The Effect of a Female Physical Educator's Physical Appearance on Physical Fitness Knowledge and Attitudes of Junior High Students

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Abstract

This study was designed to determine if a female physical educator's appearance of body fatness affects 1) the cognitive performance of junior high school students on a test of health-related fitness knowledge, and 2) student attitudes toward the instructor. Ninety-three seventh through ninth grade students from two schools, participated in a six-week instructional course on health-related fitness knowledge. Instruction was identical with one exception: In one group, the instructor wore an under garment to present an image of an obese physical educator. A pretest —posttest health-related fitness examination was administered to the students. Additionally, student attitudes toward the physical educator were assessed during w_1, w_3, and w_6. Analysis of covariance revealed a significant group x posttest score interaction, $F_{(1, 88)} = 4.408$ $p = .039$. The student attitude questionnaire (SAQ) sums were analyzed for all participants and detected no significant group x time interaction. However, an SAQ sum score main effect was found to exist, $F_{(2, 75)} = 10.056$, $p = .000$. Paired t-tests found significant differences between all combinations of SAQ mean scores, except for the values of w_1 to w_3. Within group paired t-tests were computed for the SAQ to detect differences independent of group. Analysis revealed significant differences in attitudes occurred between w_i and w_3 and w_1 and w_6, for the control group $t (32) = -3.323$, $p = .002$; $t (32) = -3.800$, $p = .001$). Similarly, for the experimental group significant difference occurred between w_1 and w_6, $t (44) = -2.5\,17$, $p = .016$. Results indicate instructor physical appearance is related to student performance on a cognitive based health-related fitness test. In contrast, instructor physical appearance does not appear related to student attitude toward the instructor.

Introduction

The significance of positive, competent role modeling by teachers to assist students in forming desired practices is both known and accepted. This is especially critical for instruction in physical education. In contrast to other disciplines, role modeling is an integral component of physical education. It is not surprising that modeling of motor skills has been used as an instructional strategy more often in physical education than in any other educational framework (Spencer, 1998). Leaders in physical education agree that as a result of the nature of the physical educator's leadership position, physical education teachers naturally become models for their students (Whitley, Sage, & Bucher, 1988).

Whether they like it or not, physical educators must view themselves as role models. Good and Brophy (1973) indicate that teachers cannot choose when to model, but in fact, are models of behavior at all times. As a result, they need to be aware of the potential influence that modeling can have on the physical and social behavior of their students. Therefore, it is essential that as role

models, physical educators exhibit healthy life-style practices to optimize teaching effectiveness.

Widespread interest in pursuing a life-style that will further one's well-being and quality of life has placed the spotlight on today's physical education. As a profession, physical education is passing through one of the most critical periods in history, accentuating the need for physically fit role models. The fitness and the physical appearance of physical educators have been longstanding topics of concern within the profession (Melville & Maddalozzo 1988; Melville & Cardinal, 1997; Melville & Jones, 1990; Melville & Cardinal 1988). There is concern that physical education professionals do not appear physically fit. They appear to be engaging in many of the same unhealthy behaviors as the general population, for example, smoking, excessive consumption of caffeine, obesity, and a general appearance of being "out-of-shape" (Karper & Dignan, 1983). Too often the apparent fitness level of a person is based on others' visual perceptions and judgments (about fitness) are based upon those perceptions (Thomson, 1996). Accordingly, a perception of fitness is often determined by the overall physical appearance of an individual. In brief, body shape and body composition are components of one's overall physical appearance, and are two of the variables that affect the way physical educators are (a) perceived and (b) responded to by their students (Thomson, 1996). In addition, studies show that some physical educators are overweight (Melville & Jones, 1990). This fact has left authorities questioning the consequences of an overweight and unfit physical educator.

In the November-December, 1992 Journal of Physical Education, Recreation and Dance (Issues, 1992) the question of whether or not physical education majors should be expected to maintain a certain level of physical fitness was debated. The published reactions strongly supported the position that they should be physically fit in order to serve as appropriate role models. Johnson (1985) indicates that in order to gain students' respect, physical fitness must become a way of life for all physical educators. He questions how physical educators can expect students to listen to what they say if they are, in fact, overweight and unfit. This concern has prompted authorities to express the need for physical fitness assessment of physical educators (Cardinal, 1995).

According to the National Association of Sport and Physical Education (1999), physical educators have a professional responsibility to model active lifestyles and fitness promoting behaviors. In assuming this responsibility, a physical educator should be fit, set an example for others, and be devoted to helping others understand that good health is more choice than chance. Physical educators who model good health behaviors will have a more positive impact on their students, whereas, those who exhibit poor health habits may act as negative role models (Bucher & Thaxton, 1981).

One aspect of role modeling that warrants further investigation is that of teacher physical appearance. The notion that lifestyle modeling of health and fitness by physical educators affects both teaching effectiveness and student outcomes is clear. Yet, there are only two empirical studies that have investigated this supposed relationship. Melville and Maddalozzo (1988) conducted a study to determine if a male physical educator's appearance of body fatness affects his ability to teach and instill good exercise habits in high school students. They found that the appearance of fatness in a physical educator does affect students' learning of exercise concepts. They compared the results of cognitive test scores between two randomly assigned groups of high school students who viewed one of two 20-minute videotapes covering flexibility and nutrition. In one videotape, a male physical educator was made to look overweight by enlarging his abdominal region. In the other videotape, the instructor's appearance was unaltered and he appeared trim and fit. After viewing their respective videotapes, students' knowledge, attitudes, and behavioral intentions were assessed. Results showed students

who viewed the videotape of the fit instructor scored significantly higher on a cognitive test than did students who viewed the videotape of the overweight instructor. The students also expressed a perception that the fit looking instructor was more knowledgeable, more likable, and they were more likely to follow the exercise and dietary suggestions of that instructor.

Replicating the previous study, Melville & Maddalozzo, and 1988 and Thomson (1996) found similar findings to be true of sixth and seventh grade students. Both studies indicate that physical educators can enhance teaching effectiveness if they are perceived by their students as being physically fit.

Research in the area relating physical appearance and teacher effectiveness is limited. No studies were found using: 1) the female gender, 2) natural (gymnasium) setting, 3) total body obesity, and 4) long-term exposure.

The purpose of the study was to determine if a female physical educator's physical appearance affected the cognitive performance of junior high school students on a test of health-related fitness knowledge. A secondary purpose was to determine if a female physical educator's physical appearance affected students' attitudes toward the instructor.

Method

Participants in the study consisted of 93 seventh through ninth grade students, enrolled in two selected junior high schools in Arkansas. Students ranged in age from 12 to 16 years. This study employed an experimental research design; the independent variable, the physical educator's physical appearance, was manipulated. Also, this study was designed to determine if a physical educator's physical appearance affected the students' attitudes toward the instructor over a six-week period. This was done in order to determine if appearance, ideal body weight vs. obese, changed student attitudes over time.

The investigator, a female physical educator, taught a six-week instructional course on health-related fitness knowledge to two separate physical education classes. In both classes, the instruction was identical, in that the physical educator met with each class three times a week (Monday, Wednesday, and Friday) for one 60-minute period each day. The only difference between the two classes was the physical educator's physical appearance. For the control class, the instructor remained her normal body size. For the control class, the instructor was classified as having ideal body weight, thus appearing physically fit. The experimental class was taught by the same instructor. In this class the instructor wore a polyurethane under garment to present an obese image. It was believed that by presenting an appearance of overall body fatness the students would judge the physical educator as physically unfit.

The physical educator weighed 125 pounds, was *5* feet 6.5 inches tall, and had 19.9 percent body fat, as determined by girth measurement. The determined percent body fat ranked in the 70th percentile, when corrected for age and gender, by the American College of Sports Medicine (2000). In addition, her body dimensions were measured at 35-inch chest, 28-inch waist, 34-inch hips, 18.5-inch thighs, and 11-inch arms.

To appear obese and unfit the physical educator wore a personalized custom made undergarment titled "fat suit." This under garment was constructed from a basic dress shell pattern (size 18) made of polyurethane. The shell was stuffed and sculpted with polyester batting and foam sheeting to create an obese figure. The fat suit resulted in a 47-inch chest, 44-inch waist, 50.5-inch hips, 35-inch thighs, 16.0-inch arms, and had 54.2 percent body fat. The determined percent body fat ranked under the 10th percentile, when corrected for age and gender, by the American College of Sports Medicine (2000). The clothing worn by the physical educator for both classes was identical with the exception of size, one being 6 and the second being 18.

Physical Education Content

A 6-week unit plan on health-related fitness knowledge by Dr. C. J. Bross (1993) was modified for instruction. Practice sessions and lesson plan reviews were conducted three times before instruction to ensure that both content and presentation style were the same for both groups. The physical education content was dispersed over the course of 6-weeks. Content pertained to the five components of health-related physical fitness: (a) aerobic endurance, (b) body composition, (c) flexibility, (d) muscular endurance, and (e) muscular strength. This content was introduced, defined, and related to promoting a healthy and active lifestyle. One week was spent on each of the five components.

Physical activity labs, related to the five health-related fitness components accompanied the subject matter. The labs consisted of the following: (a) one-mile run, (b) pull-ups and pushups, (c) sit-ups, (d) stretching—sit and reach, and (e) body composition assessment (Bross, 1993), and were organized to coincide with the curriculum. Physical activities were organized to enhance the subject matter. These included, (a) step-aerobics, (b) circuit strength training, (c) crab soccer, (d) yoga, and (e) Roll For Fitness (Bross, 1993), a model week included three sessions, which included: 1) Monday—instruction, 2) Wednesday — lab assessment designed to measure the weekly content variable, and 3) Friday—activities designed to reinforce the weekly content variable. Table 1 summarized the six-week unit plan by daily activity.

Table 1

Six-Week Lesson Plan

Week	Monday Instruction	Wednesday Physical Lab	Friday Physical Activity
1	Introduction	Introduction	Introduction
2	Aerobic Endurance	1 Mile Walk/Run	Step-Aerobics
3	Muscular Strength	Push-Ups	Circuit Training
4	Muscular Endurance	One-Minute Bent Knee Sit-Up	Crab Soccer
5	Flexibility	Modified Sit And Reach	Stretching Stations
6	Body Composition	Three Site Skinfold	Roll For Fitness

Instrumentation

In addition to a demographic questionnaire, two additional instruments were included in the study, those being: (a) a health-related fitness examination (Bross, 1993), and (b) a student attitude and behavioral intention questionnaire (Melville & Maddalozzo, 1988a).

Demographic Information

Demographic information was obtained using a questionnaire. The form was used to determine background information including age, race, gender, and a four-digit identification number.

Health-Related Fitness Examination

The health-related fitness examination was administered to the students in a pretest and posttest format. From the content provided by the physical educator, a 35-item multiple-choice exam was constructed. The exam was shown to two university professors of physical education, who had reviewed the subject matter to gain a consensus that the questions were fair and consistent with the information covered in the 6-week course. Additionally, two junior high school teachers, one from physical education and one from English, judged the questions for content validity using criteria, such as readability and appropriateness for use with junior high school students.

Student Attitude Questionnaire

The Student Attitude Questionnaire (SAQ) included 8 items, which required responses on a 5-point Likert scale. The following statements represent the SAQ questionnaire. For reader ease, specific attitudinal variables by statement are designated in bold.

1. I think I would **like** having *(instructor name)* as a physical education teacher.
2. *(instructor name)* **knows** a lot about physical education.
3. A physical education teacher **should** be physically fit.
4. *(instructor name)* **appears** physically fit.
5. I will try to **use** the information *(instructor name)* talked about to improve my own physical fitness.
6. I **believe** *(instructor name)* leads a healthy lifestyle.
7. I **think** *(instructor name)* exercises regularly.
8. *(instructor name)* **motivates** me to exercise and lead a healthy lifestyle.

The SAQ was administered to the students a total of three times during the 6-week instructional period [week one (w_1), week two (w_2,)week three (w_3), and week six (w_6)]. Total sum score on the SAQ was calculated for each student and used in the statistical analysis. Individual sum scores could range from 40 "strongly agree" to 8 "strongly disagree."

Procedures

Prior to the study: (a) a written explanation of the study, (b) an outline of the 6-week unit plan, (c) the health-related fitness examination, and (d) the demographic questionnaire and SAQ were mailed to the superintendent, principal, and teacher from both schools. Before instruction, participants were informed that a guest physical educator would be instructing a course, three days a week for six weeks. The students were informed that they would be given two examinations (pretest and posttest) and the SAQ on three occasions (week one, week three, and week six).

Instruction, labs, activity and testing were conducted in a gymnasium. The teacher at each participating school administered the health-related fitness examination, demographic questionnaire and the SAQ.

Statistical Analysis

Descriptive statistics were calculated for all variables. An analysis of covariance (ANCOVA) was used to control for initial differences between groups, the pretest score on the health-related fitness exam served as the covariate. A repeated measures analysis of variance was used to

determine if significant (group x time) differences existed for the SAQ. Paired ttests were utilized as follow-up analysis when main effects were determined to be significant. A significance level of alpha = .05 was used for all analyses. The dependent variables were students' total posttest score on the health-related fitness exam and sum score on the SAQ. The independent variable was group.

Results

Posttest means from the knowledge test were compared between groups with the pretest scores used as a covariate. After satisfying the pretest score assumption of homogeneity for both groups, $F_{(1, 87)} = .336$ $p = .564$, a significant group x posttest score interaction was found, $F_{(1, 88)} = 4.408$ $p = .039$. Figure 1 displays the significant differences.

To assess the effects of teacher instruction on health-related fitness, within group paired t-tests were computed for pre- and post health-related fitness tests. Significant knowledge improvements were detected in both the control, t (51) = -5.438, $p = .000$, and experimental class, t (38) = -5.440, $p = .000$. Figure 1 displays the significant differences.

SAQ sums showed no significant group x time interaction. However, an SAQ sum score main effect was found to exist, Wilks' $\Lambda = .789$, $F_{(2, 75)} = 10.056$, $p = .000$. Paired t-tests showed that significant differences existed between all combinations of SAQ mean scores, except for the values of week one (w_1), to week three (w_3), which demonstrated a trend toward being significant ($p = .053$). Figure 2 displays the SAQ sum for students over the 6-week instructional period.

Within group paired t-tests revealed significant differences in attitudes occurred between the weeks one and three and one and six, for the control class t (32) = -3.323, $p = .002$; t (32) = -3.800, $p = .001$). Likewise, for the experimental class a significant difference occurred between weeks one and six t (44) = -2.517, $p = .016$. Figures 3 and 4 display within group paired comparison for each group independently.

Discussion

Findings indicate that the physical appearance of obesity does affect the test scores of junior high students on health-related fitness knowledge. This is consistent with previous research comparing the effects of physical appearance on student performance (Melville, 1988a; Thomson, 1996).

Because differences did exist between groups, even more support is given to the idea that the physical appearance and apparent fitness level of a physical educator is important to student performance. Perhaps, students are more likely to accept information and advice presented by a fit instructor. It is possible students have trouble valuing knowledge when they visually perceive that the instructor does not model the information presented. Thus, it could be argued, hypocrisy differences between knowledge (what is said) and behavior (what is observed) are not likely to be accepted by students. Consequently, the learning process is affected, especially when discussing health-related fitness.

Previous studies have shown physical appearance of body fatness to have a negative effect on students' attitudes toward the physical educator (Melville & Maddalozzo, 1988; Thomson, 1996). Although methodology differences exist, the results of this study do not support previous findings. In this study no significant (group x time) interaction was observed in student attitudes between groups. One possible reason for not finding significant differences was that the current study had a maturation period of six weeks as compared to previous studies using a 20-minute videotape.

Students in both groups had personal interaction with the instructor for six-weeks, the instructor's physical appearance seemed less of a factor in their attitudes toward the instructor. Both groups had SAQ sums that reflected positive perceptions toward the physical educator. Another probable explanation was that the physical educator was physically active and participated in both groups. The fat suit worn by the instructor in

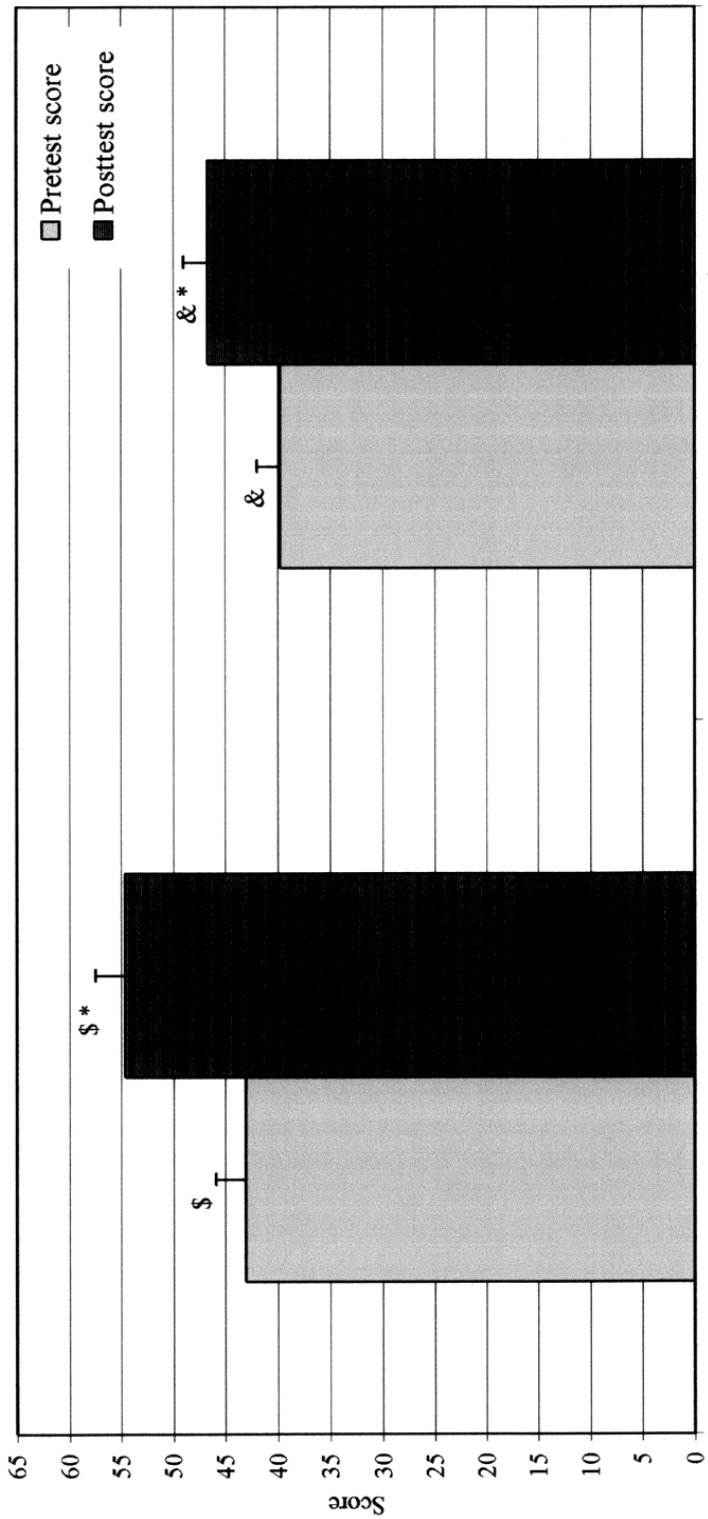

Figure 1. Health-Related Fitness Knowledge Mean Scores

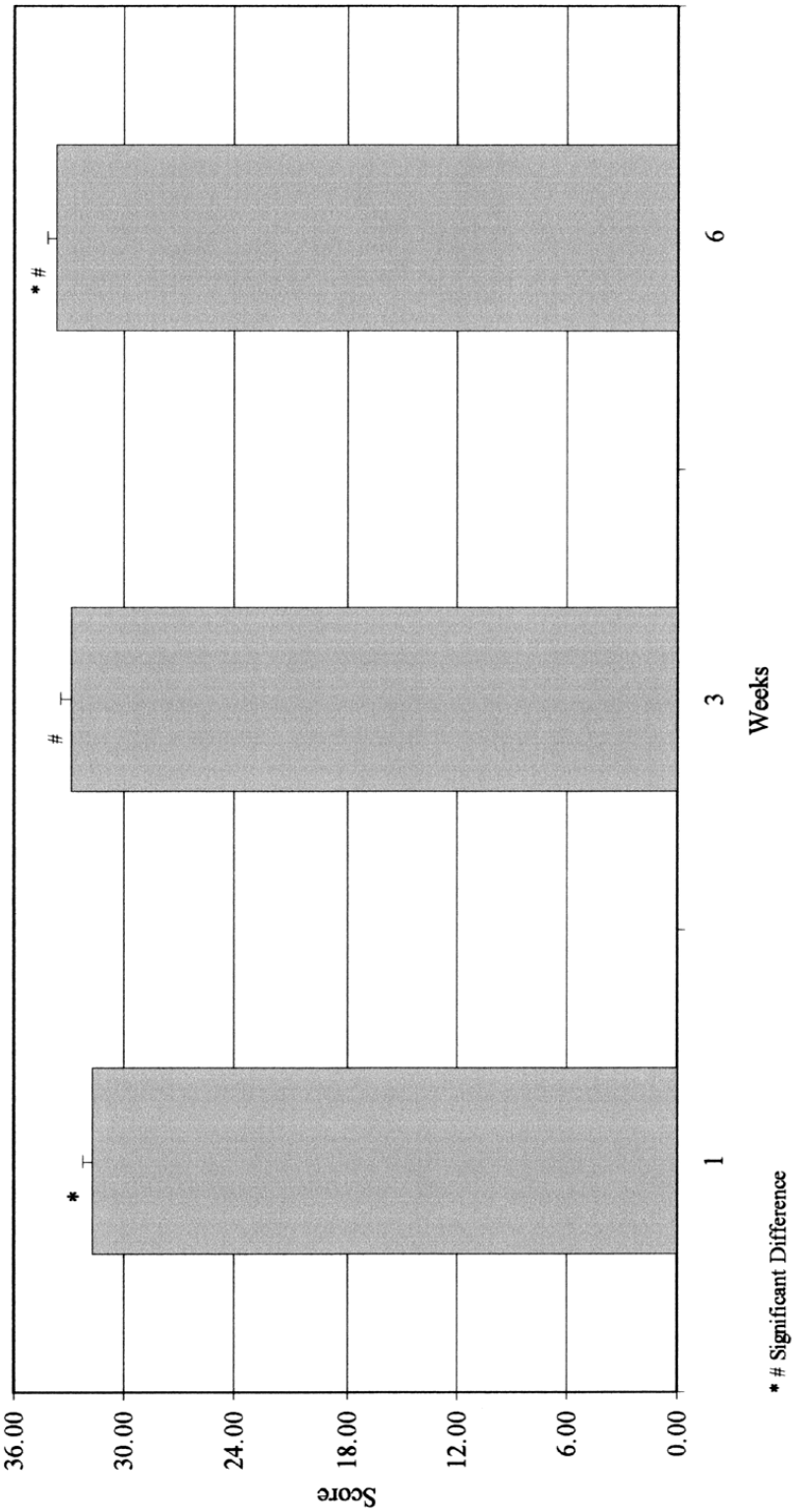

Figure 2. SAQ Sum Scores

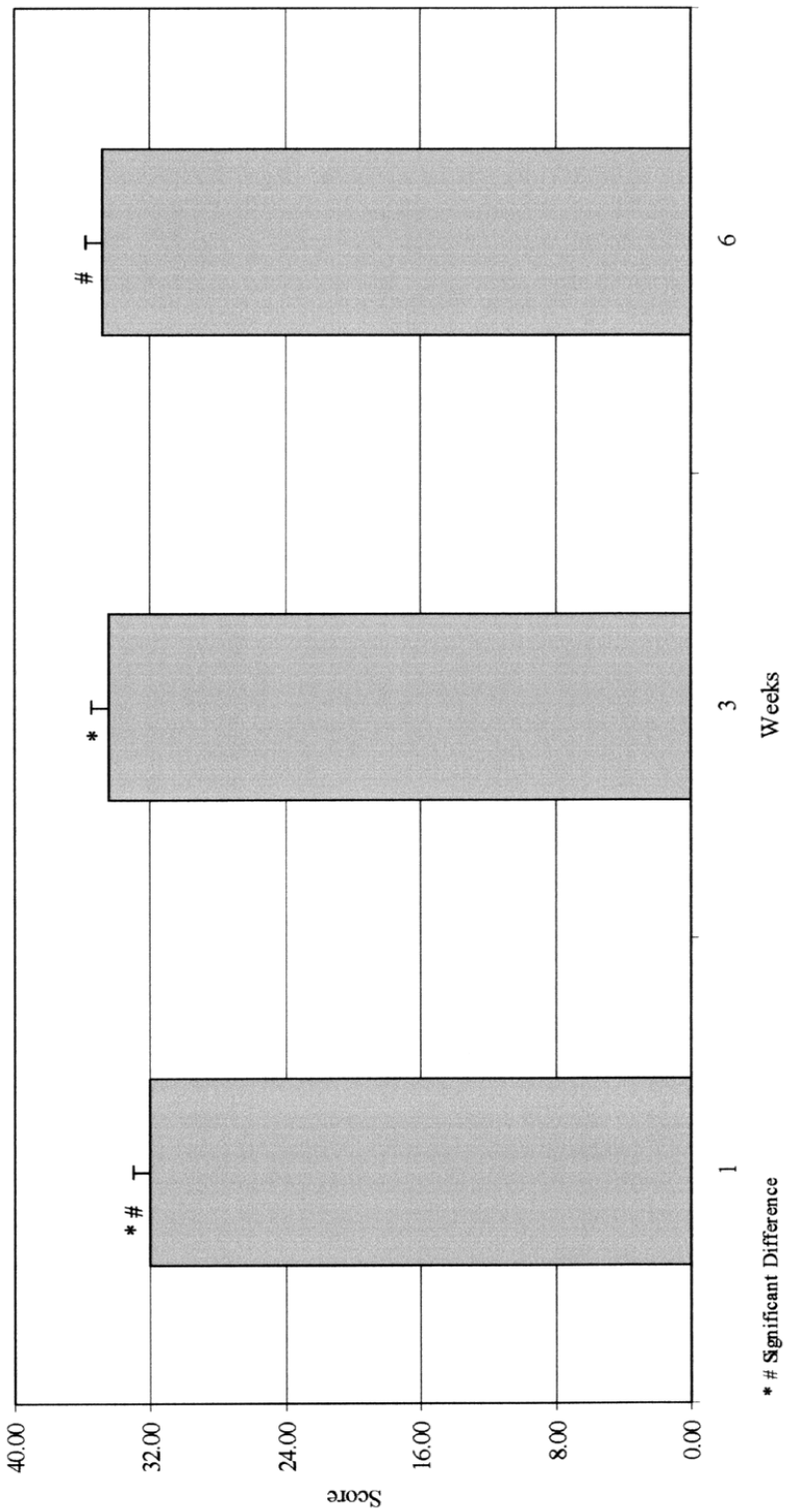

Figure 3. SAQ Scores For Control Group

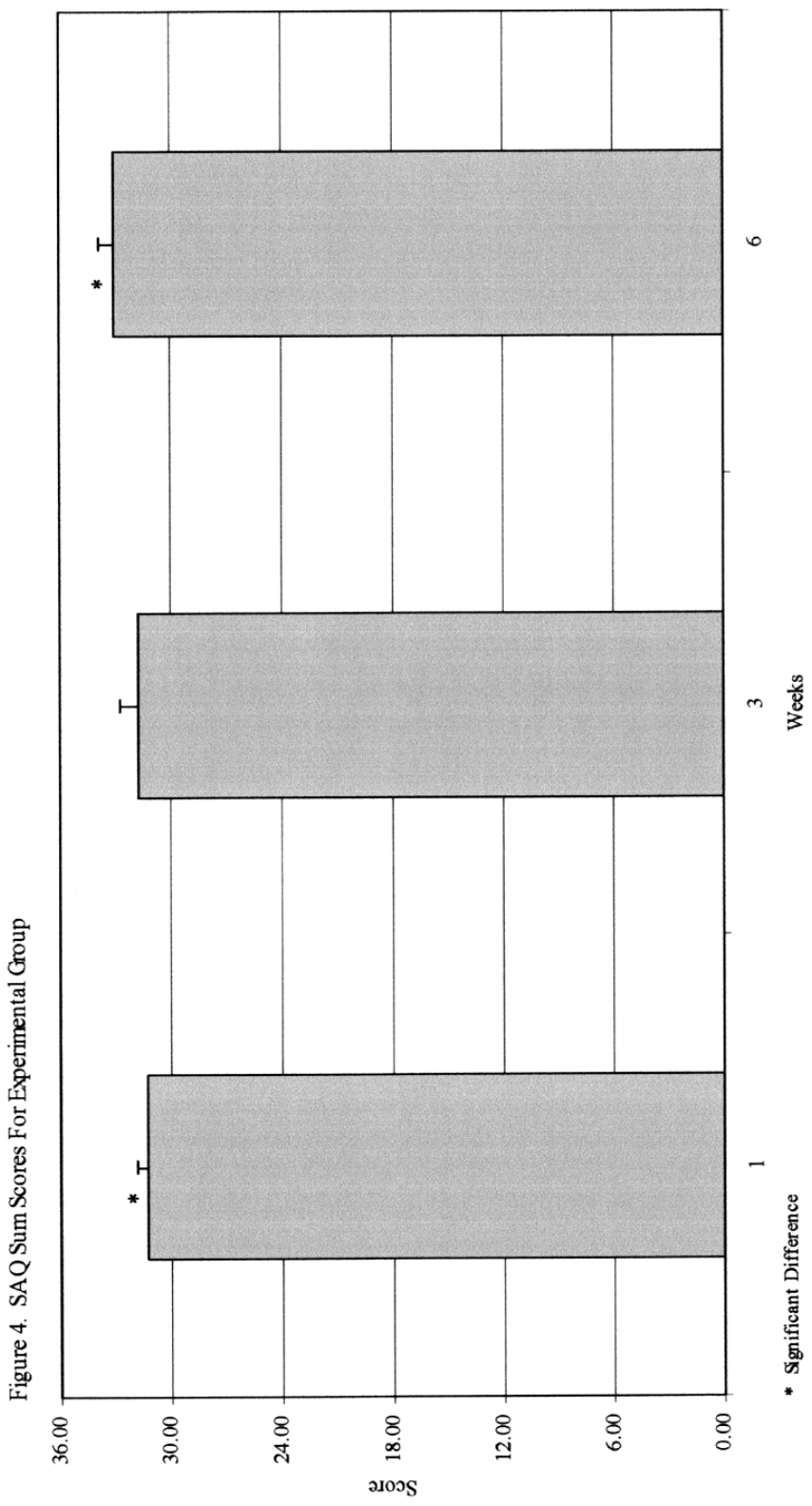
Figure 4. SAQ Sum Scores For Experimental Group
36.00
30.00
24.00
18.00
12.00
6.00
0.00
Score
1
3
6
Weeks
* Significant Difference

the experimental class allowed physical movement that was identical for both groups. The fact that the instructor was obese seemed less important than her physical abilities.

Although significant (group x time) interaction did not exist, significant main effects were observed over 6-weeks in student attitudes. The emerging trend was that the longer the physical educator was involved with the group the more positive the students' perceptions were of the instructor. Figure 2 displays the positive increase in student attitudes a result based on sum SAQ score for the 6-week instructional period.

Significant attitude differences were observed in both groups. Students that were in the control class had significant attitude interactions toward the physical educator between weeks one (w_1) and three (w_3) and weeks one (w_1) and six (w_6). Positive increases in student attitudes were apparent within the first three weeks of the study. A significant attitude change, however, was not as noticeable in the last three weeks of the study. One explanation for this might be that there were no physical barriers presented to inhibit student attitudes toward the instructor. Therefore, attitudes were established initially and peaked within the first three weeks and leveled off during the last three weeks.

In the experimental class, students had significant attitude interactions toward the instructor between weeks one (w_1) and six (w_6). While the control class established an initial level of credibility with the instructor, the experimental class seemed to perceive the physical appearance of the instructor as an obstacle to overcome in establishing credibility. Recall, SAQ for week one ($\overline{X}$ = 31.29) and week six ($\overline{X}$= 33.82) revealed a significant increase in student attitudes. With a range in SAQ scores from 8 (strongly disagree) to 40 (strongly agree), it is clear students were somewhat uncertain about the obese physical educator initially. Between weeks three and six students in the experimental class were able to establish nearly the same level of instructor credibility as the students in the control class. According to the students' SAQ sum response during the sixth week, students in both classes agreed that the female physical educator was (a) physically fit, (b) knowledgeable, (c) leading a healthy lifestyle, and (d) exercising regularly.

The reason for student attitudes in the experimental class to positively change during the final weeks of the study include the possibility that the students were initially focused on limitations that might be posed by the physical educator's obesity rather than her physical abilities. Consequently, the students' first impressions reflected uncertainty. However, as the students observed the obese instructor's mobility over the course of 6-weeks, they may have determined the instructor was not limited by her size, and the issue became less important. Thus, the students began to concentrate more on instructor qualities and personal characteristics and less on physical appearance and fitness level.

Conclusions

Given the results of this study, instructor physical appearance, of which apparent body fat is a part, plays a role in how students perform on a health-related fitness cognitive test. In contrast, instructor physical appearance does not seem to play a major role in student attitudes toward the instructor. Both classes had an overall positive attitude toward the physical educator. Students in the control class showed a significant change in developing positive attitudes toward the instructor within the first three weeks of the study. While students in the experimental class showed a significant change in developing positive attitudes toward the instructor within the final three weeks of the study. Results of this study indicate that instructor: (a) personality, (b) characteristics, (c) training, (d) enthusiasm, and (e) efficacy seem to be better indicators of student attitudes toward the instructor as opposed to instructor physical appearance.

REFERENCES

American College of Sports Medicine (2000). *ACSM's guidelines for exercise testing and prescription*, (6th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Bross, C. J. (1993). *Fit to try*. Durham, NC: Great Activities Publishing Company.

Bucher, J. H., & Thaxton, N. A. (1981). *Physical education and sport: Change and challenge*. St. Louis, MO: The C. V. Mosby.

Cardinal, B. J. (1995). Cardiorespiratory fitness and physical activity behavior of physical education majors. *The Physical Educator, 52*(4), 211-218.

Good, T., & Brophy, J. (1973). *Looking in classrooms*. New York, NY: Harper and Row Publishers.

Issues. (1992). Should physical education, dance, and recreation educators be expected to maintain a certain level of physical fitness? *Journal of Physical Education. Recreation & Dance*, *63*(9), 8-10, 73-75.

Johnson, M. W. (1985). Physical education: Fitness or fraud? *Journal of Physical Education. Recreation, and Dance, 56*(1), 33-35.

Melville, D. S., & Maddalozzo, J. G. F. (1988). The effects of a physical educator's appearance of body fatness on communicating exercise concepts to high school students. *Journal of Physical Education. Recreation and Dance, 7*, 343-3 52.

Melville, D. S., & Cardinal, B. J. (1988). The problem body fatness within our profession. *Journal of Physical Education, Recreation, and Dance, 59*, 85-87, 95.

Melville, D. S., & Jones, D. M. (1990). Should physical education majors have their fitness level assessed? *Journal of Physical Education, Recreation and Dance, 61*(1), 30-32.

Melville, D. S., & Cardinal, B. J. (1997). Are overweight physical educators at a disadvantage in the labor market? A random survey of hiring personnel. *The Physical Educator, 54,* 216-221.

National Association for Sport and Physical Education (1999). *Code of conduct for sport and physical educators: Position statement sponsored by NASPE philosophy academy*. Reston, VA.

Spencer, A. (1998). Physical educator: Role model or role the ball out? *Journal of Physical Education, Recreation, and Dance, 69*(6), 58-63.

Thomson, C. W. (1996). Apparent teacher fitness level and its effect on student test scores. *Indiana Association for Health, Physical Education, Recreation, and Dance, 25,* 17-20.

Whitley, J. D., Sage, 1. N., & Bucher, M. (1988). Cardiorespiratory fitness: Role modeling by physical education instructors. *Journal of Physical Education, Recreation, and Dance, 59*, 81-84.

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