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Physical Fitness and Body Mass Index As Predictors of Academic Achievement

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The University of Southern Mississippi

PHYSICAL FITNESS AND BODY MASS INDEX AS PREDICTORS OF ACADEMIC
ACHIEVEMENT

by

Kristin Sumrall

A Thesis
Submitted to the Honors College of
The University of Southern Mississippi
in Partial Fulfillment
of the Requirements for the Degree of
Bachelor of Science
in the School of Human Performance and Recreation

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Abstract

In the United States, a significant portion of the population is overweight or obese. In addition to this, there are very low levels of physical fitness amongst the general population. However, in numerous studies healthy body weight and moderate to high levels of physical fitness have been linked with many benefits, including improved academic performance. This study focused on the relationship between physical fitness, body mass index, and academic achievement in college students at the University of Southern Mississippi. The aim of this study was to conduct a quantitative correlational analysis of these three factors in order to determine if either physical fitness or body mass index could potentially correlate with academic performance at the college level. A sample population was obtained students enrolled in HPR 303 (Evaluation in Human Performance and Recreation) at the University of Southern Mississippi. The subjects completed the FITNESSGRAM to measure their physical fitness levels. Body mass index was derived from the subjects' self-reported height and weight. Academic achievement was determined by the self-reported grade point average. The correlation between physical fitness levels, body mass index, and academic achievement were analyzed through a Pearson's r correlation. This study revealed non-significant trends of a correlation between physical fitness and academic achievement, especially amongst Caucasian subjects. As such, based on the results of this study, it is possible that one may generally predict whether an individual will do well academically based on their physical fitness and body mass, and vice versa.

Key Words: physical fitness, body mass, academic achievement, college students

Dedication

Jerry Purvis, Collin Creel, and Wayne and Vicki Sumrall:

Thank you for your continuous support and unfailing optimism.

I could not ask for a better support system.

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Chapter 1: Body Mass Index and Physical Fitness Levels as Predictors of Academic Achievement

With a newfound attentiveness to health and fitness in the past decade, much awareness of the obesity epidemic has arisen (Bates & Eccles, 2008). Awareness of risk factors for obesity and strategies for reducing obesity are now part of the public discourse. Although in recent years there has been a slight decrease in obesity levels and a slight increase in physical fitness levels, 35.7% of adults in the United States are still obese (Center for Disease Control and Prevention, 2012). Among adolescents, obesity rates are lower but rising (Bishop, Middendorf, Babin, & Tilson, 2005). Currently 12.1% of children aged two through five, 18.0% of children aged six through eleven, and 18.4% of adolescents aged twelve through nineteen are classified as obese (Center for Disease Control and Prevention, 2012). There have been numerous studies performed that focus on obesity and physical fitness and the factors that can influence both. Yet despite these studies, the obesity rates in the United States are still at high levels (Center for Disease Control and Prevention, 2012).

It is quite obvious that the obesity levels in the United States are much higher than they should be. Currently, one in three children and 35.7% of adults in the United States are considered overweight or obese (Carroll, Flegal, Kit, & Odgen, 2012). In some states and areas, this number is even higher. In Mississippi, 44% of children are overweight or obese (Elliot, 2011). Being obese or overweight is currently the fifth leading cause of death in the world with approximately 2.8 million people dying each year as a result of being overweight or obese (World Health Organization, 2012). Compounding the obesity epidemic is the general state of unfitness. In a three-year study performed on elementary and middle school students in Mississippi, only 12% of the students passed all

six levels of the FITNESSGRAM physical fitness test (Alvarez, Hudson, Kolbo, Werle, & Zhang, 2012). The high obesity levels and the low fitness ratings are not a good combination for the health of the United States population.

There have been several movements attempting to lower the rates of obesity and unfitness, particularly in the elementary and middle school systems. First Lady Michelle Obama's campaign "Let's Move!" is a healthy living initiative that focuses on decreasing the obesity rates in the upcoming generation of children. This program focuses on nutrition, health, and fitness, making it a very well rounded health initiative (Let's Move, 2013). However, this recent program has not yet proven successful, although it has gained popular support (Gibi, 2013). Similarly, there have been numerous adolescent and adult exercise programs in the past few years that cater to both the fit and the unfit. These programs promise a fun time while also giving a good workout. Examples of these include Zumba, Pilates, Hoopnotica, Yoga, and Insanity. These programs can be performed in a gym or at home, allowing people who do not feel comfortable exercising in front of others to utilize the workouts in addition to those who enjoy group exercise. These programs are offered at gyms, fitness centers, on DVD, and on television and have become very popular. The popularity of these programs indicates that people in the United States are at least interested in increasing their fitness level and decreasing their body mass. These two movements are just a couple of the various movements designed to improve the fitness levels and lower the obesity levels in the United States.

Unfortunately, many times in schools the physical fitness levels of the students may be lower due to the fact that many schools allow their students to replace physical education with other activities, such as band, another class, or extracurricular activities.

The importance of physical education is not very well stressed in the school systems, and that could quite possibly be negatively impacting the health of the students. Some educators suggest allowing students to take other classes in the place of physical education. The reasoning behind this is that if they do not have to participate in physical education, the students will be free to take another class or better focus on the classes they are already taking in order to improve their academics. Contrary to this belief, however, are the numerous studies that have been performed in the last several years that link physical fitness with academic achievement. Studies performed in elementary, middle, and high schools have shown that the more physically fit a person is, the more likely they are to succeed academically (See Chapter Two). These studies show a correlation between body mass, physical fitness, and academic achievement, if not causation. On average for these studies the positive Pearson r correlation of increased physical fitness with academic achievement ranges from 0.07 to 0.34 (Van Duesen, Kelder, Kohl III, Ranjit, & Perry, 2011). This trend has proven to be especially true the younger that the student is, although there is still a significant correlation in the upper grades (Alvarez et. al. 2012). The slight decrease found in the upper grades could be due to the fact that students are more often allowed to substitute other classes or extracurricular activities in the place of physical education once they reach high school. Not allowing students to substitute another class or an extracurricular activity could potentially correct this slight decrease (Alvarez et. al. 2012). Regardless, the positive trend between academic achievement and physical fitness still clearly continues in high schools even if it does so at a smaller rate than it does in elementary and middle schools.

Unfortunately, little research has been conducted on the relationship of physical fitness and body mass with academic achievement on college students. College students are at approximately the same rate for being overweight and obese as school-aged children are. Currently, three out of every ten college students can be classified as either overweight or obese (Sparling, 2007). While much research has been done to try to combat the levels of obesity in school children, the same cannot be said for college students. There is a scarcity of research in this particular area for college students. Little to no research has been done to determine if the trend that was identified in elementary, middle, and high school students of the correlation between physical fitness, body mass, and academic achievement continues at the college level. If the trend does indeed continue, it is reasonable to expect that the correlation would be less than the correlation for high school students (Van Deusen et. al. 2011). But because there has been little to no research done on this topic with this age group, the question remains: What is the relationship between physical fitness, body mass, and academic achievement in college students?

Chapter 2: A Literary Analysis of Physical Fitness Levels and Body Mass Indexes as Predictors of Academic Achievement

Literature focusing on the topic of physical fitness levels and body mass index as predictors for academic achievement can generally be separated into three major categories: literature with a primary focus on physical fitness levels as they relates to academic achievement, literature with a primary focus on body mass as it relates to academic achievement, and literature with a primary focus on the correlation of physical fitness levels and body mass. The majority of studies performed on this topic typically use a sample study of elementary and/or middle school students; however, there are many studies that have focused on high school students as well. A good consensus among these studies is the correlation between higher physical fitness levels and lower body mass with higher academic achievement. This trend, however, is generally shown to decrease slightly with high school students. Unfortunately, there is a major gap in the literature when it comes to continuing the study of this topic amongst college students. Therefore, much remains unknown about whether physical fitness levels and body mass can reliably be used as predictors of academic success for students of all ages.

Physical Fitness Levels and Academic Achievement

Numerous studies have been performed across the United States on whether or not physical fitness levels have a significant positive correlation with academic achievement (Fox, Barr-Anderson, Neumark-Sztainer, & Wall, 2010; Wittberg, Northrup, & Cottrell, 2012; Grissom, 2005; Van Deusen, Kelder, Kohl, Ranjit, & Perry, 2011). These studies have been performed on a wide range of ages, from as young as five to age eighteen. The results of these studies have been fairly conclusive that there is indeed a

positive correlation, although the correlational coefficient varies from study to study, generally between 0.07-0.34 (Van Deusen et. al. 2011). Each study used a slightly different testing method, but all resulted in essentially the same conclusion: the more physically fit a student was, the more likely they were to succeed academically. This trend was also time-proven. In a study performed by Wittberg, Northrup, and Cottrell (2012) over a period of three years from the West Virginia public school students' fifth grade year to their seventh grade year, the researchers used the FITNESSGRAM test to assess students' physical fitness and the WESTEST to assess their academic achievement. Students who were shown to be physically fit on the FITNESSGRAM test and who remained physically fit had significantly higher scores on the WESTEST on average than those students who were not classified as physically fit (Wittberg, Northrup, & Cottrell 2012). Similarly, Van Deusen et. al. (2011) also used FITNESSGRAM to assess physical fitness, but instead used the TAKS achievement test, due to their location in Texas. This study focused on students in grades 3-11 and found that while there was a positive correlation between physical fitness and academic achievement, this correlation peaked around ninth or tenth grade. (Van Deusen et. al. 2011).

This trend of increased academic achievement with increased physical fitness can also vary depending on other variables. A study performed by Dr. J.B. Grissom (2005) in California found that this trend tended to be more prevalent for students from a higher socioeconomic background than those from a lower socioeconomic background. Additionally, he found that this trend of increased academic achievement with increased physical fitness tended to be more reliable for female students than male students (Grissom, 2005). This difference between the genders was also found in a similar study

performed by Fox et. al. (2010). This study focused on the relationship between physical activity, team sports participation, and academic achievement. The researchers found that for females, both physical activity and team sports participation were good predictors of academic achievement while for males, only team sports participation could be used reliably as a predictor for academic achievement (Fox et. al. 2010). While the economic status, age, and gender of the students might somewhat impact the positive correlation between physical fitness and academic achievement, it is clear from the literature that the trend of increased academic achievement with increased physical fitness still remains in the general school population.

Body Mass and Academic Achievement

Fewer studies seem to have explored the relationship between body mass and academic achievement. The studies that have been performed on the topic (Alatupa, Pulkki-Råback, Hintsanen, Ravaja, Raitakari, Telama, Viikari, & Keltikangas-Järvinen, 2010; London & Castrechini, 2011) have shown that while body mass is not as reliable an indicator as physical fitness levels are, body mass can still be used to predict academic achievement to some extent. London and Castrechini (2011) studied California students in grades four through nine. Their findings indicated a negative correlation between body mass and academic achievement that ranged from -0.131 to -0.45 (London & Castrechini, 2011). However, this correlation fluctuated highly from student to student. Thus, they found that the average body mass index of the entire class and/or school could be used to efficiently predict the average grade point average of the entire class and/or school, rather than used at an individual level (London & Castrechini, 2011).

Similarly, academic achievement was used to predict adulthood obesity. A twenty-one year study done by Alatupa et. al. (2010) found that a low grade point average in elementary and middle school was a risk factor for adulthood obesity. This risk factor was multiplied for women, lending credence to the previous research (Grissom, 2005) that showed female students' academic performance was affected by physical activity more than male high school students (Alatupa et. al. 2010). Thus, while body mass may not be as reliable as physical fitness in predicting academic achievement, it can still be used effectively as a predictor of academic achievement, particularly when it is combined with other variables such as physical fitness.

Physical Fitness and Body Mass

The connection between physical fitness and body mass with academic achievement is further strengthened by the firm relationship between physical fitness and body mass. Several studies (Datar & Sturm, 2004; Kimm, Glynn, Obarzanek, Kriska, Daniels, Barton, & Liu, 2005) have shown that the more physically fit a person is, the lower their body mass tends to be. These two factors working together can cause the correlation with academic achievement. Similarly to Grissom's research (2005), the relationship between physical fitness and body mass tends to be more significant for girls than boys. In a study conducted on kindergarten and first grade students across the United States, Datar and Sturm (2004) found that the more time that was allotted for physical education, the healthier the body masses of the female students tended to be. However, the amount of time allotted for physical education had little effect on the body masses of the male students (Datar & Sturm, 2004). Correspondingly, the study done by Kimm et. al.(2005) sampled African American and Caucasian female students. The

authors found that there was a direct correlation between physical activity/fitness and body mass; this study found that for every 10 metabolic times per week decreased, body mass went up 0.14 kg/m² and skinfold thickness increased 0.62 mm (Kimm et. al. 2005). Therefore, physical fitness and body mass can be shown throughout the numerous studies and literature on the topic to have a significant correlation, and it is this relationship that then influences academic achievement.

Samples

For the literature that has been mentioned thus far, the predominant sample has been elementary and middle school children. Only one study (Alatupa et. al. 2010) collected data from its subjects after high school. Of the aforementioned studies, six studies (Wittberg, Northrup, & Cottrell, 2012; Van Deusen et. al. 2011; Grissom, 2005; London & Castrechini, 2011; Alatupa et. al. 2010; Datar & Sturm, 2004) collected at least some of its data from elementary students, seven studies (Wittberg, Northrup, & Cottrell, 2012; Van Deusen et. al. 2011; Grissom, 2005; Fox et. al. 2010; London & Castrechini, 2011; Alatupa et. al. 2010; Kimm et. al. 2005) collected at least some of its data from middle school students, and five studies collected some of its data from high school students (Van Deusen et. al. 2011; Grissom, 2005; Fox et. al. 2010; London & Castrechini, 2011; Alatupa et. al. 2010). The sample of college students has been grossly neglected.

In conclusion, the wide range of literature on the topic has shown that fitness levels and body mass can be used to predict academic achievement. The firm relationship between fitness levels and academic achievement is the strongest correlation

between the two; however, body mass can also be used to predict academic achievement, especially when it is combined with physical fitness levels. Unfortunately, as shown by the aforementioned studies, there has been little to no research done on this topic amongst college students. This significant gap in the literature should be corrected to assess if using physical fitness levels and body mass to predict academic achievement truly does peak in early to mid high school or if it extends throughout a student's college career. Therefore, the research question remains: What is the relationship between physical fitness, body mass, and academic achievement among college students?

Chapter 3: Methodology

Sample

For this research study, data was collected from twenty university students enrolled at the University of Southern Mississippi. Of the twenty participants, eleven were male, and nine were female. Fifty-five percent of the sample identified as African American, forty percent identified as Caucasian, and five percent identified as Hispanic/Latino. The age ranged from nineteen to thirty-two years of age with the average age being 22.2 years of age.

This sample was obtained by voluntary participation in a survey that was handed out to students currently enrolled in HPR 303 (Evaluation in Human Performance and Recreation). The students in this course participated in the FITNESSGRAM, which assesses physical fitness. Permission was obtained from the instructor, Dr. Robert Doan, to hand these surveys out to the students in the class at the end of the semester (Fall 2013). The students in this class were informed about the opportunity to participate in the research study at least one day prior to data collection. Students who wished to participate were asked to stay after class for five to ten minutes to complete the survey. Students who chose not to participate were not negatively impacted in their class work or in their standing with the university.

Variables

The primary variables in this study include the physical fitness levels, body mass index (BMI), and overall college grade point average (GPA). The physical fitness level was measured through the FITNESSGRAM. This is a physical fitness test that scores participants based on four areas of physical fitness—cardiorespiratory endurance,

muscular strength and endurance, muscular flexibility, and body composition. The FITNESSGRAM scores were based on the scores of their individual tests, which include tests of grip strength, trunk flexibility, aerobic fitness, curl ups, and push ups.

The body mass index was defined as the proportion of height to weight. Body mass index, or BMI, calculations are based on the assumption that weight should be approximate to height. For example, a person who is six feet tall should weigh between one hundred forty and one hundred eighty pounds to be considered in the normal range while a person who is five feet tall would have a much smaller healthy weight range of ninety-five to one hundred twenty-five pounds.

The GPA was defined as the students' grade point average as determined by the student's last available electronic transcript from the University of Southern Mississippi.

Procedures

The data from this study was based on the FITNESSGRAM scores, the calculated BMI, and the GPA of the students. The data for this study was collected during the fall of 2013 from the students in the HPR 303 course at the University of Southern Mississippi. The class already participated in the FITNESSGRAM test during the semester. Permission from instructor, Dr. Robert Doan, had been secured as part of the Application for Human Subjects. Students were handed a short questionnaire on which they were asked to list their scores on the FITNESSGRAM, height and weight, GPA as pulled from SOAR, and some demographic data such as race and gender. A laptop was provided for students to look up their GPA if they did not know it. Participants were allowed to drop out of the FITNESSGRAM at any point that they wished.

The only instruments necessary for this research study were the instruments necessary for the FITNESSGRAM test. The procedure for data collection, not including the FITNESSGRAM test, may be completed in less than ten minutes. Including the FITNESSGRAM test, data collection may be completed in approximately forty-five minutes to one hour.

Analysis

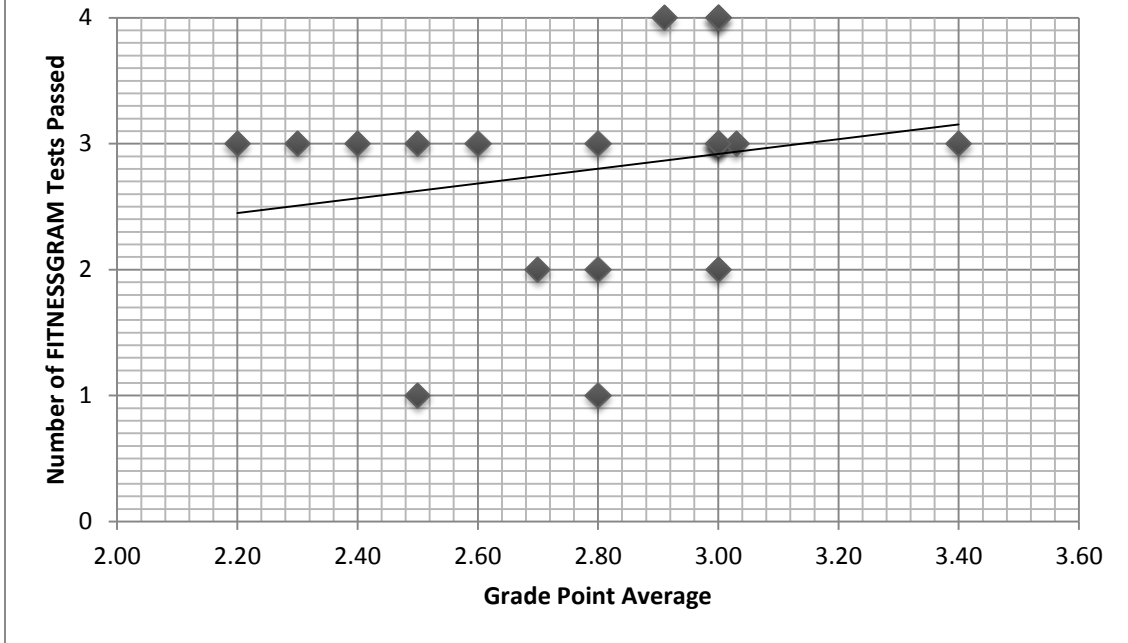
All data was analyzed using the SPSS version 10 statistical analysis software program (SPSS IBM, Armonck, NY). The variables analyzed consisted of the number of FITNESSGRAM tests the participants passed, the body mass indexes, and the overall grade point averages. Pearson r correlations were calculated for all variables, then calculated again for each subgroup to determine any further correlations. The threshold of statistical significant was $p=0.05$. The University of Southern Mississippi statistician, Dr. James Johnson, was also consulted to ensure accurate statistical measures.

Chapter 4: Results

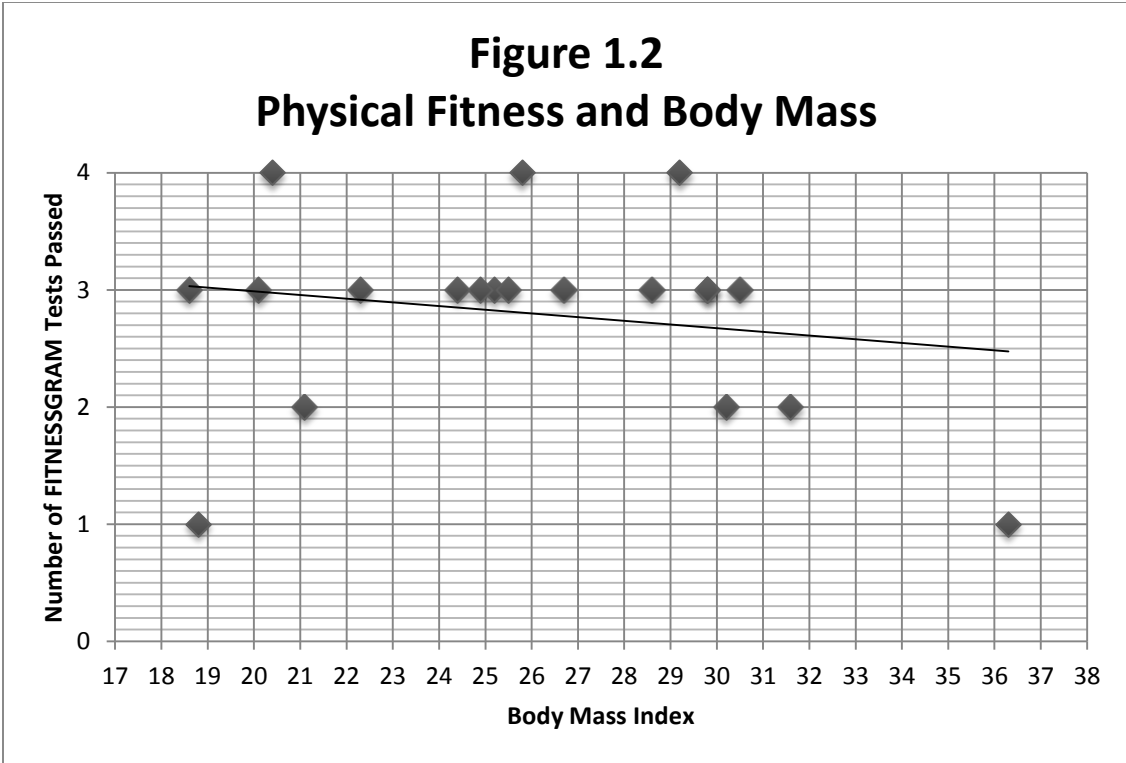
Due to the limitation of the small sample size, this study did not produce any results that were statistically significant. However, this study did indicate trends toward correlations between the three variables studied. Two of the subgroups in particular, the males and the Caucasians, showed strong correlations. If this study were to be replicated with a larger sample, it is likely that the follow-up study would yield significant results.

Overall, the study yielded a very small correlation of $r(19)=0.2104$, $p=0.3733$ between physical fitness and academic achievement (see Figure 1.1), although this somewhat differed between gender and race. There was no significant correlation between physical fitness and academic achievement (see Figure 1.2) or between body mass and academic achievement (see Figure 1.3) overall. These results overall indicate a potential trend between physical fitness and academic achievement. As predicted earlier, the trend of higher academic achievement with higher levels of physical fitness was present, albeit slightly weaker than the correlation observed in high school students of 0.07-0.34 (Van Deusen et. al. 2011). While these results might not seem particularly enlightening overall, they are much more informative when looked at in the subgroups particularly affected.

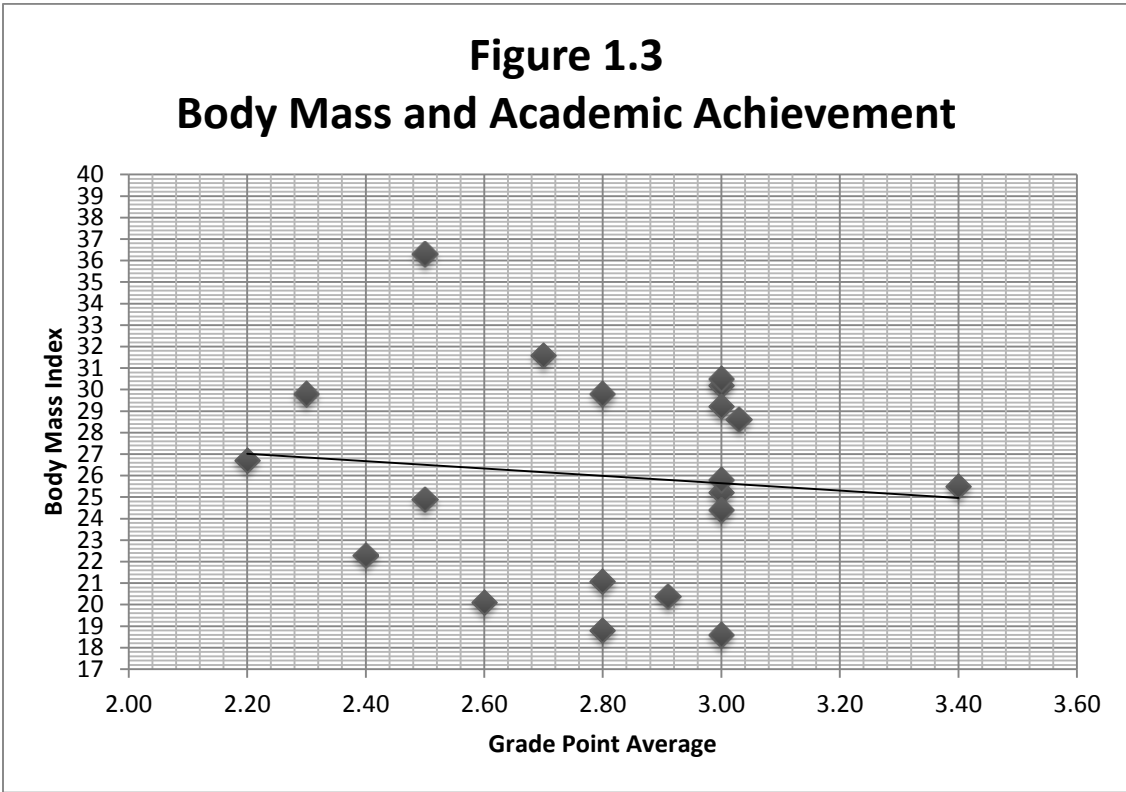
Figure 1.1
Physical Fitness and Academic Achievement



*Note that for Figure 1.1, Point (3.00, 3) represents the scores of 4 participants who had identical scores. Similarly, Point (3.00, 4) represents the scores of 2 participants with identical scores.



*Point (29.8, 3) represents the identical scores of two test subjects.



Males

For the eleven males who participated in this study, a moderate correlation existed between levels of physical fitness and academic achievement and between physical fitness and body mass. The correlation between physical fitness and body mass was the stronger of the two at $r(10)=-0.3917$, $p=0.9528$ (see Figure 2.1). The correlational coefficient of physical fitness and academic achievement was almost as strong at $r(10)=0.3728$, $p=0.2588$ (Figure 2.2).

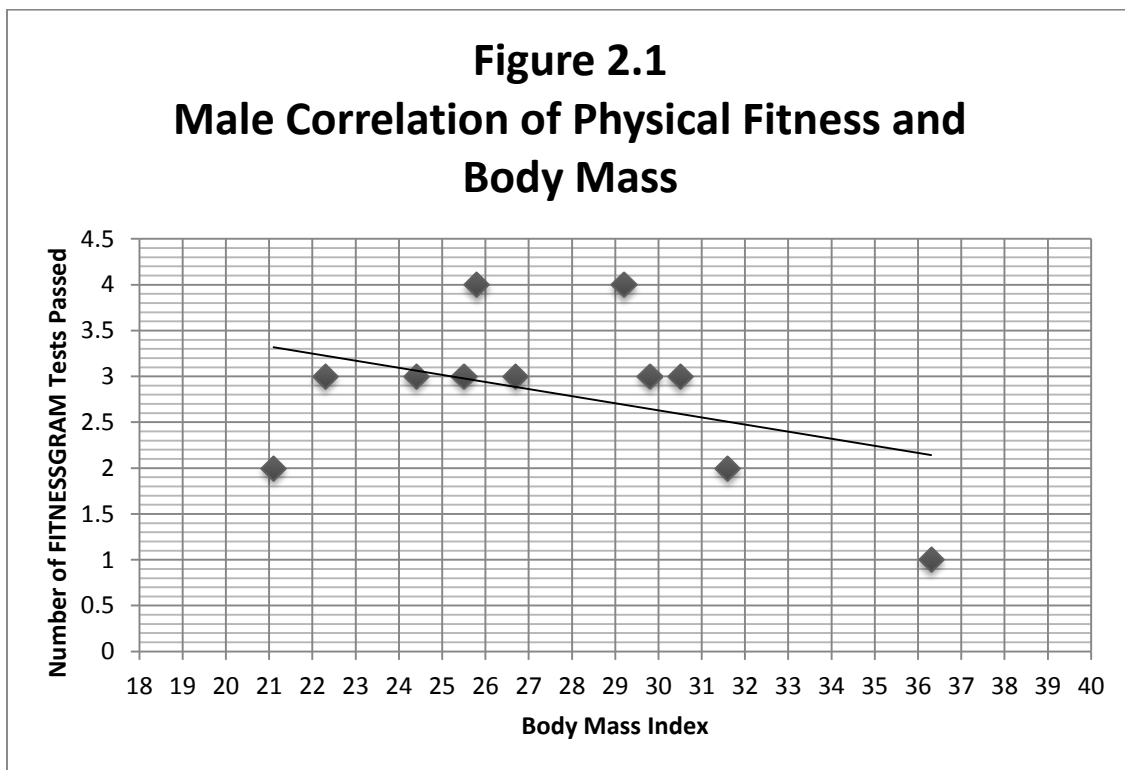
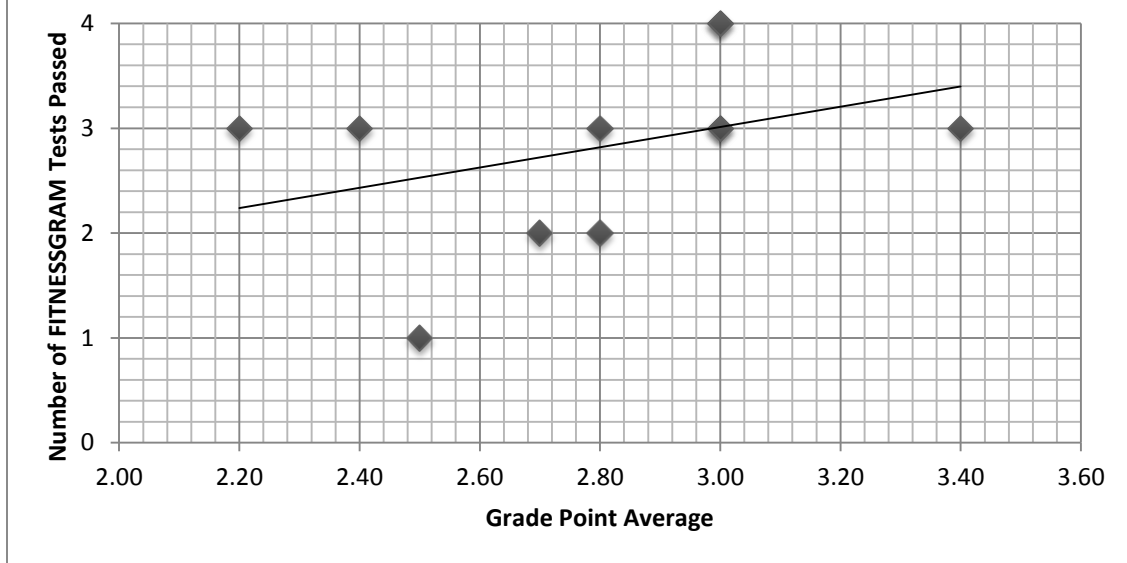


Figure 2.2
Male Correlation of Physical Fitness and
Academic Achievement



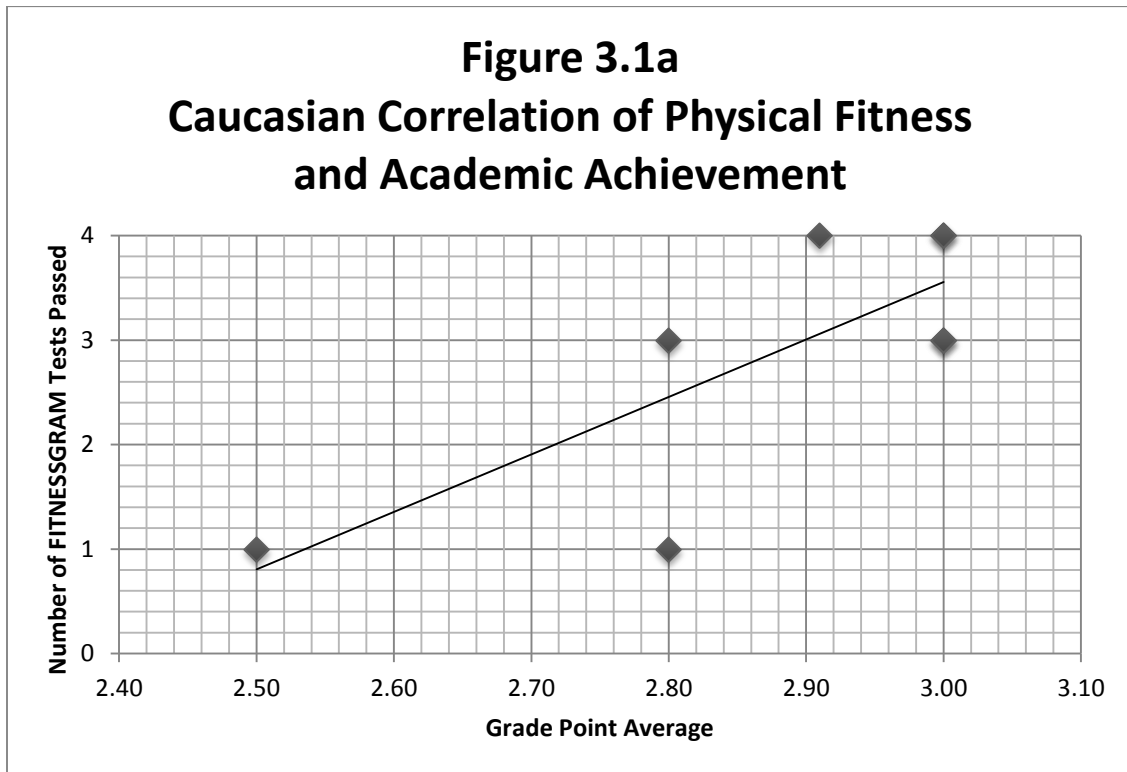
*Point (3.00,3) and Point (3.00,4) each represent sets of two identical scores.

Caucasians

The results were very strong for the Caucasian population of test subjects. Of the individuals surveyed, there was a strong positive correlation between physical fitness and academic achievement of $r(7)=0.6434$, $p=0.0852$ (see Figure 3.1a). This correlation was even higher for the Caucasian males at $r(5)=0.7273$, $p=0.1014$ (see Figure 3.1b). The correlation was not particularly strong overall for physical fitness and body mass for Caucasians (see Figure 3.2a), but was very strong for Caucasian males. The Caucasian males had a strong correlational coefficient of $r(5)=-0.8049$, $p=0.0534$ for the relationship between physical fitness and body mass (see Figure 3.2b). The Caucasian subject group also showed a strong correlation between body mass and academic achievement of $r(7)=-$

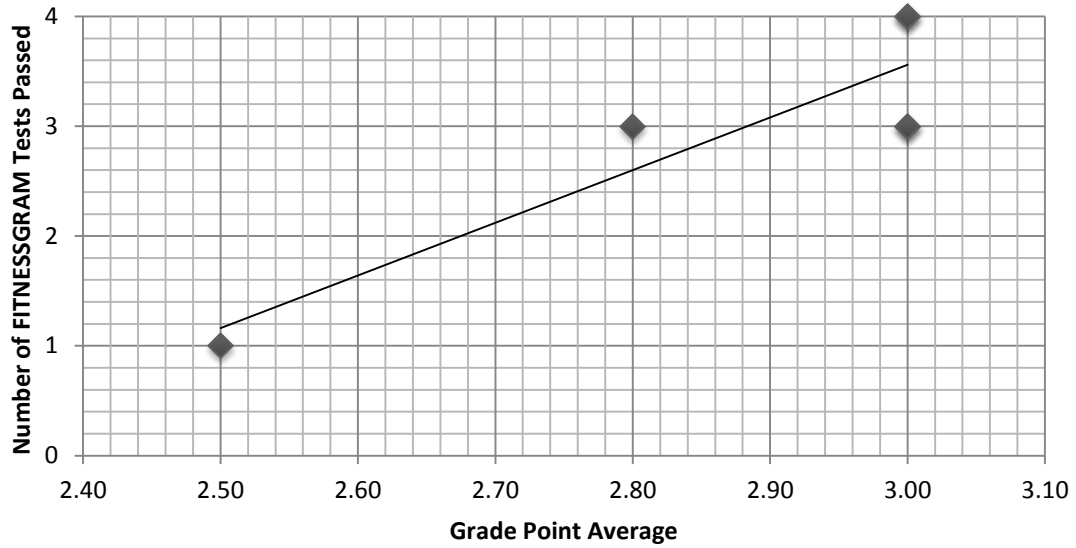
0.6434, $p=0.0852$. This indicates a trend toward a strong relationship between body mass index and grade point average in the Caucasian subject group (see Figure 3.3a).

Similarly to the previous two correlations, the Caucasian males had a stronger correlation at $r(5)=-0.7273$, $p=0.1014$ (see Figure 3.3b). Overall for the Caucasian subject group, there were strong non-significant correlations between physical fitness, body mass, and academic achievement.



*Point (3.00,4) and (3.00,3) represents pairs of identical scores.

Figure 3.1b
Male Caucasian Correlation of Physical Fitness and Academic Achievement



*Point (3.00, 3) and Point (3.00, 4) represent pairs of identical scores.

Figure 3.2a
Caucasian Correlation of Physical Fitness
and Body Mass

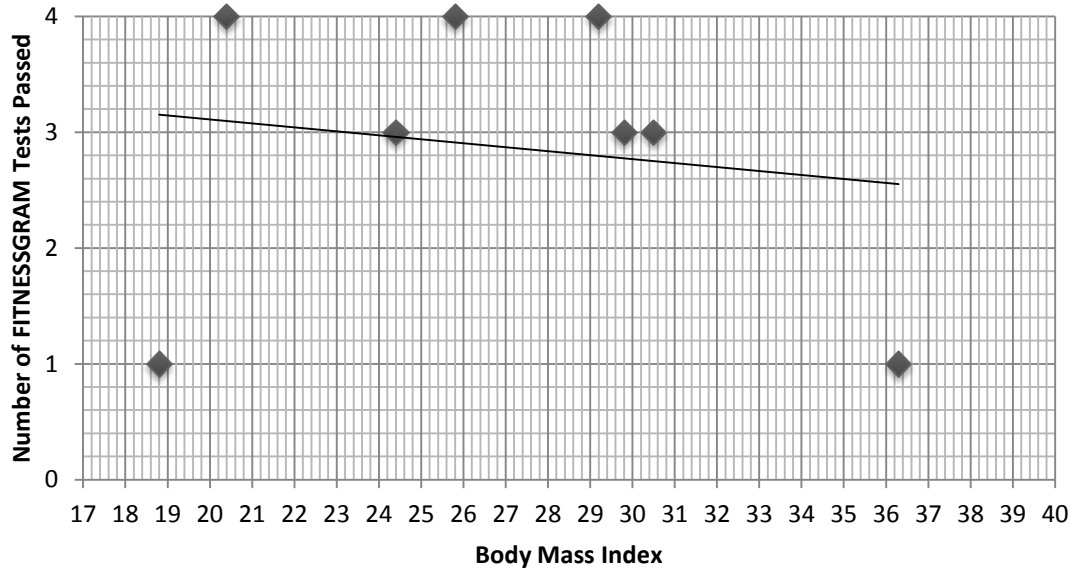


Figure 3.2b
Male Caucasian Correlation of Physical
Fitness and Body Mass

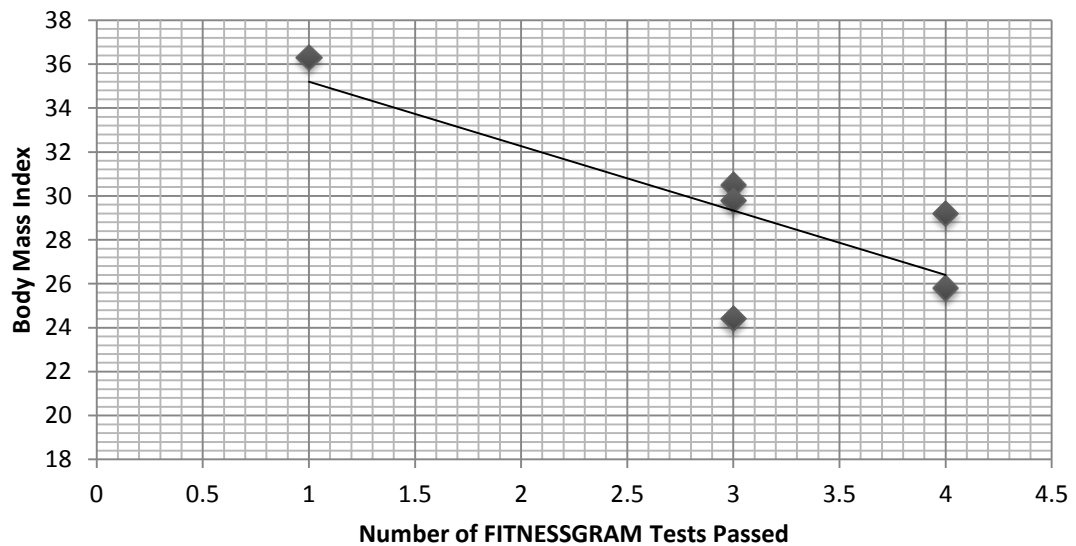


Figure 3.3a
Caucasian Correlation of Body Mass and Academic Achievement

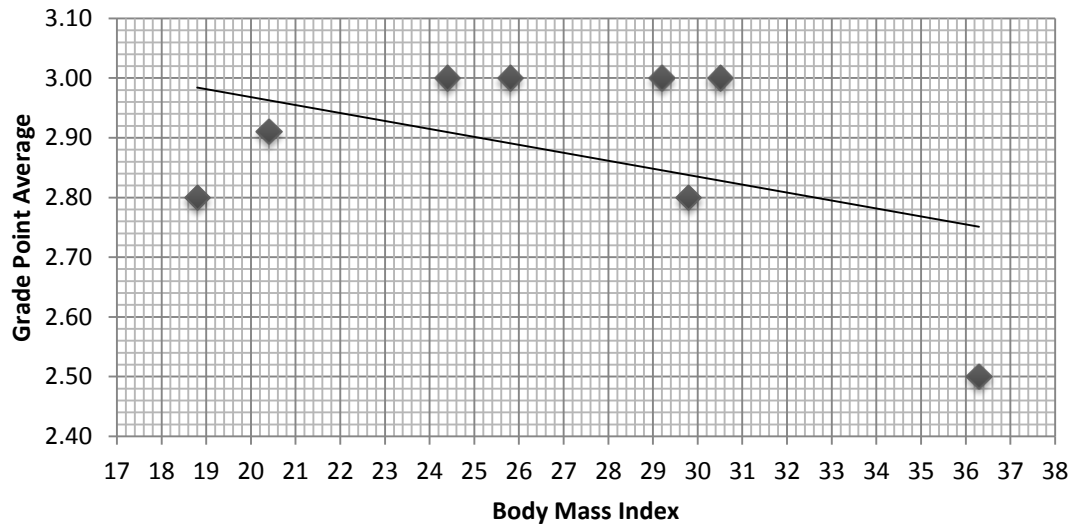
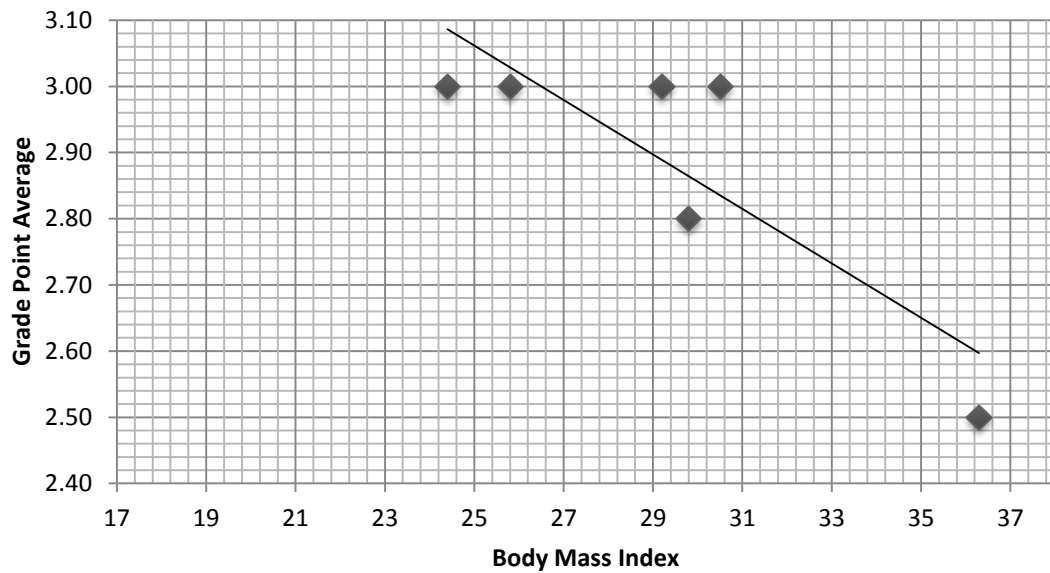


Figure 3.3b
Male Caucasian Correlation of Body Mass and Academic Achievement



Chapter 5: Discussion

While much research has been done in the last decade regarding the impact of physical fitness and body mass on school children, little to no research has been done on how body mass and physical fitness impact college students' academic achievement. This study has taken a small step toward correcting that deficit. By performing a similar test to those that were done on numerous elementary and middle school students, this study has indicated that there is a potential trend toward a positive correlation of physical fitness and academic achievement overall, a moderate correlation between physical fitness and academic achievement and between physical fitness and body mass, and a moderate to strong correlation between physical fitness and academic achievement and between body mass and academic achievement for Caucasians.

As predicted at the beginning of this study, the sample of college students studied demonstrated a statistically non-significant correlation between physical fitness, body mass, and academic achievement at a lesser rate than that of elementary students, junior high, and high school students. However, this does not mean that there is any less importance in advocating physical fitness and healthy body mass at the college level. If anything, it is just as important, if not more so, as it is in the younger students. As these individuals start college, many of them are experiencing major lifestyle changes. Many people who were active and played sports in high school stop doing so once they enter college. It becomes exceedingly difficult to stay healthy as students begin to stay up later and sleep less in order to have more time to do homework and study. Many students find that they do not have the time or energy to workout. However, this study has shown a

possible trend that the healthier a person is (through being physically fit and maintaining a healthy body mass) the better they tend to do in school.

There are many potential causal connections between physical fitness and academic performance. One such causal connection is the fact that physical exercise has been shown in numerous studies to boost cognition (Hillman, Erickson, & Kramer, 2008). By boosting cognition, regular physical activity aids in academic performance. Also, physical activity has been linked with lowering body mass and better overall health (Center for Disease Control, 2011). Healthier students generally are not sick as often, and therefore, do not miss class as often as their less healthy classmates, which further aids them in their academics. There are numerous other explanations for such trends that may be further explored if desired (See Reference).

While this study has not proven that physical fitness, body mass, or academic achievement can cause one or both of the other factors, it has shown that there is a mild to moderate trend in the variable studied. As such, based on the results of this study, it is possible that one may generally predict whether an individual will do well academically based on their physical fitness and body mass, and vice versa. This study corroborates with the previous work done in this field that evidenced a relationship between physical fitness, body mass, and academic achievement.

This study has a few weaknesses. The small sample size is the primary limitation. The small subject group of twenty subjects did not allow for any of the results to achieve significance. Should this study be replicated at a larger level it is likely that the study would produce significant results. Additionally, participants were recruited from only

one university. It is possible that if this study were to be replicated at another university in another region, it could have vastly different results. There is far too little research available to know for certain how applicable these results are in other locations.

However, this study also has strengths. The data collection process itself was very short and required minimal time. The FITNESSGRAM took approximately thirty minutes to complete, in addition to the five to ten minutes necessary to fill out the data collection form. Additionally, this study could be easily modified to work with a different physical fitness test or a different measure of academic achievement.

As this field is fairly barren in research amongst college students, there is much opportunity for further study. Unfortunately, due to time and funding constraints, this study was only able to sample a small population in one university in the United States. In order to get a more accurate measurement of the relationship between physical fitness, body mass, and academic achievement in college students, larger samples need to be taken. Ideally, in the future a team of researchers will be able to measure a sample of thousands of college students from all across the United States. However, any research done will be one more piece we have to the puzzle that is physical fitness and body mass's relationship to academic achievement.

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INSTITUTIONAL REVIEW BOARD

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NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported

immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Effect Report Form”.

- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 13111203 PROJECT TITLE: Physical Fitness and Body Mass as Indicators of Academic Achievement PROJECT TYPE: New Project RESEARCHER(S): Kristin Sumrall COLLEGE/DIVISION: College of Health DEPARTMENT: Human Performance and Recreation FUNDING AGENCY/SPONSOR: N/A IRB COMMITTEE ACTION: Exempt Review Approval PERIOD OF APPROVAL: 12/05/2013 to 12/04/2014 Lawrence A. Hosman, Ph.D. Institutional Review Board

APPENDIX 2: Consent Form and Survey

Physical Fitness and Body Mass as Predictors of Academic Achievement Survey

Upon hearing the oral presentation of informed consent and having the opportunity to ask questions pertaining to my participation, please consider my completion of this questionnaire as my consent to participate in this study.

Demographic Questions:

Age: _____

Gender: Male Female

Race: Caucasian African American Hispanic Asian Native
 Prefer not to respond

Academic Questions:

GPA: _____

Year in School: Freshman Sophomore Junior Senior

Health Questions:

Height: _____

Weight: _____

FITNESSGRAM Scores:

Grip Strength: _____

Flexibility: _____

Pacer: _____

Curl ups: _____

Push ups: _____