand that any relationship between myself and the information I contribute to this study will be kept confidential. I understand that no individual names will be used and all individual data will be presented as group data. I understand that I may terminate participation in this study at any time without prejudice to myself, course grade, employment status, or any other personal matter. Given the nature of this investigation I

further acknowledge that the investigator may in his/her discretion terminate the study at any time deemed appropriate.

If I have any questions, I may contact Dr. Kevin L. Burke, Chair of the Department IRB, at 912-681-5267, or the IRB Coordinator at the Office of Research Services and Sponsored Programs at 912-681-5465.

Print Subject's Name_____

Subject's Signature_____

Witness_____

Date_____

Appendix G: Flyer

Flyer

Wanted

WHO: Female students participating in Fitness Walking activity classes or Aerobic activity classes.

WHEN: Spring Quarter, 1998

WHAT: Participate in an interesting study
Learn more about your body image
Discovery how body fat applies to body image
Learn about your self-esteem

*** If you are interested in participating in this study, please contact Jessica Lloyd at 871-1990 or in Hanner Room 2219.**