

# How Sports Help the Teens' Cognitive Development (Reading Performance)

Harry Feng

Wyoming Seminary Upper School

\*Corresponding author details: Harry Feng; [hfpfinn@gmail.com](mailto:hfpfinn@gmail.com)

## ABSTRACT

With the widespread use of electronics nowadays the youths spent more and more screen time rather than outdoor play and school related extracurricular or physical activities. It is important to participate in physical activities not only because it supports physical growth as it improves blood circulation, respiratory function, but also improves mental health, emotional status, as well as increased attention span, increased concentration, executive functioning, cognitive skills, and academic performance. In this study, the importance of physical activity participation in youth was discussed in great depth and an experiment based on self health chart was reported to demonstrate the positive effect of sports on youth health development.

**Keywords:** reading performance; physical exercise; motivation; concentration; mental well-being

## INTRODUCTION

Nowadays, with the widespread use of electronics among the youths, in U.S. more and more children spent long period of time in front of a screen and have reduced amount of time playing outside or participating in physical activities. Lack of physical activities poses a lot of problems such as rise of obesity rates among the youth, lack of motivation on task completion, poor sleep quality, lack of executive functioning skills, lack of time on reading and other academic activities which the youth should spend more time on. The youth often have a hard time managing screen time and not to mention cyberbullying and obsession with video games. However, I am not against electronics. If electronics can be used wisely, it does make our life easier and more convenient. For instance, you can communicate with a friend on the other end of the world via a virtual platform, which was hard to imagine in the previous century. However, the pressing issue of physical exercise and its importance can't be neglected.

I myself enjoy playing sports whether it is basketball or swimming. One of the important reasons why I love sports is my body doesn't lie to me -- whenever I have vigorous exercise, I feel a kind of relief; sweating makes me relaxed. Whenever I participate in exercise, I take away everything on my mind, all the stresses no longer exist, I enjoy every moment of feeling free and peaceful mentally. Physically, sports and physical exercise not only build muscle strength, coordination, flexibility, but also promote blood circulation, respiratory capacity because during sports and exercises I feel better and fresh afterwards. I would assume the physical activities facilitate heart pump, increase oxygen level in my blood and promote the exchange of carbon dioxide. I believe that's what my body feels and I trust what I feel because my body will never lie. According to my personal experience, if I sit for more than three hours indoors, my concentration level decreases. I wouldn't feel I could concentrate any more -- I may still sit here doing my academic work, but I actually didn't take in any information.

First of all, I want to talk about different types of sports. Among the sports I participated in, there are sports or exercises that can be either aerobic, anaerobic, or strength training. Aerobic exercises are low intensity activities such

as swimming and jogging. Aerobic exercises don't increase heart beat as much as anaerobic exercise (e.g., weight lifting, wrestling). Another type of exercise that I am involved in, and I have a lot of friends who also participate in, is the strength building exercise, that strengthens muscles and builds endurance. All of these activities help blood circulation, requiring glucose and ATP. In summary, all of these exercises increase blood circulation, increase oxygen intake, which promotes carbon dioxide empty out of your body, increases vital capacity, improves lung function, which leads to a strong heart and sleep well.

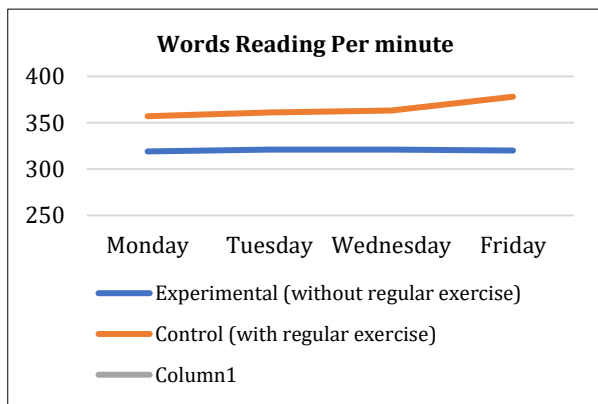
Second, I want to emphasize how especially sports and exercises are extremely important for youths. Sports can improve mental health in youth. sports and exercises are especially crucial for youths because during the developmental periods, physical activities not only improve physical, physiological growth, but also improves cognitive, social, emotional skills, and increases mental health and reduces depression (Gore, Farrell, & Gordon, 2001). Gore, Farrell, and Gordon's (2001) study focuses on sports involvement as a factor to support mental health, reduce depression. A large number of high school students enrolled in 9th-11th public high school in northeastern U.S. were interviewed twice and the data collection were one year apart respectively in 1988 and 1989. Results indicate that students who spent some or a lot of time in sports reported lower depression levels. Participating in sports is an important ingredient in creating emotional balance mentally for children. (Ge, Lorenz, Conger, Elder, & Simons, 1994; Larson & Ham, 1993). Participation in sports benefits not only typically developing youths but also those with disabilities, which is supported by Robertson and Emerson's (2009) study. It shows physical activities improve the health and wellbeing of those with intellectual disabilities.

Third, I can testify this through my personal experience: all my friends who participated in either club or high school varsity team sports are outgoing, easy to make friends, and live a healthier lifestyle such as eating healthier, sleeps well and concentrate well in class, and have better academic standing in class. For instance, one study conducted by Tilp, Scharf, Payer, Presker, and Fink (2019)

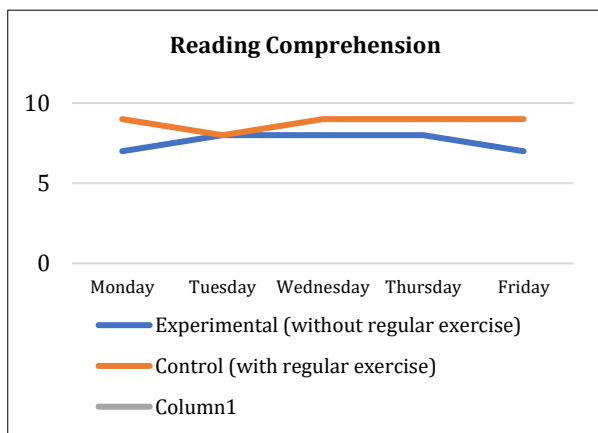
focuses on physical exercise during the morning school-break and the results show that the regular morning school-break exercise can improve basic academic and cognitive functions. Another study by Kubesch and collegus (2009) proves that a 30-minute physical education program improves students' executive attention. Kubesch et al.'s study focuses on 13- to 14- year-old students in 7th grade in Germany and the results indicated that physical exercise increases student on task attention in the face of distraction, therefore has potential of improving academic performance across subject areas.

**EXPERIMENTATION**

As an active person myself, I decided to conduct an experiment on myself, as I regularly work out. On most days I exercise one and a half hours per day as I am part of the swim team in my high school. During the experiment, I abstained from any sort of exercise; the only physical activity I did for a week was walk my dog around my community. After each day I would do two brain exercises including reading two types of text: one is hard (a concentration book such as Shakespeare) and the other easy text (for enjoyment, like *Jaws*) and doing a reading comprehension test through SAT prep on khanacademy.org. After the end of this week, I resumed regular physical exercise with the normal vigorous exercise: one hour of swimming and one hour of playing basketball or cross-country training. During the two-week period including one week experimental week and one week control week I control other variables to the same as much as possible such as nutrition taking in, amount of time sleeping and abstain from any other mental activities such as reading for leisure, music instrument practice because I only want to focus on the variable of physical activity on my cognitive skills. My brain test results were reported below comparing the experimental week and control week.



**FIGURE 1:** Reading Fluency Test



**FIGURE 2:** Reading comprehension test (Khan Academy, SAT level passages)

As shown above in figure 1, during the experimental week my reading speed is about the same across the five days of experiment period, it is pretty stable. In contrast, during the control period, my reading fluency increased from 357 to 378 with an increase of 5% in the five day range. My suspicion is I started this study by abstaining from all physical activities and when I resumed my physical activities in the second week from abstention to regular exercise, my reading performance increases steadily over the five day period as my body gradually goes back to the normal exercise mode. However, if I continue the experiment the following week, there may not be much increase unless I participate in some reading intervention because there is only that much exercise, I can do every day. If I increase my physical exercise time, my hypothesis is my reading performance might decrease due to fatigue, which leads to being unable to focus as much as when I only have a moderate physical exercise, which is 1.5 hours per day. However, this could be an interesting topic for my next research, which can focus on what the optimal length of physical exercise can lead to best reading performance.

**CONCLUSION**

In conclusion, I prove through regular physical exercise my reading performance improves in terms of reading fluency and reading comprehension through checking the number of words read per minute and the standardized reading comprehension test. This study supports previous research studies on physical exercise and cognitive development and academic performance. One limitation of the current study is that the participant is only myself, thus the results may not be generalized to individuals who have different socioeconomic statuses and different educational systems. Those who are from different socioeconomic status may not be able to access the equal amount of reading materials; individuals from different educational systems may not focus on reading in the same way that my school places importance on reading. Other limitation is although I can control the diet, sleeping to the exact same as much as possible, I am unable to control other variables such as emotional status, as what I mentioned in my literature review that sports/physical exercise actually can improve the emotional status, which in turn promotes my reading performance and my performance at standardized tests.

For my future study, I would like to get an IRB approval so that I can experiment on more participants and my future topic will be what is the appropriate amount of physical exercise that leads to the optimal reading performance level.

**REFERENCES**

- [1] Glazzard, J., & Szreter, B. (2020). Developing students' mental health literacy through the power of sports coaches. *Sports for Learning*, 35(2), 222-251.
- [2] Gore, S., Farrell, F., & Gordon, J. (2001). Sports involvement as protection against depressed mood. *Journal of Research and Adolescence*, 11(1), 119-130.
- [3] Hanson, S. (2007). Young women, sports, and science. *Theory into Practice*, 46(2), 155-161.
- [4] Kubesch, S., Walk, L., Spitzer, M., Kammer, T., Lainburg, A., Heim, R., & Hille, K. (2009). A 30-minute physical education program improves students' executive attention. *Mind, Brain, and Education*, 3(4), 235-242.
- [5] Robertson, J., & Emerson, E. (2009). participation in sports by people with intellectual disabilities in England: A brief report. *Journal of Applied Research in Intellectual Disabilities*, 23, 616-622.
- [6] Tilp, M., Scharf, G., Payer, G., Presker, M., & Fink, A. (2019). Physical exercise during the morning school-break improves basic cognitive functions. *Mind, Brain, and Education*, 14(1), 24-31.