

The Effect of Youth and Collegiate Sport Participation on Total Earnings as an Adult:  
Research from the Panel Study of Income Dynamics

Andrew Lyman

The College of New Jersey

Dr. Donka Mirtcheva-Brodersen

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### Abstract

Involvement in sports is commonly known to enhance the competency necessary to develop future economic success. Studies have shown that those who engage in sports deep into their academic career can have a significantly higher wage than those who do not participate. In addition, physical activity advances personal skills which correlate to greater financial capital. Is participation in athletics a platform that enables higher income in the future? The study will investigate potential connections between individuals' future earnings to their participation in sports. This paper will argue that there is indeed a correlation between engaging in physical activity as a youth to receiving higher salaries in the future.

## ***I. Introduction and Motivation***

Engaging in physical activity while growing up is a main passageway for social and mental competence. It provides opportunities to be with groups of people and the ability to build a healthy and competitive lifestyle. A crucial form of physical activity comes from the participation in sports. According to the Sports & Fitness Industry Association annual survey of households, just over 21 million Americans between the ages of 6 and 17 play team sports on a regular basis, with another 5 million engaging on an occasional basis. With such a significant percentage of participation among adolescence and teenagers, it is easy to see the prevalence and importance of sport involvement around the country.

This paper will focus on the sport participation of youth and college athletes, so it is important to emphasize what youth sports is defined as. Youth sports is observed as children being the age of 5 through 17, which reaches the end of an individual's high school career. These youth sport opportunities involve community and school programs such as agency-sponsored programs, national service organizations, club sports, recreational programs, intramural programs, and interscholastic programs. The last two are ways to get involved through school. In 2014, according to the National Federation of State High School Associations, high school sport participation has increased for the 25<sup>th</sup> consecutive year (NFHS, 2014). In addition, there was an all-time high of around 7.8 million athletes in the U.S in that same year. In terms of gender breakdown, in 2014 girls' participation increased by 45 thousand to 3.3 million, and boy's involvement broke 4.5 million for the first time (NFHS, 2014). Based on these figures, a clear upward trend in community sport involvement around the country can be observed.

While engaging in sports and physical activity has obvious effects such as improved health, the concept that physical activity can help impact different aspects of human development

has been studied thoroughly in the past few decades. Gould and Carson (2008) analyzed the improvement of life skills through sport involvement, and found it to be extremely apparent. Mental and emotional development were two of the personal skills that can be obtained from taking part in team organizations such sports (Gould and Carson, 2008, p.58). According to a recent report in 2013, Bailey, Hillman, Arent, and Petitpas describe physical activity in a way that has hardly been considered before. The paper emphasizes that the full scope of its value is rarely appreciated, and that physical involvement produces ‘investments’ that can be attributed to different capitals of a human’s domain (Bailey et al., 2013, p.289).

Immersion into sports has been seen to increase the intellectual and personal development of a person, and thus can create many benefits for imminent endeavors. Specifically, sports involvement has been seen to have positive effects on the economic success of a person, including potential earnings. Charlotte Cabane and Andrew E. Clark (2013) performed an examination on the correlation between participation in sports and earnings, and produced results that were positively correlated. The research deducted that organized sports is a substantial factor in developing skills that are favorable in the labor-market (Cabane and Clark, 2013, p.4). For adolescents and teenagers, the ability to engage in a group activity can improve underlying skills such as communication and work-ethic, which will be utilized in schooling and in the work-place. With more developed capabilities, the competence of an individual who has had experience in a competitive environment will benefit when achieving educational and career attainment.

For the organization of this research, it will follow the examination of whether total annual earnings of an individual is a function of sport participation as a youth and through college. In particular, the relationship between the participation of sports from childhood through

college and the earnings as an adult is analyzed. The aim of the paper is to identify whether sports involvement has a correlation on the economic outcome of an individual, and will differ from previous work by using a longitudinal survey from the Panel Study of Income Dynamics (PSID). The PSID provides self-reported data that allows for accurate selections of variables for the research. The precise measure of responses will provide the estimations for this paper.

## *II. Literature Review*

Playing sports and partaking in physical activities from adolescence to young adulthood has many valuable aspects. According to the Aspen Institute, there is substantial evidence that physical activity can help improve academic achievement, including grades and standardized test scores (Aspen Institute, 2014). For instance, this activity can enhance cognitive skills, attention, concentration, and classroom behavior. Each of these benefits will improve the educational outcome of a person, from attending college and getting degrees, to career success. For example, high school athletes are more likely than non-athletes to attend college and get degrees, and the rate is even higher when the athlete is a team captain or a valuable member (US Department of Education, 2005). Most importantly, physical activity and sports in particular can positively affect features of personal maturity among young people, including growth in self-esteem, goal setting, and leadership (Aspen Institute, 2014).

In the report from Richard Bailey et al., a key model was introduced that makes sense of the effects that physical activity has on human assets. This model, called the Human Capital Model, provides evidence to prove that engaging in physical activity has direct benefits to six domains of ‘capital,’ and articulates the conditions necessary to realize personal growth through physical involvement (Bailey et al., 2013, p.289). Each of these domains is examined using this

model, and include: physical, emotional, individual, social, intellectual, and financial capital. In the domain most important to this study, financial capital, the paper says, “Gains in terms of earning power, job performance, productivity and job attainment, along with reduced costs of health care are linked to regular physical activity participation” (p.291). The paper finds that investment in physical activity is a powerful catalyst for personal and social change, and that it offers a wide variety of benefits to human health and function.

Before the financial capital is examined, exploration into how physical activity effects individual capital is an important facet to consider. Individual capital involves the mental and emotional capabilities that an individual possesses. So to be able to achieve financial success, building these personal developments are a necessity. In a research examination performed by Daniel Gould and Sarah Carson (2008), the review summarized and critiqued current life skills through sport research. In particular, the study focused on the theoretical explanations of how, when, and under what conditions do life skills develop in sport participants. According to the study, individual capital is the contribution that physical activity has on the development of life skills, social skills, and values, especially through the interactive character of organized sports (Gould and Carson, 2008). The development of life skills through conditions like sport involvement is extremely apparent, according to the study, with most contemporary youth sports organizations having social-emotional development as one of their primary goals (Gould and Carson, 2008). The value of sport as a vehicle for personal development has been a standard over the last decade, and not only originates from the sport community, but it has been fueled by the shift that has taken place on positive psychology-building activities. Through the research, the development of life skills in children and the youth through sport was found to have a strong positive association.

Another study regarding the effect that organized activities have on personal skills was one by Jacquelynne S. Eccles, Bonnie L. Barber, Margaret Stone, and James Hunt (2003). The study investigated whether extracurricular activities result in the progression of adolescent development. It was found that constructive and structured activities, like sports, provide opportunities to practice specific social, physical, and intellectual skills that may be useful in school, to establish social networks for the present and the future, and to experience and deal with challenges (Eccles, Barber, Stone & Hunt, 2003, p.866). The study proclaimed that participation in organized activities is associated with both short term and long term displays of positive development including school achievement and educational attainment.

The study utilized data from the Michigan Study of Adolescent Life Transitions, which is a longitudinal study that followed a cohort of about 1800 youths. The analysis showed that sport participants liked school better than non-participants, and were more likely to attend and graduate college as well (p.871). In addition, sport participation led to a higher than expected 12<sup>th</sup> grade GPA, more years of tertiary education by age 26, and predicted having a job with a future and a job with autonomy at age 24 (p.871). The most significant factor corresponding to financial capital that the study demonstrated was that the students who did participate in sports are more successful in the future than non-participants, and the benefits include having a higher wage. Therefore, one of the conclusions that can be drawn from the study is that individual skills are a result generated from constructive activities such as sports, and these skills result in more effective education and eventually greater wage premiums.

Referring once again to Bailey et al., financial capital is believed to be determined mostly by non-cognitive factors, such as determination, self-discipline, time-management, goal-setting, and decision-making, which have a more sustained impact on the success in life. These non-

cognitive features can all be developed through physical activity and team environments. As a result, sport-players are more productive through the utilization and enhancement of these non-cognitive factors. For example, the paper finds that engaging in physical activity yields a 6%-10% wage increase, and while moderate exercise leads to a positive income effect, frequent exercise generates an even larger impact (p.300). The paper affirms that in terms of the Human Capital model, physical activity helps construct more successful people due to the involvement of the other capitals (p.300). More specifically, the advancement of social, intellectual, individual, emotional, and physical capital correlates to a greater financial capital.

In a study by Barron, Ewing, and Waddell (2000), the effects of participation in high school athletics on future educational achievement and labor market outcomes in regards to wages and employment were analyzed. Data was taken from the National Longitudinal Survey of Youth (NLSY), as well as the National Longitudinal Study of the High School Class of 1972 (NLS-72). According to the NLSY, it was found that men at an average age of 32 were paid up to 31% higher wages when participating in high school athletics compared to non-participants (Barron, Ewing, & Waddell, 2000, p.409). In addition, based on the results from the NLS-72, men at an average age of 31 who had participated in athletics in high school were paid 12% higher wages than those who did not participate (p.409).

Therefore, empirical results established that there was a clear direct link for men between athletic participation and both additional formal education and wages. Specifically, there is evidence that shows an increase in educational attainment and wages that accompanies athletic involvement can be attributed to an individual's ability factor (p.417). For example, higher-ability individuals are more likely to choose to participate in athletic activities because it is a signal of a greater work ethic. This 'industriousness' results in higher educational potential and



enhanced labor market outcomes which is linked to the intrinsic capabilities of athletic participation. Overall, the study found that athletic participants have higher subsequent educational attainment and higher wages (p.416). The evidence is valuable to this paper since the focus is on high school athletics, and shows that the students who played sports generated higher wages and better employment opportunities.

Similarly, another study that was conducted on the effect of youth sport participation on earnings was by James Curtis, William McTeer, and Philip White (2003). The paper reported examinations of relationships between participation in organized sport as a youth and earned income in adulthood. The data was taken from the 1997 National Survey of Giving, Volunteering and Participating (NSGVP), which was conducted by Statistics Canada through telephone interviews on individuals aged 15 and over. The questions were based on how respondents used their time, and analysis showed that there might be some payoff in higher income attainment from the involvement in sports (Curtis, McTeer, & White, 2003, p.65). In addition, participation in sports was believed to provide participants with cultural, social, and physical capital. The individuals who were revealed to possess more forms of capital compared to those who have less, proved to do better economically (p.65).

Based on the statistical experimentation, results showed that before and after appropriate controls were considered, those who participated in organized sports as a youth tended to have higher annual earned incomes as adults (p.60). This was compared to those who did not participate in sport related activities in any way. The relationship, however, was found to be stronger and more consistent for males rather than females across the social subgroups described by the education level completed (p.60). Even though sport involvement has become more common for females in Canada, employment incomes are apparently not paying the same

dividends as compared to males. Also, the lack of statistically significant involvement in early sport interactions within the female labor subsample suggests that there has not been a considerable change for recent cohorts of women (p.73).

Further analysis focuses on the importance of sport participation on voluntary association activity as an adult. Results showed that those who were involved in physical activity were more inclined to participate in charitable actions, as well as other forms of community envelopment (p.76). The outcomes in this study work to emphasize the cultural, social, and physical capital products that sport involvement creates. These ‘capitals’ that are formed contribute to the mature personalities that help an individual develop, and thus have attributed to more sustainable moral characteristics.

An additional study by Charlotte Cabane and Andrew E. Clark (2013) examined the correlation between sport participation at school and labor-market outcomes, and determined that there is positive correlation. The study utilized data from the National Longitudinal Study of Adolescent Health, which took sport participation information of individuals aged 12 to 18 in Wave I, and links it to their labor-market status 13 years later (Cabane & Clark, 2013, p.6). Physical activity, especially in organized sports, was indicated to attribute to career advantages and produced ‘soft skills,’ such as communication and collaborative skills (p.4). Evidence suggested that childhood sports predicts adult labor-market autonomy, which was interestingly only significant for boys. Also, team sports had a much larger effect on boys than individual sports did, and in both cases the correlation is the strongest when the sport was played at high school (p.4).

A specific example of a study in which focused upon the effects of high school athletic participation on education, occupational status attainment, and earnings was conducted by

Howell, Miracle, and Rees (1984). The research was utilized through the five-wave Youth in Transition panel based on a national sample of 1,628 males, in which the respondents were surveyed repeatedly during their high school years (Howell, Miracle, & Rees, 1984, p.15). A post high school follow-up survey was performed one year and five years after graduation. According to the outcomes, however, the experimentation did not provide favorable results. The findings did not support the hypothesis that sport participation had positive effects on earnings (p.15).

Although there was a lack in supportive data, the study helps to suggest that it may be explained from the period at which the survey was completed. More specifically, the stage in the life cycle that the respondents are in was too immature to provide any economical payoffs. According to the study, membership in high school athletics does not provide an immediate return in earnings and occupational status because individuals most likely need ten or more years after graduation to accumulate skills and career experience (p.15). In addition, the correlation between earnings and high school involvement, based on the study, may only be significant for those who subsequently attend college, mainly because it augments any kind of influences that are established during high school participation. While the empirical report performed by Howell, Miracle, and Rees did provide unfavorable results, it is beneficial to this paper because it may offer explanations as to the results of the regressions and the management of the control variables.

### ***III. Data and Methods***

The data set that will be used as the foundation of this study is the Transition into Adulthood (TA) supplement of the Panel Study of Income Dynamics (PSID) and its Child

Development Supplement (CDS). The PSID is directed by the University of Michigan and consists of a nationally representative sample of over 18,000 individuals in nearly 9,000 families. The study is a longitudinal survey on U.S. families which began in 1968 and was updated every year until 1997, for which afterwards was updated every two years. The PSID includes up to four generations within a family, and includes factual and statistical data on educational, economical, health, and social indicators of the respondents within the survey.

The TA segment, which will be the primary supplement from where the data is observed, is the most recent installation of the PSID. The TA is an interview conducted when an individual in the CDS is over 18 years of age, has left high school, and has families still active in the PSID. It is a study that was initiated to bridge a gap between the data collected in the PSID and the data collected in the CDS supplement. The CDS, which began in 1997, was an interview that determined information on education, health, cognitive and behavioral development, and time use (PSID, 2015). It consisted of an initial group of adolescents who were ages 12 and under, and were then tracked through their childhood progressions up to young adulthood. The supplement has followed the subjects up until 2007 with interviews in 2002 and 2007. Those who have turned 18 would move on to the TA to be interviewed based on their development through childhood to the beginnings of adulthood.

More specifically, the TA's purpose is to fill the void between the thorough information about development from early and middle childhood up through adolescence, and the comprehensive data on adulthood once the youth assume the role of economic independence and become household heads in the PSID (PSID, 2015). It began in 2005, when individuals emerging from the CDS were 18 to 20 years of age. It has been performed biennially thereafter, with questions that consist of time use, education, financial stability, and outlook on life. The TA's

ability to expand on the data collected from the children interviewed in the 2002 and 2007 waves has helped to realize the developmental pathways and outcomes of those in the study. It allows a look into how adolescents develop in educational, capital, and familial aspects into their early adulthood.

For the purposes of this study, the key variables will be drawn from the TA and CDS segments. More precisely, the 2005, 2007, 2009, and 2011 TA waves, as well as the 2002 CDS wave, will be utilized. This way, cross-sectional variables can be obtained which makes the analysis of individual data over a span of several years more advantageous. The value of expanding the PSID is that it allows an observer to draw concise data on an individual's activities in one segment and correlate it to activities of the same individual a decade later. The PSID organizes the interview questions in a clear way that breaks down each variable into unique, individual identifiers. More defiantly, it contains and accounts for all stages and levels of a young individual's lifestyle. In addition, in terms of this paper, the ability to collect the main explanatory variables and correlate it across time to a specific dependent variable is certainly beneficial.

This study will draw the total earnings variable from the TA 2011 segment. The interview poses the question, "How much did you earn altogether from work in 2010, before anything was deducted for taxes?" (PSID, 2015). The answers were given as an actual dollar amount for the total earnings of the respondents. The average amount that was recorded in 2011 was \$4727.14, with a maximum, however, of \$70,000. Ages in the entire sample of the CDS and TA, which consists of 3,249 people, range from 13 to 27 years old, with a mean of 18. Of course, age data from the TA 2011 is much more restricted, as the age group is from 18 to 27. This way, the research will draw data on an age group more likely to begin economic dependence.

However, the relatively young sample is still a primary reason why the average earning results are so low, as many of the respondents have not gained full-time time employment or career experience. For example, out of the entire sample population, 1,138 people are currently working or have recently taken a leave of absence.

The core independent variables that will be focused on are membership and frequency of participation in sports. The question that is utilized from the TA consists of “Were you a member of any athletic or sports teams in the last 12 months?” (PSID, 2015). This question was drawn from each of the four waves of the TA, and the participants either responded yes, no, or don’t know. The amount of respondents who were involved with sports was 204 in 2005, 257 in 2007, 329 in 2009, and 354 in 2011. The differences in these numbers are not great, but are likely due to the age range of the sample. In each year the maximum possible age increases by about two years, so while 2005 had a sample of 18-20 year olds, 2011 had a sample of 18-27, which increased the sample size. An explanation for the low amount of individuals who responded “yes” is that because the sample is at least 18 years of age, it is more difficult to be involved in organized and recreational sports. For the testing that will be performed, the variables of the four waves will be combined into one variable in order to account for any missing variables for those who did not answer.

Other sport variables were collected from the 2002 CDS. The activity questions were for those at least 10 years of age, and included “Were you a member of any athletic or sports team in school in the last 12 months?” and “During the last 12 months, did you spend time on athletic or sport teams at school?” (PSID, 2015). For these questions, it was important to collect data from a younger sample to account for sport participation up through high school. The age range for the 2002 CDS is 5 to 17 years, and since these specific questions relate to sport involvement in

school, there should be greater amount of individuals involved with sports compared to the TA waves. For 2002, the amount of participants who were a member of an athletic organization was 926, which is indeed a larger result. In regards to whether the respondents spent time on a sport team in school, the available answers consisted of “less than once a month”, “at least once a month”, “once a week”, “several times a week”, “almost every day”, and “every day while the sport lasted”. The amount of people who spent once a week on a sport was 125, while 702 people reported spending several times a week to every day on school sports. The 2002 CDS is important to this study because younger individuals are more likely to be a member of a sports organization due to the availability to academic and organized sport programs.

A variation of demographic control variables are included in the research. The variables include the individual’s gender, age, race, and ethnicity. In addition, measures of educational status and achievement are included, which were answered in the 2011 TA wave. These comprise of whether the individual graduated high school, what the grade point average in high school and college was, whether a college degree was obtained, and what the respondent’s highest educational level was. Among the respondents, 1,151 reported graduating high school or earning a GED, which is 35.4% of the population. In addition, 236 people who graduated high school or received a GED stated that their highest education involved earning degrees such as an Associate’s, Bachelor’s, Master’s, or Doctoral. Out of the sample who received degrees, 68.1% earned a Bachelor’s degree, while 15.7% received an Associate’s degree.

Lastly, a few questions on the subject’s current employment status were observed for purposes of the study. These include whether the respondent is currently working, temporarily laid off, or unemployed and looking for work. Another question is if the subject, in general, is

doing work for money now. The number of subjects who are currently doing work for money is 1,295, or 40% of the sample population.

The use of the control variables is to strengthen the model's predictive power and diminish the possibility for omitted variable bias. Inclusions of demographic information and educational attainment should capture important effects in which correlate to economic success. In regards to the model, using cross-sectional observations on sports involvement and correlating it to the individuals' respective 2011 earnings will be the basis for this research. It is expected that membership and frequent participation in sports will be a significant predictor for the dependent variable, earnings. In particular, the primary regression will be estimated using an Ordinary Least Squares simple regression method, and can be formulated as follows:

$$Y_i = \alpha_0 + \beta_1 x_{11} + \beta_2 x_{22} + \beta_3 x_{33} + \beta_4 x_{44} + \epsilon_i$$

$Y_i$  = total earnings

$B_1$  = member of a sports team (2005-2011)

$B_2$  = member of a school sports team (2002)

$B_3$  = frequency of school sports (2002)

$B_4$  = gender, age, race, hispanic, whether high school graduate, less than high school, high school, some college, earned a college degree, high school GPA, college GPA

$\epsilon_i$  = error terms

#### ***IV. Results & Analysis***

##### *Descriptive Statistics*

After data cleaning, the sample size consisted of 697 observations of individuals who were not currently a student or in college. Table 1 shows the summary statistics for the variables



used in the model. Demographically, the sample size consisted of about 47.2% males and 52.8% females. Regarding race and ethnicity, the variables were split into dummy variables for the regression, and the results of the sample included 49.0% white, 46.3% black, and 4.6% “other”. In this questionnaire, “other” includes Chinese, Filipino, Japanese, Korean, Vietnamese, other Asian, Native Hawaiian, American Indian or Alaska native, and Asian Indian. The age group ranged from the youngest of 19, to an oldest of 27.

In terms of the educational achievement of the respondents in this particular sample, 56.8% graduated high school with a maximum high school GPA of 3.8. The average college GPA was notable at 3.27. Among the subjects in the sample, the majority of the respondents graduated high school or earned a GED while serving some years in college, which was at 41.2%. In addition, for those who did attend college, 5.2% obtained an Associate’s degree, 24.3% earned a Bachelor’s degree, and 5.4 earned a Master’s, Doctorate, or “other” degree.

In terms of sport participation in the regression, the sport membership questions in the four TA waves from 2005 to 2011 were merged together to account for any missing observations. This method was performed in case an individual in one wave did not answer but did in a later one. In total, 173 subjects participated in sports from 2005 to 2011. Regarding income, the average yearly earnings was \$4,727. This low amount is due to the relatively young population who may have not had time to develop a career and sustainable monetary earnings. However, when observing the average earnings for those who participated in sports, it was 42.85% higher compared to the sample mean, at an amount of \$6753.47. In addition, after comparing the average wages of those who did participate in sports to those who did not, those who were a member on average earned 66.41% higher. While this statistic is unrelated to the

regression, it is an essential piece of information for the study as it directly shows the premium that sport participators have earned within the sample.

### *Regression Analysis*

Table 2 shows the results from the total earnings model with the measures of sport membership and frequency of participation from both the TA and CDS segments, as well as the control and dummy variables.

According to the model, being a member of a sports team resulted in a \$1,581.12 premium in total earnings, compared to those who did not participate. This variable was found to be significant at a 10% interval level with a p-value of 0.066. Furthermore, gender was found to be significant in the regression at a 10% interval level. For comparison purposes, two additional regressions were conducted that included one model with just males, and the other with just females. It was observed that males earned \$542.9 more in yearly earnings when compared to females. For those respondents who participated in sports, males had a \$1341.77 wage premium while females had a \$959.02 wage premium. Although neither of these two models had significant variables for sports, each had significant variables for age, whether graduated high school, and education attainment that was less than high school. For the full model, it was also found that age was very significant at a 1% interval level, and that none of the races had any reported effect on yearly earnings. However, a notable observation for race is that being black or an 'other' race resulted in earning a -\$1006.67 and -\$1295.15 wage premium respectfully for those who participated in sports.

In regards to education, graduating high school was found to be very significant at a 1% confidence level, however it did not result in an earnings premium for those who reported it. In

addition, the GPA of high school did not affect the total earnings, but whether the respondent graduated college with a college degree was significant at a 5% interval level. With a p-value of 0.031, it was clearly valuable to the model and predictably resulted in a \$2,712.10 increase in income. For the highest educational level for those who attended some years of college, it was not significant, but it did in fact still result in \$1,174.44 more in yearly wages.

Shown in Table 2, the regression, overall, resulted in an adjusted coefficient of determination value of 0.3407. This adjusted R-squared value means that 34.07% of the variation in total earnings can be explained by the variation in the independent variables. With a fairly lower sized R-squared value, it indicates that the explanatory variables can explain the dependent variable at a less than standard level. In respect to the F-value, its p-value is  $<0.000$ , which means there is no probability that the slope of the regression line is zero. Therefore, the low p-value for the model signifies that the probability is extremely small that the variables are not related. In regards to the additional regression models that controlled for males and females, males actually had a slightly less adjusted R-squared at 32.16%, while females had a slightly higher value of 35.56%.

## ***V. Conclusion***

The results of this empirical paper determined that membership in sports does have an impact on the total annual earnings for an individual. The outcomes conceptualized that the following groups would result in a significant correlation of annual earnings: membership in a sports organization in 2005, 2007, 2009, and 2011, the gender of individuals, the age of individuals, whether the subject graduated high school, and whether the respondents had less than high school experience as well as earned a college degree. The variables that were found to

create an influential premium in the total annual earnings included being a member of a sports team, the gender and age of the individual, being Hispanic, and having attended some years of college in addition to earning a college degree.

The findings are consistent with the literature that sport participation does have a significant impact on earnings, and results in a premium on the earnings (Bailey et al., 2013, p.300, Barron, Ewing & Waddell, 2000, p.409). In addition, the results agree with the literature showing that males have an influential premium on earnings (Barron, Ewing, & Waddell 2000, p.409). Also, compared to females, males earn more in the labor market, which agrees with Curtis, McTeer, and White (2003).

The results show that being involved with sports is a significant determinant of earnings, as among the sample, there is a 66.41% wage increase for those who participate in sports over those who do not. However, with a relatively smaller sample size, the regression results must be taken with a grain of salt. In addition, as the literature of Howell, Miracle, and Rees (1984) state, the period in the life cycle for which data is drawn from has a significant effect on the analysis. The paper suggests that individuals need at least ten years to really see the impact of sport participation on their respective career attainment.

It is also important to consider the notion that unobservable characteristics and flaws may occur that can damage the mechanisms of the model, and the accuracy of the investigation. While the paper explored whether individuals' sport participation has an effect on future earnings, issues such as reverse causality may arise throughout the research and data analysis. Reverse causality will exist in the occurrence that the participation in a sport is not the variable in determining earnings, but instead the earnings is the variable directly causing sport participation. The particular instance would result in a problem for the research model, as it

would skew the analytical findings. Reverse correlation in regards to sport participation and earnings is possible when individuals who earn a wealthy income find it as a high opportunity cost to be playing a sport, as well as those who must pay a premium cost to join a sport or club membership. Unforeseen events such as reverse causality found in the data will negatively impact the purpose of the research question, and thus must be accounted for.

In addition to direct and reverse causality, a third case of unanticipated relationships is possible in regards to the model's correlation. For example, a third variable may be involved in the determination of a relationship, such as a characteristic of an individual that both effects earnings and sport participation. Furthermore, the participation in a sport may influence a certain trait for a person, such as confidence or concentration, which can therefore induce a greater chance of earning a higher income in the future. The problems that the misrepresented causations produce can be avoided by referencing to data on individual sport participation several years before the earning's outcomes of the individuals, and prior to when characteristics would affect the encouragement of sports or other fundamentals.

In this paper, earnings data from the TA only took into account subjects with a range of 18 to 27. So, with a very limited time period for the individuals to develop on their physical and mental 'capitals' gained from playing sports, realizing the financial capital will be more difficult. The ability to gain career skills and experience from involvement in sports is a crucial, underlying factor that will impact foreseeable economic attainment in the workplace. Allowing these factors to take place will generate more accurate regression results for not only this study, but for future studies as well.

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**Table 1: Summary Statistics**

<b>VARIABLE</b>	<b>N</b>	<b>MEAN</b>	<b>STD. DEV.</b>	<b>MIN</b>	<b>MAX</b>
Earnings Last Year	697	4727.136	10620.59	0	70000
Member of Sports Team (2005-2011)	697	.2482066	.4322825	0	1
Member of School Sports (2002)	697	.5121951	.5002102	0	1
Frequency of School Sports (2002)	697	.4088953	.4919829	0	1
Male	697	.472023	.4995752	0	1
Age	697	23.3056	2.031331	19	27
<i>White</i>	697	.4906743	.500272	0	1
Black	697	.4634146	.4990178	0	1
Race is "other"	697	.045911	.2094425	0	1
Hispanic	697	.1090387	.3119116	0	1
Graduated High School	697	.5681492	.4956896	0	1
High School GPA	697	.0054519	.1439353	0	3.8
College GPA	697	.6468723	1.313875	0	4
<i>Education: High School</i>	697	.2926829	.4553208	0	1
Education: Less than High School	697	.1205165	.3257983	0	1
Education: Some College	697	.4117647	.4925064	0	1
Education: Earned a College Degree	697	.1750359	.3802707	0	1



**Table 2: Regression Analysis of Total Earnings Model**

VARIABLES	FULL SAMPLE	MEN	WOMEN
Member of Sports Team (2005-2011)	1581.117 (858.50)*	1341.767 (1344.12)	956.0232 (1096.29)
Member of School Sports Team (2002)	-461.0742 (1151.67)	67.595 (1968.42)	-1124.9350 (1307.47)
Frequency of School Sports (2002)	-115.8589 (1194.44)	-345.8809 (2021.57)	20.8518 (1362.84)
Male	1191.043 (698.43)*	Omitted	Omitted
Age	672.1395 (185.99)***	943.4465 (322.37)***	401.1722 (207.67)*
Black	-1006.67 (718.956)	-1498.383 (1240.63)	-665.3452 (808.0615)
Other	-1295.149 (1868.804)	-1328.24 (2893.65)	-1331.695 (2418.032)
Hispanic	320.6022 (1251.488)	780.6579 (2161.403)	-31.3599 (1404.28)
Education: Less than High School	-5105.345 (1358.78)***	-3406.301 (2081.12)*	-7050.748 (1748.88)***
Education: Some College	1174.436 (862.95)	2987.625 (1473.06)**	-617.4759 (988.60)
Education: Earned a College Degree	2712.101 (1257.49)**	1995.374 (2260.06)	2557.346 (1373.96)*
College GPA	-1678.419 (1949.234)	2740.665 (3551.347)	-4491.21 (2130.009)**
High School GPA	-225.8775 (2295.11)	Omitted	83.6435 (1889.66)
Whether Graduated High School	-13035.43(741.62)***	-14533.8 (1244.86)***	-11636.95 (857.07)***
Adj. R-squared	0.3407	0.3216	0.3556
N	697	327	370

Source	SS	df	MS	
Model	2.7938e+10	16	1.7462e+09	Number of obs = 697
Residual	5.0568e+10	680	74364993.1	F( 16, 680) = 23.48
Total	7.8507e+10	696	112796875	Prob > F = 0.0000
				R-squared = 0.3559
				Adj R-squared = 0.3407
				Root MSE = 8623.5

**Table 3: Variables**

VARIABLE NAME	NEW VARIABLE NAME	DESCRIPTION
<b>TA110483</b>	earn_lastyear	Total income earned in the last 12 months
<b>TA110019</b>	member_sports11	Whether member of a sports team in 2011
<b>TA090019</b>	member_sports09	Whether member of a sports team in 2009
<b>TA070018</b>	member_sports07	Whether member of a sports team in 2007
<b>TA050018</b>	member_sports05	Whether member of a sports team in 2005
<b>Q23K3</b>	Member_schoolsports02	Whether member of a school sports team in 2002
<b>Q23K3A</b>	Freq_schoolsports02	Time spent on school sports in 2002
<b>ER32000</b>	Male	Gender
<b>ER34104</b>	age_years	Age
<b>ER34103</b>	Relhd11	The relation to the head of the household
<b>TA111057</b>	race	Racial background

<b>TA111056</b>	hispanic	Whether hispanic
<b>TA110688</b>	Wtr_grad_hs	Whether graduate high school
<b>TA110682</b>	GPA_hs	GPA in high school
<b>TA110725</b>	GPA_college	GPA in college
<b>TA110722</b>	college_degree	College degree obtained
<b>TA091008</b>	highest_educlevel09	Highest education level
<b>TA110137</b>	Employment_status	Current employment status