Cody Perez 6/1/14

ENG 212W Bousquet

**The Achievement Gap and Predicting Future Success *(Printable Version)***

Education is the basis for success not only in the United States, but also all around the globe. This is why millions of children attend school on a daily basis from the time they are around five years old. But the fact that millions of children are attending school does not mean that they are all receiving the same quality of education. On the contrary, there are significant disparities between the qualities of the educations received by children of affluent and low-income families, as well as those received by White and minority children, as evidenced by substantial achievement gaps between these groups. This achievement gap has serious implications, not only for those being underserved by the American Education System, but also for the economy and the future of the country as a whole. The focus of this site will be to explore the issue of the achievement gap in detail and investigate which factors have the biggest effect on achievement, as measured by college GPA. It will also investigate if these effects influence college students' choices of their majors, as well as develop a model to be used as a predictor of future academic success.

The "achievement gap" is defined as the disparity in academic performance across groups of students, most often by socioeconomic class and race. It shows up in grades, standardized test scores, graduation (or dropout) rates, college-completion rates, disciplinary infractions, and other measures of academic success. The historic ruling in the case of Brown V. Board of Education in 1954 had overturned the decision of Plessy V. Ferguson, which had upheld the constitutionality of "separate but equal" facilities for White and Black citizens. The Supreme Court Justices for the Brown case had unanimously decided that as it pertained to public education, separate would be inherently unequal. However, despite the Supreme Court's attempts at desegregating the schooling system and providing all children with equal educational opportunities 60 years ago, the education system continues to underserve low-income and minority children across the country today. This is clearly evidenced through the persistence of the gaps in achievement between racial and socioeconomic groups.

Ever since the 1966 publication of the report Equality of Educational Opportunity, better known as the "Coleman Report", research in the United States has been dedicated to studying the underlying causes of the gaps in achievement between children of different races and income levels. Through this sustained research, several major factors have been identified as playing critical roles in the determination of a student's individual achievement. These factors include, but are not limited to, income inequality leading to reduced access to many of the critical elements that contribute to stronger educational achievement, lower quality schools and inferior educational resources and opportunities in economically disadvantaged schools, minority status leading to institutionalized predispositions that negatively affect achievement, the disproportionate representation of minority and lower-income students in the lowest-achieving schools and lowest-level academic classes, and familial factors that reduce academic motivation.

As is a universally known fact about United States history, the institution of slavery was a central aspect of American society until the Union's victory in the Civil War. Consequently, the Thirteenth Amendment was ratified in 1865, officially outlawing slavery. Shortly after, the ratification of the Fourteenth Amendment in 1868 and the Fifteenth Amendment in 1870 both "strengthened" the rights of African Americans by mandating that no state deprive any citizen of " due process of law" and "equal protection of the law", and by prohibiting states from denying anyone the right to vote based on color, respectively. However, despite slavery officially being outlawed and these new amendments being enacted, the effects of racism and segregation continued to exert serious influence over life in America for many years to follow. African Americans continued to be discriminated against, especially in the South where many state legislatures passed laws in order to legally sustain segregation. These laws, commonly referred to as Jim Crow laws, declared that Blacks could not use the same public facilities as Whites, ride the same buses, or even attend the same schools. It would not be until 1892 that these laws would be directly challenged in court in the case of Plessy V. Ferguson. After being arrested for refusing to give his seat up to a White man on a train, Plessy used the "equal protection" clause of the Fourteenth Amendment. However, in this monumental case the Supreme Court ruled 8-1 against Plessy, which would thereby set the stage for the prolongation of discrimination and segregation in America for the years leading up the the Brown V. Board case.

In 1909, the National Association for the Advancement of Colored People (NAACP) was founded in order to fight for the abolition of Jim Crow laws and for overall racial equality. Initially, the organization focused its efforts on trying to persuade Congress to pass legislature that would protect African Americans from lynchings and other similar racist crimes, but by mid 1930s it had changed its focus. Through the utilization of its Legal Defense and Education Fund, the NAACP began looking towards the courts in order to make strides to overcome legalized segregation. Two of the then-leaders of the organization, Charles Houston and Thurgood Marshall, devised a plan to end Jim Crow laws by attacking their weak spot, which as it appeared to them was in the field of education. Though Houston stepped down in 1938 in order to resume working in private practice, Marshall stuck around to see his plan to fruition. Though he headed several other similar cases, by far the most important would be Brown. In 1951, thirteen Topeka, Kansas parents filed a lawsuit against the Topeka Board of Education on behalf of their children. They asserted that the system of racial segregation in public schools across the country was unconstitutional, with schools not simply being "separate but equal", but rather the schools that their children were being forced to attend provided them with inferior accommodations, services, and treatment. As such, they were seeking for the school district to reverse its policies towards racial segregation in its schools.

 Though simply named Brown V. Board of Education, the case as heard before the Supreme Court was actually an aggregation of five NAACP-sponsored cases. Though the facts of each of these cases were different, the central theme in all of them was the issue of state-sponsored racial segregation in public schools. Marshall himself represented the case in front of the Supreme Court, and cited that separate school systems for Blacks and Whites was inherently unequal and thus violated the "equal protection" clause of the Fourteenth Amendment, as well as citing sociological tests as evidence that the segregated school system frequently made Black children feel inferior to White children. Despite the fact that most of the Justices did want to declare segregation of public schools to be unconstitutional, they were unable to come to a solution by the end of the court's 1953 term. Upon rehearing the case later that year, they returned a unanimous decision declaring the segregation of schools to be unconstitutional, thereby overturning the ruling of the Plessy V. Ferguson case. This led to the eventual desegregation of all schools across the country, continued educational reform, and contributed to the overall fight for Civil Rights.

In 1966, James Coleman published his report called Equality of Educational Opportunity, which is now largely regarded as the most important research on education in the 20th century. This report utilized data on over 600,000 students and teachers nationwide, and the research found that academic achievement was not so much related to the quality of a school as it was related to the social composition of the school, the student's sense of control of his environment and future, the verbal skills of teachers, and the student's family background. Furthermore, there was one prediction made in the report that was focused on more than anything else by the media and policymakers: Black children attending integrated schools would have higher test scores if the majority of their classmates were White. This led to the mass busing of black students to white schools in an attempt to achieve racial balance in the public school system.

 However, in 1975 Coleman concluded in a new study that this busing had failed since it prompted "White Flight", which refers to the large-scale migration of White families from racially-mixed cities to more homogeneous suburbs. But as White families moved to suburban areas and placed their children in these schools, it destroyed the chances of achieving any racial balance in schools. In 1981, a third Coleman Report was released where he concluded that after controlling for family background, private and Catholic schools provided better educations than did public schools. Overall, despite the controversiality of many of his findings, Coleman's work continues to be viewed as some of the most important research pertaining to education, as he provided such new and valuable insights into factors that most effect academic achievement. Beyond this, whereas "equality of opportunity" was traditionally regarded as equality as it pertained to schools' resources, Coleman was more focused on how effective schools truly were by examining student performance, as he was the first to study test scores in his research. The Coleman Report, in essence, set the stage for virtually all subsequent educational research.

 Possibly the single biggest issue in America currently is that of income inequality. During the extended period starting in the early 1940s and lasting into the 1970s, economic inequality was substantially reduced as the wealth and income disparities between the rich and poor reached some of the lowest levels in US history. However, this progress towards economic equality has essentially been reversed as the disparity has continued to grow since the 1970s, and has actually reached historically high levels as shown by the Gini coefficient. The Gini coefficient is a measure of statistical dispersion intended to represent the income distribution of a nation's residents, and in turn capture the level of income and wealth inequality as a numerical value between 0 and 1 (0% and 100%). In fact, the United States currently ranks first among all of the countries composing the Organization for Economic Cooperation and Development (OECD), with a post-tax Gini coefficient of 0.42. The OECD is comprised of 34 countries, most of which have high-income economies and a high Human Development Index and are thus considered to be of the world's most developed countries. Being atop of such countries, the United States is effectively the most economically inequitable country in the First World. This has led to much recent activism and countless calls for social and economic reform in an attempt to consolidate these socioeconomic disparities.

 The Occupy Movement is one such example of this. After first receiving widespread attention following the Occupy Wall Street protest in New York in September 2011 where thousands of people gathered and even camped out in the City's Zuccotti Park in order to bring to light the issues of social and economic inequality, and the greed, corruption, and undue influence of big business on government, the movement quickly spread to over 600 communities in the United states and 950 cities across 82 countries globally. The slogan for this campaign was "We Are the 99%", which is a statement meant to describe the income disparity between the top 1% of Americans and the other 99%. This top 1% holds approximately 35% of the entire country's wealth, with the lowest income to qualify for inclusion in this elite group being $344,000 and the average income being $960,000. This group also saw their post-tax income increase by 275% over the period from 1979 to 2007, as compared to the 40% increase received by the middle 60% of the income distribution during this same period. To give a more complete picture of the true extent to the overall economic disparities in America, it should be noted that the next 19% of the population, defined as those with yearly incomes above $92,000 but below that $344,000 mark, hold about 50% of the country's wealth themselves. However, despite the fact that 50% of the nation's wealth is held by this next 19%, many families falling outside of the top 5% (167,000 or more) would classify themselves as middle-class. And with 85% of the country's wealth being held amongst the top 20% of its citizens, one can only begin to imagine the hardships faced by the bottom 80% of the population who are only manage to hold the remaining 15% of wealth, especially those faced by the 16% of Americans living below the poverty line. This income inequality has severe effects on the quality of life for those who are not fortunate enough to be wealthy in America, from their homes and the neighborhoods they live in, to their health and the healthcare provided to them, and to the quality of the education that their children receive. And as one can probably imagine, this income inequality has much more pervasive effects on minority groups in America, which are most densely represented in the lower socioeconomic classes. One of the most important areas affected by the income inequality in the United States is the educational system.

Education is the process by which knowledge and skills are passed down from one generation to the next through teaching, training, and research. Although individuals can educate themselves, most often this process occurs under the guidance of an older or more experienced person. Formal education is divided into different stages such as primary (elementary) school, secondary (high) school, and post-secondary school (college), with participation in the education system being compulsory for of-age children in most countries. However, despite the fact that education is compulsory and necessary for overall life success, it does not ensure that all students will receive the same type or quality of education. On the contrary, there are significant disparities in the qualities of the schools that children attend, and consequently in the educations they receive. These disparities play vital roles in students' level of academic achievement, as evidenced by the prevalence of achievement gaps in America.

It is well known that in America there is a significant positive correlation with socioeconomic status and the quality of school that children attend. Within the public school system, there are thousands of schools serving millions of children nationally with varying degrees of success. Schools range anywhere from incredibly efficient at producing students that consistently achieve at high levels, to nothing more than a building where students simply spend the majority of their time without ever actually honing the necessary skills to succeed. There are a number of reasons why this happens, but perhaps the most prominent reason boils down to the school's resources. In all of the best schools, the one thing that they can be guaranteed to have in common is a plethora of resources to aid their students in maximizing their academic achievement. From well-maintained facilities, up-to-date and sufficient quantities of textbooks and computers, and well-educated and caring teachers that develop rich curricula for the students to navigate through, these are the types of resources that the best schools employ not only promote academic success, but rather to ensure it. And this is precisely what differentiates the top schools from the "dropout factories".

These so-called "dropout factories" are amongst the worst schools in the nation, and have earned their nickname for the alarmingly high rate at which the schools produce high school dropouts. They are known for their dilapidated facilities, shortage of and/or outdated textbooks and computers, and ineffective teachers that are often unconcerned with whether their students learn anything. Beyond this, these schools are also known to have significantly larger class sizes than the top schools, who know that an instructor becomes even more effective when they are able to give students more individualized attention. Because of these differences in resources, and in turn the overall quality of the school and its ability to produce high-achieving students, affluent families that know the value of education for life success make sure their children attend these top schools. While it is extremely unfortunate that there are such great disparities between the qualities of schools in America, it is even more unfortunate that there is such a disproportionate representation of lower-income and minority children in our nation's worst schools.

Another one of the biggest problems with the severe disparities between the qualities of schools in America is the disproportionate representation of lower-class and minority children in the lowest achieving schools. This is due to the severe income inequality in America, which has left staggeringly large gaps between the upper-, middle-, and lower-classes. This inadequate dispersion of the nation's wealth has resulted in astoundingly different lifestyles; wealthy families own large houses, multiple cars, and expensive clothes, while their lower-income counterparts often struggle to even pay their monthly bills and keep food on the table. And one of the most prominent, though sometimes overlooked, differences between the lifestyles of the rich and poor is the schools that their children attend.

There are two main reasons why the country's top schools consist primarily of children from affluent backgrounds, while the worst schools have an almost exclusively lower-class student body. The first reason is the recognition of the importance of education. Be it from their own personal experiences in attending top educational institutions, or realizing the connection between education and wealth simply from observation, upper- and many middle-class families understand the importance of quality education for successful life outcomes. They know that knowledge is in fact power, as it is well-known and well documented that there is a positive correlation between educational level and things such as job type, compensation (wages/salary), and even overall life happiness. Because of this, they actively seek out homes with great schools in the area, or will allow their children to travel slightly farther if it means attending a better school than the one nearest them. They have no problems with sending their children to a public school if they feel the quality is up to their standards, but otherwise they place them in private or Catholic schools, which are known to provide better educations than public schools in many cases. Unfortunately, the majority of middle- and lower-class families do not have this same recognition of the importance of quality education. Most of the parents themselves have not experienced quality education in their lifetimes, and because of this they do not stress the importance of doing well in school, or really see the necessity of sending their children to great schools. Sometimes based on the family's situation, education can even be deemed as less significant than things such as working to provide another supplemental income. This brings us to the second reason.

The second reason for the disproportionate representation of low-income and minority students in the lowest achieving schools comes down to a family's economic ability to send their children to quality schools. For a family with enough money to actively search different neighborhoods while hunting for a new home, it makes sense for the schools in the area to be amongst the top of the considerations. However, most families do not have that luxury. According to the U.S. Department of Housing and Urban Development, approximately 1.2 million families nationwide are living in public housing units. These public housing facilities were established to provide "decent" and "safe" rental housing for eligible low-income families, the elderly, and persons with disabilities. (Although it is also well known that these facilities are far from being either decent or safe.) These families really have no choice whatsoever in where they live as they cannot afford anything else, and therefore simply have to deal with their situations. For the vast number of families that do not live in public housing, most often they are also constrained by their economic situations from being able to live wherever they choose. They are forced to look at homes that fall within their budget, and oftentimes this means conceding on features of the home or the neighborhood in which it is located, including having good schools in the area.

Additionally, middle- and low-class families often cannot afford to send their children to private or Catholic schools, which carry hefty tuition fees. Because of this they are forced to utilize the local public school, which are often amongst the worst schools due to the fact that the schools in low-income communities do not receive the same funding or have the same educational resources as public schools in wealthier neighborhoods, they employ inexperienced teachers, and the student bodies are almost exclusively lower-income and minority kids. All of these things are proven to negatively impact academic achievement, and in turn lead to the persistence of achievement gaps between these low-income and minority students and their affluent white counterparts. The disproportionate representation of low-income and minority students in the worst schools is also a problem because this truly promotes the cycle of subordination of these people in American society.

Another way in which the income inequality in America affects academic achievement amongst students is through the different family environments that are created as a result of it. The differences between the lifestyles of the rich and poor can be astonishing. Wealthy families tend to have large homes or apartments in beautiful and expensive neighborhoods, and it is not uncommon for them to even own multiple properties. These homes sport granite countertops, new appliances, large TVs and surround sound stereos, and even sometimes a pool in the backyard. This is starkly contrasted with the homes that the poorest Americans inhabit. For the families that are forced to live in public housing facilities, they are subjected to things such as small, cramped apartments, faulty plumbing, mold, and even rodent and insect infestations. And then there is the ever-lingering threat of being a victim of a crime from the moment they step out of their front door, as these public housing facilities and their surrounding neighborhoods tend to be amongst the most unsafe areas in the country. Just these things in themselves create two completely different home environments, one of which provides severe stressors and is significantly less amenable to academic success. But this home environment is just the beginning of the differences that distinguish the lifestyles of the upper- and lower-classes.

One problem that is rampant amongst lower-class families, but is virtually never experienced by their upper-class counterparts, is not having enough money to adequately support your family. These families frequently struggle with unemployment or working minimum-wage jobs, living paycheck to paycheck and barely being able to make ends meet. This brings another stressor into the home environment that can impact a student's academic achievement, and the effect is multiplied when the family requires their child to pick up a job in order to help contribute to the bills in order for them to get by. This not only limits the time and energy that a student can devote to their studies, but it also sends the message that earning some sort of wage is more important than receiving an education. And this is something that children of wealthy families simply do not have to deal with. Building on this notion of not having enough to get by, many lower-income families receive government assistance in the form of food stamps. For these families, and even those who don't receive food stamps but are simply on a tight budget, they tend to buy cheaper foods with less nutritional value. Though this isn't one of the first things that come to mind when considering the differences between wealthy and impoverished families, it is definitely a reality and one that has legitimate effects. In the short run, a lack of proper nutrition can lead to a loss of focus and sharpness, which are two very vital pieces in academic success. But in the long run, this inadequate nutrition can lead to things such as obesity, high blood pressure, and numerous other health ailments.

Health and well-being is another area that differentiates upper- and lower-class families. Be it respiratory issues resulting from the mold in their apartments that they are forced to endure, to diabetes from constantly eating food with no nutritional value, or even from the prominence of HIV/AIDS in low-income communities stemming from shared syringes during drug use or simply from unprotected sex, there are serious health-issues that poor families face that wealthy families do not. And what makes matters even worse is the disparities in the quality of the healthcare received between economic classes. Upper-class families can afford legitimate health insurance or have it as a part of the benefits provided by their employer, and are serviced at top-notch medical facilities. Lower-class families are not as fortunate, and are often relegated to receiving government-funded Medicaid and being serviced at large, public medical facilities that are more run down and can have patients waiting for hours before even being seen by a doctor. Being afflicted by some sort health impairment, or having a family member that suffers from one, especially when there isn't adequate healthcare to treat it, can definitely impact a student's academic performance.

Furthermore, upper-class families tend to have significant previous experience with the educational system, and therefore understand what is necessary to be successful academically and can use their insights to ensure that their children will maximize their academic experience. They provide a much greater support system for their children by being actively involved in their academic careers, having expectations of their performance, and even acquiring tutors to supplement in-class learning and provide one-on-one help if they begin to struggle. This is very different from lower-class families, who often do not have the same experience with the educational system, and therefore cannot provide their children with the same quality of education as affluent families can. This lack of familial support leads to decreased levels of academic motivation, and is reflected through their reduced levels of achievement. Unfortunately, this, as well as the aforementioned environmental differences between the lifestyles of families with different economic standings severely plays into the persistence of achievement gaps.

Low-income and minority students are not receiving the same educational opportunities as their affluent, white peers, as they continue to attend schools with dilapidated facilities, a lack of essential educational resources such as computers and updated textbooks, poor teacher quality, and high concentrations of other minority and low-income students. Regardless of an individual's own learning capacity, simply attending schools with these features severely disadvantages students, as each is shown to have a negative impact on academic performance. This is clearly evidenced through the persistence of the gaps in achievement between racial and socioeconomic groups. And since education is one of the largest predictors of overall life success, the achievement gap has some serious implications.

For starters, there are the obvious. Achieving at low levels in school means having significantly less refined skills than the higher achieving students, even with critical skills such as reading comprehension and mathematics. With even every day activities requiring a certain level of mastery of these skills, one can only expect how much expertise is required for society's best, highest paying jobs. It should then come as no surprise that students demonstrating weaker skill sets are relegated to jobs that require only menial levels of mastery, which are often low-paying and physically demanding positions that many other people are not themselves interested in. As should also be expected, lower wages translates to things such as poverty, poor health, and an overall lower quality of life.

Beyond this, the minority and low-income students most greatly affected by the achievement gap are also subject to significantly higher rates of incarceration. But beyond simply the implications that the achievement gap has on an individual's life outcome, there are serious implications for the American economy as well. According to MacKinsey & Company's research, the achievement gap has an equivalent effect on the economy as a permanent recession. In the video below, they do things such as quantify this effect by attaching dollar amounts to show what the GDP would look like had the achievement gaps between different groups been closed, and discussing how GDP has actually changed over the last several years. A discussion of the facts about achievement gaps presented with an examination of the economic consequences really puts into perspective how vitally important it is for the educational system to be reformed.

The achievement gap is one of the biggest issues in modern American society, as it has so many far reaching implications. It fuels a cycle of systematic oppression of the most disenfranchised groups in the country. Low-income and minority families are forced to deal with a number of issues that their white, affluent counterparts simply do not have to face, including poor healthcare, reduced nutrition, and very limited access to sufficient educational opportunities. It is because of this lack of access to the same types of educational opportunities that leads to the continual subjugation of these groups, as education is the key to social mobility in America. Increased levels of education correspond with better jobs, higher wages, and consequently, better overall quality of life. It is for this reason that the achievement gap needs to be closed, so as to provide all people with equal opportunities to succeed.

As described throughout this site, there are various factors that influence student achievement. These factors include the student's own race and socioeconomic status, the racial and socioeconomic composition of the school they attend, whether the school is in an urban area, the average class size within the school, the quality of the teachers at the school, how involved the student's parents are in their educational experience, and whether the student attended Pre-Kindergarten. This site aims to further research the effects of these factors on the achievement gap, and to investigate how they consequently affect future academic success. I plan to achieve this through a robust review of previous literature on the subject of the achievement gap and factors that influence individual achievement, and by developing a regression model that will predict the effect of these factors on students' GPA. I will then examine the results in order to try to determine if there are certain majors and certain intended career paths that correspond with the higher GPAs.

As has been stated numerous times throughout this site, the achievement gap is one of the most significant issues that America currently faces. As such, there has been significant research conducted in an attempt to identify the ways in which the achievement gap manifests itself, the groups that are affected by these gaps, and what factors contribute to the gap in order to come up with viable solutions to close the gap. Overall, research has found that the achievement gaps manifest themselves as disparities in measures of academic performance such as grades, standardized test scores, graduation rates, college-completion rates, and number of disciplinary infractions. Research has also found that low-income and minority groups are severely affected by these achievement gaps, and a number of contributing factors to these gaps have been identified.

Since low-income and minority groups are impacted the most by the presence of the achievement gap, it should come as no surprise that an individual's race and socioeconomic status are largely considered to be the biggest predictors of academic achievement. However, research has found that there are various other factors that also significantly contribute to an individual's academic performance. Bankston and Caldas performed two separate studies in which they investigated the effect of a school's student body composition on individual achievement. In the first study that they conducted, they found that the racial composition of a school had an effect, as the concentration of minority students exhibited a negative influence on the achievement of individual students. Not only did higher concentrations of minority students have greater negative impacts, but the research found that minority students were even more seriously affected than White students. Additionally, in the second study they conducted they found that the socioeconomic composition of a school also effected the performance of an individual student, as schoolmates' socioeconomic status was positively correlated with individual achievement. Both the racial and socioeconomic composition of a school's population have these effects as a result of the cultural capital that the student bodies bring into the school, thereby creating different learning environments. Primarily minority and low-income student bodies both have low levels of cultural capital, and as such are associated with poorer individual academic achievement.

Continuing to research regarding the effects of cultural capital, Lee and Bowen conducted an investigation of how parental involvement affects elementary school children's academic attainment. They found that active parental involvement in a child's academic experience, by creating a positive learning environment within the home, attending parent teacher conferences, and having expectations of their child's performance, positively influences academic achievement. Furthermore, they found that the cultural capital that a parent has accumulated over time through knowledge gained from their own personal educational experience and access to "education-related objects" such as books and computers, also positively influences achievement. Building on this research of the effects of parental involvement on academic performance, Jeynes investigated the effect specifically as it pertained to minority students. After conducting a statistical analysis on several previous studies that examined the effects of parental involvement on the academic achievement of Black, Hispanic, and Asian children in all grades between kindergarten and 12th grade, he was able to conclude that there was in fact a significant effect on achievement for all groups, but most specifically for African Americans and Latinos. This provided valuable insight to urban educators and parents, as it shows the importance of parents being actively involved in order to help maximize a child's academic performance.

Research on factors contributing to achievement gaps was continued by Talbert-Johnson, who investigated the structural inequalities prevalent in urban schools. She found that these schools were often dilapidated and segregated, with run down facilities and predominantly minority student populations. In addition to the effects caused by the school's population, which are substantial considering the typical composition of urban schools, the lack of resources, quality teachers, and large class sizes that these schools have has significant negative impacts on individual achievement. Talbert-Johnson stated that a large part of the issue with teachers in urban schools is that they are not culturally responsive to their often largely minority students. She says that they lack care, compassion, and competency as they fail to address not only the academic, but the emotional, behavioral, and social characteristics of these students. The effect of class size on individual attainment was further studied by Krueger and Whitmore. After doing a follow-up on Tennessee's Project STAR, in which Kindergarten through third grade students were assigned to either "small" or "normal" sized classes, their research found that both Whites and African Americans do benefit from smaller class sizes, although African Americans do benefit significantly more. In addition to all of these other factors that were studied, Fitzpatrick investigated the effect of attending Pre-Kindergarten on the long-term success of life outcomes. After analyzing data from the National Assessment of Educational Progress on the test scores and overall progression of students through the fourth grade, she found that all groups did in fact benefit from attending universal Pre-Kindergarten programs, although socioeconomically disadvantaged students benefited significantly more.

After reading through all of these studies, I believe that it is safe to conclude that all of the aforementioned factors contribute to academic achievement, and in turn contribute to the presence of achievement gaps. It is my intention to use these factors as variables in a regression model in order to predict how the achievement gap influences individuals' future success. More specifically, I intend on developing a model that attempts to predict a student's GPA, then trying to determine if there is any relationship between it and the Major that the student chose. I would then use a combination of the two as an indicator for the type of wages they would expect to receive from jobs that frequently hire from the specified majors.

Regression analysis is a statistical process for modeling the relationship between a dependent variable Y and one or more independent variables X. This modeling is done by finding the regression, or prediction, line that best fits the data, and then using it in order to identify the mathematical relationship that exists between the dependent and independent variables, to quantify the effect that changes in the independent variable have on the dependent variable, and to utilize these ideas in order to predict values of the dependent variable given the values of the independent variables for a specific observation. The most rudimentary regression model is the simple (linear) regression model, which consists of one dependent variable and one independent variable.

The next most simple model is the multiple regression model, which consists of one dependent variable and two or more independent variables and is what will be utilized in this project. It is worth noting that these regression models can become increasingly more complex as different features become included (i.e. quadratic/logarithmic/exponential models, log transformations of the variables), but for the sake of simplicity and avoiding confusion, they will not be explained on this site. The interpretation for B0, or the Y-intercept, is the value of the dependent variable (Y) if the value of all independent variables is equal to zero (Xi...Xk = 0). This value provides a starting point on which we can begin to build our predictions, and it may or may not provide a useful interpretation based on whether it crosses the threshold of reality. The interpretation for Bi, or the slope of the line given one variable while holding all others constant, is the Bi unit increase in the dependent variable (Y) for a one unit increase in the independent variable (X).

In examining the results from this regression, there are a number of very troubling issues. First, we can see that the value of R Squared is 0.1994, which means that 19.94% of the variation in the dependent variable GPA is explained by all 9 of the independent variables. This is not a good percentage to begin with, but after looking at the value of Adjusted R Squared, which penalizes for additional independent variables and for this model is equal to -0.0125, we can see that our independent variables do not explain absolutely any of the variation in the dependent variable. Continuing to examine the results, we can see that Significance F is 0.5037, which is much greater than the 0.05 cutoff that we use to determine significance. This shows us that the overall regression is not statistically significant, and there is a 50.37% chance that the results that we got were completely due to chance. Furthermore, upon examining the P-values for each of the individual independent variables, we see that each of them are greater than the 0.05 cutoff that we use to determine significance, which shows that none of the independent variables utilized are statistically significant, and further supports that our overall regression is not statistically significant. Based on all of this evidence, it is easy to determine that this model does not do a good job of making a statistically significant prediction for Y.

My purpose for creating this site was to build upon the current discussion of factors that influence academic achievement. I attempted to do this through the development of a regression model that would be able to predict a college student's GPA by utilizing factors that are known to impact achievement. Through my research of the subject, I was able to determine 9 individual independent variables to be utilized in my regression model in an attempt to quantify their effect on GPA, which was being used as a measure of academic success. I then intended on using these results to try to find any potential pattern between the explanatory variables, GPA, and the major they chose. However, after an analysis of my regression model, I came to the conclusion that it was not able to provide statistically significant results.

This is not the worst thing in the world, since my results were meant to be suggestive as opposed to concrete. Despite the fact that my results are not statistically significant, I do think that there are positives that can be taken away from it. I have reason to believe that my results came back the way they did as a result of the sample I drew as opposed to the variables I included or the overall regression itself. First of all, the population from which I drew my sample was the Emory University student population. However, the Emory student population is in no way representative of the overall population of American college students. On the contrary, since Emory is an elite university, the students represented in the sample are all extremely strong students with very high quality educational backgrounds and (for the most part) good study habits. This is definitely not the case for the overall population of college students in America. On top of this, the sample that I drew was not a true random sample, as is required for this sort of analysis, but rather was closer to a convenience sample that exhibited at least one form of bias. Despite my efforts to try to keep the sample as random as possible, I was unable to actually do this. Furthermore, my sample size was a mere 45 students. A sample this small could in no way represent the entire population of college students, especially considering the fact that the sample was drawn with sampling biases from an unrepresentative population.

As I said previously, I have no reason to believe there is any sort of issue with the variables I chose to utilize or the way the regression model was constructed. Each of the variables included was chosen after careful research on variables that affect the achievement gap. Each study that I read provided significant results of the described factor having an impact on academic attainment, which provided the basis for their inclusion. Furthermore, the regression model was constructed in compliance with Econometric theory and fulfilled the requirements for an OLS estimator. Because of these things, I feel that someone with the time and resources to gather a unbiased sample from a more representative population would fare better, as their data would be much more likely to provide statistically significant results. These results would be capable of predicting GPA (or another pre-determined measure of academic success), but would not necessarily be able to determine a relationship with the college majors that students chose. However, it may be possible for the researcher to determine such a relationship. Furthermore, this exact regression model can be used to test the effect of these factors on economic success, as measured by things such as wages, if the data is collected from adults (perhaps in their 40s) as opposed to college students. Overall, I feel that my research and the development of this regression model was successful, and I hope that my work has furthered the extremely important discussion surrounding the achievement gap in America.

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