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True Value of a College Education

Lindsey Beran
John Carroll University, lberan15@jcu.edu

Lindsey Beran
Dr. Calkins
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Section 1: Introduction

Some people wonder whether a college education is worthwhile after hearing many news stories about the astoundingly high costs of attending college, and also how recent college graduates struggle to find jobs. The press often reports how the cost of a college education has increased astronomically, and this is not just blogs and Wikipedia sources. For instance, a Bloomberg article shows how college tuition in the United States has risen 1,225% since 1978, but does not account for inflation (Jamrisko and Kolet). Americans with little knowledge about economic theory may be easily misled into thinking that the benefits of attending college may no longer outweigh the costs from obtaining a college degree. Before coming to this conclusion, it is vital to examine whether a college education is as expensive as people believe, and also to examine the benefits of obtaining a college degree. This study will demonstrate that by analyzing the rate of return for schooling amongst other societal and health benefits, it is clear that obtaining a college degree is still a wise investment, possibly even more so today than in years past.

The more education a person receives, the more likely he or she is to participate in the labor force, hold a job, and make more money. There are also non-financial benefits of a college education, like higher job satisfaction, healthier

lifestyles, and more social mobility, just to name a few (Baum, Ma, and Payea). How much education a person receives can also serve as a signal to businesses about his or her level of productivity (Borjas 262-267).

An analysis of the personal monetary gains, personal wellness benefits, and societal benefits obtained from a college education will show that it is still wise to go to college today. Section 2 will describe the personal monetary gains from a college education; section 3 will show the societal benefits from more people getting a college degree; section 4 will explain the personal wellness benefits that come from getting a college degree; and section 5 will include a summary of the paper.

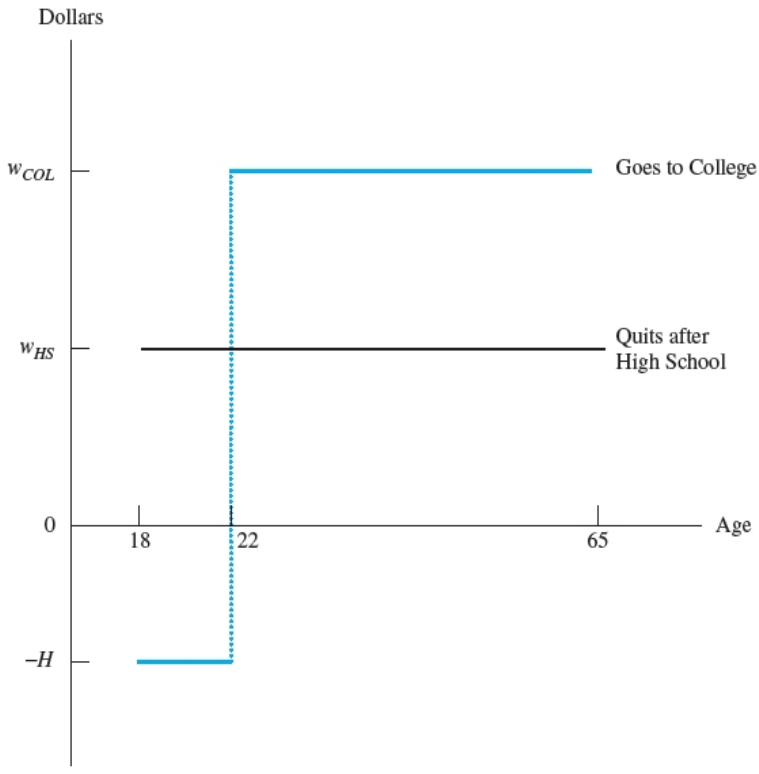
Section 2: Personal Monetary Gains

One of the reasons people may choose not to attend college is simply because they think the financial burden of paying tuition outweighs the benefits of holding a degree. However, studies show the exact opposite. It is true that individuals have to give up earning some money while attending school, but it has also been proven that college graduates will earn more than enough to pay off their college loans (Abel and Deitz 8).

The mathematical way to compare people's future earnings is to use the present value formula: $PV = \sum_{t=1}^{t} \frac{y_t}{(1+r)^t}$ where "y" is future cash flows, "r" is the discount rate, and "t" is number of periods. "Present value allows us to compare dollar amounts spent and received in different time periods" (Borjas 238). This becomes important for someone who only looks at the near future when making decisions. Education is a long-term investment; individuals give up earnings for the

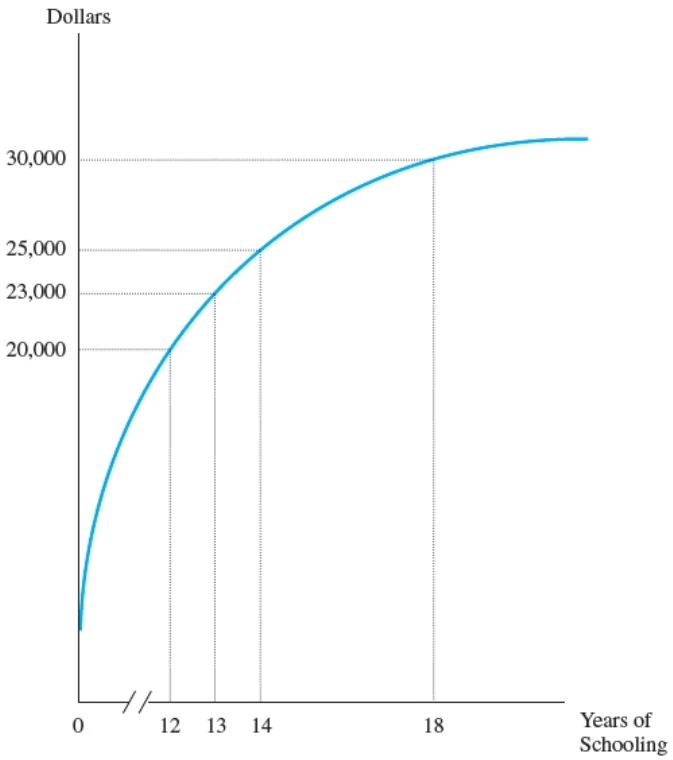
years they attend school and typically earn back this money and more, but this occurs years in the future, not immediately following schooling.

An age-earnings profile is a graph that shows a wage path over a person's life cycle. When a high school graduate decides whether to go to college or directly enter the labor market, the wage path will show this decision. If the graduate decides to enter the labor market, he or she will earn W_{HS} as indicated on the graph below. If the graduate decides to go to college, he or she will give up W_{HS} for the years he or she is in school and incur direct costs of H dollars for tuition, books, and other fees; after college, he or she will earn W_{COL} as illustrated in the graph below (Borjas 239).



Graph 1: "Potential Earnings Streams Faced by a High School Graduate." Source: Borjas 240.

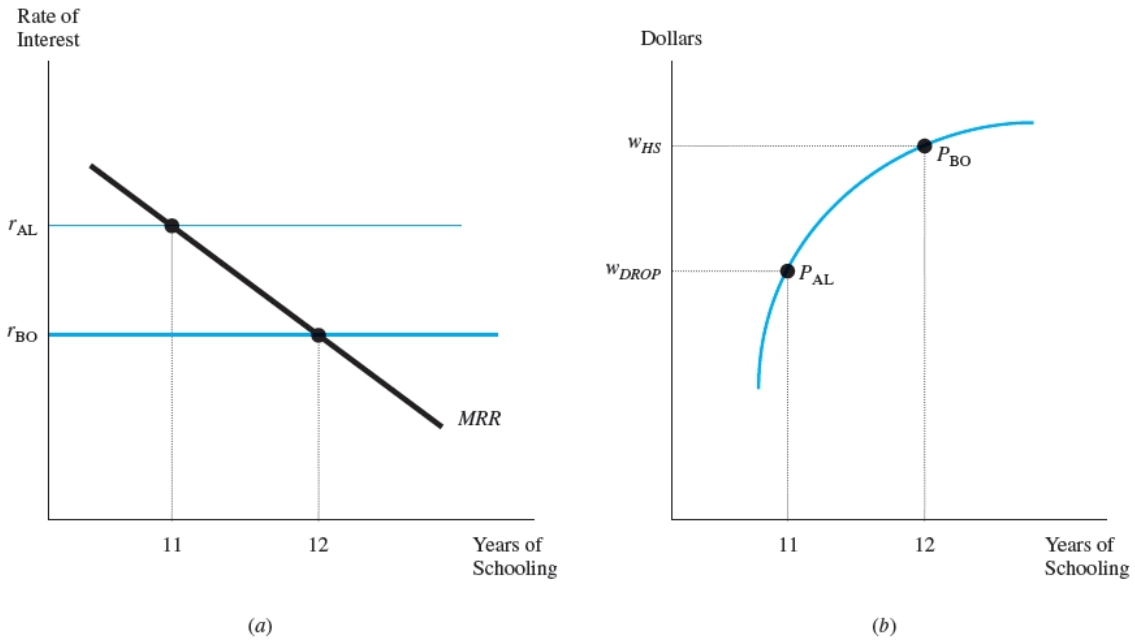
The wage-schooling locus "gives the salary employers are willing to pay a particular worker for every level of schooling" (Borjas 242). The wage-schooling locus has three important properties. It is upward sloping, indicating that workers with more education must earn more as long as their educational decisions are motivated by financial gains only. Employers must pay these workers more for the costs they acquired to earn their education. The wage-schooling locus's slope tells by how much a worker's earnings would increase if he or she were to obtain one more year of schooling, and will be closely related to the a rate of return to schooling. The wage-schooling locus is concave, meaning the monetary gains from each additional year of school decline as more school is acquired; each additional year of schooling generates less incremental knowledge and lower additional earnings (Borjas 243). The wage-schooling locus is depicted below.



Graph 2: "The Wage-Schooling Locus." Source: Borjas 242.

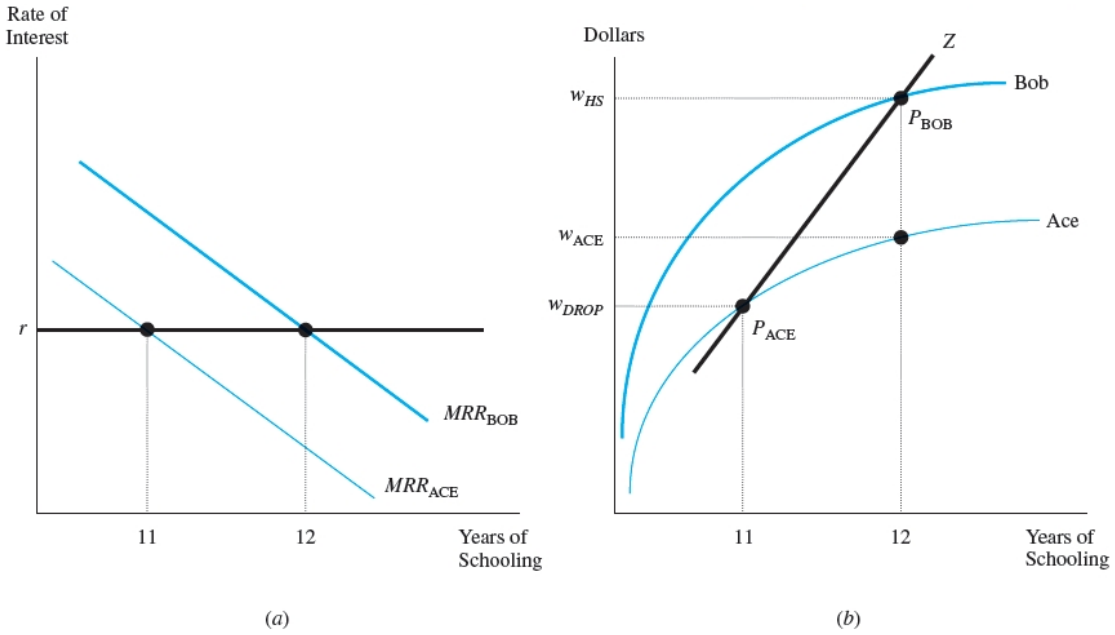
People should attend school until their marginal rate of return to schooling is equal to their discount rate, as described in the next paragraph. This maximizes the worker's present value of earnings over his or her life cycle. A worker's marginal rate of return to schooling is simply the percentage change in earnings resulting from one more year of school. Because the wage-schooling locus is concave, the marginal rate of return to schooling must decline as a person gets more schooling (Borjas 243-244).

The discount rate used in a present value calculation of wage earnings over a lifetime changes from person to person. This makes it difficult to give a blanket statement that everyone should pursue higher education. The higher the discount rates people exhibit, the less of a chance they will attend college because they will need a higher present value of earnings to make going to college financially worthwhile; these people are more present-oriented. A lower discount rate means people do not need to make as much money throughout their lifetime for college to be worthwhile; these people are more future-oriented (Borjas, pg 245-246). In the graph below, Bo and Al have different discount rates; Bo's discount rate is lower than Al's. Consequently, Bo will choose more schooling.



Graph 3: "Schooling and Earnings When Workers Have Different Rates of Discount." Source: Borjas 246.

It is more difficult to estimate a person's marginal rate of return to schooling. This is based on a person's natural abilities, and it is challenging to put a numeric value on ability. It is assumed that higher ability will shift the marginal rate of return to schooling to the right, so that the earnings gain resulting from one more year of schooling outweighs the increase in foregone earnings; higher ability individuals get relatively more from an extra year of schooling (Borjas 247). In the graph below, both students have the same discount rate, but Bob has more ability than Ace. Consequently, Bob's marginal rate of return to schooling is shifted further to the right than Ace's, and Bob benefits more from an extra year of schooling.



Graph 4: "Schooling and Earnings When Workers Have Different Abilities." Source: Borjas 248.

An analysis of median pay shows that people who choose to go to college do earn less than those who choose to go right into the labor force directly following high school. While this difference in pay does not last forever, it does last for more than a few years before individuals with a higher education yield higher earnings.

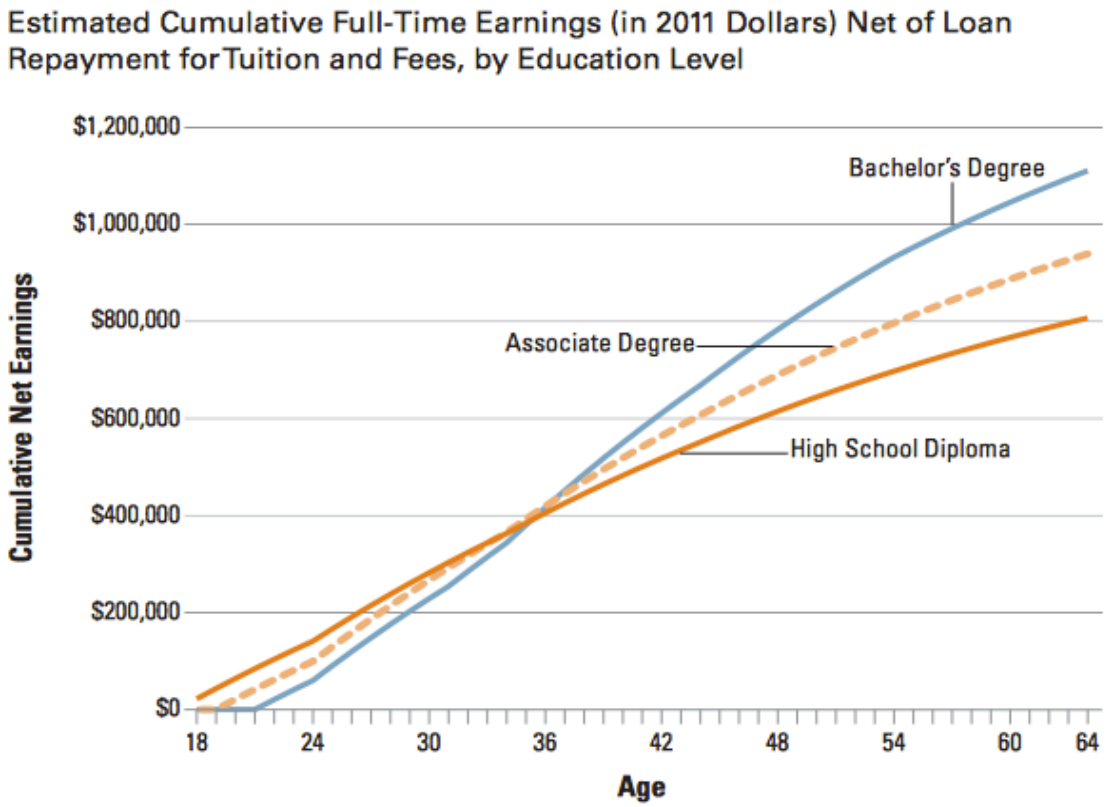


Figure 1. "Estimated Cumulative Full-Time Earnings (in 2011 Dollars) Net of Loan Repayment for Tuition and Fees, by Education Level." Source: Baum, Ma, and Payea 13.

The above figure shows the age-earnings profile for students with just a high school diploma, students with an associate's degree, and students with a bachelor's degree. This takes into account student loans that college students will pay as well as tuition costs. The associate degree recipients are assumed to earn zero dollars during the two years they attend college and the bachelor's degree recipients are assumed to earn zero dollars for all four years they attend college. According to Baum, Ma, and Payea, by the age of 34, associate degree recipients earn enough to compensate for attending college instead of entering directly into the labor force. By the age of 36, bachelor's degree recipients earn enough to compensate for attending college rather than working (Baum, Ma, and Payea 13).

Lifetime earnings of high school graduates are quite different from those of college graduates. Even though college graduates only surpass the earnings of high school graduates in their mid-thirties in Abel and Deitz's analysis, the opportunity for higher pay later in their careers is much greater. The graph below shows Abel and Deitz's analysis of wages earned by people with a high school diploma compared to people with an associate's degree and people with a bachelor's degree. People that go to college start earning money later than people who enter the labor force directly following high school. While the college graduates do not earn income for the years they are taking college courses, they have higher starting salaries when they do enter the labor force and continue to earn a higher salary than high school graduates. The graph below depicts this phenomenon.

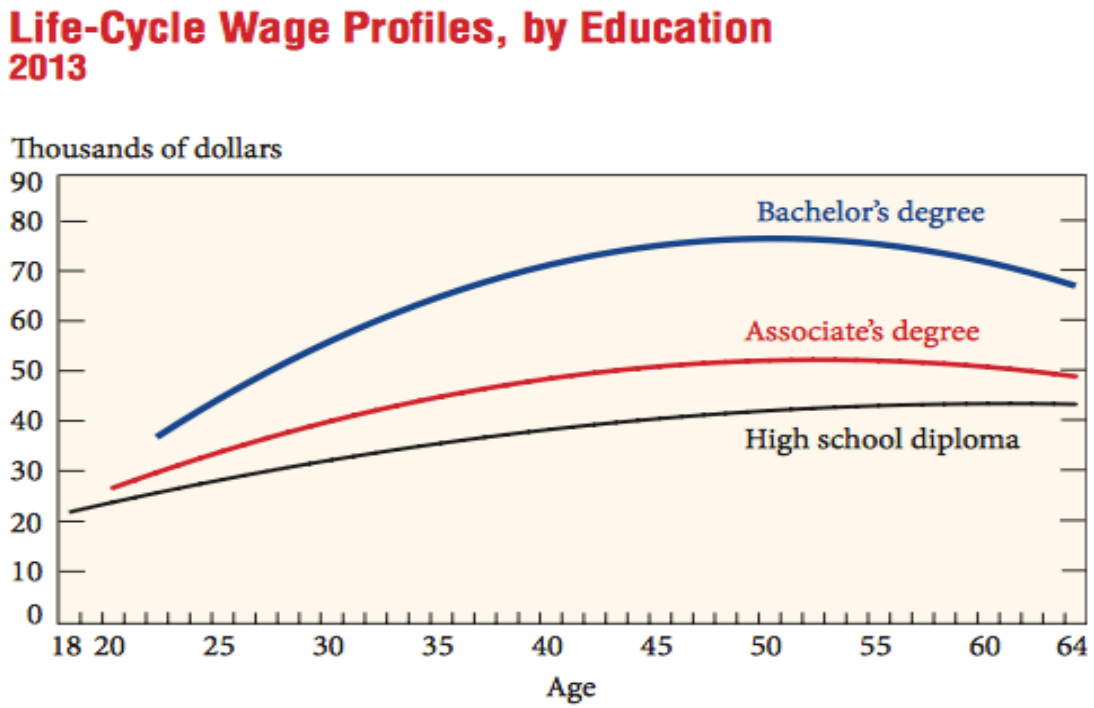


Figure 2. "Life-Cycle Wage Profiles, by Education 2013." Source: Abel and Deitz 4.

For full-time workers whose highest degree is a bachelor's degree, the earnings gap, or the difference between high school and college graduates' earnings, increases from 54% for 25- to 29-year-olds to 86% for 45- to 49-year-olds, and is 74% for 60- to 64-year-olds (Baum, Ma, and Payea 17). Over the course of a lifetime, assuming college graduates did not earn a wage while in school, college graduates with a bachelor's degree earn on average well over $1 million more than high school graduates (Abel and Deitz 4).

The wage gap between those with and those without a college degree changed over the past few decades as the demand for workers with more education increased relative to the demand for less skilled workers. The service sector is the largest employed sector in the U.S. economy and will continue to grow, and it is this sector that employs more college-educated workers (Department for Professional Employees, AFL-CIO).

At the beginning of the recession in 2008, 77.2% of the jobs in our economy were service based and this number is expected to increase to 78.8% by 2018 (Department for Professional Employees, AFL-CIO). As a way to ease out of the most recent recession, the government put even more of an emphasis on the service sector as a way to create more jobs. Over 55% of people aged 25 and over were attending or had attended at least some college; in fall 2014, 21 million students were expected to go to college, an increase of about 5.7 million since 2000 (U.S. Department of Education).

Attending college raises job productivities and makes college-educated workers better candidates for a job in the service industry. "Several factors have

contributed to the rising demand for skills in the labor market: technological and organizational change, trade, deregulation of key industries, and the decline of unions" (Lerman and Schmidt). In fact, the average hourly earnings for workers with a high school degree or less have actually declined in real terms – those who did not finish high school saw a decline of 2 percentage points and those with a high school degree saw a decline of 1.2 percentage points since 1973. College graduates' hourly earnings remained roughly constant in real terms, with a 0.7 percentage point increase, further fueling the idea that a college education is financially important (Lerman and Schmidt). In addition, the minimum wage, which affects less skilled workers more than skilled workers, has not kept up with inflation. The highest the minimum wage was in real terms was during 1968 at $10.69 per hour in today's prices. The federal minimum wage today is only $7.25, possibly indicating that the real value of the lowest skilled jobs has decreased (Elwell).

Not only do college graduates make more money, the amount they make relative to those without a college degree is increasing. Part of this could be attributed to the declining value of the real minimum wage as discussed above, but perhaps more can be attributed to the fact that college graduates are earning more relative to what they earned in the past. In the period 1970 to 2013, a college graduate with a bachelor's degree made an average of $64,500 per year while a high school graduate made only $41,000 per year. Also, "over the past four decades, those with a bachelor's degree have tended to earn 56 percent more than high school graduates" (Abel and Deitz, 2-3).

Since the early 1980s, the wage gap has widened between college and high school graduates. During the 20-year period beginning in 1980, "technological advancement and the computer revolution took hold" and because of these new technologies, college graduates became more productive (Abel and Deitz, 3). The wage gap between 1982 and 2001 nearly doubled, reaching almost 80% for those with a bachelor's degree. The wage gap then fell between 2001 and 2013, which could be the result of a poor job market during the recession, but still, workers with bachelor's degrees earn 75% more than those with a high school degree (Abel and Deitz, 4).

Section 3: Societal benefits

The benefits of a college education stretch beyond just individual monetary benefits; they can impact employment statistics and society as a whole as well. This can become quite obvious when analyzing labor market characteristics between people with just high school educations compared to those with college educations. Only 61.9 percent of workers who receive less than a high school diploma even enter the labor force, and of this group the unemployment rate is almost 17 percent. Seventy-six percent of workers with high school diplomas enter the labor force, and of this group 12.2 percent are statistically unemployed. Comparatively, people with some college have a labor force participation rate of 79.9 percent and an unemployment rate of 8.7 percent. College graduates have a labor force participation rate of 85.8 percent and an unemployment rate of just 4.7 percent (Borjas, 237).

Education has a particularly strong beneficial impact on the labor markets of women and minorities. The unemployment rate for women who graduate college is just 4.3 percent, compared to 9.9 percent for women with just a high school degree and 15.4 percent with less than a high school degree. The labor force participation rate of women who have a college degree is 17.9 percentage points higher than the women with just a high school degree. Similar results can be shown for black and Hispanic workers. The labor force participation rate for black college graduates is 23 percentage points higher than black high school graduates. The black unemployment rate decreases from 17.7 percent to 7.9 percent when black workers get a college degree, as opposed to only having a high school degree. While the labor force participation rate for Hispanics does not change as drastically, increasing 7 percentage points for those who receive a college diploma, the unemployment rate decreases from 12.3 percent for Hispanics with a high school degree to 5.6 percent for Hispanics with a college degree (Borjas, 237).

The educational attainment of workers in the United States is increasing according to the Bureau of Labor Statistics. The census from 2010 showed that only 11.6 percent of persons aged 25 years and older had not received a high school diploma while 32.5 percent of persons did receive a high school diploma with no additional schooling. 16.8 percent of the people had some college, 9.1 percent had an associate degree, 19.4 percent had a bachelor's degree, and 10.5 percent had an advanced degree. As more people choose to obtain college degrees, the price earnings potential between those with a high school education versus a college education will keep widening (Borjas, 236).

Employment levels fall when the economy enters a recession and rise when the economy is booming. At all points in the business cycle, the unemployment rate for people without a college degree has historically been higher than for people with a college education. Therefore, an inverse relationship exists between education and unemployment: more education is associated with less unemployment. "In 2009, the unemployment rate for workers with college degrees was 4.6 percent. The rate for workers without a high school diploma was 10 points higher" (U.S. Bureau of Labor Statistics). See the figure below.

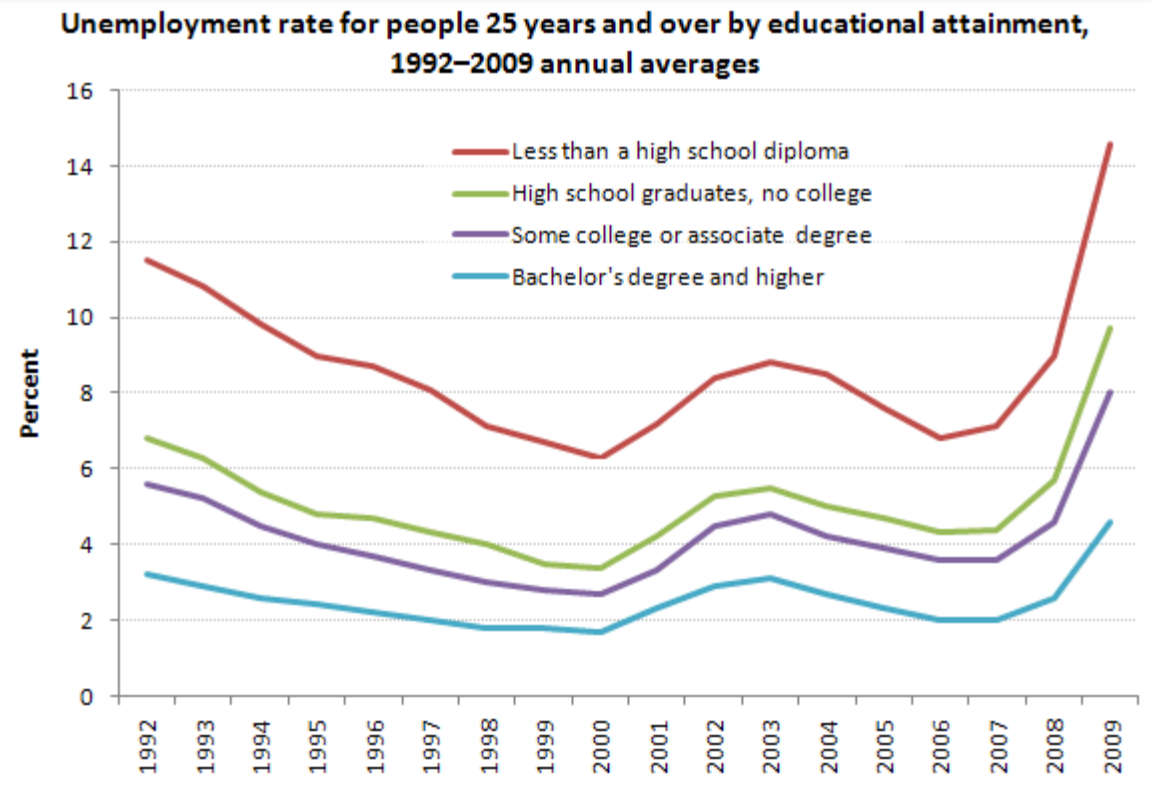


Figure 3. "Unemployment rate for people 25 years and over by educational attainment, 1992-2009 annual averages." Source: U.S. Bureau of Labor Statistics.

Unemployment carries obvious problems for individuals, but unemployment is a major problem for society at large as well. When the unemployment rates rise, there are often calls for protectionism, which is bad for the U.S. economy. When

countries can specialize in production and trade with each other, citizens will have access to a vast amount of goods at lower prices. When domestic protection is enacted, specialization decreases and citizens do not have the same access to goods as they did before the protection (Bhagwati). If more Americans choose to go to college, they will be more employable in the growing service economy and continue to allow the United States to specialize in services, leading to a competitive advantage for our country.

More unemployment also means higher transfer payments from state and federal governments for things like unemployment benefits, food assistance, and Medicaid. Because less people are receiving paychecks, the government is collecting less in income taxes, and will need to either raise taxes or borrow money to pay for the transfer payments (Simpson). As more people go to college and become employed, less transfer payments are needed from the government. Comparing families in which both parents have only high school degrees versus families in which both parents have bachelor's degrees demonstrates this occurrence. The families whose parents hold high school degrees report using food stamps almost three times as often, and federal or state welfare nearly four times as often, as the families whose parents hold bachelor's degrees (Colleens 71).

Over the years, publications have cited that increases in education generate extensive social benefits by allowing citizens to make more informed evaluations of the complex social, political, and technological issues embedded in campaign literature, legislative initiatives and ballot referenda (Dee 1). Recently, "contemporary literature among political scientists has also put a particular stress

on the positive effects that schooling may have on the likelihood of civic participation" (Dee 1). Civic engagement is important because civically responsible individuals recognize themselves as active members of a larger social community, and will recognize the moral and civic dimensions of political issues. These individuals will also consider social problems to be at least partly their own fault, be more likely to make more informed civic judgments, and take action when necessary ("The Definition of Civic Engagement").

There is evidence that voter participation increases with higher education levels. A study conducted by Thomas S. Dee with the National Bureau of Economic Research found that "estimates indicate that college entrance increases voter participation by roughly 21 to 30 percentage points" (Dee 16). Further, an additional year of schooling increases voter participation by 3.8 percentage points (Dee 20). These results are consistent with the conventional claims that educational attainment is a critical determinant of civic engagement (Dee 16).

Dee also conducted research on newspaper readership frequency by taking data from General Social Surveys on how often people read the newspaper based on five given choices: never, less than once a week, once a week, a few times a week and every day. The measure is meant to indicate how informed voters are with current affairs. Dee found that each additional year of school significantly increases the index of newspaper readership by 3 percentage points (Dee 20). This implies that more schooling leads to a more informed general public.

Along the same lines, College Board found that the more education a person receives, the more he or she will understand about current political issues. Results

from a survey showed that among adults ages 25 and older, 45 percent of those with at least a bachelor's degree, 34 percent of those with some college or an associate degree, 21 percent of those with at most a high school degree and only 15 percent of those without a high school diploma reported understanding quite a bit or a great deal about the political issues facing our country (Baum, Ma, and Payea 31). See the figure below.

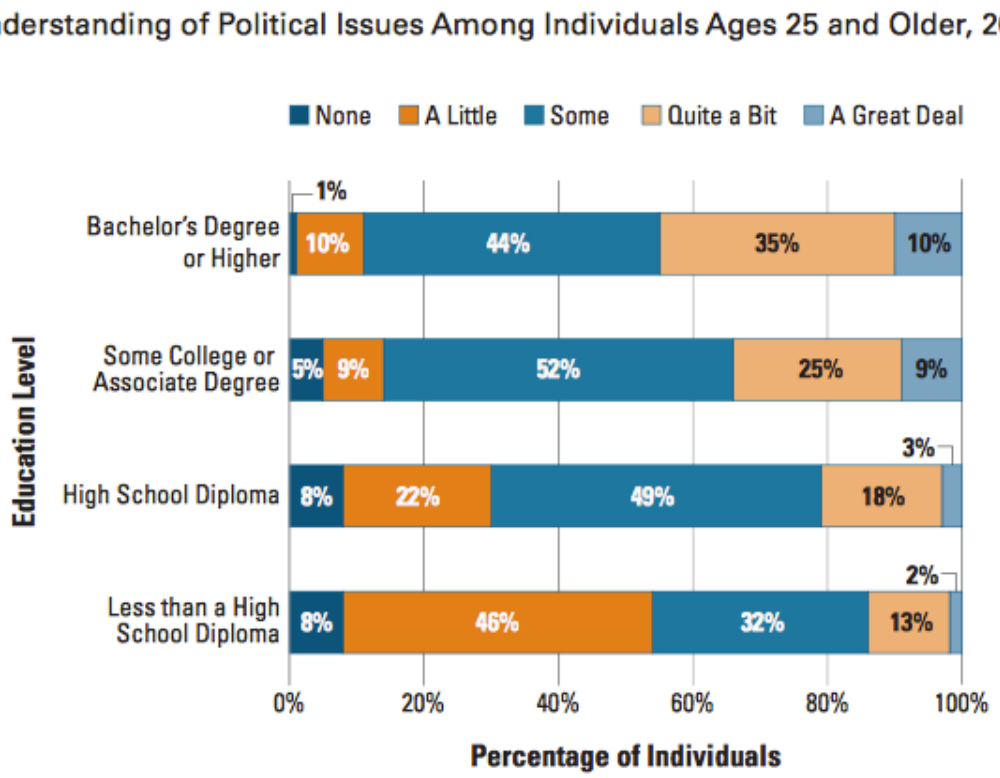


Figure 4. "Understanding of Political Issues Among Individuals Ages 25 and Older, 2012." Source: Baum, Ma, and Payea 31.

The amount of volunteer work individuals perform is correlated with how much schooling they receive. The U.S. Department of Labor found that in 2014, for "persons age 25 and over, 39.4 percent of college graduates volunteered, compared with 27.3 percent of persons with some college or an associate's degree, 16.4

percent of high school graduates, and 8.8 percent of those with less than a high school diploma" ("Volunteering in the United States, 2014"). College Board provided similar observations from the Bureau of Labor Statistics' 2012 data in the following figure.

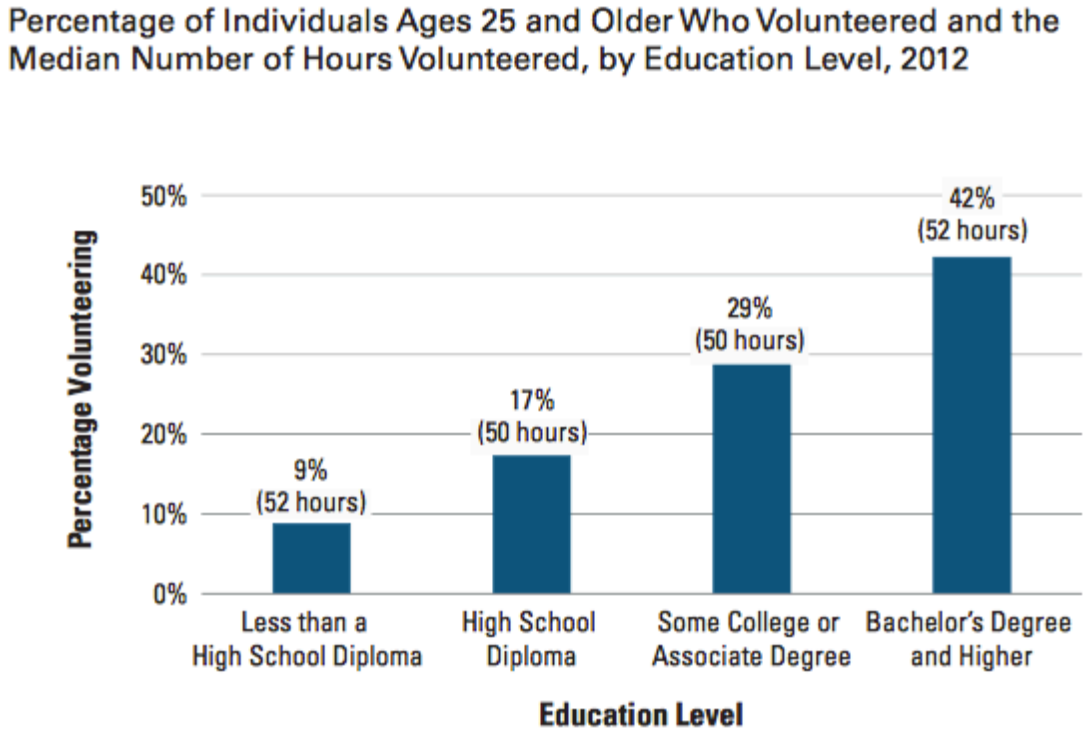


Figure 5. "Percentage of Individuals Ages 25 and Older Who Volunteered and the Median Number of Hours Volunteered, by Education Level, 2012." Source: Baum, Ma, and Payea 31.

An important social benefit correlated with college education is reduction in poverty rates. College graduates historically have lower poverty rates compared to individuals with an associate degree or high school diploma. According to a study done by the Pew Research Center, among those ages 25 to 32, 22 percent of people with only a high school diploma are living in poverty, compared with just 6 percent of today's college-educated young adults (Pew Research Center). Another study

done by the Washington Higher Education Coordinating Board found that "families in which both parents are high school graduates are more than three times as likely to live below federal poverty guidelines as families in which parents earned bachelor's degrees" (Colleens 71).

National studies have long shown the correlation between education level and crime. The U.S. Department of Justice provides data on offenders sentenced in U.S. District Court by education level. "While 15.5 percent of the U.S. population 25 years or older have less than a high school diploma, those with less than a diploma make up nearly half of those sentenced. At the same time, those with a college degree make up 35 percent of the U.S. population but only account for 5.4 percent of those sentenced" (Colleens 77). See figure below.

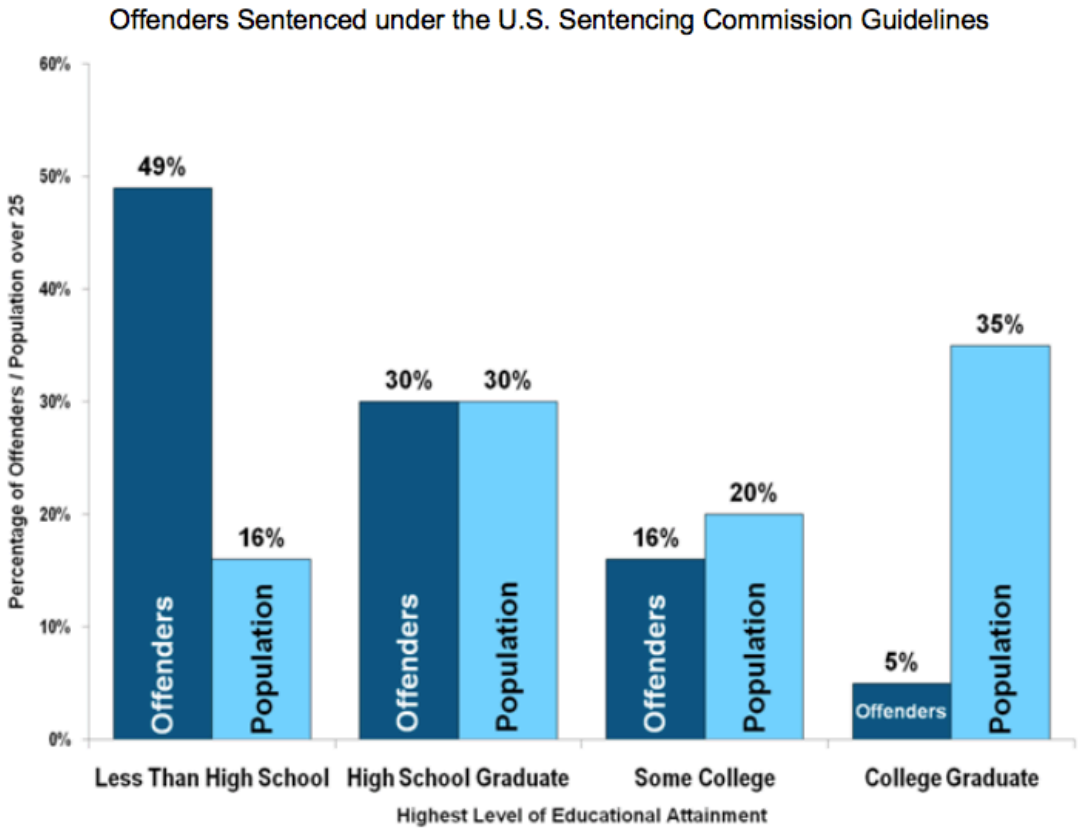


Figure 6. "Offenders Sentenced under the U.S. Sentencing Commission Guidelines." Source: Colleens 77.

The Vera Institute of Justice surveyed prisons in forty states and found that the average cost per inmate per year was $31,307 in 2010 (CBS News). If the link between higher education and crime prevention holds and more people choose to become educated, the amount of tax money needed to fund prisons would decrease and those taxes could go toward other projects.

Section 4: Personal Wellness Benefits

People who attain higher levels of education report feeling healthier than people who do not. "Nationally, at every age and income level, individuals with higher degree attainment report better health than those with less postsecondary

education," according to a study done by the Washington Higher Education Coordinating Board (Colleens 76). Not only do these people report feeling healthier, they also exercise more, smoke less, and live healthier lifestyles on their own and with their families.

Life expectancy is higher for people with postsecondary education than those with a high school diploma or less. In the year 2006, 25-year-old men without a high school diploma had a life expectancy 9.3 years less on average than those with a Bachelor's degree or higher. Women without a high school diploma had a life expectancy 8.6 years less than those with a bachelor's degree or higher ("Higher Education and Income"). Not only is life expectancy different between the two groups, but the difference is widening as well. "Between 1996-2006, the gap in life expectancy at age 25 between those with less than a high school education and those with a bachelor's degree or higher increased by 1.9 years for men and 2.8 years for women." ("Higher Education and Income")

College educated people also report being more satisfied with their jobs and learn new things with their jobs than people without college educations. "About half (53 percent) of all employed college graduates in their mid-20s and early 30s say they are "very satisfied" at work. In contrast, only 37 percent of comparably aged Millennials with a high school diploma or less are as satisfied with their job" (Pew Research Center 3). Among workers ages 30 to 45 with a bachelor's degree or higher, 56 percent strongly agree that their jobs require them to keep learning new things, compared to just over 30 percent of those with a high school diploma (Baum, Ma, Payea 21).

College educated workers are more likely than workers with less education to exercise on a regular basis and stay in good shape. The Office of Disease Prevention and Health Promotion has physical activity guidelines to promote good health for Americans. Recommended exercise for adults is at least two hours and thirty minutes a week of moderate intensity aerobics or one hour and fifteen minutes of vigorous intensity aerobics a week in addition to at least two days of muscle-strengthening activities (Office of Disease Prevention and Health Promotion). Data from the National Center for Health Statistics found that "in 2011, 63 percent of four-year college graduates and 38 percent of high school graduates reported meeting the federal guidelines for physical activity" (Baum, Ma, Payea 28).

Further data measuring how active individuals are based on their education level show similar results.

FIGURE 1.17B
Age-Adjusted Percentage Distribution of Leisure-Time Aerobic Activity Levels Among Individuals Ages 25 and Older, by Education Level, 2011

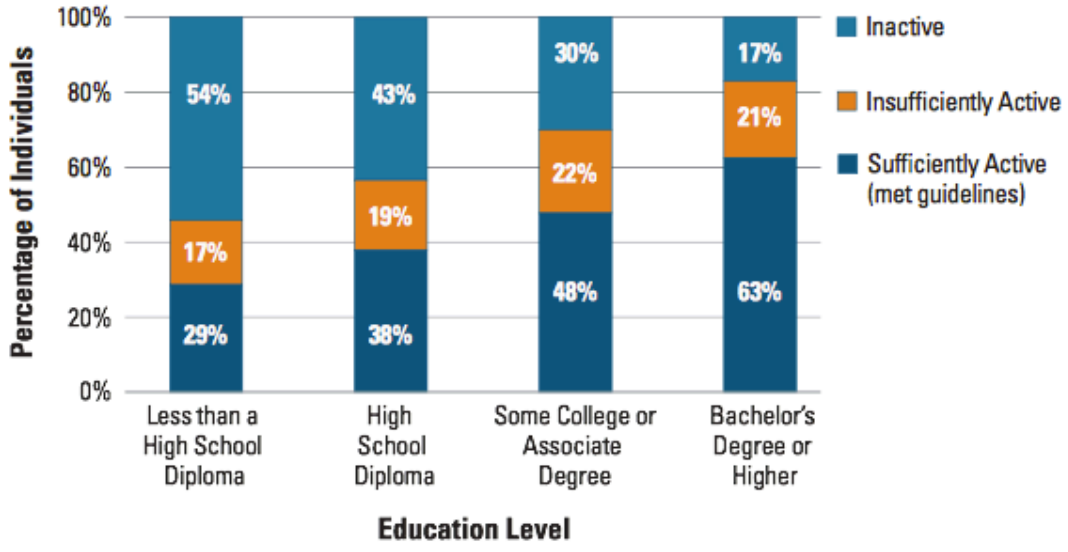


Figure 7. "Age-Adjusted Percentage Distribution of Leisure-Time Aerobic Activity Levels Among Individuals Ages 25 and Older, by Education Level, 2011." Source: Baum, Ma, and Payea 31.

Smoking is the leading preventable cause of death in the United States today, causing more than 480,000 deaths in the United States each year ("Health Effects of Cigarette Smoking"). Research shows that people with college educations smoke less than people without college educations. In 2010, 19 percent of Americans aged 18 and over were smokers. In the same year, 31 percent of adults 25-64 years of age with a high school diploma or less were current smokers, compared with 9 percent of adults with a bachelor's degree or higher ("Higher Education and Income).

The percentage of smokers in the United States was lower in 2012, with just 8 percent of individuals with a bachelor's degree or higher smoking and 25 percent of individuals with a high school diploma or less (Baum, Ma, Payea 27). While this decrease is promising from a health and wellness perspective, it also shows a clear correlation between educational attainment and likelihood of smoking.

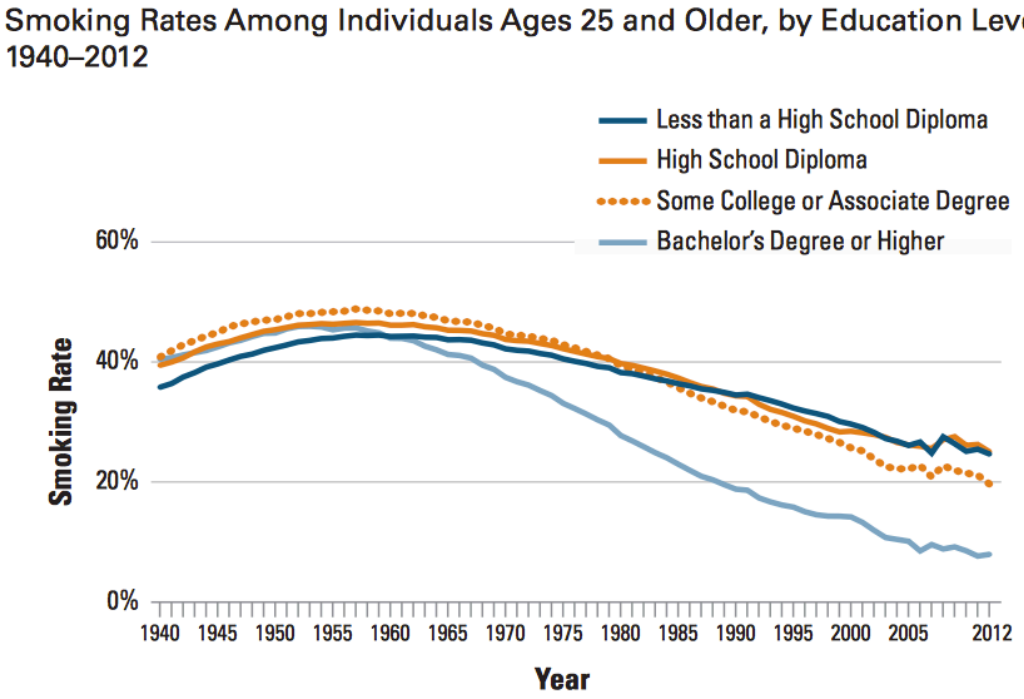


Figure 8. "Smoking Rates Among Individuals Ages 25 and Older, by Education Level, 1940-2012." Source: Baum, Ma, and Payea 28.

Part of the reason more individuals with college educations than individuals without college educations are choosing not to smoke may be because "college graduates are more likely to heed widespread public warnings about the serious health effects of smoking than those with less education" (Colleens 76). In 1965, Surgeon General warnings had to be put on cigarette packages for the first time, with warnings about the health dangers of smoking cigarettes. By 1970, "the smoking rate among college graduates had declined to 37%, while 44% of high school graduates smoked. This gap increased to 13 points in 1982, to 16 points in 1992, and to 17 points in 2012" (Baum, Ma, Payea 27).

Studies indicate that higher education and obesity rates are correlated. When 35 percent of all men and 36 percent of all women ages 25 and over were

defined as obese during the years 2007-2010, only 28 percent of men and 26 percent of women with bachelor's degrees were obese (Baum, Ma, Payea 29). In addition, children whose parents received a college degree also were less likely to be obese than children whose parents just had high school education. During the same time period of 2007-2010, 24 percent of boys and 22 percent of girls whose head of household had less than a high school education were obese. In households where the head had a bachelor's degree or higher, obesity prevalence was 11 percent for boys aged 2-19 years and 7 percent for females ("Higher Education and Income").

The time mothers spend on their children's activities increases with more education. "Employed mothers with four-year college degrees report spending about 51 percent more time on their children's activities than employed mothers who are high school graduates. Among those who are not employed, the difference is about 42 percent" (Baum, Ma, Payea 30). See figure below.

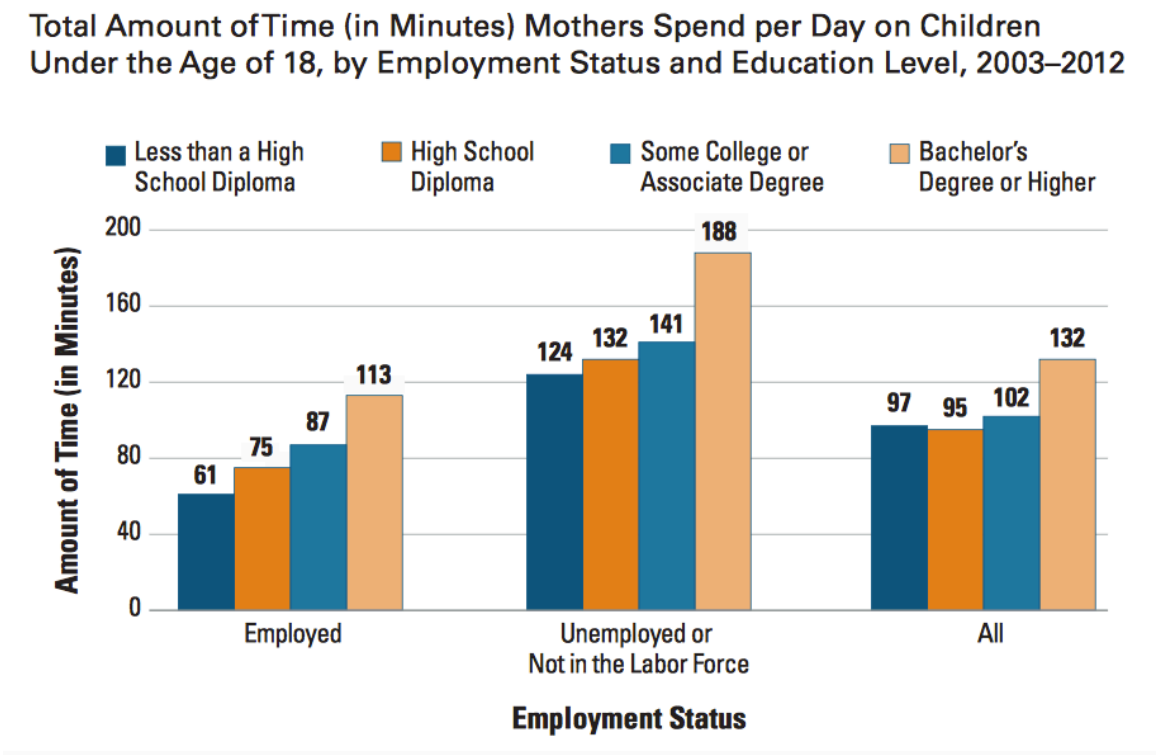


Figure 8. "Total Amount of Time (in Minutes) Mothers Spend per Day on Children Under the Age of 18, by Employment Status and Education Level, 2003-2012." Source: Baum, Ma, and Payea 30.

Highly educated mothers also spend time with their children differently, shifting "the composition of their time as their child grows in ways that adapt to different developmental stages" (Kalil). For example, when children are in preschool, the more highly educated mothers will spend more time teaching their children reading and problem solving to prepare the children for elementary school. This is important because "an additional year of daily mother–child reading increases children's reading test scores in the early school grades by 41 percent of a standard deviation from average" (Kalil).

Section 5: Conclusion

While it is not possible to say every person would benefit from attending a four-year college based on monetary terms because of differences in individuals' discount rates and natural abilities, numerous studies have shown that for the majority, college is a wise financial decision. The social benefits are numerous and personal wellness benefits abundant for people who choose to go to college. College graduates on average have lower unemployment rates, higher salaries, and are healthier as individuals and within families. As a whole, the majority of people will still find it beneficial to attain a college degree for the financial, social, and individual health benefits.

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