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# The Effect Role Modeling and the Apparent Fatness of a Physical Educator has on Student Learning and Attitudes

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**THE EFFECT ROLE MODELING AND THE APPARENT FATNESS  
OF A PHYSICAL EDUCATOR HAS ON STUDENT LEARNING AND ATTITUDES**

by

**Kurt Kenneth Weaver  
Bachelor of Science, Northwestern College, 1990**

**A Thesis**

**Submitted to the Graduate Faculty**

**of the**

**University of North Dakota**

**in partial fulfillment of the requirements**

**for the degree of**

**Master of Science**

**Grand Forks, North Dakota**

**May**

**2001**

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This thesis, submitted by Kurt Kenneth Weaver in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

James R. Whitehead  
(Chairperson)  
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This thesis meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

Carl F. ...  
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## ABSTRACT

The purpose of this study was to investigate the effects of a physical education instructor appearing overweight versus lean, and role modeling exercise behavior versus “do as I say” on student learning and attitudes.

High school student participants viewed four videotapes of the same instructor using the same script. However, in two tapes the instructor wore a “fat suit” (generously provided by Nasco’s Lifeform) designed to make him look overfat. In one of those tapes he role modeled participation to emphasize it’s importance for health—while he merely instructed in “do as I say” mode in the other tape. Similarly, two more tapes did the same except that the instructor appeared lean. After viewing the tapes, the students (who had been randomly assigned to the four conditions) took a knowledge test to assess their learning of the tapes’ content, and completed items tapping their attitudes to the instructor and his effectiveness.

The results indicated that role modeling desired behavior had a significant and positive effect on the test scores and attitudes of participants. Specifically students who viewed the role modeling tapes scored significantly higher on the knowledge test ( $ES = .62$   $SD$ ). The students also showed a significant effect for attitude ( $F[3,100] = 2.70, p < .05$ ) from the role modeling tapes vs. the “do as I say” tapes.

Further analysis revealed students liked the role modeling instructor better than the “do as I say” instructor, ( $p < .01$ ,  $ES = .54 SD$ ) and they also believed him to be more of a role model who actually practiced what he preached about physical activity and fitness ( $p = .05$ ,  $ES = .39 SD$ ). Students who viewed the role modeling tape were significantly higher in their agreement with the item “regarding whether physical education instructors should be good role models” ( $F[1, 102] = 5.56$ ,  $p < .05$ ,  $ES = .45 SD$ ) than the students who watched the “do as I say instructor”. Students did not show any statistically greater motivation to be physically active and fit regardless of which video they watched. However, there was a significant interaction effect for responses to this item ( $F[1, 100] = 4.40$ ,  $p < .05$ ).

Subsequent analysis of this interaction effect revealed that students who watched the lean “do as I say” instructor were more motivated to be physically active and fit than the students who watched the fat “do as I say” instructor ( $p < .05$ ,  $ES = .56 SD$ ). Students who watched the fat role modeling instructor were also more motivated than the fat “do as I say” instructor ( $p < .05$ ,  $ES = .63 SD$ ).

## CHAPTER I

### INTRODUCTION AND REVIEW OF LITERATURE

#### Physical Activity

Physical activity is now readily accepted as a crucial component of a healthy lifestyle. The Surgeon General's report represented the compilation of a tremendous amount of data from many studies to reach its many conclusions relating to physical activity. Some of the conclusions, drawn from a wealth of research articles are presented below as an introduction to the importance of physical activity.

The 1996 Surgeon General's Report affirms on paper what has been promoted as common knowledge for many years. Exercise promotes health (US. Dep. Of Health and Human Services)

The report states that regular physical activity can benefit everyone, regardless of age or gender (Surgeon General Report, 1996). Conditions which physical activity can protect against are listed in the report. Specifically, physical activity reduces the risk of coronary heart disease, hypertension, colon cancer, diabetes mellitus, and premature death (Surgeon General Report, 1996). Components of the body which benefit from physical activity include the mind, musculature, skeleton, joints, metabolic system, endocrine system, and immune system (Surgeon General Report, 1996). Physical activity may also help to relieve depression and anxiety. (Surgeon General Report, 1996).

According to the Centers for Disease Control and Prevention (1999)

cardiovascular disease is the number one cause of death in the United States, making this disease responsible for 40% of our death rate. Obesity is another condition which poses a greater risk for poor health. Twenty to thirty percent of this nation's population is classified as obese which puts them at greater risk for health problems, including heart disease, high blood pressure, high cholesterol, and diabetes (Stamler, 1994). However, physical activity and healthful eating can also help to control weight gain (Surgeon General Report, 1996).

Yet of all the conditions resulting from a lack of activity it would seem that cardiovascular disease, with its death toll of 960,000 Americans per year looms most prominently over us (Stamler, 1994). So it is curious indeed that 1 in 4 U.S. adults are sedentary, and 60% of the nation's adults are not active on a regular basis (Surgeon General Report, 1996). As sobering as this news is, it pales in comparison to the figures given out by the Surgeon General, depicting the activity levels of our nation's youth.

Almost half of American children aged 12-21 years are not vigorously active on a regular basis (Surgeon General Report, 1996). Adolescents have shown a decline in physical activity and the percentage of high school students enrolled in daily physical education classes has dropped from 42% to 25% from 1991-1995 (Surgeon General Report, 1996). To top it all off CDC reported that sedentary people run twice the risk of suffering a heart attack compared to active people (1999).

The preceding statistics make the issue clear. It is imperative to promote health and fitness practices in children.

“Although cardiovascular disease usually becomes evident in middle or older age, progressive harmful conditions (e.g., atherosclerosis) leading to such disease begin in childhood. Reducing the health and economic burden of cardiovascular disease in the United States depends in large measure on reaching our young people early, before unhealthy behaviors are adopted” (Stamler, 1994).

The amount of physical activity recommended to improve health for adults is a minimum of 30 minutes of moderate physical activity on most or every day of the week, with greater benefits being accrued through longer or more vigorous sessions (Surgeon General Report, 1996).

Resistance training is recommended two times per week in addition to cardiorespiratory activity (Surgeon General Report, 1996).

The physical activity must be performed consistently to maintain the health benefits of exercise (Surgeon General Report, 1996).

Health benefits diminish greatly within 2 weeks if the physical activity is extensively decreased, and the benefits will be gone in 2-8 months if the decrease continues. (Surgeon General Report, 1996). The question then becomes: How can we promote and instill in people the desire to become and stay physically active?

### Role Modeling

Role modeling is accepted as an effective method of promoting specific types of behavior. Students are more likely to emulate observable behavior than verbal instruction (Bryan & Walbek, 1970). Bandura (1969) stated that “the influence of models in



activating, channeling, and supporting the behavior of others is abundantly documented in both laboratory and field studies" (p. 50).

The importance of demonstrating desired activity cannot be overstated. "Through the years modeling has always been acknowledged to be one of the most powerful means of transmitting values, attitudes, and patterns of thought and behavior" (Bandura, 1986, pp. 47-48). Most teachers recognize the importance of demonstrating desired behavior. But what happens to the learning process if the instructor does not role model the desired activity? Furthermore, what happens if the instructor not only fails to role model, but also gives the impression that the content being taught is not important or relevant to themselves on a personal level? One example might be a student who wonders what right an unfit and/or overfat instructor has to preach fitness and physical activity to them. We postulate that physical educators will have a greater impact on their students' motivation to be physically active, if they practice and look like they lead a healthy lifestyle. "People pay close attention to modeled performances that produce rewarding outcomes but disregard those having no noticeable effect" (Bandura, 1986, p. 53).

Virtually every child in the United States will at some time participate in a physical education program. It is accepted that physical educators have the responsibility of providing these children with the knowledge and skill to achieve and maintain physical fitness and an active lifestyle.

It is also important that physical educators assume the responsibility of providing a suitable role model for this lifestyle. Not only demonstrating desired behavior, but actually living an active lifestyle and looking the part.

Models who practice what they preach validate their claim that the behavior is appropriate and useful. In contrast, when models say one thing and do another, they are conveying to observers that a behavior is fine for observers but not for them, and observers may wonder why (Pintrich & Schunk, 1996, p. 170).

Certainly everyone is built differently and most people are not super models and body builders. However, there is a clear difference in appearance between a fit instructor and one who carries 30 pounds of excess abdominal fat.

The physical education profession has made great strides throughout the last 20 years, in the study of sport and exercise, and has gained more credibility as a discipline. The "dumb jock" stereotype is becoming less common and physical educators hold a respectable position in most schools.

However, some studies have raised questions concerning the health and fitness status of physical educators. Whitley, Sage, and Butcher (1988) report that 47% of physical educators do not maintain cardiorespiratory fitness.

Brandon and Evans (1988) administered fitness tests to physical educators and the overall scores were below average. It may be possible that physical educators who do not provide a good role model for their students risk a loss of credibility. This may also limit their ability to instill healthy values in their students.

Wilson (1993) also supported the idea that physical educators should act as role models. The implication was made that perhaps the reason adolescents may not be interested in physical education is related to a lack of believable role models (Wilson, 1993). Wilson (1993) pointed out that children see us reading and buying things, so they

grasp the concept that the skills required to perform these activities are important (1993). Yet if children do not see physical educators enjoying physical activity, the importance of an active lifestyle may not be substantiated (Wilson, 1993).

Educators need to show children an example of a healthy lifestyle if they want to convince them of the importance of physical activity (Wilson, 1993).

Pooley (1979) stated:

The role of the physical education teacher as a model for children is second only in importance to parents and stronger than that of any other schoolteacher since the physical education teacher is proficient in the elements in which children place a high value, namely strength and physical agility. This ability to strongly influence children carries with it important responsibilities for the physical educators, the profession and society to ensure that the values, attitudes and behaviors learned by children from their role models are perceived by the society to be 'desirable' (p. 30).

McTeer and White (1988) conducted a survey of students enrolled in Ontario physical education classes. The survey was designed to determine the effect significant people have on students' activity levels.

Students were asked to indicate the level of physical activity exhibited by themselves and other people significant to them. McTeer and White's (1988) results indicated that physical education teachers who were viewed by their students as being active at moderate or high levels appear to be more capable of inciting their students toward "higher levels of physical activity" (p. 21). The results seem to indicate that more

active physical education teachers exert a more positive effect on student activity levels than their less active peers (McTeer & White, 1988). The author pointed out that physical education teachers, parents, and best friends had similar levels of influence on the subjects in this survey, therefore, the conclusion was drawn that physical educators may be able to significantly influence the lifestyle of their students (McTeer & White, 1988).

Blomquist (1986) promoted the concept of role modeling by health educators, and stated that people can be influenced to learn and practice a healthy lifestyle if they are shown how to accomplish this objective.

Johnson (1985) gave a strong call for physical educators to promote fitness in the schools. He stated that it is the responsibility of physical educators to ensure that school children are physically fit (Johnson, 1985):

How can we expect anyone to listen to what we have to say about the benefits of fitness if we are overweight and in poor physical condition ourselves? We must become role models and legacies for the fit and active way of life (p.34).

Finally, Wilmore (1982) gave this charge to physical education professionals:

First and foremost, each of us in the profession must make a personal commitment to achieve or maintain a good level of physical fitness. How can we be effective in promoting health and fitness if our bodies are not living testimonies of our commitment? What we are communicates so much more than what we say! (p. 43).

## Studies on Role Modeling in Physical Education

Limited research has been completed on the effect a physical educator's appearance has on student learning and attitudes.

A study conducted by Melville and Maddalozzo (1988) addressed the physical appearance of a physical education instructor and the effect it had on student test performance. Two videotapes were developed using the same physical education teacher. One of Melville and Maddalozzo's (1988) tapes featured a fit appearing instructor, and the other tape featured the same instructor appearing overweight by disguising his build with a fat suit (Melville & Maddalozzo, 1988). High school students watched either the fit or overweight instructor tape, and then completed a questionnaire which included five questions they could indicate their level of agreement or disagreement on by choosing a corresponding number from one 1 through 4 (Melville & Maddalozzo, 1988).

They found that students liked the fit instructor better than the unfit instructor, believed the fit instructor to be more knowledgeable, and believed the fit instructor was more likely to practice what he preached (Melville & Maddalozzo, 1988).

The participating students agreed that teachers should be good role models, and the students who viewed the fit tape showed a stronger inclination to improve their personal fitness levels (Melville & Maddalozzo, 1988).

Melville and Maddalozzo (1988) also gave a 13-question knowledge test to the students pertaining to the subject matter of the tapes. The students who viewed the unfit tape missed an average of almost 2 more questions than the students who viewed the fit tape, yielding scores of 72% and 85% correct respectively (Melville & Maddalozzo,

1988). The author's wrote that "the appearance of fatness in a physical educator does affect the teaching of exercise concepts to high school students" (Melville & Maddalozzo, 1988, p.350). The above results would seem to indicate that the fit instructor was indeed more effective at getting his point across and motivating students.

Melville and Cardinal (1988) proposed that more research needs to be done to determine the effect of role modeling on instruction. Their article concluded that "current data shows the physical educator's appearance of fatness to be a potentially strong instructional variable" (Melville & Cardinal, 1988, p. 86). The authors recommended that "during fifth year and/or graduate studies, students be mandated to take part in a health-related physical fitness test" (Melville & Cardinal, 1988, p. 95). Physical fitness tests made available to physical educators through universities, encouragement by various means, and school districts and/or AAHPERD providing assistance in pursuing recreational activities were additional suggestions to help physical educators practice what they preach (Melville & Cardinal, 1988).

Thomson (1996) conducted a study using Melville and Maddalozzo's fit and unfit physical educator tapes. Thomson (1996) showed the tapes to sixth and seventh graders, and then gave them a 15-question quiz. Students who viewed the fit instructor averaged 10.85 correct responses while students who viewed the unfit instructor averaged 9.86 correct responses, a small but significant difference (Thomson, 1996).

Thomson (1996) defended the modest differences by stating that the test format consisted of multiple choice and true-false questions which provided a greater opportunity to guess correctly. According to Thomson (1996) this could cause a smaller margin

between the two groups of students. Although the results of this study are not as dramatic as those of Melville and Maddalozzo's they do point to a similar conclusion.

### Condition of Physical Educators

A study conducted by Clark, Blair, and Culan (1988) administered a questionnaire to 388 K-12 health and physical education teachers from a midwestern state. Results inform that 77.5% of the instructors exercise at least 3 to 6 times per week (Clark et al., 1988). When asked to rate their personal fitness level teachers responded in the following percentages: extremely fit (9.8%), fit (44%), somewhat fit (26.3%), average (12.8%), somewhat unfit (3.8%), unfit (.8%), and extremely unfit (.4%) (Clark, et al., 1988). The above percentages would seem to indicate that teachers who responded to this survey were mostly fit with active lifestyles. Clark, et al. (1988) compared these statistics with that of the national population and found that the Physical Education teachers surveyed appear to be far more active than the people in the national population.

The investigators were reportedly unable to find any studies in the literature which related to health and physical education teachers, and their adherence or lack there of, to a healthy lifestyle (Clark et al., 1988).

Whitley, Sage, and Butcher (1988) surveyed high school physical education teachers in Kern county California, and discovered that 47% of respondents were not participating in a cardiorespiratory fitness program. This study also found that physical educators involved in a cardiorespiratory fitness program were more likely to provide fitness activities for their students than those teachers who were not active in a cardiorespiratory fitness program (Whitley et al., 1988).

Several variables were addressed in the survey including sex, age, and years of teaching experience to see if there were any correlations between any of these variables and participation in a regular cardiovascular fitness program. No correlations were noted (Whitley et al., 1988).

Brandon and Evans (1988) conducted a survey on all elementary and secondary physical education teachers in Bibb County Georgia. However, those researchers also gave a sub sample of the respondents a fitness test, which included: cardiorespiratory fitness, muscular endurance, body composition, and flexibility components (Brandon & Evans, 1988). The women scored above average on the cardiovascular and muscular endurance test, with the men scoring above average on the muscular endurance test, but the educators scored below average on the test battery when taken as a whole (Brandon & Evans, 1988). Even though 85% of the subjects who responded to the questionnaire reported that they exercised regularly, and 72% of the people surveyed considered themselves good examples of fitness, still 57% of the teachers felt they were overweight (Brandon & Evans, 1988). These results seem to be contradictory.

Karper and Dignan (1983) developed a study involving health and physical education professionals working at the collegiate level. The inspiration for this study was the sight of health and physical education professionals at HPERD and HPE meetings who appeared to be unfit, consuming too much caffeine, and smoking (Karper & Dignan, 1983). A sample of health and physical education faculty was taken from the United States, and given a questionnaire (Karper & Dignan, 1983). Karper and Dignan (1983) found that 85% of the men and 78% of the women indicated that they exercise a minimum



of 3 times per week. Similarly 85% of the men and 71% of the women claimed they exercise for at least 30 minutes during each session (Karper & Dignan, 1983). Karper and Dignan's (1983) study shows that the majority of health and physical education professionals exercise at least three times per week. The vast majority also reported exercising a minimum of 30 minutes during an exercise session.

One suggestion the authors give as a reason for the contrast between the results of their study and their observations refers to the theory that the nonrespondents (49%) were more likely to not be active exercisers (Karper & Dignan, 1983).

### Summary

Bandura (1986) found that people who observe a role model may emulate the modeled behavior. Modeling is also important in that it can be used to teach the processes we need to follow in order to utilize the knowledge we have learned (Bandura, 1986). As an example a student may know many different activities and exercises but have no idea how to formulate this knowledge into a workable fitness plan. Role modeling a fit lifestyle may help a student to see how the parts shape into a whole. Bandura (1986) argues that: "The anticipated benefits of modeled skills and strategies provide incentives for paying attention to how others behave." (p. 53). Relating the above statement to a physical education instructor who does not personally show any rewards for being active and exercising. Students may ask themselves why they should exercise or be active to improve their health when the person telling them to do this does not appear to be fit. People tend to ignore models that do not exhibit success in their performance (Bandura, 1986).

Few studies have addressed the effect of physical educators' appearance on student learning. Thus the purpose of this study was to investigate the effect physical educators' appearance and role-modeling practices exert on student learning and attitude towards activity and fitness.

The study aimed to determine whether students learn better from a fit instructor who role models exercise, or who does not, or from an unfit looking instructor who role models exercise, or who does not.

This study will also examine the attitudes and beliefs the students develop towards the instructor based on the instructor's appearance and exercise role modeling practices.

In summary, this study attempted to ascertain which type of instruction and instructor appearance provides the students with the most content retention, confidence in the instructor, and motivation to be active and fit.

## CHAPTER II

### METHOD

The purpose of this study was to investigate the effects of a physical education instructor appearing overweight versus lean, and role modeling exercise behavior versus “do as I say” on student learning and attitudes. High school student participants viewed four videotapes of the same instructor using the same script. However, in two tapes the instructor wore a “fat suit” designed to make him look overfat. In one of those tapes he role modeled participation to emphasize its importance for health—while he merely instructed in “do as I say” mode in the other tape. Similarly, two more tapes depicted the same conditions except that the instructor appeared lean. After viewing the tapes, the students (who had been randomly assigned to the four conditions) took a knowledge test to assess their learning of the tapes’ content, and completed items tapping their attitudes toward the instructor and his effectiveness.

#### Participants

The participants consisted of 107 (41 male, 59 female, and 7 unreported sex) high school students from two high schools in a mid-sized mid-western city. Following approval by the Institutional Review Board parents were informed of the study by letter and given the opportunity to withdraw their children without penalty (see Appendix A).

## Video Tapes

The fitness and wellness tapes consisted of 4 separate tapes with 4 different presentations. Each tape featured the same instructor giving instruction on fitness and wellness concepts. However, in each tape the instructor assumed a particular guise and method of content delivery.

Tape 1 consisted of the instructor appearing fit and role-modeling the activities he presented. Tape 2 displayed the instructor disguised as fat and role-modeling the same activities. Tape 3 showed the instructor in fit condition again, but he did not role model the activities he presented. Tape 4 depicted the instructor as fat again, but he also did not role model the activities he presented.

The instructor was made to look fat through the use of a 20-pound body fat vest which was graciously provided for our use in this study by Nasco's Lifeform.

Scripts (see Appendix B) were used by the instructor during the taping of each video to ensure identical content coverage. The tapes were essentially identical in their approach except for tape 2. Minor additions to tape 2 conveyed that the fat appearing instructor was struggling with his weight and would be working out with the students rather than just telling them what to do. See Appendix B for details.

## Knowledge Test and Questionnaire

The knowledge test (see Appendix C) consisted of 20 multiple-choice questions. These questions were carefully written to reflect the content fitness and wellness concepts of the script.

The questionnaire (see Appendix D) included five attitude and opinion statements concerning role modeling, Darren's expertise, like-ability of Darren, and the students' motivation to be active and fit as a result of watching the video. The students responded by indicating their level of agreement with the statement on a 1-5 Likert-type scale. Two additional items allowed the student's to rate the instructor's body fat level as well as their own body fat level. The last portion of the questionnaire provided a section for the students to provide their height, weight, sex, age, perceived ideal weight, and attitude toward present weight.

#### Procedures

The students were randomly assigned (balanced for males and females) to four groups. The groups were each assigned to a room with a supervising teacher. The supervising teachers had been briefed on the proper procedure for administering the video, test, and questionnaire. Upon entering the appropriate room students were informed that they would be viewing a video on fitness and wellness. The students were also instructed that immediately after watching the video they would complete a test based on the content of the video. An attitude/opinion questionnaire was also administered with the test and included a section for the students to record personal height and weight information, and their perception of what their ideal weight should be. At the completion of the knowledge test and attitude questionnaire the students were debriefed as to the true nature of the video presentation (see Appendix E). The tests and questionnaires were collected and stored. All tapes were viewed simultaneously in each school and on the same day so student interaction regarding the tapes could not take place between showings.

### Design and Analysis

A 2 x 2 (Appearance x Role Modeling) ANOVA was used to assess the effect of the intervention on knowledge test scores. Similarly, the effect of the intervention on the attitude items was tested by a factorial MANOVA and an ANOVA.

Coefficient alpha (Cronbach, 1951) and principal components analyses were conducted on the three items that were written to tap students' attitudes regarding the instructor Darren. This was to ascertain whether to treat those items as a scale, or whether to analyze them separately.

A manipulation check was conducted by conducting a oneway ANOVA on the item that assessed the students' responses to viewing the instructor in the "fat" versus "lean" condition.

Whenever possible, an evaluation of the substantive significance of statistically significant effects was made by calculating effect sizes (Thomas, Salazar, & Landers, 1991).

## CHAPTER III

### RESULTS

This study was conducted to determine the effects of role modeling and teacher appearance on student learning and attitudes. It was theorized that students would respond more favorably and perform better when instructed by a fitter looking teacher, who also role modeled the presented activities. The study was implemented using videotapes which were shown to high school students. Following the video presentation students completed a knowledge test and attitude questionnaire. This chapter will present the results of these sessions.

#### Descriptive Statistics and Preliminary Checks

The descriptive statistics for all variables are presented in Table 1. Some preliminary analyses were conducted to check for possible confounds, or causes of bias in the results. These analyses showed that there were no differences between groups, or group x sex interaction effects on age, own weight, or ideal weight. There were sex differences in ideal weight ( $F [1, 85] = 7.15, p < .01$ ), and own weight ( $F [1, 92] = 8.79, p < .005$ ). There were no differences between schools, or school x group interaction effects on scores on the knowledge test.

Table 1. Descriptive Statistics for all Variables

	Number	Age	Weight	Height	Body Fatness Perception	Ideal Weight	Test Score
Group One							
Male	8	15.4 (.92)	140.25 (22.81)	69.75 (3.11)	2.75 (.46)	1.88 (5.30)	12.75 (2.76)
Female	11	16.1 (1.19)	139.42 (41.77)	66.15 (2.15)	3.46 (.97)	-12.82 (22.39)	13.85 (2.73)
Total	19	15.73 (1.16)	140.24 (33.86)	67.36 (3.08)	3.18 (.85)	-6.3 (18.14)	13.5 (2.69)
Group Two							
Male	9	15.6 (.73)	150.22 (19.44)	70.56 (2.40)	2.67 (.71)	3.33 (7.07)	13 (4.42)
Female	13	15.62 (.87)	125.31 (17.89)	64.00 (2.04)	3.15 (.99)	-4.77 (13.05)	13.31 (3.45)
Total	22	15.59 (.80)	135.5 (22.00)	66.68 (3.93)	2.95 (.90)	-1.45 (11.53)	13.18 (3.78)
Group Three							
Male	12	15.5 (1.09)	168.23 (33.85)	71.14 (2.57)	2.86 (.86)	-1.00 (12.23)	9.29 (4.14)
Female	8	15.8 (.63)	140.82 (27.07)	64.64 (4.86)	3.45 (1.04)	-16.11 (32.67)	12.64 (3.07)
Total	20	15.64 (.90)	154.24 (33.40)	68.23 (4.84)	3.23 (1.14)	-7.18 (23.45)	10.23 (4.01)
Group Four							
Male	10	15.8 (.92)	166.00 (28.53)	69.5 (1.90)	3.20 (.92)	-2.00 (24.52)	13.20 (2.30)
Female	20	15.86 (.99)	137.00 (32.83)	65.50 (2.26)	3.59 (.85)	-14.65 (30.38)	11.14 (3.87)
Total	30	15.84 (.95)	146.35 (33.95)	66.75 (2.84)	3.47 (.88)	-10.43 (28.78)	11.78 (3.55)
Overall Scores							
	91	15.71 (.95)	144.64 (31.80)	67.25 (3.72)	3.24 (.96)	-6.69 (22.15)	11.97 (3.77)

Numbers in parentheses denote standard deviations.



Pearson correlation coefficients were computed to see if students' perceptions of their own weight were related to their responses to the attitude items. All correlations were nonsignificant.

### Manipulation Check

A one-way ANOVA was computed to test for mean differences on the students responses to the item that tapped their perceptions of Darren's "weight or body fatness" after they had seen the fat versus lean appearance videos (see Figure 1). A significant difference was found ( $F [1, 104] = 21.48, p < .001$ ), and calculation of an effect size ( $ES = .82 SD$ ) revealed that the substantive effect was "large" (Thomas, Salazar, & Landers, 1991).

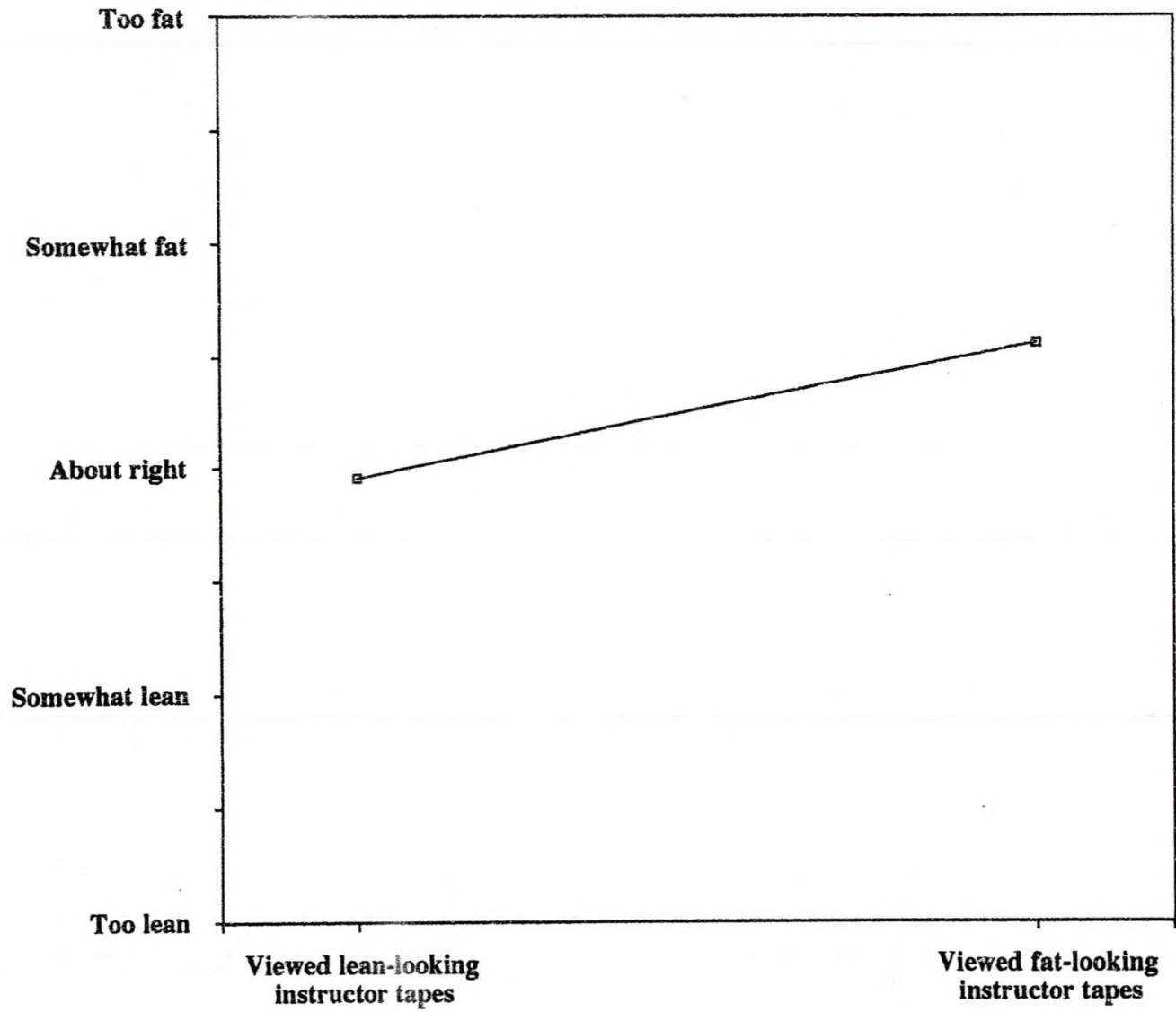
### Attitude Items Analyses

Analyses of the three items written to tap attitudes towards Darren as an instructor indicated that they formed a coherent scale. Specifically, an alpha reliability analysis revealed an acceptable coefficient ( $r = .77$ ) which would not have been elevated by removal of any of the three items, and the principal components analysis showed that the items formed one clear factor (eigenvalue = 2.07, 69% of the variance explained).

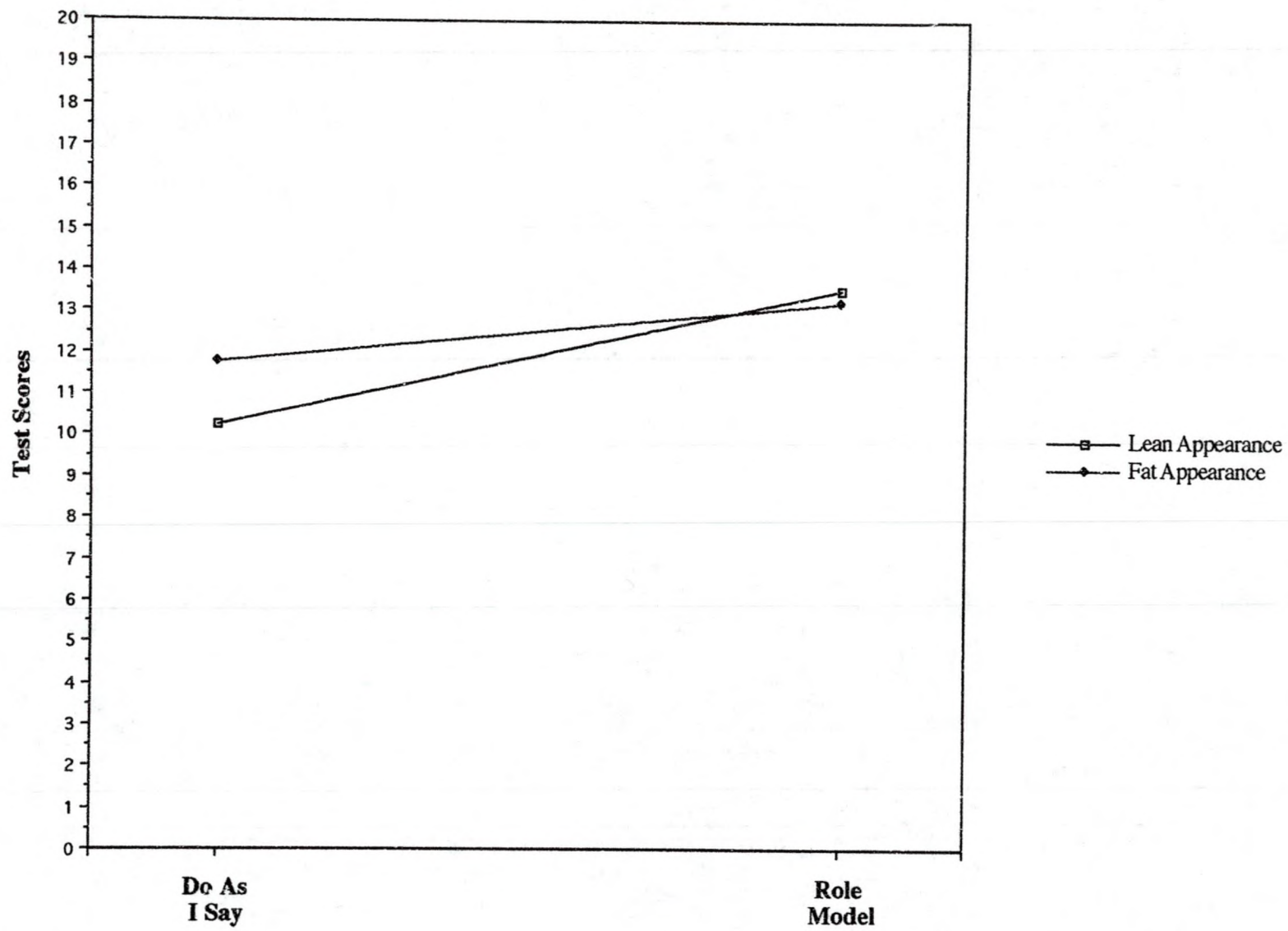
### Effects of the Intervention

A 2 x 2 (Appearance x Role Modeling) ANOVA revealed that there were no significant interaction effects, or effect for instructor appearance on students' test scores. However, there was a significant effect ( $F [1, 103] = 11.01, p = .001$ ) of role modeling vs. "do as I say" on the test scores (see Figure 2). Calculation of an effect size ( $ES = .62 SD$ ) indicated that the higher mean score of the students who viewed the role modeling

**Figure 1. Analyses of Attitudes Towards Darren.**



**Figure 2. Role Modeling vs “Do as I Say” on Test Scores.**



condition was of moderate-to-large significance substantively (Thomas, Salazar, & Landers, 1991).

A 2 x 2 (Appearance x Role Modeling) MANOVA revealed that there were no significant interaction effects, nor effect for instructor appearance on the students' attitudes toward the instructor.

However, there was a significant effect ( $F [3, 100] = 2.70, p < .05$ ) of role modeling vs. "do as I say" on their attitudes (see Figure 3). Subsequent univariate analyses showed that students who viewed Darren role modeling exercise rated him significantly higher as "...a role model who practices what he preaches about physical activity and fitness." ( $p = .05, ES = .39 SD$ ), and they also "...liked Darren as an instructor." more ( $p < .01, ES = .54 SD$ ).

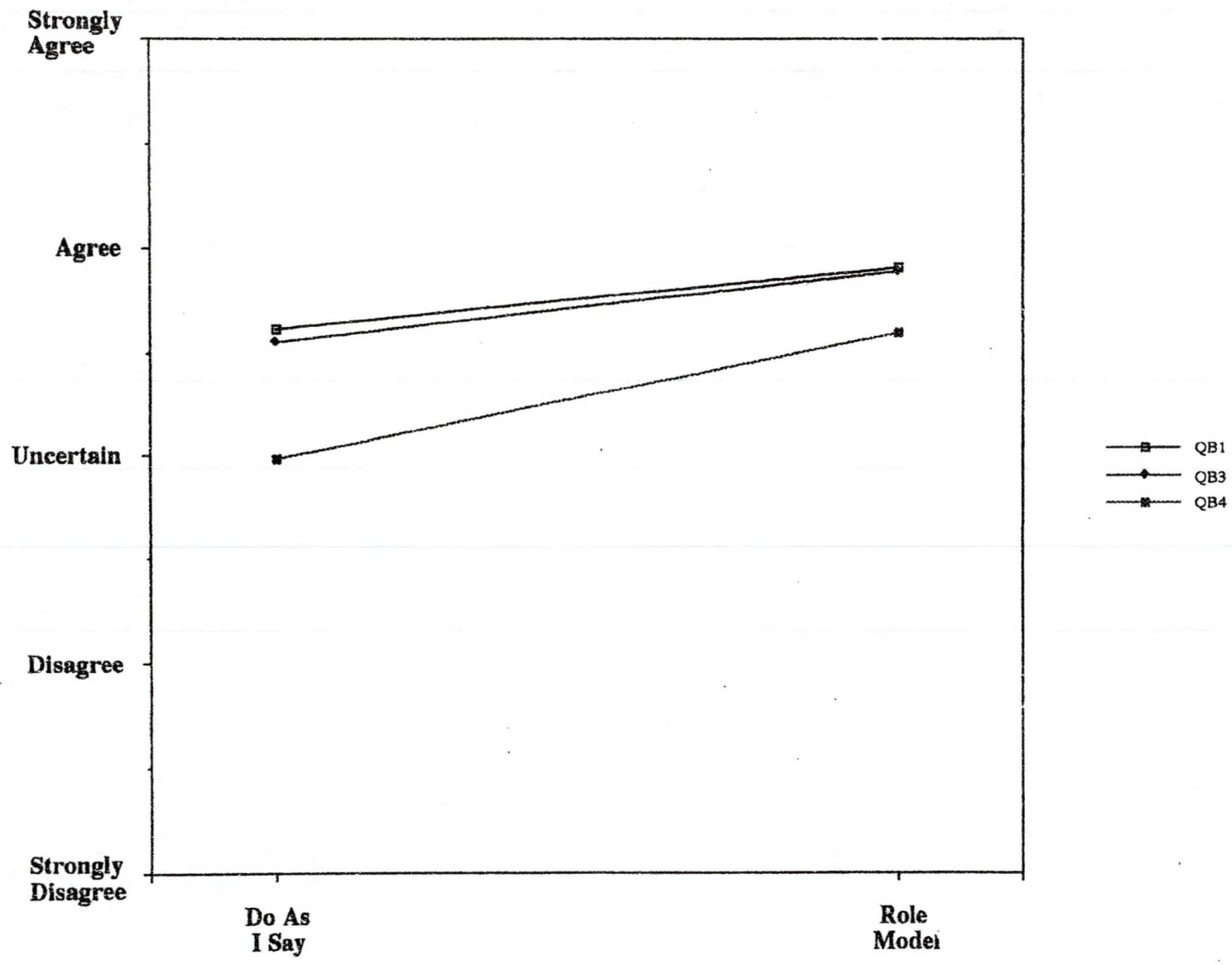
With regard to the item "PE instructors should be good role models who practice what they preach about physical activity and fitness," A 2 x 2 (Appearance x Role Modeling) ANOVA revealed no significant interaction effects, or effect for instructor's appearance. However, once again the students who saw the role modeling tapes were significantly higher in their agreement with the item ( $F [1, 102] = 5.56, p < .05, ES = .45 SD$ ) than the students who saw the instructor in "do as I say" mode (see Figure 4).

Finally, a 2 x 2 (Appearance x Role Modeling) ANOVA showed a significant interaction effect ( $F [1, 100] = 4.40, p < .05$ ), but no main effects (see Figure 5) for responses to the item "This videotape helped motivate me to be physically active and healthfully fit." Follow-up oneway ANOVAs showed that for the "do as I say" mode those who saw the instructor appearing lean rated their motivation as higher ( $F [1, 52] =$

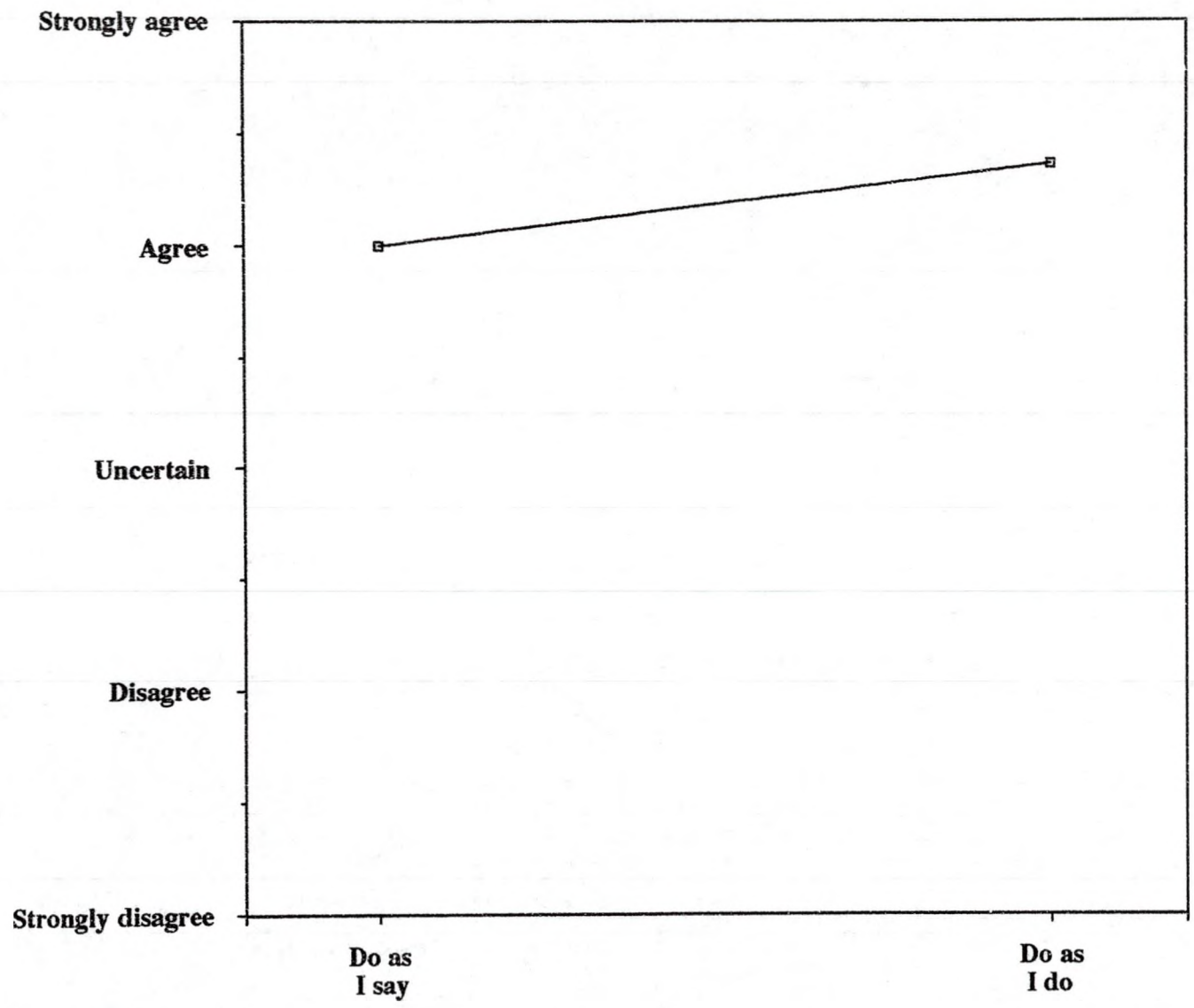
5.05,  $p < .05$ .  $ES = .56$ ) than those who saw the fat-appearing instructor tape, and those who saw the fat-looking instructor role model exercise were more motivated than those who saw him in “do as I say” mode ( $F [1, 52] = 5.67$ ,  $p < .05$ .  $ES = .63$ ).

**Figure 3. Role Modeling vs “Do as I Say” on Attitudes.**

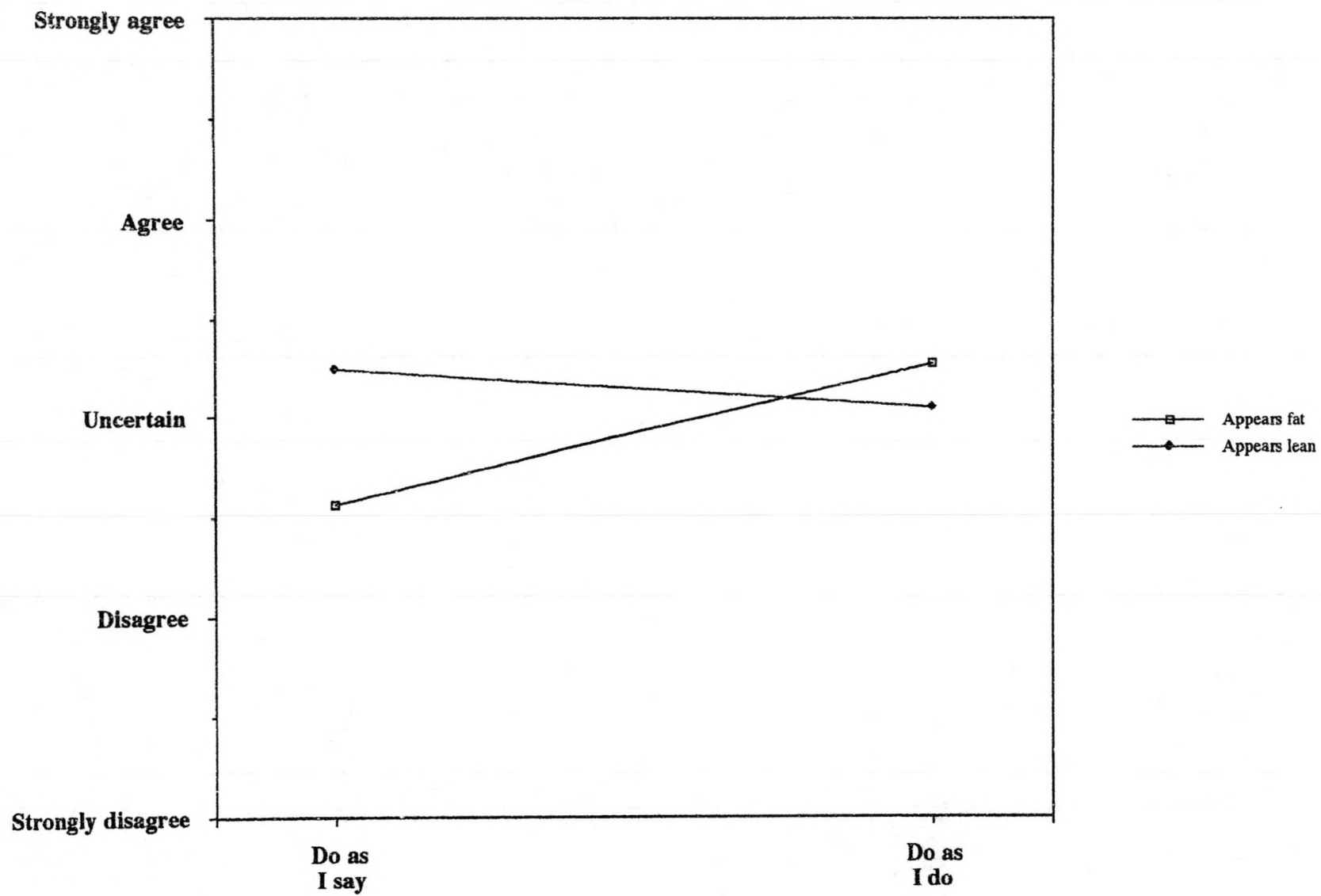




**Figure 4. Role Modeling vs. "Do as I Say" on Role Modeling Belief.**



**Figure 5. Interaction Effect for Motivation.**



## CHAPTER IV

### DISCUSSION

This study was centered on two issues in physical education instruction—the effects of role modeling desired behavior, and the effects of the instructor's fitness-related appearance. The study was conducted to determine whether these variables significantly affected student learning and attitudes. This chapter will discuss the results of this study, and will draw implications regarding how this study may affect professionals in the field.

Data were analyzed to ensure that randomization of the students had produced equal groups. As typically reported in the literature, significant differences between males' and females' perceptions of their ideal weight and their own weight were found within groups. However, those differences did not interact with key experimental variables; nor did they produce differences between groups, so it is unlikely that they introduced biases or confounds into the analyses.

A key result of this study was that the appearance of the instructor had no significant effect on the students' learning of fitness knowledge from the tapes. Similarly the appearance of the instructor also had no significant effect on the student's responses to the attitude items pertaining to him directly. This could be seen as surprising given the importance society places on appearance. An obvious explanation for these results would be that the students did not recognize the fat instructor as fat—or in other words, that the

experimental manipulation of appearance had failed. However, analysis of the data revealed that students did indeed notice a significant and substantive difference between “lean Darren” and “fat Darren” and thus, the manipulation of the instructor’s appearance was clearly successful.

Thus, it appears that in this study, the students disregarded, or accepted the instructor’s fatter appearance at least in so far as his teaching effectiveness. Similarly, in most cases, appearing fat did not cause negative attitudinal outcomes. When appearing fat, as opposed to lean, the students did not like Darren less, nor did they think of him as less of a role model. It was only when effects of the lean vs. fat appearance tapes on the item that read, “This videotape helped motivate me to be physically active and healthfully fit” were contrasted, for the “do as I do” condition only, that a negative outcome was found for the appearance of being fat. Otherwise, these results are intriguing given the common (usually erroneous) belief that a person cannot be fat and fit.

Role modeling desired behaviors did produce significant differences between groups in this study, with the students who saw the “do as I do” condition tapes scoring significantly higher on the knowledge test. These groups also liked the role modeling Darren more and believed him to be a better role model. While it is reassuring to find that role modeling desired behavior has positive effects, it may be seen as surprising in view of current societal attitudes towards fatness. Given that admonitions such as “practice what you preach” and “walk the talk” are common in our society and speak to the value we place on modeling our beliefs with a matching lifestyle, many may have expected an

advantage consequent to receiving information from a fit looking instructor over a fat looking instructor.

A possible explanation may be found for these results when the presentation of the fat role model is considered. Fat appearing Darren clearly gave the impression that he was struggling with his weight and had been working to lower his body fat level.

He also assured the students that he was not just telling them what to do, but rather working along with them in the quest for fitness and wellness. This may have been a key component of the presentation. The students may have disregarded Darren's appearance because of his seemingly sincere attempt to be fit in spite of not being able to reach his desired body fat level. This attitude coupled with the active role modeling of the fitness activities produced results statistically equal to a fit instructor who also role modeled the fitness activities.

Further data analysis showed that students who watched the role modeling tapes agreed more strongly that "physical education instructors should be good role models who practice what they preach about physical activity and fitness."

The results of this study were mostly in contrast to Melville and Maddalozzo's (1988) results, where it was found that the appearance of an instructor negatively impacted student learning and attitudes. Melville and Maddalozzo (1986) found that students who viewed a fit instructor scored significantly higher on a knowledge test, like the fit instructor better, and believed him to be more expert. Lastly the students who watched the fit instructor believed more strongly that he "practiced what he preached" (Melville & Maddalozzo, 1988, p. 348).



The preceding results were not replicated in the present study. The variable of role modeling was not overtly presented in the Melville and Maddalozzo (1988) study. Role modeling did appear in both the fat and fit tapes used by Melville and Maddalozzo but was limited to the demonstration of stretches. According to the current study, role modeling would clearly appear to be an even more important factor in student performance and attitude, than appearance of the instructor.

Thus these results support the view that "Through the years modeling has always been acknowledged to be one of the most powerful means of transmitting values, attitudes, and patterns of thought and behavior" (Bandura, 1986, pp. 47-48). In other words, these data suggest that role modeling is an important behavior which can have a positive effect in overcoming the obstacle of a less-than-perfect appearance.

Certainly this study suggests that role modeling desired behavior may play a significant role in the transfer of information from teacher to student. Additionally, role modeling may help convince the student of the instructor's credibility, and foster a more receptive emotional response from the student.

The current study demonstrated that a fat role model who admits his struggle with developing the ideal build, and establishes a camaraderie with his students, can obtain results equal to that of a lean role model in teaching fitness concepts.

Additional studies should be conducted to further understand the impact of role modeling for physical education and fitness instructors. One suggestion would be to conduct an identical study with a female instructor. Another would be to show two tapes. One of a fat role model, and the other of a lean role model, which are exactly the same in

presentation. A study such as this would help to verify if role modeling alone is enough to produce equal results between fat and lean instructors.

The most effective study would entail using actual (as opposed to video-taped) instructors over a longer period of time, although a difficulty would be the task of standardizing their presentations. Videotape is not a typical format used in teaching physical education classes. Neither do students see an instructor only one time.

The opportunity does not exist for a relationship or personal contact with a video. Both essential in effective teaching. However, this study has shown that regardless of appearance an instructor can be an effective presenter. It also appears that it may be beneficial for an instructor to divulge some of his or her personal struggle with fitness. Students may appreciate the idea of an instructor who they can relate to in terms of sharing their fitness problems. Someone who follows the lifestyle they promote. In short it would seem honesty is truly the best policy.

In conclusion perhaps as a society we are too quick to judge the capabilities of a person based on their appearance. All people are different and everyone brings different strengths and weaknesses to the game of life. An instructor with an over fat body regardless of living an active and healthful lifestyle may possess a charismatic and motivating personality that really gets students excited about fitness. On the other hand, a fit looking instructor might be uninspiring and unsympathetic to the needs of students. Who will prove to be the more effective instructor? In summary, this study suggests that it seems to be far more important to evaluate a person based on their commitment and talent for a particular task rather than on their appearance.

## **APPENDICES**

APPENDIX A

Consent Letter

March 2000

Dear Parents:

We have agreed to help \_\_\_\_\_ and \_\_\_\_\_ of the University of North Dakota with a research study on physical fitness and wellness. The project will involve your child learning important concepts about healthful physical activity, fitness, and wellness.

We have carefully reviewed all aspects of the project and have determined that there are no undue risks involved, or activities of a sensitive or disturbing nature. In fact, we expect that students will benefit from learning important fitness- and wellness-related information.

It is expected that the project will be completed in one health or physical education class period. During that class your child will watch a videotaped presentation on fitness and wellness that is being tested for the effectiveness of its content and delivery. After watching, your child will complete two short written tests so that the effectiveness of the video presentation can be evaluated. No further participation of your child will be required.

All data collected from your child will be held completely confidential, and will not be used to determine his or her grade. If you wish for more information on the project, please call \_\_\_\_\_ at xxxxxxxx, or \_\_\_\_\_ at xxxxxxxx.

Because we feel that this is an educationally valuable project, we hope that you will allow your child(ren) to participate.

Sincerely,

.....  
(Only sign and return this part if you do not want your child to participate in the project)

I/we do not wish our child \_\_\_\_\_ to take part in the research project.

\_\_\_\_\_  
Signature

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Date

## APPENDIX B

### Scripts

#### Basic Script With Sources Referenced

**Darren:** Hello, my name is Darren Albrecht and I'll be your physical education instructor for this session. During this time I will discuss 5 important fitness components, and how to develop and maintain them through exercise.

**Darren:** I will also discuss some of the concerns associated with being overweight. But I want to let you know that it is important to be active whatever your size and shape.

**Darren:** So even though we can't all be super models or body builders we can still choose active lifestyles, and regular activity and exercise will increase the odds that we will live healthier and longer. I will show you how to develop and maintain the five fitness components in this lesson. As I do this I want you to think of me as someone who is working at being active with you and not just telling you what to do!

**Darren:** It is very important to keep fit. Studies show that being active and staying fit may increase a person's life span (U.S. Department of Health and Human Services, 1996). But what exactly does it mean to be fit? It means several things. First of all a fit person's physiological systems work healthfully together (Corbin, 1997). Being fit also means that you have the energy to perform daily activities without becoming exhausted (Corbin, 1997). Furthermore, a fit person will also have energy to enjoy other activities and to handle many emergencies, which may arise (Corbin, 1997).

**Darren:** I'm going to talk about some of the reasons it is important to be physically active. Physical activity and or exercise can help to control a multitude of what are called "hypokinetic conditions" (Corbin, 1997). A hypokinetic condition is a medical problem that is related to a lack of exercise or physical activity (Corbin, 1997). Examples of hypokinetic conditions are atherosclerosis, which is narrowing of the arteries, heart attack, stroke, high blood pressure, cancer, diabetes type II, obesity, and osteoporosis or weakened bones (Corbin, 1997). Physical activity and exercise can help to combat these conditions (Corbin, 1997). Avoidance of hypokinetic conditions is a very important reason to be physically active.

**Darren:** Besides controlling and preventing hypokinetic conditions there are many other benefits which result from being physically active and exercising. These benefits include, looking fitter, having more energy for work and leisure, improved emotional health, greater chances for fun and socialization, increased chance of a longer and fuller life, and a greater capacity for handling emergencies (Corbin, 1997). Being active helps you feel better!

**Darren:** The first of the five fitness components I will discuss is cardiovascular fitness, which is the ability to get lots of oxygen from the air to where it's needed in your body (Corbin, 1997)! A strong heart and lungs, along with clear blood vessels characterize a healthy cardiovascular system (Corbin, 1997). With a healthy and fit cardiovascular system you will be able to vigorously exercise your body for a long period of time (Corbin, 1997). Being cardiovascularly fit will help to decrease the chances of getting heart disease, stroke, diabetes, high blood pressure, and having good cardiovascular of fitness also helps prevent or reduce overfatness or overweight conditions (Corbin, 1997).

*(Darren walks over to treadmill, gets on and starts it up.)*

**Darren:** The second of the five fitness components that I'm going to address is body fatness. By body fatness we mean how much fat our body contains compared to everything else in our body-such as muscle and bone (Corbin, 1997). So if we have 10% body fat and we weigh 100 pounds then 10 pounds of our body is fat and 90 pounds of our body is everything else but fat. Many people think that we don't want any body fat but that is a mistake! Fat plays a vital role in our health. We just want the right amount, not too much and not too little. As a matter of fact, we cannot live without some fat in our bodies. Fat is used by our bodies as an insulator from heat and cold (Corbin, 1997). It is also used as a shock absorber to protect the body (Corbin, 1997). Some vitamins must have fat in order to work properly, and fat is also an energy source used by our bodies (Corbin, 1997).

**Darren:** There are several factors that influence what your body fat levels will be. One of these factors is heredity (Corbin, 1997). You will inherit your body type from your parents or ancestors and you may have a tendency to be lean or a tendency for fatness (Corbin, 1997). People's metabolisms are also different. Two people could eat the exact same food while one of the persons remains thin and the other becomes fat.

**Darren:** Another factor, which determines how much fat you may carry, is maturation (Corbin, 1997). As people mature their hormone levels change and this causes fat levels to change as well, but it's different for boys and girls (Corbin, 1997)! Teenage girls typically will add some fat while teenage boys will develop more muscle (Corbin, 1997). This is a biologically natural occurrence and results in girls usually having a higher percentage of body fat than boys- (Corbin, 1997) the girls need the extra energy stores for future pregnancies and breastfeeding. Therefore the lowest recommended body fat levels are different for teenage boys and girls (Corbin, 1997). For a teenage girl about 11% is the minimum healthy level, and the highest level is 25% (Corbin, 1997). Boys should not fall below 6% body fat and not rise above 20% (Corbin, 1997). Having a body fat percentage over 30% is considered obese for teenage boys, and being over 35% is considered obese for teenage girls (Corbin, 1997).

**Darren:** The most common problem is excess body fat. Too many people are overfat (Centers for Disease Control and Prevention, 1999). Having too much body fat can result in a higher risk for heart disease, high blood pressure, diabetes, and other diseases (Corbin, 1997). Overfat people are also at greater risk for unsuccessful surgeries and tire faster than lean people (Corbin, 1997). On the other hand, being underfat is especially a concern for adolescent and adult females because it may cause problems with menstrual periods, and may put them at risk for poor bone health. Again, a not-too-much—not-too-little optimal level is best.

**Darren:** The aerobic activities, which are beneficial to developing cardiovascular fitness, are also helpful in reducing body fat levels (Corbin, 1997). Some of the activities, which are common to many people, are biking, jogging, and this old favorite.

*(Darren picks up the jump rope and begins to jump)*

**Darren:** Jumping rope is an excellent way to burn calories and is an economical and easy way to reduce body fat. When you do aerobic exercises to burn *calories* it is important to do them regularly (Corbin, 1997). Because aerobic exercises demand lots of “calorie burning” oxygen compared to other types of exercise, they are excellent choices for fat control.

**Darren:** Other principles which need to be followed to control body fatness are: Eating sensibly—eating 3 regular nutritious low-fat meals or 4-5 smaller meals a day (Corbin, 1997). Do not skip meals (Corbin, 1997). There are 3500 calories in a pound of fat (Corbin, 1997). So, to gain or lose a pound of fat you must increase or decrease your caloric intake by 3500 calories (Corbin, 1997). If losing body fat is your goal you should use a combination of diet and exercise to lose no more than 1-2 pounds per week (Corbin, 1997). One pound per week is a sensible goal (Corbin, 1997)—and this means a change in the balance of calories eaten versus calories burned of about 500 per day.... Seven days at 500 calories equals 3,500 calories, or one pound of fat lost.

*(Darren stops jumping rope)*

**Darren:** It is also important that exercise is used along with good eating habits to lose weight (Corbin, 1997). Losing weight by dieting alone results in fat and muscle loss (Corbin, 1997). Using physical activity and caloric reductions together results in mostly fat loss (Corbin, 1997). Think of nutritious food as the fuel that keeps you healthy and fuels the exercise that keeps you in great shape. It has also been shown that lifestyle activities are just as effective at producing fat loss as sports and games (Corbin, 1997). These lifestyle activities may be even more effective at keeping fat off than sports and games (Corbin, 1997). Lifestyle activities include things like walking instead of driving, doing housework, mowing the lawn, and other things that are a part of normal life and can be done as physical activity (Corbin, 1997).

**Darren:** The third of the five fitness components that we need to address is muscular endurance—which is the ability of muscles to keep on working over time without tiring too quickly (Corbin, 1997). Building and maintaining good muscular endurance has many benefits, including looking better, being able to work longer, better posture, less aches and pains, increased lean body mass, lower body fat, and stronger bones (Corbin, 1997).

**Darren:** Building muscular endurance is important as this allows our muscles to work for long periods of time without tiring (Corbin, 1997). Thus it requires high reps with a fairly light weight to build muscular endurance (Corbin, 1997). One example would be doing 20 reps on a bench press (Corbin, 1997). As your muscular endurance increases you could gradually increase the reps to 25 and the sets to three (Corbin, 1997). Once this weight becomes easy to do for 3 sets of 25 reps the weight could be increased and the system repeated (Corbin, 1997). This would be repeated until the desired level of muscular endurance is reached (Corbin, 1997).

*(Darren does 20 reps on the benchpress)*

**Darren:** That was one set of 20 reps. As I increase my muscular endurance I would gradually increase my reps to 25 and my sets to 3. Once this weight becomes easy to do for 3 sets of 25 reps I would increase the weight and start over. I can continue to do this until I reach my desired level of muscular endurance.

**Darren:** Muscular endurance exercises should be done 3 to 7 days per week using about a quarter to a half of your one rep maximum (Corbin, 1997). A person should rest for about 2 minutes between sets (Corbin, 1997).

**Darren:** Because strength is closely related to muscular endurance I will talk about that next, as the fourth of the five fitness components. By strength we mean the maximum amount of weight that a muscle can move (Corbin, 1997). However, strength training provides other benefits to the body besides greater strength. Bones can be strengthened through strength training (Corbin, 1997). Also, a stronger muscle may be more likely to remain healthy, and not become injured (Corbin, 1997). A person who has muscular strength may have a better appearance than someone without muscular strength (Corbin, 1997). Strong abdominal muscles will help to maintain a healthy back, and the more muscle the body carries the more calories the body can burn, even at rest (Corbin, 1997). Increasing muscle mass and maintaining the same fat content will lower bodyfat percentages, and strength training itself will burn calories. All of these factors can help to control body fatness.

*(Darren walks over to the bench press)*

**Darren:** Because the bench press is such a popular lift I will use it to demonstrate the process for developing muscular strength. The recommended resistance for developing



strength is 60%-75% of a person's one rep maximum lift Corbin, 1997). I will use 200 pounds as an example of my maximum bench press. I would then calculate 60%-75% of that number. I will use 120 pounds, which would be 60% of 200 pounds. This weight should be done for 7 to 10 repetitions and for 3 sets (Corbin, 1997). (*Darren does a set of 10 reps*) Always remember to begin gradually. One set like I just showed you might be good enough to start. Strength training is usually best not done on consecutive days (Corbin, 1997). This allows for recovery, and allows time for cardiovascular exercises.

*(Darren moves over to mat)*

**Darren:** I'm going to move over to the mat here so I can demonstrate a few stretches. You can probably guess the fitness component I will be talking about from that hint. I'm going to present the last of the five components, flexibility. Joints that are healthfully flexible are able to move through a full range of motion (Corbin, 1997)—but not too much, which could cause joint instability! Flexibility, like body fatness, is a part of fitness where you could have too much as well as too little. However, over-flexibility is uncommon, and usually the result of an injury.

For most people the problem is staying flexible enough—which helps to ensure that joints and muscles will not become stiff (Corbin, 1997)). Flexible muscles are also more difficult to injure, and posture can be improved when flexibility is improved (Corbin, 1997). It's often a good idea to work on flexibility in your warm-up and cool-down parts of the exercise sessions.

Flexibility can be increased, but only if the muscle is stretched beyond the range it is accustomed to (Corbin, 1997). A muscle should be stretched until a pulling sensation is felt, but not to the point of pain (Corbin, 1997). I'll show you a stretch here on the mat called the "backsaver sit and reach" when I'm doing this stretch I am stretching until I feel a pulling sensation in the back of my leg (Corbin, 1997, p. 143). I will hold this stretch for 10-15 seconds (Corbin, 1997). Now I will rest for 10 seconds and repeat the stretch 2-3 times (Corbin, 1997). If I want to increase my flexibility I will try to keep stretching further every time I stretch (Corbin, 1997). It's a good idea to start with just one repetition and one set when first starting to stretch (Corbin, 1997). Then over time the sets can be gradually increased to 3-4 but the repetitions should remain at one (Corbin, 1997). Stretching should be done at least three days per week (Corbin, 1997). If you are already at a satisfactory level of flexibility you can just move your muscles through a full range of motion to maintain your flexibility (Corbin, 1997).

**Darren:** There are some specific guidelines concerning exercise and physical activity that have been established for adults. These guidelines have been developed with the purpose of providing the information needed to develop and maintain the fitness components. As many of you are of legal age or fast approaching it I am going to give you these guidelines.

**Darren:** First of all to maintain cardiorespiratory and body composition fitness it is recommended that adults engage in 20-60 minutes of aerobic activity 3-5 days a week (American College of Sports Medicine, 1998). The intensity should be at 65-90% of the maximum heart rate (ACSM, 1998). A lower range of about fifty-five to 64% is OK for people who are very unfit (ACSM, 1998). The activity should be continuous and rhythmical using large muscle groups (ACSM, 1998). Lower intensity exercise should be continued for longer periods than higher intensity exercise (ACSM, 1998). At least thirty minutes for lower intensity and at least 20 minutes for higher intensity exercise (ACSM, 1998). However lower intensity exercise is usually recommended over high intensity exercise because of injury reduction and better adherence (ACSM, 1998). Total fitness is also easier to develop with longer sessions (ACSM, 1998). Another option given is to accumulate the exercise time in 10-minute bouts throughout the day (ACSM, 1998). However this is the minimum amount of time (ACSM, 1998).

**Darren:** The recommendations given for adult development and maintenance of muscular strength and endurance are as follows. Do one set of 8-10 different exercises that work the major muscle groups (ACSM, 1998). These sets should be done 2-3 days per week (ACSM, 1998). Doing more than one set may provide further improvement (ACSM, 1998). Eight to twelve reps should be done for each exercise (ACSM, 1998). Older and frail people may want to use 10-15 reps (ACSM, 1998).

**Darren:** Flexibility should be worked using stretches for the major muscle groups at least 2-3 days per week (ACSM, 1998). Appropriate static and/or dynamic stretches should be employed (ACSM, 1998). For most people, static stretches in warm-up and cool-down are sufficient. Some dynamic stretches may be needed to warm-up for dynamic activities-like running a hurdle race.

**Darren:** There is another guideline which has been developed for the purpose of enhancing adults' health and decreasing their chances of acquiring a disease. This other guideline explains the level of exercise is not really sufficient for fitness improvement, but gives very worthwhile health benefits at a lower level of exertion. The recommendation is that adults should accumulate at least 30 minutes of exercise (Pate, et al., 1995). The exercise should be done at a moderate intensity level and may include such things as brisk walking, taking the stairs, gardening or doing housework (Pate, et al., 1995).

**Darren:** There are also some general guidelines for physical activity that have been developed for people your age. These guidelines recommend that adolescents engage in at least 30 minutes of moderate physical activity on most or better yet every day of the week (U.S. Department of Health and Human Services, 1996; Sallis and Patrick, 1994). Moderate physical activity would be at an intensity level of walking, riding bike, or climbing stairs

**Darren:** In addition to 30 minutes of moderate physical activity it is also recommended that adolescents engage in at least 3 sessions per week of moderate to vigorous physical activity (Sallis and Patrick, 1994). These sessions should last at least 20 minutes and should be at an intensity level at least as strenuous as fast walking and should include a variety of exercise which work large muscle groups (Sallis and Patrick, 1994). Some examples would be jogging, swimming, cross country skiing, basketball, soccer, and strength training (Sallis and Patrick, 1994).

**Darren:** Now you may be asking, if I do all this stuff can I be certain that I'll get in great shape? Will I have more body fat than I wish? Is there a point to doing all this activity if you can't look the way that you want?

**Darren:** The reality is that, for many, appearance may not be changed as much as desired. However, the good news is that research has shown that taking part in aerobic activity and eating sensibly can improve the physiological health of overweight, or unfit people (Tremblay et al., 1991). The research has shown that sensible exercise and eating can reduce the risk of problems like heart disease and diabetes to normal levels even if the exercisers remain somewhat overfat (Tremblay et al., 1991). Thus, it's worth doing (said humorously) even if the results may not be good enough to get your picture on the front page of Muscle and Fitness, or Cosmopolitan magazine!

**Darren:** So it is important to exercise and eat right even if our bodies don't respond as we wish. We can be healthier on the inside even if we don't always change as much as we would like on the outside.

**Darren:** The final thing I want to mention in this lesson is that it is extremely important that we are careful of quick fix weight loss methods. There is no such thing as a quick fix. (example) A lifestyle change is required to develop and maintain fitness and to control body fatness. If a diet or weight loss program sounds too good to be true, chances are it may be.

**Darren:** This session is only a brief overview of the fitness components and how to develop them. A physical education instructor or other qualified instructor can assist in answering any questions you may have and help you fill in the blanks. I hope my presentation showed you that healthful physical activity is important for everybody—and I hope that it will encourage all of you to take an active roll in developing and maintaining your personal fitness. Good luck and good health to you all in the future.

#### Script Used By Fat Appearing Role Model

**Darren:** Hello, my name is Darren Albrecht and I'll be your physical education instructor for this session. During this time I will discuss 5 important fitness components, and how to develop and maintain them through exercise.

**Darren:** I will also discuss some of the concerns associated with being overweight. *As you can see I have a problem of being overweight myself, but this doesn't mean that I'm inactive. In fact, I especially want to let you know that it is important to be active whatever your size and shape.*

**Darren:** So even though we can't all be super models or body builders we can still choose active lifestyles, and regular activity and exercise will increase the odds that we will live healthier and longer. I will show you how to develop and maintain the five fitness components in this lesson. As I do this I want you to think of me as someone who *especially needs exercise*, and is working at being active with you and not just telling you what to do!

**Darren:** It is very important to keep fit. Studies show that being active and staying fit may increase a person's life span. But what exactly does it mean to be fit? It means several things. First of all a fit person's physiological systems work healthfully together. Being fit also means that you have the energy to perform daily activities without becoming exhausted. Furthermore, a fit person will also have energy to enjoy other activities and to handle many emergencies, which may arise.

**Darren:** I'm going to talk about some of the reasons it is important to be physically active. Physical activity and or exercise can help to control a multitude of what are called "hypokinetic conditions". A hypokinetic condition is a medical problem that is related to a lack of exercise or physical activity. Examples of hypokinetic conditions are atherosclerosis (narrowing of the arteries), heart attack, stroke, high blood pressure, cancer, diabetes type II, obesity, and osteoporosis (or weakened bones). Physical activity and exercise can help to combat these conditions. Avoidance of hypokinetic conditions is a very important reason to be physically active.

**Darren:** Besides controlling and preventing hypokinetic conditions there are many other benefits which result from being physically active and exercising. These benefits include, looking fitter, having more energy for work and leisure, improved emotional health, greater chances for fun and socialization, increased chance of a longer and fuller life, and a greater capacity for handling emergencies. Being active helps you feel better!

**Darren:** The first of the five fitness components I will discuss is cardiovascular fitness- which is the ability to get lots of oxygen from the air to where it's needed in your body! A strong heart and lungs, along with clear blood vessels characterize a healthy cardiovascular system. With a healthy and fit cardiovascular system you will be able to vigorously exercise your body for a long period of time. Being cardiovascularly fit will help to decrease the chances of getting heart disease, stroke, diabetes, high blood pressure, and having good cardiovascular fitness also helps prevent or reduce overfatness or overweight conditions.

*(Darren walks over to treadmill, gets on and starts it up.)*

**Darren:** Jogging is a popular cardiovascular activity. I like to jog 3 times a week. *For adults, the recommendation is that* cardiovascular fitness exercises, such as jogging, should be done at least 3 days per week at a minimum of 60% of the maximum heart rate and for 20 continuous minutes. If a person wishes to further increase their fitness level it is recommended that the activity be done 3 to 5 days per week at 60% to 90% of the maximum heart rate, and for 20 to 60 minutes. The maximum heart rate is calculated by taking 220 minus your age. For example, say I am 30 so I would take 220 minus 30 to figure my maximum heart rate. That would equal 190. Then I would take 190 times 60% to figure the minimum heart rate I need to maintain during cardiovascular activity.

**Darren:** The second of the five fitness components that I'm going to address is body fatness. By body fatness we mean how much fat our body contains compared to everything else in our body-such as muscle and bone. So if we have 10% body fat and we weigh 100 pounds then 10 pounds of our body is fat and 90 pounds of our body is everything else but fat. Many people think that we don't want any body fat but that is a mistake! Fat plays a vital role in our health. We just want the right amount, not too much and not too little. As a matter of fact, we cannot live without some fat in our bodies. Fat is used by our bodies as an insulator from heat and cold. It is also used as a shock absorber to protect the body. Some vitamins must have fat in order to work properly, and fat is also an energy source used by our bodies.

**Darren:** There are several factors that influence what your body fat levels will be. One of these factors is heredity. You will inherit your body type from your parents or ancestors and you may have a tendency to be lean or a tendency for fatness. People's metabolisms are also different. Two people could eat the exact same food while one of the persons remains thin and the other becomes fat.

**Darren:** Another factor, which determines how much fat you may carry, is maturation. As people mature their hormone levels change and this causes fat levels to change as well, but it's different for boys and girls! Teenage girls typically will add some fat while teenage boys will develop more muscle. This is a biologically natural occurrence and results in girls usually having a higher percentage of body fat than boys-the girls need the extra energy stores for future pregnancies and breastfeeding. Therefore the lowest recommended body fat levels are different for teenage boys and girls. For a teenage girl about 11% is the minimum healthy level, and the highest level is 25%. Boys should not fall below 6% body fat and not rise above 20%. Having a body fat percentage over 30% is considered obese for teenage boys, and being over 35% is considered obese for teenage girls.

**Darren:** The most common problem is excess body fat. Too many people are overfat. Having too much body fat can result in a higher risk for heart disease, high blood pressure,

diabetes, and other diseases. Overfat people are also at greater risk for unsuccessful surgeries and tire faster than lean people. *On the other hand, being underfat is especially a concern for adolescent and adult females because it may cause problems with menstrual periods, and may put them at risk for poor bone health. Again, a not-too-much—not-too-little optimal level is best.*

**Darren:** The aerobic activities, which are beneficial to developing cardiovascular fitness, are also helpful in reducing body fat levels. Some of the activities, which are common to many people, are biking, jogging, and this old favorite.

*(Darren picks up the jump rope and begins to jump)*

**Darren:** Jumping rope is an excellent way to burn calories and is an economical and easy way to reduce body fat. When you do aerobic exercises to burn calories it is important to do them regularly. Because aerobic exercises demand lots of “calorie burning” oxygen compared to other types of exercise, they are excellent choices for fat control.

**Darren:** Other principles which need to be followed to control body fatness are: Eating sensibly—eating 3 regular nutritious low-fat meals or 4-5 smaller meals a day. Do not skip meals. There are 3500 calories in a pound of fat. So, to gain or lose a pound of fat you must increase or decrease your caloric intake by 3500 calories. If losing body fat is your goal you should use a combination of diet and exercise to lose no more than 1-2 pounds per week. *One pound per week is a sensible goal—and this means a change in the balance of calories eaten versus calories burned of about 500 per day.... Seven days at 500 calories equals 3,500 calories, or one pound of fat lost.*

*(Darren stops jumping rope)*

**Darren:** It is also important that exercise is used along with good eating habits to lose weight. Losing weight by dieting alone results in fat and muscle loss. Using physical activity and caloric reductions together results in mostly fat loss. Think of nutritious food as the fuel that keeps you healthy and fuels the exercise that keeps you in great shape. It has also been shown that lifestyle activities are just as effective at producing fat loss as sports and games. These lifestyle activities may be even more effective at keeping fat off than sports and games. Lifestyle activities include things like walking instead of driving, doing housework, mowing the lawn, and other things that are a part of normal life and can be done as physical activity.

**Darren:** The third of the five fitness components that we need to address is muscular endurance—which is the ability of muscles to keep on working over time without tiring too quickly. Building and maintaining good muscular endurance has many benefits, including looking better, being able to work longer, better posture, less aches and pains, increased lean body mass, lower body fat, and stronger bones.

**Darren:** Building muscular endurance is important as this allows our muscles to work for long periods of time without tiring. Thus it requires high reps with a fairly light weight to build muscular endurance. One example would be doing 20 reps on a bench press. As your muscular endurance increases you could gradually increase the reps to 25 and the sets to three. Once this weight becomes easy to do for 3 sets of 25 reps the weight could be increased and the system repeated. This would be repeated until the desired level of muscular endurance is reached.

*(Darren does 20 reps on the benchpress)*

**Darren:** That was one set of 20 reps. as I increase my muscular endurance I would gradually increase my reps to 25 and my sets to 3. Once this weight becomes easy to do for 3 sets of 25 reps I would increase the weight and start over. I can continue to do this until I reach my desired level of muscular endurance.

**Darren:** Muscular endurance exercises should be done 3 to 7 days per week, *using about a quarter to a half* of your one rep maximum. A person should rest for *about 2 minutes* between sets.

**Darren:** Because strength is closely related to muscular endurance I will talk about that next, as the fourth of the five fitness components. By strength we mean the maximum amount of weight that a muscle can move. However, strength training provides other benefits to the body besides greater strength. Bones can be strengthened through strength training. Also, a stronger muscle may be more likely to remain healthy, and not become injured. A person who has muscular strength may have a better appearance than someone without muscular strength. Strong abdominal muscles will help to maintain a healthy back, and the more muscle the body carries the more calories the body can burn, even at rest. Increasing muscle mass and maintaining the same fat content will lower bodyfat percentages, and strength training itself will burn calories. All of these factors can help to control body fatness.

*(Darren walks over to the bench press)*

**Darren:** Because the bench press is such a popular lift I will use it to demonstrate the process for developing muscular strength. The recommended resistance for developing strength is 60%-75% of a person's one rep maximum lift. I will use 200 pounds as an example of my maximum bench press. I would then calculate 60%-75% of that number. I will use 120 pounds, which would be 60% of 200 pounds. This weight should be done for 7 to 10 repetitions and for 3 sets. *(Darren does a set of 10 reps)* Always remember to begin gradually. One set like I just showed you might be good enough to start. Strength training is usually best not done on consecutive days. This allows for recovery, and allows time for cardiovascular exercises.

*(Darren moves over to mat)*

**Darren:** I'm going to move over to the mat here so I can demonstrate a few stretches. You can probably guess the fitness component I will be talking about from that hint. I'm going to present the last of the five components, flexibility. Joints that are healthfully flexible are able to move through a full range of motion—but *not too much, which could cause joint instability!* Flexibility, like body fatness, is a part of fitness where you could have too much as well as too little. However, over-flexibility is uncommon, and usually the result of an injury. For most people the problem is staying flexible enough—which helps to ensure that joints and muscles will not become stiff. Flexible muscles are also more difficult to injure, and posture can be improved when flexibility is improved. It's often a good idea to work on flexibility in your warm-up and cool-down parts of the exercise sessions.

**Darren:** Flexibility can be increased, but only if the muscle is stretched *beyond the range it is accustomed to*. A muscle should be stretched until a pulling sensation is felt, but not to the point of pain. I'll show you a stretch here on the mat called the "backsaver sit and reach" when I'm doing this stretch I am stretching until I feel a pulling sensation in the back of my leg. I will hold this stretch for 10-15 seconds. Now I will rest for 10 seconds and repeat the stretch 2-3 times. If I want to increase my flexibility I will try to keep stretching further every time I stretch. It's a good idea to start with just one repetition and one set when first starting to stretch. Then over time the sets can be gradually increased to 3-4 but the repetitions should remain at one. Stretching should be done at least three days per week. If you are already at a satisfactory level of flexibility you can just move your muscles through a full range of motion to maintain your flexibility.

**Darren:** There are some specific guidelines concerning exercise and physical activity that have been established for adults. These guidelines have been developed with the purpose of providing the information needed to develop and maintain the fitness components. As many of you are of legal age or fast approaching it I am going to give you these guidelines.

**Darren:** First of all to maintain cardiorespiratory and body composition fitness it is recommended that adults engage in 20-60 minutes of aerobic activity 3-5 days a week. The intensity should be at 65-90% of the maximum heart rate. *A lower range of about fifty-five to 64% is OK for people who are very unfit.* The activity should be continuous and rhythmical using large muscle groups. Lower intensity exercise should be continued for longer periods than higher intensity exercise. At least thirty minutes for lower intensity and at least 20 minutes for higher intensity exercise. However lower intensity exercise is *usually* recommended over high intensity exercise because of injury reduction and better adherence. Total fitness is also easier to develop with longer sessions. Another option given is to accumulate the exercise time in 10-minute bouts throughout the day. However this is the minimum amount of time.



**Darren:** The recommendations given for adult development and maintenance of muscular strength and endurance are as follows. Do one set of 8-10 different exercises that work the major muscle groups. These sets should be done 2-3 days per week. Doing more than one set may provide further improvement. Eight to twelve reps should be done for each exercise. Older and frail people may want to use 10-15 reps.

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**Darren:** There is another guideline which has been developed for the purpose of enhancing *adults'* health and decreasing their chances of acquiring a disease. *This other guideline explains the level of exercise is not really sufficient for fitness improvement, but gives very worthwhile health benefits at a lower level of exertion.* The recommendation is that adults should accumulate at least 30 minutes of exercise. The exercise should be done at a moderate intensity level and may include such things as brisk walking, taking the stairs, gardening or doing housework.

**Darren:** There are also some general guidelines for physical activity that have been developed for people your age. These guidelines recommend that adolescents engage in at least 30 minutes of moderate physical activity on most or better yet every day of the week. Moderate physical activity would be at an intensity level of walking, riding bike, or climbing stairs

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**Darren:** So it is important to exercise and eat right even if our bodies don't respond as we wish. *That's why I try to exercise regularly even though I've never managed to become as lean as I'd really like.* We can be healthier on the inside even if we don't always change as much as we would like on the outside.

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#### Script Used By Lean Appearing Role Model

**Darren:** Hello, my name is Darren Albrecht and I'll be your physical education instructor for this session. During this time I will discuss 5 important fitness components, and how to develop and maintain them through exercise.

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**Darren:** So even though we can't all be super models or body builders we can still choose active lifestyles, and regular activity and exercise will increase the odds that we will live healthier and longer. I will show you how to develop and maintain the five fitness components in this lesson. As I do this I want you to think of me as someone who is working at being active with you and not just telling you what to do!

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lack of exercise or physical activity. Examples of hypokinetic conditions are atherosclerosis, which is narrowing of the arteries, heart attack, stroke, high blood pressure, cancer, diabetes type II, obesity, and osteoporosis or weakened bones. Physical activity and exercise can help to combat these conditions. Avoidance of hypokinetic conditions is a very important reason to be physically active.

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*(Darren walks over to treadmill, gets on and starts it up.)*

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**Darren:** There is another guideline which has been developed for the purpose of enhancing adults' health and decreasing their chances of acquiring a disease. This other guideline explains the level of exercise is not really sufficient for fitness improvement, but gives very worthwhile health benefits at a lower level of exertion. The recommendation is that adults should accumulate at least 30 minutes of exercise. The exercise should be done at a moderate intensity level and may include such things as brisk walking, taking the stairs, gardening or doing housework.

**Darren:** There are also some general guidelines for physical activity that have been developed for people your age. These guidelines recommend that adolescents engage in at least 30 minutes of moderate physical activity on most or better yet every day of the week. Moderate physical activity would be at an intensity level of walking, riding bike, or climbing stairs

**Darren:** In addition to 30 minutes of moderate physical activity it is also recommended that adolescents engage in at least 3 sessions per week of moderate to vigorous physical activity. These sessions should last at least 20 minutes and should be at an intensity level at least as strenuous as fast walking and should include a variety of exercise which work large muscle groups. Some examples would be jogging, swimming, cross country skiing, basketball, soccer, and strength training.

**Darren:** Now you may be asking, if I do all this stuff can I be certain that I'll get in great shape? Will I have more body fat than I wish? Is there a point to doing all this activity if you can't look the way that you want?

**Darren:** The reality is that, for many, appearance may not be changed as much as desired. However, the good news is that research has shown that taking part in aerobic activity and eating sensibly can improve the physiological health of overweight, or unfit people. The research has shown that sensible exercise and eating can reduce the risk of problems like heart disease and diabetes to normal levels even if the exercisers remain somewhat overfat. Thus, it's worth doing (said humorously) even if the results may not be good enough to get your picture on the front page of Muscle and Fitness, or Cosmopolitan magazine!

**Darren:** So it is important to exercise and eat right even if our bodies don't respond as we wish. We can be healthier on the inside even if we don't always change as much as we would like on the outside.

**Darren:** The final thing I want to mention in this lesson is that it is extremely important that we are careful of quick fix weight loss methods. There is no such thing as a quick fix. (example) A lifestyle change is required to develop and maintain fitness and to control body fatness. If a diet or weight loss program sounds too good to be true, chances are it may be.

**Darren:** This session is only a brief overview of the fitness components and how to develop them. A physical education instructor or other qualified instructor can assist in answering any questions you may have and help you fill in the blanks. I hope my presentation showed you that healthful physical activity is important for everybody—and I hope that it will encourage all of you to take an active roll in developing and maintaining your personal fitness. Good luck and good health to you all in the future.



## Script Used By Fat and Lean Appearing Non-Role Model

**Darren:** Hello, my name is Darren Albrecht and I'll be your physical education instructor for this session. During this time I will discuss 5 important fitness components, and how to develop and maintain them through exercise.

**Darren:** I will also discuss some of the concerns associated with being overweight. But I want to let you know that it is important to be active whatever your size and shape.

**Darren:** So even though we can't all be super models or body builders we can still choose active lifestyles, and regular activity and exercise will increase the odds that we will live healthier and longer. I will show you how to develop and maintain the five fitness components in this lesson. As I do this I want you to think of me as someone who is working at being active with you and not just telling you what to do!

**Darren:** It is very important to keep fit. Studies show that being active and staying fit may increase a person's life span. But what exactly does it mean to be fit? It means several things. First of all a fit person's physiological systems work healthfully together. Being fit also means that you have the energy to perform daily activities without becoming exhausted. Furthermore, a fit person will also have energy to enjoy other activities and to handle many emergencies, which may arise.

**Darren:** I'm going to talk about some of the reasons it is important to be physically active. Physical activity and or exercise can help to control a multitude of what are called "hypokinetic conditions". A hypokinetic condition is a medical problem that is related to a lack of exercise or physical activity. Examples of hypokinetic conditions are atherosclerosis (narrowing of the arteries), heart attack, stroke, high blood pressure, cancer, diabetes type II, obesity, and osteoporosis (or weakened bones). Physical activity and exercise can help to combat these conditions. Avoidance of hypokinetic conditions is a very important reason to be physically active.

**Darren:** Besides controlling and preventing hypokinetic conditions there are many other benefits which result from being physically active and exercising. These benefits include, looking fitter, having more energy for work and leisure, improved emotional health, greater chances for fun and socialization, increased chance of a longer and fuller life, and a greater capacity for handling emergencies. Being active helps you feel better!

**Darren:** The first of the five fitness components I will discuss is cardiovascular fitness- which is the ability to get lots of oxygen from the air to where it's needed in your body! A strong heart and lungs, along with clear blood vessels characterize a healthy cardiovascular system. With a healthy and fit cardiovascular system you will be able to vigorously exercise your body for a long period of time. Being cardiovascularly fit will help to decrease the chances of getting heart disease, stroke, diabetes, high blood

pressure, and having good cardiovascular fitness also helps prevent or reduce overfatness or overweight conditions.

**Darren:** Jogging is a popular cardiovascular activity. *For adults, the recommendation is that* cardiovascular fitness exercises, such as jogging, should be done at least 3 days per week at a minimum of 60% of the maximum heart rate and for 20 continuous minutes. If a person wishes to further increase their fitness level it is recommended that the activity be done 3 to 5 days per week at 60% to 90% of the maximum heart rate, and for 20 to 60 minutes. The maximum heart rate is calculated by taking 220 minus your age. For example, say I am 30 so I would take 220 minus 30 to figure my maximum heart rate. That would equal 190. Then I would take 190 times 60% to figure the minimum heart rate I need to maintain during cardiovascular activity.

**Darren:** The second of the five fitness components that I'm going to address is body fatness. By body fatness we mean how much fat our body contains compared to everything else in our body-such as muscle and bone. So if we have 10% body fat and we weigh 100 pounds then 10 pounds of our body is fat and 90 pounds of our body is everything else but fat. Many people think that we don't want any body fat but that is a mistake! Fat plays a vital role in our health. We just want the right amount, not too much and not too little. As a matter of fact, we cannot live without some fat in our bodies. Fat is used by our bodies as an insulator from heat and cold. It is also used as a shock absorber to protect the body. Some vitamins must have fat in order to work properly, and fat is also an energy source used by our bodies.

**Darren:** There are several factors that influence what your body fat levels will be. One of these factors is heredity. You will inherit your body type from your parents or ancestors and you may have a tendency to be lean or a tendency for fatness. People's metabolisms are also different. Two people could eat the exact same food while one of the persons remains thin and the other becomes fat.

**Darren:** Another factor, which determines how much fat you may carry, is maturation. As people mature their hormone levels change and this causes fat levels to change as well, but it's different for boys and girls! Teenage girls typically will add some fat while teenage boys will develop more muscle. This is a biologically natural occurrence and results in girls usually having a higher percentage of body fat than boys-the girls need the extra energy stores for future pregnancies and breastfeeding. Therefore the lowest recommended body fat levels are different for teenage boys and girls. For a teenage girl about 11% is the minimum healthy level, and the highest level is 25%. Boys should not fall below 6% body fat and not rise above 20%. Having a body fat percentage over 30% is considered obese for teenage boys, and being over 35% is considered obese for teenage girls.

**Darren:** The most common problem is excess body fat. Too many people are overfat. Having too much body fat can result in a higher risk for heart disease, high blood pressure, diabetes, and other diseases. Overfat people are also at greater risk for unsuccessful surgeries and tire faster than lean people. *On the other hand, being underfat is especially a concern for adolescent and adult females because it may cause problems with menstrual periods, and may put them at risk for poor bone health. Again, a not-too-much—not-too-little optimal level is best.*

**Darren:** The aerobic activities, which are beneficial to developing cardiovascular fitness, are also helpful in reducing body fat levels. Some of the activities, which are common to many people, are biking, jogging, and this old favorite.

*(Darren holds up jump rope)*

**Darren:** Jumping rope is an excellent way to burn calories and is an economical and easy way to reduce body fat. When you do aerobic exercises to burn calories it is important to do them regularly. Because aerobic exercises demand lots of “calorie burning” oxygen compared to other types of exercise, they are excellent choices for fat control.

**Darren:** Other principles which need to be followed to control body fatness are: Eating sensibly—eating 3 regular nutritious low-fat meals or 4-5 smaller meals a day. Do not skip meals. There are 3500 calories in a pound of fat. So, to gain or lose a pound of fat you must increase or decrease your caloric intake by 3500 calories. If losing body fat is your goal you should use a combination of diet and exercise to lose no more than 1-2 pounds per week. *One pound per week is a sensible goal—and this means a change in the balance of calories eaten versus calories burned of about 500 per day.... Seven days at 500 calories equals 3,500 calories, or one pound of fat lost.*

**Darren:** It is also important that exercise is used along with good eating habits to lose weight. Losing weight by dieting alone results in fat and muscle loss. Using physical activity and caloric reductions together results in mostly fat loss. Think of nutritious food as the fuel that keeps you healthy and fuels the exercise that keeps you in great shape. It has also been shown that lifestyle activities are just as effective at producing fat loss as sports and games. These lifestyle activities may be even more effective at keeping fat off than sports and games. Lifestyle activities include things like walking instead of driving, doing housework, mowing the lawn, and other things that are a part of normal life and can be done as physical activity.

**Darren:** The third of the five fitness components that we need to address is muscular endurance—which is the ability of muscles to keep on working over time without tiring too quickly. Building and maintaining good muscular endurance has many benefits, including looking better, being able to work longer, better posture, less aches and pains, increased lean body mass, lower body fat, and stronger bones.

**Darren:** Building muscular endurance is important as this allows our muscles to work for long periods of time without tiring. Thus it requires high reps with a fairly light weight to build muscular endurance. One example would be doing 20 reps on a bench press. As your muscular endurance increases you could gradually increase the reps to 25 and the sets to three. Once this weight becomes easy to do for 3 sets of 25 reps the weight could be increased and the system repeated. This would be repeated until the desired level of muscular endurance is reached.

**Darren:** Muscular endurance exercises should be done 3 to 7 days per week *using about a quarter to a half* of your one rep maximum. A person should rest for *about 2 minutes* between sets.

**Darren:** Because strength is closely related to muscular endurance I will talk about that next, as the fourth of the five fitness components. By strength we mean the maximum amount of weight that a muscle can move. However, strength training provides other benefits to the body besides greater strength. Bones can be strengthened through strength training. Also, a stronger muscle may be more likely to remain healthy, and not become injured. A person who has muscular strength may have a better appearance than someone without muscular strength. Strong abdominal muscles will help to maintain a healthy back, and the more muscle the body carries the more calories the body can burn, even at rest. Increasing muscle mass and maintaining the same fat content will lower bodyfat percentages, and strength training itself will burn calories. All of these factors can help to control body fatness.

**Darren:** Because the bench press is such a popular lift I will use it to explain the process for developing muscular strength. The recommended resistance for developing strength is 60%-75% of a person's one rep maximum lift. I will use 200 pounds as an example of a maximum bench press. I would then calculate 60%-75% of that number. The answer is 120 pounds, which would be 60% of 200 pounds. This weight should be done for 7 to 10 repetitions and for 3 sets. Always remember to begin gradually. One set might be good enough to start. Strength training is usually best not done on consecutive days. This allows for recovery, and allows time for cardiovascular exercises.

*(Darren moves over to mat)*

**Darren:** I'm going to present the last of the five components, flexibility. Joints that are flexible are able to move through a full range of motion—*but not too much, which could cause joint instability!* Flexibility, like body fatness, is a part of fitness where you could have too much as well as too little. However, over-flexibility is uncommon, and usually the result of an injury.

*For most people the problem is staying flexible enough—which helps to ensure that joints and muscles will not become stiff. Flexible muscles are also more difficult to injure, and*

posture can be improved when flexibility is improved. It's often a good idea to work on flexibility in your warm-up and cool-down parts of the exercise sessions.

Flexibility can be increased, but only if the muscle is stretched *beyond the range it is accustomed to*. A muscle should be stretched until a pulling sensation is felt, but not to the point of pain. The stretch should be held for 10-15 seconds, followed by 10 seconds of rest. Then the stretch should be repeated 2-3 times. If you want to increase your flexibility try to keep stretching further every time. It's a good idea to start with just one repetition and one set when first starting to stretch. Then over time the sets can be gradually increased to 3-4 but the repetitions should remain at one. Stretching should be done at least three days per week. If you are already at a satisfactory level of flexibility you can just move your muscles through a full range of motion to maintain your flexibility.

**Darren:** There are some specific guidelines concerning exercise and physical activity that have been established for adults. These guidelines have been developed with the purpose of providing the information needed to develop and maintain the fitness components. As many of you are of legal age or fast approaching it I am going to give you these guidelines.

**Darren:** First of all to maintain cardiorespiratory and body composition fitness it is recommended that adults engage in 20-60 minutes of aerobic activity 3-5 days a week. The intensity should be at 65-90% of the maximum heart rate. *A lower range of about fifty-five to 64% is OK for people who are very unfit.* The activity should be continuous and rhythmical using large muscle groups. Lower intensity exercise should be continued for longer periods than higher intensity exercise. At least thirty minutes for lower intensity and at least 20 minutes for higher intensity exercise. However lower intensity exercise is *usually* recommended over high intensity exercise because of injury reduction and better adherence. Total fitness is also easier to develop with longer sessions. Another option given is to accumulate the exercise time in 10-minute bouts throughout the day. However this is the minimum amount of time.

**Darren:** The recommendations given for adult development and maintenance of muscular strength and endurance are as follows. Do one set of 8-10 different exercises that work the major muscle groups. These sets should be done 2-3 days per week. Doing more than one set may provide further improvement. Eight to twelve reps should be done for each exercise. Older and frail people may want to use 10-15 reps.

**Darren:** Flexibility should be worked using stretches for the major muscle groups at least 2-3 days per week. Appropriate static and or dynamic stretches should be employed. For most people, static stretches in warm-up and cool-down are sufficient. Some dynamic stretches may be needed to warm-up for dynamic activities-like running a hurdle race.

**Darren:** There is another guideline which has been developed for the purpose of enhancing *adults'* health and decreasing their chances of acquiring a disease. *This other guideline explains the level of exercise is not really sufficient for fitness improvement, but gives very worthwhile health benefits at a lower level of exertion.* The recommendation is that adults should accumulate at least 30 minutes of exercise. The exercise should be done at a moderate intensity level and may include such things as brisk walking, taking the stairs, gardening or doing housework.

**Darren:** There are also some general guidelines for physical activity that have been developed for people your age. These guidelines recommend that adolescents engage in at least 30 minutes of moderate physical activity on most or better yet every day of the week. Moderate physical activity would be at an intensity level of walking, riding bike, or climbing stairs.

**Darren:** In addition to 30 minutes of moderate physical activity it is also recommended that adolescents engage in at least 3 sessions per week of moderate to vigorous physical activity. These sessions should last at least 20 minutes and should be at an intensity level at least as strenuous as fast walking and should include a variety of exercise which work large muscle groups. Some examples would be jogging, swimming, cross country skiing, basketball, soccer, and strength training.

**Darren:** Now you may be asking, if I do all this stuff can I be certain that I'll get in great shape? Will I have more body fat than I wish? Is there a point to doing all this activity if you can't look the way that you want?

**Darren:** The reality is that, for many, appearance may not be changed as much as desired. However, the good news is that research has shown that taking part in aerobic activity and eating sensibly can improve the physiological health of overweight, or unfit people. The research has shown that sensible exercise and eating can reduce the risk of problems like heart disease and diabetes to normal levels even if the exercisers remain somewhat overfat. Thus, it's worth doing (said humorously) even if the results may not be good enough to get your picture on the front page of Muscle and Fitness, or Cosmopolitan magazine!

**Darren:** So it is important to exercise and eat right even if our bodies don't respond as we wish. We can be healthier on the inside even if we don't always change as much as we would like on the outside.

**Darren:** The final thing I want to mention in this lesson is that it is extremely important that we are careful of quick fix weight loss methods. There is no such thing as a quick fix. (example) A lifestyle change is required to develop and maintain fitness and to control body fatness. If a diet or weight loss program sounds too good to be true, chances are it may be.

**Darren:** This session is only a brief overview of the fitness components and how to develop them. A physical education instructor or other qualified instructor can assist in answering any questions you may have and help you fill in the blanks. *I hope my presentation made it clear to you that healthful physical activity is important for everybody—and I hope that it will encourage all of you to take an active roll in developing and maintaining your personal fitness.* Good luck and good health to you all in the future.

## APPENDIX C

### What I Learned From The Fitness Video

On each of the 20 questions, circle the answer you think is correct:

- 1. According to Darren, keeping physically active and fit usually helps people to:**
  - A. Have good health and the energy to enjoy daily activities without becoming exhausted.
  - B. Never get sick.
  - C. Improve their ability to work hard enough to earn higher-than-normal incomes later in life.
  - D. Have more friends and a better-than-normal social life.
  
- 2. Darren explained that a “hypokinetic condition” is:**
  - A. A mental tendency in a person to become over-excited.
  - B. A medical problem related to lack of exercise or physical activity.
  - C. An injury from ballistic training exercises.
  - D. A person’s attitude to certain types of exercises or to physical activity in general.
  
- 3. With a healthy and fit cardiovascular system you should be able to:**
  - A. Do more sit-ups and push-ups than most other young people.
  - B. Be good at most popular sports.
  - C. Go for months or years without getting head colds.
  - D. Vigorously exercise your body for long periods of time.
  
- 4. In the video Darren emphasized the potential health benefits of good cardiovascular fitness. He especially noted that having good cardiovascular fitness...**
  - A. ...decreases the risk of heart disease, stroke, diabetes, and high blood pressure.
  - B. ...reduces the risk of dying from most types of cancer.
  - C. ...guarantees a longer life for almost everybody.
  - D. ...makes it very unlikely that people will get fatter as they age.
  
- 5. According to Darren, which statement best describes what we should aim for in terms of how much fat our bodies contain?**
  - A. Try to keep body fatness as low as possible.



- B. Not too much, not too little is best.
- C. Accept becoming a bit plump as you age because it carries no health risk.
- D. For your health's sake, lose it any way you can if you are obese.

**6. Which is NOT true?**

- A. We should try to get rid of all our body fat.
- B. We cannot live without some fat in our bodies.
- C. Fat is an energy source used by our bodies.
- D. Fat is need as needed as a shock absorber in some parts of our bodies.

**7. Which was NOT cited in the video as an important influence on a person's body fatness level?**

- A. Maturation level of young people.
- B. Male sex versus female sex.
- C. The genes you inherit from your parents.
- D. Where you live in the USA.

**8. In the video, Darren emphasized that it's biologically normal and healthy for:**

- A. Both boys and girls to add fat in the teenage years.
- B. Both boys and girls to lose fat in the teenage years.
- C. Boys and girls to stay the same weight as they mature into adults.
- D. Young girls to add some body fat as they mature into adult women.

**9. Darren mentioned that aerobic exercises, such as jumping rope, are excellent for controlling, or reducing body fatness because:**

- A. They really get you sweating a lot.
- B. They demand lots of "calorie burning" oxygen compared to other types of exercise.
- C. They work the areas of the body, such as on the hips, where excess fat is often stored.
- D. They really get the blood flowing to the areas where fat is stored in the body.

**10. To lose one pound of fat, a person must expend about \_\_\_\_\_ more calories than are consumed.**

- A. 2,000
- B. 2,500
- C. 3,000
- D. 3,500

- 11. Which is NOT a good example of what Darren meant by “lifestyle activity?”**
- A. Mowing the lawn.
  - B. Doing housework.
  - C. Jogging 20 minutes several times a week.
  - D. Choosing to walk instead of driving.
- 12. Darren’s definition of “muscular endurance” was:**
- A. The ability of muscles to keep on working over time without tiring too quickly.”
  - B. The ability of exercisers to go on exercising for at least 30 – 60 minutes at one time.
  - C. The ability to maintain muscle size increases for a long time after building them up.
  - D. The ability of some exercisers to keep on going when the going gets tough!
- 13. Which was the recommendation given for doing exercises to improve muscular endurance?**
- A. Do lots of reps until you can’t stand the “burn” in the muscles any more.
  - B. A real light weight, do reps continually for at least 10 minutes whenever you can.
  - C. 20-25 reps, 3 sets, 3 -7 days a week, using about a quarter to a half of your one rep. maximum.
  - D. 7-10 reps, 3 sets, about every other day, using 60-75% of your one rep. maximum.
- 14. With regard to strength training and management of body fatness, which is NOT true?**
- A. The more muscle in the body, the more calories burned at rest.
  - B. Strength training is of little use for management of body fatness.
  - C. Increasing muscle mass lowers body fat percent.
  - D. Muscular strength usually has a positive effect on physical appearance.
- 15. Which is NOT true about flexibility?**
- A. Good flexibility reduces exercise injury risk.
  - B. Posture is often improved by proper flexibility.
  - C. You can be too flexible.
  - D. To improve flexibility, you should stretch to the point of pain.
- 16. Which is true?**
- A. For most people, static stretches are not sufficient.

- B. Stretching during warm-up and cool-down is not enough for the majority of people.
- C. Stretches for the major muscle groups should be done at least 5 times a week, preferably daily.
- D. Dynamic stretches may be needed to prepare for dynamic activities—like running a hurdles race.

**17. To improve fitness, adults should work out 3-5 times a week at about 65-90% of their maximum heart rate for about 20-60 minutes. However, for those who don't meet that standard, but manage to *accumulate about 30 minutes of moderate activity most days*—the result should be:**

- A. No real benefits of any sort because it fails to stimulate the body enough to improve.
- B. Some health and fitness benefits, but it would need a bit more effort to be worthwhile.
- C. Little fitness improvement, but very worthwhile health benefits from that lower level of exertion.
- D. Quite remarkable health and fitness improvements from that lower level of exertion.

**18. Darren mentioned that the physical activity recommendation for adolescents is:**

- A. Accumulate 30 min. of moderate activity most days plus 3 X 20 min. per week of moderate-to-vigorous.
- B. Accumulate 30 min. of moderate activity every day.
- C. On most days do at least 20 min. of moderate-to-vigorous continuous exercise.
- D. Accumulate 60 min. of moderate-to-vigorous activity every day.

**19. If an overfat person follows an exercise program for several weeks or months, but only loses some of the excess fat, then that person...**

- A. ...been unlucky to have gained no benefits at all.
- B. ...will have to work much harder in the future to get meaningful benefits.
- C. ...has probably not done as much exercise as they claim.
- D. ...has most likely benefited from physiological health improvements.

**20. Darren's advice on "quick fix" weight loss methods or products was:**

- A. "It's worth a try to see if it works for you."
- B. "You've nothing to lose since you can insist on your money back."
- C. "Sometimes there's benefit, but probably in a while rather than quickly."
- D. "If it sounds too good to be true, chances are it may be."

## APPENDIX D

**You just watched a videotape of an instructor (Darren) who gave you a lot of information about physical activity, fitness, and health.**

**Please respond to each of the statements below by circling the most appropriate response:**

- |  |                           |              |                  |                              |
|--|---------------------------|--------------|------------------|------------------------------|
| <p>•Darren seems to be an expert with regard to his knowledge about physical activity and fitness.</p>                               | <p>Strongly<br/>Agree</p> | <p>Agree</p> | <p>Uncertain</p> | <p>Strongly<br/>Disagree</p> |
| <p>•Physical education instructors should be good role models who practice what they preach about physical activity and fitness.</p> | <p>Strongly<br/>Agree</p> | <p>Agree</p> | <p>Uncertain</p> | <p>Strongly<br/>Disagree</p> |
| <p>•Darren seems to be a good role model who practices what he preaches about physical activity and fitness.</p>                     | <p>Strongly<br/>Agree</p> | <p>Agree</p> | <p>Uncertain</p> | <p>Strongly<br/>Disagree</p> |
| <p>•I liked Darren as an instructor.</p>   | <p>Strongly<br/>Agree</p> | <p>Agree</p> | <p>Uncertain</p> | <p>Strongly<br/>Disagree</p> |
| <p>•This videotape helped motivate me to be physically active and healthfully fit.</p>   | <p>Strongly<br/>Agree</p> | <p>Agree</p> | <p>Uncertain</p> | <p>Strongly<br/>Disagree</p> |

**Also with regard to Darren, please circle the most appropriate response on the statement below:**

- |   |                    |                         |                        |                          |                     |
|---|--------------------|-------------------------|------------------------|--------------------------|---------------------|
| <p>•In terms of his weight or body fatness, Darren looked as though he is probably:</p> | <p>Too<br/>fat</p> | <p>Somewhat<br/>fat</p> | <p>About<br/>right</p> | <p>Somewhat<br/>lean</p> | <p>Too<br/>lean</p> |
|---|--------------------|-------------------------|------------------------|--------------------------|---------------------|

**With regard to *your own* weight or body fatness, please answer the item below as honestly as you can:**

- |  |                    |                         |                        |                          |                     |
|--|--------------------|-------------------------|------------------------|--------------------------|---------------------|
| <p>•I feel that in terms of my own body fatness, I am:</p> | <p>Too<br/>fat</p> | <p>Somewhat<br/>fat</p> | <p>About<br/>right</p> | <p>Somewhat<br/>lean</p> | <p>Too<br/>lean</p> |
|--|--------------------|-------------------------|------------------------|--------------------------|---------------------|

**Finally, please fill in the blanks, or respond as accurately as possible:**

- My height is \_\_\_\_\_ feet and \_\_\_\_\_ inches, and my weight is \_\_\_\_\_ pounds.
- I feel my weight is: OK / Not OK (circle one). If my weight is "Not OK," I would like to weigh \_\_\_\_\_ pounds.
- I am Male / Female (circle one), and I am \_\_\_\_\_ years in age.

## APPENDIX E

### Debriefing Statement

- You have just watched a video where Darren explained how to exercise healthfully, and what the benefits of sensible physical activity are.
- However, there was a purpose to this project that we didn't fully explain to you at the start—it was actually an experiment to find out if the instructor's physical appearance made a difference to what you learned, and to how you felt about Darren's expertise as an instructor.
- There are four versions of the videotape. The main differences are that in two videotapes, Darren is wearing a special suit designed to make him look fat. In two tapes, one where Darren appears lean, the other where he appears fat, Darren actually *role models* the exercises. In the other two, he just explains—sort of “do as I say” rather than “do as I do!”
- The main reason we are doing this project is because we really want to know if appearance of fatness by an instructor, and also his/her role modeling efforts makes a difference to his or her teaching effectiveness.
- Unfortunately, there is often unfair stereotyping and discrimination against overweight people in this society. It is especially unfair because it is now well-known that body fatness is largely genetically determined.
- We also know, from the results of recent important research, that if you eat sensibly and exercise regularly, you can be fit and healthy even if you still are overfat! It's actually healthier to be fat and fit than it is to be lean and unfit!
- Thus, this project is part of an educational effort to promote two very important messages:
  1. Healthful physical activity is for *everybody*!
  2. Discrimination based on appearance is unfortunate and *wrong*!

Thanks for your assistance. Do any of you have questions?

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