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## **The Correlation between Physical Activity and Grade Point Average**

Asia McCoy  
*University of Southern Mississippi*

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The University of Southern Mississippi

The Correlation between Physical Activity and Grade Point Average

by

Asia McCoy

A Thesis  
Submitted to the Honors College  
of The University of Southern Mississippi  
in Partial Fulfillment  
of Honors Requirements

May 2019



Approved by

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Jeffrey Parr, Ph.D., Thesis Adviser  
Assistant Professor and Program Director  
of Athletic Training

---

Scott Piland, Ph.D., Director  
School of Kinesiology and Nutrition

---

Ellen Weinauer, Ph.D.,  
Dean Honors College

## Abstract

The correlation between grade point average (GPA) and physical activity has typically been researched in adolescents, but not a lot of research has focused on traditional college students. Previous research in adolescents has shown mixed outcomes, but there is still evidence that a positive correlation exists between physical activity and GPA. It is also believed that adolescents who are physically active tend to have better academic outcomes than their non-active counterparts as they mature. The primary purpose of our study was to examine the correlation between GPA and physical activity in students attending the College of Education and Human Sciences at The University of Southern Mississippi. Through the use of a questionnaire administered via the Qualtrics database, students' GPA, classification, physical activity levels, and moderation of exercise were measured. A total of 104 participants completed the survey with an equal variance across all schools in the College of Education and Human Sciences. Most students reported having a GPA above a 3.0 on a 4.0 scale. A small positive correlation was found between GPA and physical activity, but this correlation was not significant. While these findings prove there is no correlation between physical activity and GPA in students within the College of Education and Human Sciences at The University of Southern Mississippi, there is further research to be done in exploring the effect GPA has on academic performance in all collegiate scholars.

**Key Words:** Grade point average, physical activity, education and human sciences students

## Dedication

To my Lord and Savior, Jesus Christ:

Thank you for blessing me with the opportunity to conduct an original thesis.

To my mom and sister:

Thank you for all your encouraging words and prayers and instilling in me that anything  
is possible in life.

To Dr. Parr:

Thank you for taking me as your student to finish my thesis. This would not have  
happened without you.

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## List of Abbreviations

GPA	Grade Point Average
IRB	Institutional Review Board
SPSS	Statistical Package for the Social Sciences

## Chapter 1

### Introduction

The national obesity rate is continually growing with adult obesity above 25% in 38 states in the past year (Johnson, Moorcroft, Tucker, Calvert, and Turner, 2016). At the top of the national list for obesity is Mississippi, followed by Alabama and Tennessee (Johnson et al., 2016). These state obesity rates are roughly 34% for Mississippi and 32% for both Alabama and Tennessee (DeSilver, 2015). Colorado has the lowest percentage, 19%, and is the only state in the United States that is below 20% for obesity (Jonson et al., 2016). A recent survey found that eight out of ten voters agree that childhood obesity is a leading factor in adulthood obesity and that childhood obesity is a fundamental problem (Johnson et al., 2016). Americans only take, on average, five thousand steps daily, in comparison to Australians, who take, on average, ten thousand steps daily. This shows that Americans are much less physically active than those from other countries (Johnson et al., 2016). This could be one explanation for the higher obesity rates in the United States. In addition to falling behind on being physically active, the United States has also seen a decrease in collegiate academic performance in comparison to other countries.

The Program for International Student Assessment, which measures reading ability and math and science literacy in 15-year-olds found that students in the United States continue to rank in the middle of the pack and behind many other advanced countries. Out of seventy-one participating countries, the United States placed thirty-eighth in reading ability and math and science literacy in 15-year-olds (DeSilver, 2015). In 2015, the Pew Research Center reported that only 29% of Americans rated their

country's kindergarten through twelfth grade STEM system as above average or the best in the world (DeSilver, 2015). A companion survey was created by the American Association for the Advancement of Science, where the results revealed that 46% of scientists believe that kindergarten through twelfth grade STEM programs were below average in the United States (DeSilver, 2015). With the United States falling behind in both health trends and academic performance, many ponder could there be a correlation between academic performance (grade point average (GPA)) and physical activity.

The question of can physical activity enhance collegiate scholars' academic performance is one that many have pondered over time. With studies providing results that support the claim that physical activity has been found to decrease stress levels, researchers have yet to prove that physical activity can improve an individual's GPA (Currie, Pisarik, Ginter, Glauser, Hayes, and Smith, 2012; Khan, Afzal, Ahmed, Mishal, Manan, Cheema, and Shakil, 2017). A series of experiments within one study was conducted where the results were conclusive that regular participation in physical activity is linked to enhanced brain function and cognition (Singh, Uijtdewilligen, Twisk, Van Mechelen, and Chinapaw, 2012). Studies have also found that when physical activity is introduced to an individual during his or her adolescence years, an individual will perform academically better by the time he or she enrolls in college (Kari, Pehkonene, Hutri- Kähönen, Raitakari, and Tammelin, 2017). While studies have shown that regular participation in physical activity is linked to enhanced brain cognition, there are several researchers that disagree with these results and believe that the correlation between GPA and physical activity is insignificant (Khan et al., 2017; Martin and Chalmers, 2007; Trudeau and Shephard, 2008).

The driving force behind this research is does a collegiate scholar's physical activity amount contribute to the collegiate scholar's GPA. Specifically, the purpose of this research is to examine if a positive correlation between GPA and physical activity occurs during a collegiate scholar's academic career. Our hypothesis is that a positive correlation exists between collegiate scholars' GPA and physical activity levels.

## Chapter 2

### Review of the Literature

Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure (Caspersen, Powell, and Christenson, 1985). With energy expenditure being measured in kilocalories, physical activity in an individual's daily life can be categorized into sport, conditioning, household, and other activities.

According to a study correlating physical activity to stress levels, physical activity was found to have the ability to decrease stress and improve GPA (Khan et al., 2017).

Because physical activity has been linked to lower stress levels and higher GPAs, it can be inferred that one who engages in regular physical activity will have a higher GPA than an individual who either engages in minimal physical activity or an individual who is sedentary. However, there are several researchers who do not believe an individual's GPA will increase as a result of partaking in a physical activity regimen.

Although studies have discovered a positive correlation between physical activity and GPA in graduate students in a health and science program at an American university, many researchers believe that in order to improve an individual's academic performance, the individual must dedicate more time to focusing on their field of study (Xu and Sansgiry, 2018). This results in an individual not being able to dedicate time to physical activity (Gonzalez, Hernandez, Coltrane, and Mancera, 2014). In a study to determine the associations between GPA, physical activity, and the impact of physical education in

students in kindergarten through fifth grade, a correlation was not shown between physical activity, GPA, and physical education (Trudeau and Shephard, 2008). While a direct correlation between GPA and physical activity could not be drawn from the data, it was determined that an additional curricular emphasis on physical education may result in small absolute gains in GPA (Trudeau and Shephard, 2008). In a similar longitudinal study of adolescents, researchers examined the association between time spent in physical education and GPA. The results from this study concluded that among girls only, higher amounts of physical education can be associated with an academic benefit (Carlson, Fulton, Lee, Maynard, Brown, Kohl, and Dietz, 2008). With researchers finding a correlation between female adolescent physical education and GPA and no correlation between male adolescent physical education and GPA, the results of the study were deemed insignificant.

Because physical activity has become a part of adolescents' academic curriculum, and has resulted in adolescents developing a stamina for physical activity, the correlation between physical activity and GPA has become marginal. Following this trend, and using academic performance as an indicator of physical activity in middle school students, an experiment was conducted to determine if a correlation between GPA and physical activity in middle school students existed (Chow, Midroni, Hollenberg, and Cumner, 2017). The results from this longitudinal study also concluded that no true evidence was drawn to support the claim that middle school students who engaged in high amounts of

physical activity had higher GPAs than those who were considered physically inactive (Chow et al., 2017). A survey administered to students in pharmacy school at the University of Houston was used to determine if a correlation existed between physical activity and GPA. The results found that there was no significant correlation between physical activity and GPA (Xu and Sansgiry, 2018). While a significant correlation between physical activity and GPA was not found, researchers did find that students with lower body mass indexes had higher GPAs than pharmacy students with higher body mass indexes. (Xu and Sansgiry, 2018). A study conducted on adults enrolled in various medical universities across the United States aimed to measure both the stress levels and GPAs of students in relation to their physical activity (Khan et al., 2017). It was found that physical activity was directly correlated to decreased stress levels, but the correlation between physical activity and academic performance was not significant enough to produce valid results (Khan et al., 2017). While there are claims that support the idea that the correlation between GPA and physical activity is insignificant, there are studies that show positive correlations between GPA and physical activity.

In comparison to other countries, Americans are considered less physically active and below average in academic performance (Johnson et al., 2016). With this in mind, studies have looked to identify if a positive correlation between physical activity and GPA exists in American students.

Maintaining a high GPA, such as one above a 3.0 on a 4.0 scale, is a goal for most college students. While numerous students strive to obtain a GPA above a 3.0, the desire to remain physically active tends to become less of a priority the higher a student's classification, from freshman to senior years, and even into graduate school. A majority of college students have the mentality that there is no need to upkeep physical activity while in college, because many believe they have the metabolism to withstand the lack of physical activity on a weekly basis. While there are researchers who oppose the opinion that being physically active can improve an individual's GPA (Khan et al., 2017), studies have shown that physically active individuals can have higher GPAs than those who choose to remain inactive (Currie et al., 2012).

A study that aimed to examine the associations between sport team participation, physical activity, and GPA in middle and high school students found a positive correlation between physical activity and GPA (Fox, Barr-Anderson, Neumark-Sztainer, and Wall, 2010). Although a positive correlation was seen between physical activity and GPA, the positive correlation was unable to be separated from the correlation between sport team participation and GPA (Fox et al., 2010). Seeming as though there is no definitive correlation between physical activity and GPA in adolescents, researchers have found the opposite of this for collegiate scholars and young adults.

A study was conducted on students at the Uniformed Services University, where the correlation between physical activity parameters and GPA were measured. Using the

pilot sample from their research, the results proved that a positive correlation does exist between physical activity and GPA (Stephens, Dong, and Durning, 2015). In an effort to show a positive correlation between GPA and physical activity in collegiate scholars, researchers examined the developmental variable that may account for academic achievement beyond traditional measures, such as physical activity, in college students (Currie et al., 2012). The results from this experiment showed that both physical activity and healthy mental upkeep significantly impacted GPA (Currie et al., 2012). A total of 120 undergraduate subjects participated in a study where the results of their physical activity, measured via fitness tracker, was compared to their GPA from their completed courses. The results from this week-long observation showed that the undergraduate students who engaged in moderate to vigorous physical activity and interrupted their sitting periods every 10-20 minutes had higher GPAs than their counterparts who remained seated for longer periods of time and did not engage in as much physical activity (Felez-Nobrega, Hillman, Dowd, Cirera, and Puig-Ribera, 2018). For young adults to maintain a high GPA, they must also engage in physical activity. This statement has lead researchers to explore the question of will older adults, those beyond the age of traditional collegiate scholars, also have a positive correlation between GPA and physical activity.

In a study conducted on medical school students, a correlation between physical activity and GPA was found. A positive correlation was discovered between physical activity, in the form of aerobic exercise, and GPA in the medical school students who participated in the study (Stephens et al., 2015). Results from this research also showed a linear increase in the overall fitness levels of the participating medical school students in correlation to their cumulative GPAs (Stephens et al., 2015). This research is beneficial, because it furthers that claim that if individuals begin to engage in physical activity, and continue these activities while in college, their GPA will improve throughout their undergraduate, graduate, and professional schooling. In a longitudinal study that examined the role of physical activity in academic achievement and the effects that it will later have in the participant's life, a positive correlation between physical activity and GPA was discovered. The evidence from this study showed that when physical activity is introduced during an individual's adolescent years and continued throughout adulthood, scholastic achievements have the potential to be prominent later in that individual's life (Kari et al., 2017).

## **Chapter 3**

### **Methodology**

The discussed methods aimed to answer the question does a positive correlation between physical activity and GPA exist in college students within the College of Education and Human Sciences at The University of Southern Mississippi.

### **Participants**

Once permission was obtained from the Institutional Review Board (IRB), full-time students were invited to take part in a survey that included individuals from the College of Education and Human Sciences. The IRB approval letter can be found in Appendix A. The invited population included current full-time students, of at least sophomore standing, having completed 30 credit hours at the university, and graduate students within the College of Education and Human Sciences. This included students within the School of Child and Family Sciences, School of Education, School of Kinesiology and Nutrition, School of Library and Information Science, School of Psychology, and the School of Social Work. Participants were recruited by word of mouth, the use of flyers, and the use of technology, through email advertisements.

### **Measurements**

Data was collected using an online questionnaire via the database of Qualtrics. Questions included, but were not limited to, asking the intensity that participants engaged in physical activity on a weekly basis, the duration of a typical exercise, how many credit hours the participant was enrolled in, and demographic data, such as gender and age. A full list of questions can be found in Appendix B.

### **Procedure and Data Analysis**

The questionnaire was administered online during the fall 2018 academic year at The University of Southern Mississippi for full-time sophomore to graduate level students in all schools that were a part of the College of Education and Human Sciences through the Qualtrics research platform. Once enough data was collected, the results of the questionnaire were analyzed during the spring 2019 academic year. With 104 participants completing the survey, data was analyzed using IBM SPSS version 24.0 (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.). Data was analyzed using frequencies to examine distribution among demographics, and Spearman Rho correlations were analyzed between independent variables.

## Chapter 4

### Results

One hundred and four students within the College of Education and Human Sciences participated in the survey. The original average time for participants to complete the survey was 557.82 seconds. Upon noticing three outliers in the data, 776 seconds, 860 seconds, and 50709 seconds, for the duration of the questionnaire, the three outliers were removed, and the average time for the completion of the survey was recalculated. These outliers were removed from the data because each of the outliers were more than three times greater than the standard deviation. The corrected mean, without the included outliers, for the average amount of time that it took for a participant to complete the survey was 56.12 seconds (range 20-170 seconds). The largest percent of responses came from students who were a part of the School of Education. Students in the School of Education comprised 40.2% of the participants. The participants in this study identified as traditionally-aged college students with 69.2% of the participants being 20-22 years old. Of the students, 74.0% of the participants were of junior or senior classification (37.5% and 36.5% respectively). There were 23.1% of participants having a GPA that ranged from 3.8-4.0, 24% of students having a 3.6-3.8 GPA, and 6.7% of students having a 3.4-3.6 GPA, thus showing that over half of the participants had a GPA at or above a 3.4. Of the 104 participants, 40.8% of them were enrolled in 16 to 18 credit hours at The University of Southern Mississippi. A majority of the participants were female and of African American descent (90.4% and 49.1% respectively). In regards to workout duration, 50.0% of the participants marked that their workouts typically last 30 to 60 minutes. The results showed that 93.3% of participants engaged in physical activity that

ranged from low to high, and 6.7% of participants engaged in high to intense physical activity.

The results of the study showed that there was a -0.175 correlation between the current school that participants were enrolled in and their overall GPA. The correlation between credit hours, with a majority of participants enrolled in 16-18 credit hours, and participants overall GPA was found to have a correlation of 0.118. A 0.044 correlation was found between the participants current classification, on a sophomore to graduate level scale, in relation to the participants GPA. The intensity of the participants' exercises was found to have a 0.068 correlation to their overall GPA. There was a 0.059 correlation between how often participants engaged in physical activity and their cumulative GPA. These findings did not reach a level of significance for correlations between college students' physical activity and cumulative GPA in the College of Education and Human Sciences at The University of Southern Mississippi.

## Chapter 5

### Discussion

The purpose of this study was to determine whether there was a correlation between GPA and physical activity in college students of sophomore to graduate school level within the College of Education and Human Sciences at The University of Southern Mississippi. The results from this study showed that there was not a significant correlation between GPA and physical activity in college students of sophomore to graduate school level within the College of Education and Human Sciences.

While there have been studies conducted that show a correlation between physical activity and GPA does not exist in students ranging from kindergarten to fifth grade, and middle school adolescents, the opposite of this has been shown in collegiate scholars (Chow et al., 2017; Trudeau and Shephard, 2008). A positive correlation between physical activity and GPA was discovered in females, but not in males, where researchers discovered that individuals tend to devote more time to studying than engaging in physical activity (Carlson et al., 2008; Gonzalez et al., 2014). The results from this study could support the notion that college students spend a majority of their time focused on their academics and dedicate little time to maintaining physical fitness. This concept was further supported, with more than half of the participants having a GPA at or higher than a 3.4. There has also been research that proves that if an individual introduces physical activity into his or her life at a young age, that individual will be more successful in his or her collegiate and post graduate careers (Kari et al., 2017). Our study only looked at a current snapshot of physical activity and did not take into account whether students have had different physical activity habits in the past.

A study showed that medical school students who were previously active, prior to applying to medical school, had higher GPAs than those who were considered sedentary (Stephens et al., 2015). A positive correlation was also drawn between physical activity and GPA in graduate students who were a part of a health and science program (Xu and Sansgiry, 2018). The same results could have been found in this study if the questionnaire was created for students whose primary major was in a health and science related field, such as those majoring in nursing. However, the College of Education and Human Sciences is comprised of a diverse field and includes students who will go into a variety of professions. Another study conducted found that undergraduate students who interrupted their sitting every twenty minutes and engaged in moderate to vigorous physical activity had higher GPAs in comparison to their counterparts (Felez-Nobrega, et al., 2018). Based on their study, a positive correlation between physical activity and GPA could have been revealed within our study if the time an individual spent standing or how often breaks were taken to move around were also taken into consideration.

Limitations that were faced throughout this study included only inviting participants from one college at The University of Southern Mississippi, which resulted in a limited number of participants compared to total enrollment. Another limitation that could have affected the results of the study included the design of the questions that were a part of the survey. Further questions that could have been explored within this research include, but are not limited to, the effects of sleep and its correlation to academic performance and GPA, an examination of GPA across all schools at The University of Southern Mississippi, and the correlation between academically successful students with a GPA above a 3.6, and physical activity.

## **Conclusion**

In conclusion, our study found that no correlation existed between GPA and physical activity in a group of college students in the College of Education and Human Sciences at The University of Southern Mississippi. Further work needs to be done to examine if physical activity and GPA is dependent on a student's area of study and if these results would be similar in other geographic locations. Additionally, since previous studies have demonstrated a longitudinal correlation between physical activity and GPA, studies need to take this into account and not only examine what a student's current physical activity is during their time of participation in the study.

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# Appendix A: IRB Approval

## INSTITUTIONAL REVIEW BOARD

118 College Drive #5147 | Hattiesburg, MS 39406-0001 Phone: 601.266.5997 | Fax:  
601.266.4377 | [www.usm.edu/research/institutional.review.board](http://www.usm.edu/research/institutional.review.board)

## 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: 18080602

PROJECT TITLE: The Correlation between Physical Activity and Grade Point Average (GPA)

PROJECT TYPE: Honor's Thesis Project

RESEARCHER(S): Asia McCoy

COLLEGE/DIVISION: College of Education and Human Sciences

SCHOOL: Kinesiology and Nutrition

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Exempt Review Approval

PERIOD OF APPROVAL: 10/3/2018 to 10/3/2019

Edward L. Goshorn, Ph.D. Institutional Review Board

## Appendix B: Survey Questions

Q1. What is your current age?

- 17-19
- 20-22
- 23-25
- Over 25

Q2. What is your academic year?

- Sophomore
- Junior
- Senior
- Graduate Student

Q3. What is your gender?

- Male
- Female
- Prefer not to disclose
- Other

Q4. What is your race? Please select one or more

- White
- Black or African American
- American Indian or Alaska Native

- Asia
- Native Hawaiian or Pacific Islander
- Other

Q5. What is your current school within the College of Education and Human Sciences?

- School of Child and Family Sciences
- School of Education
- School of Kinesiology and Nutrition
- School of Library and Information Sciences
- School of Psychology
- School of Social Work

Q6. What is your current grade point average?

- 3.8-4.0
- 3.6-3.8
- 3.6-3.4
- 3.4-3.2
- 3.2-3.0
- 3.0-2.8
- 2.8-2.6
- Below a 2.6

Q7. How many credit hours are you currently enrolled in?

- 12
- 13-15

- 16-18
- 18-20
- More than 20 credit hours

Q8. How often do you exercise?

- Less than once a month
- A few times a month
- 1-2 times per week
- 3-5 times per week
- Everyday

Q9. With what intensity do you usually exercise?

- Low to moderate
- Moderate to high
- High to intense
- Highly intense

Q10. How long do your workouts typically last?

- Less than 10 minutes
- 10-29 minutes
- 20-60 minutes
- More than an hour