



January 2016

# The Effects Of Resistance Training Programs On Physical Self-Perceptions In College Females

Kelsey Lauren Zachman

Follow this and additional works at: <https://commons.und.edu/theses>

---

## Recommended Citation

Zachman, Kelsey Lauren, "The Effects Of Resistance Training Programs On Physical Self-Perceptions In College Females" (2016).  
*Theses and Dissertations*. 2091.  
<https://commons.und.edu/theses/2091>

This Thesis is brought to you for free and open access by the Theses, Dissertations, and Senior Projects at UND Scholarly Commons. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of UND Scholarly Commons. For more information, please contact [zeinebyousif@library.und.edu](mailto:zeinebyousif@library.und.edu).

THE EFFECTS OF RESISTANCE TRAINING PROGRAMS ON PHYSICAL SELF-  
PERCEPTIONS IN COLLEGE FEMALES

by

Kelsey Lauren Zachman  
Bachelor of Science, University of North Dakota, 2013

A Thesis

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

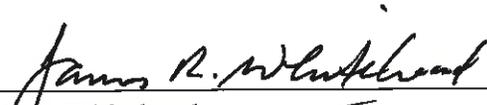
Master of Science

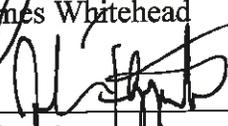
Grand Forks, North Dakota

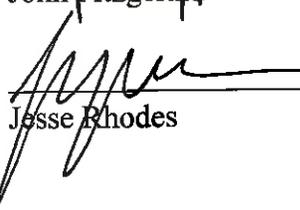
December

2016

This thesis, submitted by Kelsey Zachman 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 Whitehead

  
\_\_\_\_\_  
John Fitzgerald

  
\_\_\_\_\_  
Jesse Rhodes

This thesis is being submitted by the appointed advisory committee as having met all of the requirements of the School of Graduate Studies of the University of North Dakota and is hereby approved.

  
\_\_\_\_\_  
Grant McGimpsey

Dean of the School of Graduate Studies

  
\_\_\_\_\_

Date

## PERMISSION

Title           The Effects of Resistance Training Programs on Physical Self-Perceptions  
                  in College Females

Department    Kinesiology

Degree         Master of Science

In presenting this thesis in partial fulfillment of the requirements for a graduate degree from the University of North Dakota, I agree that the library of this University shall make it freely available for inspection. I further agree that permission for extensive copying for scholarly purposes may be granted by the professor who supervised my thesis work or, in his absence, by the Chairperson of the department or the dean of School of Graduate Studies. It is understood that many financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of North Dakota in any scholarly use which may be made of any material in my thesis.

Name: Kelsey L. Zachman

Date: November 28, 2016

## TABLE OF CONTENTS

LIST OF FIGURES.....	vi
LIST OF TABLES.....	vii
ACKNOWLEDGMENTS.....	viii
ABSTRACT.....	ix
CHAPTER	
I.    INTRODUCTION.....	1
Statement of Problem.....	1
Purpose of Study.....	3
II.   LITERATURE REVIEW.....	5
Resistance Training.....	5
Physical Self-Perceptions.....	8
Physical Self-Perception and Exercise.....	10
Summary.....	13
III.  METHODS.....	14
Participants.....	14
Procedures.....	15
Measures.....	16
Physical Self-Perception Profile.....	16
Height and Weight.....	17
Body Composition.....	17

Statistical Analyses.....	18
IV.    RESULTS.....	19
Overview.....	19
Effects of resistance training on body composition outcomes.....	20
Effects of resistance training on PSPP outcomes.....	21
V.    DISCUSSION.....	25
REFERENCES.....	29
APPENDIX A.....	32
APPENDIX B.....	34

## LIST OF FIGURES

### Figures

1. Sum of Skinfolds.....	20
2. Physical Condition.....	21
3. Strength Competence.....	22
4. Attractive Body.....	22
5. Sport/Athletic Competence.....	23
6. Physical Self-Worth.....	23

## LIST OF TABLES

Table

1. Descriptive Statistics.....	24
--------------------------------	----

## ACKNOWLEDGMENTS

I wish to express my sincere appreciation to the members of my advisory Committee for their guidance and support during my time in the master's program at the University of North Dakota.

## ABSTRACT

The effects of resistance training on females' self-perception. **Introduction:** It is generally accepted that exercise enhances physical self-perceptions, but the impact of resistance training programs on females' self-perceptions is unclear. Because exercise is an important public health behavior, and because physical self-perceptions have motivational implications, this study has potential to add knowledge that is relevant to exercise promotion. **Purpose:** The primary aim of the study was to explore the effect of two different types of resistance training programs on physical self-perceptions of college age females. **Methods:** Participants ( $n=30$ ) were randomized to muscular strength, muscular endurance resistance training groups or a comparison group. Experimental resistance training groups followed a progressive resistance training program which consisted of three, one hour sessions per week for nine weeks. Participants completed the Physical Self-Perception Profile (PSPP) pre and post study to investigate the effects of physical self-perceptions after resistance training. Height, weight, skin folds and circumference measurements were taken pre- and post-test. **Results:** Results showed a significant difference between groups on sum of skinfolds ( $p = 0.013$ ). The pairwise comparison indicates that strength was different from endurance ( $p = 0.013$ ). PSPP differences were only indicated for the physical condition subscale ( $p = 0.004$ ). Strength competence subscale ( $p = 0.015$ ) and the attractive body adequacy subscale ( $p = 0.018$ ) were trending and may be practically significant. **Discussion:** Resistance training

improved females' physical self-perception. The post hoc comparisons indicate that only the strength group was different from the comparison and no differences existed between endurance and either group.

## CHAPTER I

### INTRODUCTION

Resistance training is a type of exercise that has grown in popularity, in particular because of its role in improving athletic performance by means of increasing muscular strength, power, speed, hypertrophy, and/or muscular endurance (Kraemer et al, 2002). With a better understanding of physiological and physiological health related benefits of resistance training, it is now becoming more popular form of exercise for most populations within the general public. Extensive research has shown that physical self-perceptions improve with exercise, however most studies only compare the effects of aerobic training. Testing physical self-perceptions with different resistance training protocols on females has potential to add knowledge that is relevant to exercise promotion.

Little is known about the effects resistance training has on physical self-perceptions. The purpose of the study was to explore the effects of two different resistance training protocols on physical self-perceptions with college aged females. A key factor to successful resistance training is a proper training protocol. The adaptational changes and health implications of resistance exercise are very dynamic, and vary among individual. Health benefits to be accrued from resistance training depend on factors such as initial performance, health status, and proper program design with variables such as frequency, duration, intensity, volume and rest intervals (Kraemer et al, 2002). The positive health benefits of physical activity have gained high recognition.

Depending on the program design, resistance training can enhance strength, muscular endurance, hypertrophy and power. Strength is defined as the maximal amount of force exerted in a single attempt, featuring high resistance and few repetitions (Deschenes, 2002). Muscular endurance is best described as the ability to resist muscular fatigue, particularly when using a sub-maximal resistance, and is performed by a high number of repetitions per set. Hypertrophy is referred to as the increase in size of muscle. Muscular power can be expressed as work completed per unit of time. It is usually achieved by using lower resistance at maximal speed with fewer repetitions (Deschenes, 2002), which would include the Olympic lifts.

It is evident from a number of the adaptations that occur with resistance training that there are several health related benefits. No matter what age or sex, resistance training has equal importance in improving health benefits including bone density, hormonal response, and the health related issues associated with obesity. These health issues can be effectively managed through a regular basis of resistance exercise (Deschenes, 2002).

Research has also suggested that resistance training may have a beneficial effect on psychological health such as self-concept, self-esteem, anxiety, and depression (Lubans et al, 2010). There are many studies exploring the effects of exercise on psychological health mainly focusing on self-esteem and self-concept. Self-concept is generally viewed as one's awareness of personal characteristics, attributes and limitations and how they compare to others, while self-esteem is the evaluative component of self-concept and refers to the value that individuals place on their characteristics (Lubans et

al, 2010). Physical self-esteem is also thought to include multiple dimensions, including perceived sport competence, and body attractiveness. Puberty is a critical period for most girls. Various body changes and the development of self-perceptions are important contributors to self-esteem during this time. There have been many studies conducted focusing on self-perceptions and aerobic activity. However, little is known about the impact of different program designs of resistance training and physical self-perceptions, especially with the female population (Lubans et al, 2010).

Knowing the health benefits from resistance training and the positive outcome of having better self-perceptions of oneself after exercise, the primary aim of the study was to examine female self-perceptions following different resistance training programs. The two main resistance training program designs focused on during the study were muscular strength and muscular endurance. It is anticipated that the resistance training will result in positive changes in physical self-perceptions and body composition.

Delimitations of this study are that it will be solely focused on college-age females and their perceptions of themselves after different resistance training program designs at one specific university. Also, the act of resistance training does not ensure optimal gains in muscle strength and performance. Rather it is the magnitude of the individual effort of the training stimulus that ultimately determines the outcomes with resistance training. Consequently, if the participants do not fully participate the results of the study may be affected.

The significance of this study is to find out if college women improve their self-perceptions after resistance training. This research is important for females to learn the most effective way to program resistance training to improve physical self-perceptions.

Given that exercise is an important public health behavior, and since physical self-perceptions have motivational implications, this study has potential to add to the literature for exercise promotion.

## CHAPTER II

### LITERATURE REVIEW

Public health guidelines primarily focus on the promotion of physical activity and steady-state aerobic exercise, which enhances cardio-respiratory fitness and has some impact on body composition. However, research demonstrates that resistance training has physiological effects on musculoskeletal system, maintaining functional abilities, bone density and other disabilities. Resistance training may also positively affect risk factors such as diabetes, heart disease and cancer. When looking at the collection of studies that focused on resistance training and health benefits gained from resistance training, researchers have found that when strength training is emphasized, with proper programming, there is a positive impact on participants. Many studies have examined the relationship between resistance training and the physiological adaptation, plus the benefits such as health gains, strength and confidence.

#### **Resistance Training**

There are very important health benefits that can be easily managed through resistance training such as bone density, hormonal response, and the health risks associated with obesity. Resistance training involves the voluntary activation of specific skeletal muscles against some form of external resistance, which is provided by body mass, free weights or variety of exercise modalities (Winett & Carpinelli, 2001).

Gaining bone mineral density is one of the more important adaptations when performing resistance training, especially in women. Bone mineral density is the related amount of bone mineral per measured area of bone. Attaining a greater bone mineral density throughout life may help prevent osteoporosis and fractures (Winett & Carpinelli, 2001). A review has shown that a greater volume of training is not required to produce significant increases in bone mineral density. The primary requisite stimulus for increasing bone mineral density is an overload to specific bones, the necessity of adding volume is very unlikely (Layne & Nelson, 1999).

Resistance exercise has been shown to elicit a significant acute hormonal response. It appears that this acute response is more critical to tissue growth and remodeling than chronic changes in resting hormonal concentrations (Kraemer & Ratamess, 2012). Muscle hypertrophy associated with resistance training is determined by the role for anabolic hormones release (McCall et al., 1999). It has been shown that resistance training can acutely increase total testosterone concentrations in most studies in men, while in young women no change or an elevation may take place (Kraemer & Ratamess, 2012). A low level of testosterone in women compared to men, may be limiting factor in training induced muscle hypertrophy. The differences in the magnitude and time duration of acute exercise induced response of growth hormone may be important physiological indicator of anabolic adaptations during strength training and was found to be dependent on the structure of the resistance training protocol (Hakkinen et al., 2001). High volume training regimens typical of that used by bodybuilders to promote maximal muscle hypertrophy, resulted in greater growth hormone response

compared to a high intensity training protocol used by competitive weightlifters to promote maximal muscle strength and/or power (Kramer et al., 1990). The training protocol as well as genetic predisposition, sex, fitness level and the potential for adaption all play significant roles in the hormonal response to resistance exercise (Kraemer & Ratamess, 2012)

To gain the functional movement and health benefits from resistance training all depends on factors such as the specific program design variables such as frequency, duration, intensity, and volume. (Deschenes & Kraemer, 2002). The specific details and goals should be addressed before putting together a program with resistance training. Kraemer (2002) describes the factors and fundamentals of resistance training. The progression of resistance training may be maximized by the incorporation of progressive overload, specificity and training variations in the program (Kraemer et al, 2002). Resistance training is a careful progression system with goal targeting, exercise testing, proper exercise technique, supervision, and optimal exercise prescription which all contribute to the successful implementation of a resistance training program (Kraemer et al, 2002). Included within a program for resistance training is the use of both concentric and eccentric muscle actions and the performance of both single and multiple joint exercises, plus unilateral and bilateral movements as well (Kraemer & Ratamess, 2004). Also recommended when creating a strength training protocols, the sequence of exercises should be large before small muscle groups, multi joint before single joint exercises and higher intensity before lower intensity exercises (Kraemer & Ratamess, 2004). It is important that 8 to 12 repetition maximum is used for novice training. For intermediate to

advanced training, it is usually from 1-8 repetition range, with heavy loading and rest in between (Kraemer & Ratamess, 2004).

Dorgo (2009) performed a study to investigate the effects of manual resistance training on improving muscular strength and endurance and to compare these affects with an identically structured weight resistance training program. The study included 84 healthy college student participants which were randomly assigned to either a manual resistance training program or weight resistance training program group (Dorgo et al, 2009). The participant's performance was assessed before and after the training program. There were no significant differences between the two different resistance training programs for muscular strength or muscular endurance (Dorgo et al, 2009). Improvements in muscular strength and muscular endurance were similar results in having an effect for improving muscular fitness (Dorgo et al, 2009).

Deschenes and Kraemer (2002) reviewed the literature on weight lifting or resistance training and how it is a potent stimulus to the neuromuscular system. Each specific program design of resistance training, such as muscular strength, power or local muscular endurance (Deschenes & Kraemer, 2002) improves athletic performance, which is directly related to the physiologic adaptations through prolonged resistance training. When trained properly, the physiological adaptations are similarly impressive among women and the elderly as they are among men (Deschenes & Kraemer, 2002).

### **Physical Self-Perceptions**

Society and the media play very important roles in how girls and boys think they should look (McCreary & Sasse, 2000). Women are faced with many cultural factors that

reinforce an unhealthy, overly thin standard of bodily attractiveness in girls and women (McCreary & Sasse, 2000). Whereas, men and boys believe they need to drive for muscularity (McCreary & Sasse, 2000). The drive for thinness and muscularity can have detrimental physical and psychological consequences on an individual's health. After researching different studies conducted on the health benefits of resistance training, it is important to start to look at self-esteem and physical self-perceptions that the general public could gain or increase after participation with resistance training.

An effective way of gathering data on physical self-perceptions is to use, the Physical Self-Perception Profile (PSPP) which was created by studying open ended questionnaire responses about important contributors to the physical self-esteem of college students. Four sub-domain subscales designed to assess perceived bodily attractiveness, sport competence, physical strength, and physical conditioning were constructed along with a general physical self-worth subscale as the basis of the Physical Self Perception Profile (Fox, 2000). The Physical Self Perception Profile has met the rigors of psychometric analysis with college age population (Fox, 2000). The subscales that were created have shown that they are sensitive to a wide range of individual differences. The subscales internal means, and standard deviations have proven stable across two independent samples. This study concluded that the PSPP appears suitable for use in further research designed to investigate the origins and mechanisms involved in the emergence of physical self-perception (Fox, 2000).

The health benefits from exercise and physical activity are hard to ignore, not only are improvements found physiologically but self-esteem and self-perceptions have

an increasing contribution with exercise in both the promotion of mental well-being along with the treatment and prevention of mental illness and disorders (Fox & Corbin, 1989).

### **Physical Self Perceptions and Exercise**

Self-esteem can be regarded as an important element of well-being and could be enhanced through exercise (Fox & Corbin, 1989). A systematic review of randomized controlled trials to determine if exercise alone can help improve self-esteem in children and young people (Ekeland et al., 2005), twenty three randomized controlled trials were analyzed to gain the conclusion that exercise may have short term beneficial effects on self-esteem in children and adolescents (Ekeland et al., 2005). Results of the review are limited due to the small number of participants in the included studies and the lack of studies with a low risk of bias (Ekeland et al., 2005). Even with the need for further investigations, this study still gives good reviews due to the fact that exercise can improve self-esteem in children, which ultimately could have the same results for college age women.

Due to the benefits of physical activity and concerns regarding obesity prevalence, the promotion of physical activity among youth has emerged as a global health priority. A study was given to evaluate the efficacy of two school based resistance training programs to improve muscular strength and body composition (Luban et al., 2010). 108 participants were randomized to either free weights or elastic tubing resistance training groups. Overall, both boys and girls in both groups improved on their body composition over the study (Luban et al., 2010). The study concluded that free

weights and elastic tubing resistance training are effective strategies for improving health related fitness (Luban et al., 2010).

An investigation was studied on the relationships among self-efficacy, outcome expectancy, behavioral intention, and actual behavior over time in a novice weight training class (Gao et al, 2008). 109 participants of college age were given questionnaires assessing their self-efficacy, outcome expectancy and intentions for future weight training. Correlation analyses showed significant positive relationships among most variables during program outset and mid-program (Gao et al, 2008). The overall findings of the study enhance the understanding of the factors determining individuals' motivated behavior in a beginning weight training class. This study is focusing on the age group so limitations can be avoided in future research.

Lindwall and Lindgren (2005) examined the effects of a six month exercise intervention program on physical self-perceptions and social physique anxiety of sedentary adolescent girls. The girls completed the Physical Self-Perception profile and the Social Physique Anxiety Scale before and after testing, in addition, physical fitness, weight and height were measured (Lindwall & Lindgren, 2005). The girls were split into two groups, an intervention group and a control group. The intervention group met twice a week for 6 months, which consisted of 45 minute sessions followed by 15 minutes of a discussion regarding a healthy lifestyle. The results showed that there were no significant improvements for Physical Self-Perception Profile, however there was a lower Social Physique Anxiety Scale for the intervention group, compared to the control group (Lindwall & Lindgren, 2005). This study compared changes of a very long period of time (6 months), which is an essential component for demonstrating consistent changes for

psychological concepts resulting in exercise (Lindwall & Lindgren, 2005). This study also had a more natural setting for the participants to be able to be themselves and choose which activities they thought fitting, using interlinked discussions for feedback (Lindwall & Lindgren, 2005).

A study focused on the effects of free weights and elastic tubing resistance training on physical self-perceptions in adolescents. The participants were randomly assigned to free weights or elastic tubing resistance training groups, plus a control group (Luban et al., 2010). The students completed the children's physical self-perception profile and two scales developed for the current study to assess resistance training self-efficacy and outcome of expectancy. Physical self-perceptions remained stable among the boys though the girls in the free weights resistance training group had a significant increase in their perceived body attractiveness (Luban et al., 2010). The study found that resistance training programs may improve physical self-perceptions in adolescent girls.

Most women do not like gaining muscle mass, in fact, body dissatisfaction and body image conflicts are common for women of all ages, from the young to the old and especially for college age females which all can contribute to health related issues (Depcik & Williams, 2004). Therefore, it is important to understand factors that may be associated with these body image-related concerns. Looking at the differences between how girls strive for thinness and how boys drive for muscularity, it was thought to begin developing the concept of the drive for muscularity. The researchers created a 15 item questionnaire that assesses the participant's attitudes about their muscularity and motivation to become more muscular. This survey was used to determine that boys scored higher on the questionnaire than girls for the drive to become more muscular. This

is an important study to understand on why most girls do not strive to be muscular and strong, compared to how the boys felt.

College aged women involved in resistance training and body satisfaction of body-image-disturbed undergraduate females were assessed prior to and following a 13 week period of regular resistance training involvement or non-involvement (Depcik & Williams, 2004). The results showed that the mean satisfaction scores of body-image-disturbed weight trainers increased from 3.19 to 3.40 while the control group maintained their scores at 3.10 (Depcik & Williams, 2004). The girls involved in the resistance training group displayed body image improvements to the point that there were no body image disturbances.

### **Summary**

The literature shows that most women find an increase in physical self-perceptions with aerobic based exercise, however research shows that physical self-perceptions can increase with anaerobic training as well. The results from the collection of the few studies provide evidence to suggest that resistance training could be an effective and safe treatment for body image disturbance. However, among the few resistance training studies there are even less studies comparing the difference between different resistance training phases on self-perceptions. There is the need for further studies focusing on anaerobic training, specifically resistance training, and physical self-perceptions. The study adds to the literature to promote a strength based resistance training protocol to improve physical self-perceptions in the future for women of all ages.

## CHAPTER III

### METHOD

College students with no background in resistance training were randomized to a muscular strength group or a muscular endurance resistance training group. A comparison group was recruited from inactive college students. The resistance training groups followed a strength or endurance oriented progressive protocol for the nine weeks of the study. Participants completed the Physical Self Perception Profile pre- and post-study. Height, weight, skinfolds, and circumference measurements were also taken pre- and post-study. The purpose of the study was to investigate the effects of two different types of resistance training programs on the physical self-perceptions of college age females.

#### **Participants**

The study was conducted at the University of North Dakota (UND). Participants were enrolled and randomly assigned into two separate groups. These participants were healthy college aged females between the ages of 18 and 23 who had no previous resistance training experience. Participants were ineligible if they were currently doing resistance training, had extensive experience in resistance training, or if they had a medical condition or physical injury preventing testing or training. Ten participants made up the muscular strength resistance training group, ten comprised the muscular endurance

resistance training group and ten in the control group. Research participants were recruited from UND Wellness Center and a group of physically inactive UND students volunteered to serve as a comparison group. All participants were given a brief verbal description about the nature of the study and gave their informed consent in line with the current UND Institutional Review Board regulations.

### **Procedures**

An initial meeting was scheduled with all the participants to inform them of the procedures, risks, and expectations that would be placed on those willing to participate. Participation was voluntary and all participants provided written and verbal consent before the start of the study. Participants were free to quit the study at any time and for any reason without consequences.

A nine week intervention was conducted to assess any changes in physical self-perceptions between the three groups. The study interventions were conducted in the weight room in the Wellness Center, supervised by a Certified Strength and Conditioning Specialist (CSCS). The resistance training interventions were designed to be balanced and practical for participants unaccustomed to weight training. The muscular strength and endurance groups began with preparatory three week training/learning protocol to learn and become familiar with the lifts within the weight room which consisted of three, one hour sessions per week. During this time the participants used weights that were carefully selected by the instructor, participants were instructed in all resistance training

movements with specific emphasis on the full range of movement (ROM) aspects of each lift.

The two experimental groups, muscular strength and endurance, training intervention consisted of a six week phase of three, one hour sessions per week in which the participants did a dynamic warm-up, upper and lower body strength and range of movement (ROM) exercises. The CSCS professional was on hand for all weight training sessions. The difference between the two resistance training groups is the difference between the intensity (percent of repetition max (RM)), volume, exercise selection and order (see Appendix A). The comparison group continued with their sedentary lifestyle throughout the nine week study.

### **Measures**

All physical assessments were completed by trained research assistants and inter and intra-rater reliability tests were conducted. Measurements were completed at the university using the same instruments at each time point.

#### **Physical Self Perception Profile**

The Physical Self-Perception Profile (see Appendix B) was used in the current study to provide a measure of self-esteem in the physical domain. The PSPP contains five, six item subscales: sports competence, physical condition, strength, body attractiveness, and overall physical self-worth (Fox & Corbin, 1989). Two alternative statements or descriptions of people are presented, from which the individuals could choose which one best represent themselves, using “sort of true” to “really true”. Each item is then scored from 1 to 4 (Fox & Corbin, 1989). The participants were asked to

complete the PSPP assessing their physical self-perception regarding resistance training at pre- and post-test of the study. PSPP was distributed and conducted by the researcher in a test room.

### **Height and weight**

Height and weight measurements were taken pre- and post-test, and were conducted by the same researcher for consistency. Weight was measured in light clothing without shoes using a portable digital scale to the nearest 0.1kg and height was measured to the nearest 0.1cm using a portable stadiometer.

### **Body composition**

Hypertrophy was determined via circumference measurements taken pre- and post-test of the study. Circumference measurements were taken from the thigh, shoulder and arm focusing on the bicep and triceps (Maud & Foster, 2006). When taking measurements, a cloth tape measure was used. Measurements were taken on top of bare skin, not over clothes. Measurement of the thigh, were taken by finding the fullest part of the thigh and wrap the tape measure around the thigh from front to back and then around to the front. Measurements of the arm were taken by wrapping the tape measure around the widest part of the upper arm from front to back and around to the start point (Maud & Foster, 2006). Measurements were conducted by the researcher in a private room.

Skinfold thicknesses were at three anatomical sites (i.e. triceps, suprailiac and mid-thigh) in accordance with ACSM guidelines (2013). Measurements were taken by the same experienced tester with Lange calipers. Readings were taken three times at each site on the right side of the body and the median of these recorded.

## **Statistical Analyses**

Statistical Package for the Social Sciences (SPSS) for windows software was used for all statistical analysis. Data were analyzed using Bonferri adjustments, to account for the inflated type 1 error rate associated with multiple tests. Group one data consisted of weight, sum of circumferences, and sum of skinfolds, statistically significant at  $p < 0.017$ . Group two data consisted of the five psychological variables, statistically significant at  $p < 0.017$ .

## CHAPTER IV

### RESULTS

The participants were female college students from the University of North Dakota with an average age of 18 to 24 years, participants were inactive individuals and novice resistance trainers before participating in the study. In the nine week study the participants in the muscular strength and endurance oriented groups progressed in terms of intensity from week to week. The comparison group were inactive college students and stayed sedentary throughout the study.

#### **Overview**

Analyses utilized ANCOVAs followed by Bonferroni-adjusted ( $p$  set at  $< .017$ ) pairwise comparisons. The only physical change was a significant reduction in the sum of skinfolds in the muscular strength group ( $p = 0.013$ ). Analyses of PSPP changes showed significant effects for muscular strength on the physical condition subscale ( $p = 0.004$ ) and on the strength competence subscale ( $p = 0.015$ ) and a near-significant effect on the attractive body adequacy subscale ( $p = 0.018$ ) that but may be practically significant.

Concerning the results of the ANCOVA's, the key component is to determine if the alpha level indicating significant differences. Multiple tests determined the likelihood of finding significance due to chance will go up due to inflated Type I error. When

conducting multiple analyses on the same dependent variable, the chance of committing a Type I error increases, thus increasing the likelihood of coming about a significant result by pure chance. To correct for this, or protect from Type I error, a Bonferroni correction was conducted. The alpha level indicating significant difference between the two groups of testing variables.

### Effects of resistance training on body composition outcomes

Test of between-subjects effects showed whether or not the groups differed on their scores of the dependent variable. Within body composition measurements (weight, sum of circumferences, sum of skin folds) the only significant difference detected was sum of skinfolds ( $p=0.013$ ). Pairwise comparison indicates that strength was different from endurance. To reject the null hypothesis for body composition data, a  $p$ -value of 0.017 was needed.

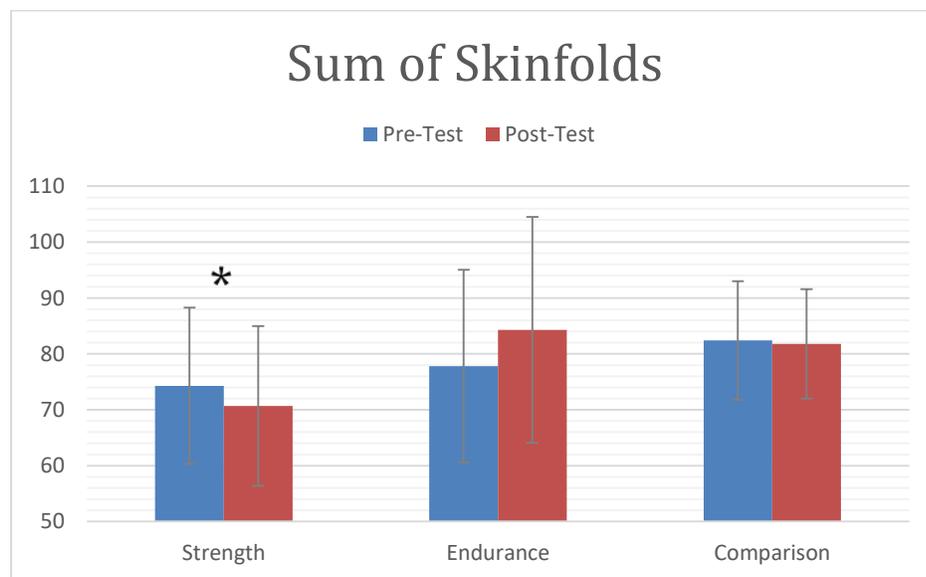


Figure 1: Sum of Skinfolds pre- and post-test.

\*Significant difference in the Muscular Strength group post-study ( $p=0.013$ ).

### Effects of resistance training on PSPP outcomes

PSPP outcomes (five psychological variables) indicated a difference for Physical Condition subscale ( $p=0.004$ ), Strength Competence subscale ( $p=0.015$ ), and also trending indication for Attractive Body Adequacy subscale ( $p=0.018$ ). To reject the null hypothesis for Group two data, a  $p$ -value of  $< 0.017$  was needed. There were no significant differences with sport competence and physical self-worth.

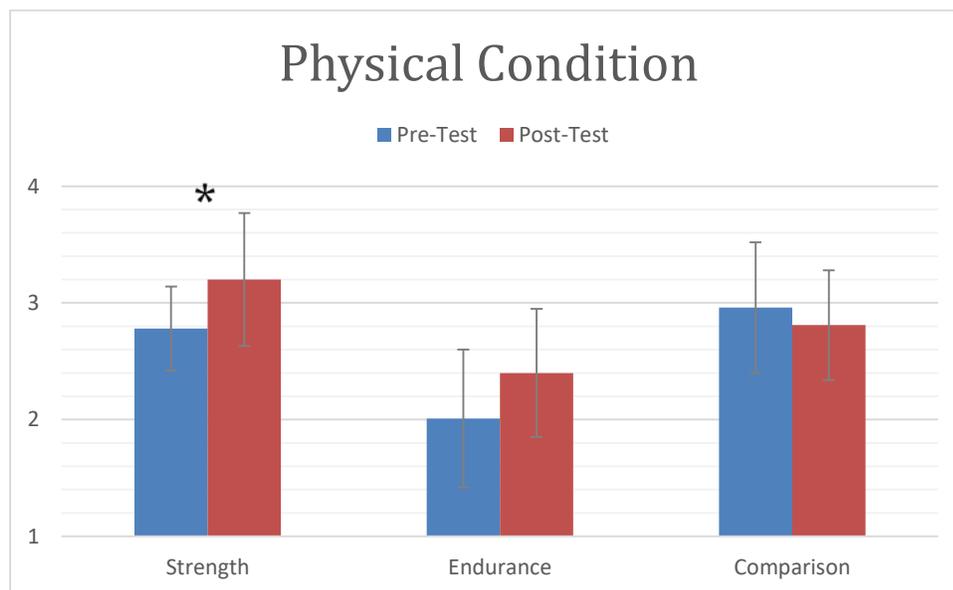


Figure 2: Physical Condition Subscale pre- and post-test.

\*Significant difference in the Muscular Strength group post-study ( $p=0.004$ ).

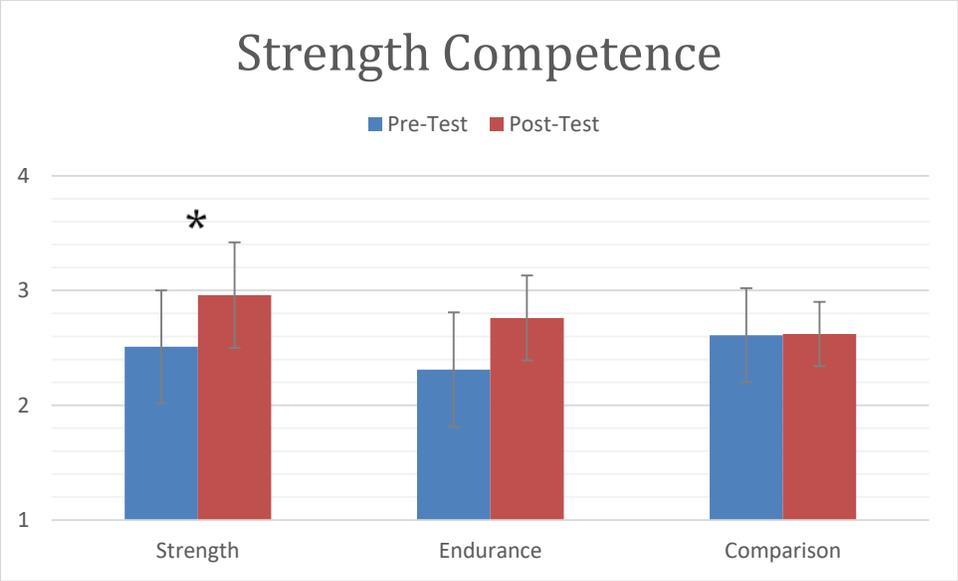


Figure 3: Strength Competence Subscale pre- and post-test.  
 \*Significant difference in the Muscular Strength group post-study ( $p=0.015$ ).

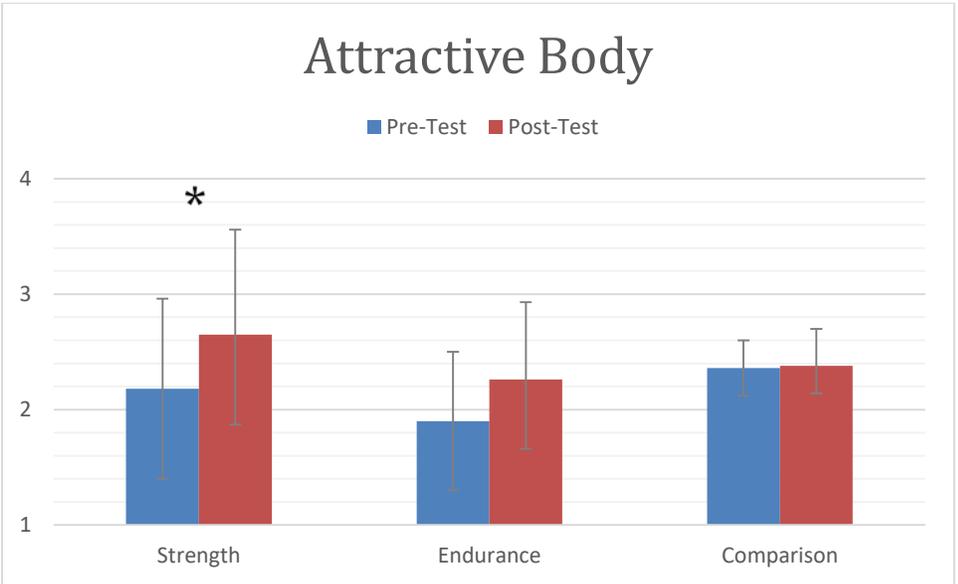


Figure 4: Attractive Body Subscale pre- and post-test.  
 \*Near significant difference in the Muscular Strength group post-study ( $p=0.018$ ).

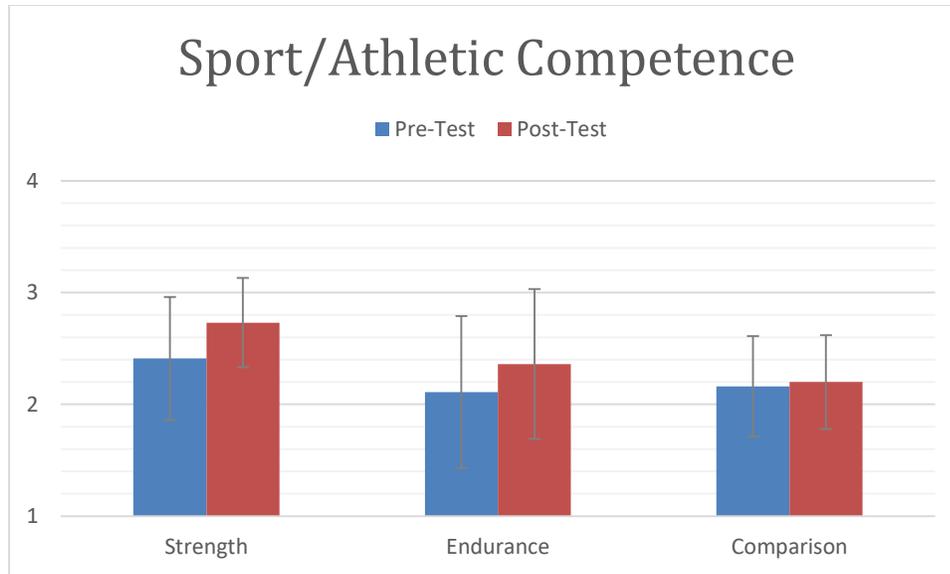


Figure 5: Sport/Athletic Competence Subscale pre- and post-test.

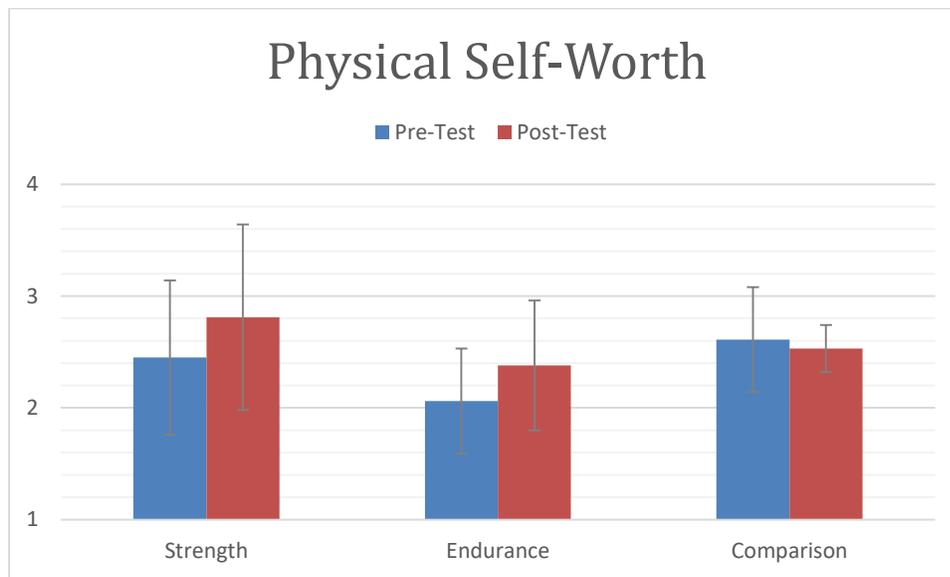


Figure 6: Physical Self-Worth Subscale pre- and post-test.

With all comparisons the post hoc comparisons indicated that only strength group was different from comparison group. No differences existed between endurance and either group.

Table 1: Descriptive Statistics

	Strength				Endurance				Comparison			
	Pre-Test		Post-Test		Pre-Test		Post-Test		Pre-Test		Post-Test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	20.6	1.17			20.4	1.57			20.1	1.28		
Height	167.4	4.32			170.1	6.47			167.4	2.47		
Weight	139.01	11.17	138.22	9.77	158.66	19.39	160.02	19.8	141.76	13.47	142.98	13.17
Circumference (Thigh)	58.5	4.6	55.6	3.13	60.3	6.03	60.2	5.67	58.6	2.78	56.7	1.94
Circumference (Shoulder)	101.9	2.08	103.3	3.3	106.5	8.41	108.7	6.83	103.6	3.63	105.3	4
Circumference (Arm)	26.7	1.88	25.5	1.71	29.5	2.67	28.1	2.02	27.5	1.58	27.4	1.65
Skinfold (Truceos)	26.5	5.25	24.9	3.93	27	6.83	28.1	6.06	28.1	3.69	27.4	2.88
Skinfold (Superilium)	20.2	7.02	17.9	7.23	23.4	9.28	26.7	10.81	23.1	6.9	22.4	6.61
Skinfold (Thigh)	27.6	5.25	27.9	4.79	27.4	5.17	29.5	5.44	31.2	2.04	32	2.78
Physical Self Worth	2.45	0.69	2.81	0.83	2.06	0.69	2.38	0.58	2.61	0.47	2.53	0.21
Sport/Athletic Competence	2.41	0.55	2.73	0.4	2.11	0.68	2.36	0.67	2.16	0.45	2.2	0.42
Physical Condition	2.78	0.36	3.2	0.56	2.01	0.59	2.46	0.54	2.96	0.56	2.81	0.46
Attractive Body Adequacy	2.18	0.78	2.65	0.91	1.9	0.6	2.26	0.67	2.36	0.24	2.38	0.32
Strength Competence	2.51	0.49	2.96	0.45	2.31	0.5	2.76	0.37	2.61	0.41	2.61	0.28

## CHAPTER V

### DISCUSSION

The primary aim of the study was to explore the effects of two different resistance training protocols on physical self-perceptions in college aged females. In addition to finding the effects of pre- and post-body composition measurements among the female participants. Strength-oriented resistance training produced improvements in some aspects of college females' physical self-perceptions.

Physical activity is essential to maintaining health, wellness and physical function. Resistance training participation overall is an important element of physical activity, however the type of intensity and/or volume can have more of an impact with maintaining muscle and bone mass. Previous research has indicated that exercise confers benefits to many dimensions of health, including physical, emotional, intellectual, and social wellness (Seguin, 2015). However, much of the exercise research has focused on aerobic training rather than just resistance training. Many studies have indicated that strength training may improve body image, but the data is not conclusive and the number of studies is limited. The data from the present study add to the literature, demonstrating effect of two different protocols of resistance training and physical self-perceptions. It was hypothesized that the muscular endurance group would show an increase in their physical self-perceptions post-study due to the findings that most females have the misconception that more volume of exercise will produce superior adaptations and outcomes (Winett & Carpinelli, 2001). Many females also fear that using heavier weights

will produce large muscles (a very unlikely consequence using any protocol), and as a result females tend to use a lighter resistance and a greater number of repetitions.

However, as stated before, fewer repetitions with a heavier load may be more beneficial for increasing health related benefits (Winett & Carpinelli, 2001).

Skinfold measurements were used to measure the layer of fat thickness just under the skin. Three locations were measured, significant improvements were only found in the muscular strength group. Post-study comparisons indicated that only strength group was different from the comparison group. No differences existed between muscular endurance and either group. The females in the muscular strength group showed significantly higher perceptions of their physical condition. It has been shown that perception of physical condition predicts the ability to maintain exercise, and confidence in the exercise and fitness settings (Edward et al., 2005). Females in the muscular strength group had significantly higher perceptions of their strength competence, and also a likely practically significant higher score on the attractive body subscale. These females would likely show more confidence in appearance, and in situations requiring strength. Previous reports indicate that females can increase their physical self-perceptions through resistance training. It is reasonable to conclude that there were differences with the muscular strength group within body composition and physical self-perceptions. PSPP provided multidimensional representation of the individuals self-rating along several noticeable elements within the physical domain (Fox & Corbin, 1989).

It is important to note that the present study had its strengths and limitations. The validity of the study increased with having the same number of participants in each

group, and all participants completing the entire study without dropping out. The study was limited in the fact that the sample size was small. The study was open to all females at the university, however only thirty participated. The participants all had similar demographics so the generalizability of the findings may be limited. The participants in the comparison group were asked to maintain their sedentary lifestyle, they were not required to record their behavior over the study period, however some may have participated in physical activity, which may have influenced the results. Future studies with larger sample sizes and more heterogeneous populations may further improve our understanding of the impact of resistance training protocols on physical self-perceptions in this population.

Participants reported that there were days they were not consistent going to the gym due to outside stressors, such as heavy school load, uncomfortable in the weight room area, did not want to exercise by themselves. Studies have shown that the most common reason for not exercising is that most individuals “have no time” (Ebben & Brudzynski, 2008). These barriers may have had an effect on the current study. An interesting subjective observation from this study is that the females in the muscular strength group seemed to enjoy their protocol more than the muscular endurance group, which the higher repetition and lower weight is what the general female population typically performs for resistance.

Resistance training is a safe and beneficial activity that college aged females can all participate in. However, training goals need to be established before performing resistance training exercises. When building strength, losing weight, gaining muscle or increasing endurance, it is important to tailor workouts to fit specific goals. Muscular

endurance will increase maximal aerobic power and time to exhaustion significantly (Campos et al., 2002). However, muscular endurance can hinder strength and power gains, while muscular strength training can increase the strength gains and build bone mass, both important for daily living. In general, it appears that a variety of training protocols and modalities can be effective, although the amount of resistance used seems to be one of the more important variables (Faigenbaum, 1999). Data demonstrates that both physical performance and the associated physiological adaptations are linked to the intensity and number of repetitions performed (Campos et al., 2002). Because of the growing popularity of resistance training, future studies with more participants and a broader demographic area should evaluate the effects of varying combinations of sets and repetitions on selected resistance training in college aged females.

## REFERENCES

- American College of Sports Medicine. (2013). ACSM's guidelines for exercise testing and prescription. Lippincott Williams & Wilkins.
- Burgess, G., Grogan, S., & Burwitz, L. (2006). Effects of a 6-week aerobic dance intervention on body image and physical self-perceptions in adolescent girls. *Body image*, 3(1), 57-66.
- Campos, G. E., Luecke, T. J., Wendeln, H. K., Toma, K., Hagerman, F. C., Murray, T. F., ... & Staron, R. S. (2002). Muscular adaptations in response to three different resistance-training regimens: specificity of repetition maximum training zones. *European journal of applied physiology*, 88(1-2), 50-60.
- Depcik, E., & Williams, L. (2004). Weight training and body satisfaction of body-image-disturbed college women. *Journal of Applied Sport Psychology*, 16(3), 287-299.
- Deschenes, M. R., & Kraemer, W. J. (2002). Performance and physiologic adaptations to resistance training. *American Journal of Physical Medicine & Rehabilitation*, 81(11), S3-S16.
- Dionigi, R. (2007). Resistance training and older adults' beliefs about psychological benefits: the importance of self-efficacy and social interaction. *Journal of Sport and Exercise Psychology*, 29(6), 723.
- Dorgo, S., King, G. A., & Rice, C. A. (2009). The effects of manual resistance training on improving muscular strength and endurance. *The Journal of Strength & Conditioning Research*, 23(1), 293-303.
- Ebben, W., & Brudzynski, L. (2008). Motivations and barriers to exercise among college students. *Journal of Exercise Physiology Online*, 11(5), 1-11.
- Edwards, S. D., Ngcobo, H. S., Edwards, D. J., & Palavar, K. (2005). Exploring the relationship between physical activity, psychological well-being and physical self-perception in different exercise groups. *South African Journal for Research in Sport, Physical Education and Recreation*, 27(1), 75-90.

- Ekeland, E., Heian, F., Hagen, K., & Coren, E. (2005). Can exercise improve self esteem in children and young people? A systematic review of randomised controlled trials. *British journal of sports medicine*, 39(11), 792.
- Faigenbaum, A. D., Westcott, W. L., Loud, R. L., & Long, C. (1999). The effects of different resistance training protocols on muscular strength and endurance development in children. *Pediatrics*, 104(1), e5-e5.
- Fox, K. R. (2000). Self-esteem, self-perceptions and exercise. *International Journal of Sport Psychology*.
- Fox, K. R., & Corbin, C. B. (1989). The physical self-perception profile: Development and preliminary validation. *Journal of sport and Exercise Psychology*, 11(4), 408-430.
- Gao, Z., Xiang, P., Lee, A. M., & Harrison Jr, L. (2008). Self-efficacy and outcome expectancy in beginning weight training class: Their relations to students' behavioral intention and actual behavior. *Research quarterly for exercise and sport*, 79(1), 92-100.
- Häkkinen, K., Pakarinen, A., Kraemer, W. J., Häkkinen, A., Valkeinen, H., & Alen, M. (2001). Selective muscle hypertrophy, changes in EMG and force, and serum hormones during strength training in older women. *Journal of Applied Physiology*, 91(2), 569-580.
- Kraemer, W. J., Adams, K., Cafarelli, E., Dudley, G. A., Dooly, C., Feigenbaum, M. S., ... & Triplett-McBride, T. (2002). American College of Sports Medicine position stand. Progression models in resistance training for healthy adults. *Medicine and science in sports and exercise*, 34(2), 364-380.
- Kraemer, W. J., Marchitelli, L., Gordon, S. E., Harman, E., Dziados, J. E., Mello, R., ... & Fleck, S. J. (1990). Hormonal and growth factor responses to heavy resistance exercise protocols. *Journal of Applied Physiology*, 69(4), 1442-1450.
- Kraemer, W. J., & Ratamess, N. A. (2004). Fundamentals of resistance training: progression and exercise prescription. *Medicine and science in sports and exercise*, 36(4), 674-688.
- Kraemer, W. J., & Ratamess, N. A. (2005). Hormonal responses and adaptations to resistance exercise and training. *Sports Medicine*, 35(4), 339-361.
- Layne, J. E., & Nelson, M. E. (1999). The effects of progressive resistance training on bone density: a review. *Medicine and science in sports and exercise*, 31(1), 25-30.

- Lindwall, M., & Lindgren, E. C. (2005). The effects of a 6-month exercise intervention programme on physical self-perceptions and social physique anxiety in non-physically active adolescent Swedish girls. *Psychology of Sport and Exercise*, 6(6), 643-658.
- Lubans, D. R., Aguiar, E. J., & Callister, R. (2010). The effects of free weights and elastic tubing resistance training on physical self-perception in adolescents. *Psychology of Sport and Exercise*, 11(6), 497-504.
- Lubans, D. R., Sheaman, C., & Callister, R. (2010). Exercise adherence and intervention effects of two school-based resistance training programs for adolescents. *Preventive medicine*, 50(1), 56-62.
- Maud, P. J., & Foster, C. (2006). *Physiological assessment of human fitness*. Human Kinetics.
- McCall, G. E., Byrnes, W. C., Fleck, S. J., Dickinson, A., & Kraemer, W. J. (1999). Acute and chronic hormonal responses to resistance training designed to promote muscle hypertrophy. *Canadian Journal of Applied Physiology*, 24(1), 96-107.
- McCreary, D. R., & Sasse, D. K. (2000). An exploration of the drive for muscularity in adolescent boys and girls. *Journal of American College Health*, 48(6), 297-304.
- Ramirez, A. and Kravitz, L. (2012). Resistance Training Improves Mental Health. *IDEA Fitness Journal*.
- Seguin, R. A., Eldridge, G., Lynch, W., & Paul, L. C. (2013). Strength training improves body image and physical activity behaviors among midlife and older rural women. *Journal of Extension*, 51(4).
- Winett, R. A., & Carpinelli, R. N. (2001). Potential health-related benefits of resistance training. *Preventive medicine*, 33(5), 503-513.

## APPENDIX A

### PROGRAM PROTOCOLS

Specific Training Outcome	Loading (RM)	Volume	Exercise Selection	Exercise Order	Rest Period
Muscular Endurance	30-40%	3-5 x >20 reps	Single/Multi-joint	Mixed	30-60 sec
Hypertrophy	60-70%	3-6 x 8-15 reps	Single/Multi-joint	Large < Small Muscles Multi < Single High < Low Intensity	2-3 mins
Muscular Strength	75-100%	3-5 x 3-6 reps	Multi-joint	Large < Small Muscles Multi < Single High < Low Intensity	1-2 mins
Power	30-85%	2-4 x 1-3 reps	Multi-joint	Large < Small Muscles Most Complex < Least High < Low Intensity	5-8 mins

The order in which the exercises are performed is an important program variable that affects the quality and the specific training outcome of the workout. The amount of resistance used for a specific exercise is one of the key variables in any resistance training program. The stimulus of the amount of resistance used is related to changes observed in measures of muscular strength and muscular endurance. Focus on the larger muscle mass groups, by stimulating a greater neural, metabolic, and endocrine response, which potentially may augment the training with subsequent muscles or exercises trained later in the workout. This concept also applies to the order of multi-joint and single-joint exercises. Multi-joint exercises require the coordinated action of two or more muscle groups and joints. Exercises that attempt to isolate a particular muscle group's movement of a single joint are known as single-joint exercises. The rest periods play an important

role in dictating the metabolic stress of the workout and influence the amount of resistance that can be used during each set or exercise.

Focusing on the specific training outcomes, the muscular endurance group performed 3 to 5 sets for each exercise with >20 repetitions at 30-40% RM. The group performed single/multi-joint exercises in no particular order. Rest period consisted of 30 to 60 seconds between each set. The muscular strength group performed 3 to 5 sets with 3 to 6 repetitions at 75-100% RM. Exercise selection was based on large to small muscle mass, a multi joint movement to single joint movement and high to low intensity. Rest period consisted of 1 to 2 minutes between each set.

APPENDIX B

**THE PHYSICAL SELF PERCEPTION PROFILE (PSPP)**

**WHAT AM I LIKE?**

These are statements which allow people to describe themselves.  
There are no right or wrong answers since people differ a lot.

First, decide which one of the two statements best describes you.

Then, go to that side of the statement and check if it is just “sort of true” or “really true”  
FOR YOU.

Really True for Me	Sort of True for Me		EXAMPLE		Sort of True for Me	Really True for Me
<input type="checkbox"/>	<input type="checkbox"/>	Some people are very competitive	BUT	Others are not quite so competitive	<input checked="" type="checkbox"/>	<input type="checkbox"/>

REMEMBER to check only ONE of the four circles

1	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they are not very good when it comes to playing sports.	BUT	Others feel that they are really good at just about every sport	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	Some people are not very confident about their level of physical conditioning and fitness	BUT	Others always feel confident that they maintain excellent conditioning and fitness	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that compared to most, they have an attractive body	BUT	Others feel that compared to most, their body is not quite so attractive	<input type="checkbox"/>	<input type="checkbox"/>

4	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they are physically stronger than most people of their sex	BUT	Others feel that they lack physical strength compared to most others of their sex	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel extremely proud of who they are and what they can do physically	BUT	Others are sometimes not quite so proud of who they are physically	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they are among the best when it comes to athletic ability	BUT	Others feel that they are not among the most able when it comes to athletics	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	Some people make certain they take part in some form of regular vigorous physical exercise	BUT	Others don't often manage to keep up regular vigorous physical exercise	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they have difficulty maintaining an attractive body	BUT	Others feel that they are easily able to keep their bodies looking attractive	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that their muscles are much stronger than most others of their sex	BUT	Others feel that on the whole their muscles are not quite so strong as most others of their sex	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	Some people are sometimes not so happy with the way they are or what they can do physically	BUT	Others always feel happy about the kind of person they are physically	<input type="checkbox"/>	<input type="checkbox"/>
11	<input type="checkbox"/>	<input type="checkbox"/>	Some people are not quite so confident when it comes to taking part in sports activities	BUT	Others are among the most confident when it comes to taking part in sports activities	<input type="checkbox"/>	<input type="checkbox"/>
12	<input type="checkbox"/>	<input type="checkbox"/>	Some people do not usually have a high level of stamina and fitness	BUT	Others always maintain a high level of stamina and fitness	<input type="checkbox"/>	<input type="checkbox"/>

13	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel embarrassed by their bodies when it comes to wearing few clothes	BUT	Others do not feel embarrassed by their bodies when it comes to wearing few clothes	<input type="checkbox"/>	<input type="checkbox"/>
14	<input type="checkbox"/>	<input type="checkbox"/>	When it comes to situations requiring strength some people are one of the first to step forward	BUT	When it comes to situations requiring strength some people are one of the last to step forward	<input type="checkbox"/>	<input type="checkbox"/>
15	<input type="checkbox"/>	<input type="checkbox"/>	When it comes to the physical side of themselves some people do not feel very confident	BUT	Others seem to have a real sense of confidence in the physical side of themselves	<input type="checkbox"/>	<input type="checkbox"/>
16	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they are always one of the best when it comes to joining in sports activities	BUT	Others feel that they are not one of the best when it comes to joining in sports activities	<input type="checkbox"/>	<input type="checkbox"/>
17	<input type="checkbox"/>	<input type="checkbox"/>	Some people tend to feel a little uneasy in fitness and exercise settings	BUT	Others feel confident and at ease at all times in fitness and exercise settings	<input type="checkbox"/>	<input type="checkbox"/>
18	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they are often admired because their physique or figure is considered attractive	BUT	Others rarely feel that they receive admiration for the way their body looks	<input type="checkbox"/>	<input type="checkbox"/>
19	<input type="checkbox"/>	<input type="checkbox"/>	Some people tend to lack confidence when it comes to their strength	BUT	Others are extremely confident when it comes to their physical strength	<input type="checkbox"/>	<input type="checkbox"/>
20	<input type="checkbox"/>	<input type="checkbox"/>	Some people always have a real positive feeling about the physical side of themselves	BUT	Others sometimes do not feel positive about the physical side of themselves	<input type="checkbox"/>	<input type="checkbox"/>
21	<input type="checkbox"/>	<input type="checkbox"/>	Some people are sometimes a little slower than most when it comes to learning new skills in a sports situation	BUT	Others have always seemed to be among the quickest when it comes to learning new sports skills	<input type="checkbox"/>	<input type="checkbox"/>

22	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel extremely confident about their ability to maintain regular exercise and physical condition	BUT	Others don't feel quite so confident about their ability to maintain regular exercise and physical condition	<input type="checkbox"/>	<input type="checkbox"/>
23	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that compared to most, their bodies do not look in the best of shape	BUT	Others feel that compared to most their bodies always look in excellent physical shape	<input type="checkbox"/>	<input type="checkbox"/>
24	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they are very strong and have well developed muscles compared to most people	BUT	Others feel that they are not so strong and their muscles are not very well developed	<input type="checkbox"/>	<input type="checkbox"/>
25	<input type="checkbox"/>	<input type="checkbox"/>	Some people wish that they could have more respect for their physical selves	BUT	Others always have great respect for their physical selves	<input type="checkbox"/>	<input type="checkbox"/>
26	<input type="checkbox"/>	<input type="checkbox"/>	Given the chance, some people are always one of the first to join in sports activities	BUT	Other people sometimes hold back and are not usually among the first to join in sports	<input type="checkbox"/>	<input type="checkbox"/>
27	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that compared to most they always maintain a high level of physical conditioning	BUT	Others feel that compared to most their level of physical conditioning is not usually so high	<input type="checkbox"/>	<input type="checkbox"/>
28	<input type="checkbox"/>	<input type="checkbox"/>	Some people are extremely confident about the appearance of their body	BUT	Others are a little self-conscious about the appearance of their bodies	<input type="checkbox"/>	<input type="checkbox"/>
29	<input type="checkbox"/>	<input type="checkbox"/>	Some people feel that they are not as good as most at dealing with situations requiring physical strength	BUT	Others feel that they are among the best at dealing with situations which require physical strength	<input type="checkbox"/>	<input type="checkbox"/>

30



Some people feel extremely satisfied with the kind of person they are physically

BUT

Others sometimes feel a little dissatisfied with their physical selves

