

September 2009

## Educational Attainment Wage Premiums and Disparities by Race

### INTRODUCTION

For years research has shown a positive relationship between educational attainment and average earned income. The latest Public Use Microdata Samples released by the U.S. Census Bureau in January 2009 provide data by race/ethnicity. These samples also allow for comparing states — in this research, Minnesota earnings versus the U.S. average.

### DATA

Data used in this research are from the American Community Survey (ACS) three-year estimates. While the Census provides yearly surveys that may be timelier, the three-year survey provides greater reliability for subgroup comparisons because the sample size is larger, with samples averaged over a three-year period. The tradeoff for greater reliability is that data may not reflect the most recent year's snapshot.

The initial dataset contained more than 12 million records for individuals from all 50 states, the District of Columbia and Puerto Rico. To evaluate earnings differences of working age individuals more appropriately, only records where age was 18 or older were included in this research. The resulting dataset contains more than eight million records — 118,000 representing Minnesota.

### FINDINGS

#### *Population Wages by Educational Attainment*

Data in *figure 1* suggest that earnings by educational attainment for Minnesotans mirror the same general pattern as the rest of the United States. Minnesotans with a professional degree have slightly higher average earnings than their United States counterparts. This is also true for Minnesotans with a high school credential, some college education and an associate degree. Minnesotans lag slightly behind the United States average for individuals with a master's or doctorate degree. The difference in mean earnings between Minnesota and the United States within each educational category is statistically significant with the exception of bachelor's and doctorate degrees.<sup>1</sup>

<sup>1</sup> Independent sample t-tests were used to measure the statistical difference in means for MN and the U.S. by each educational level.

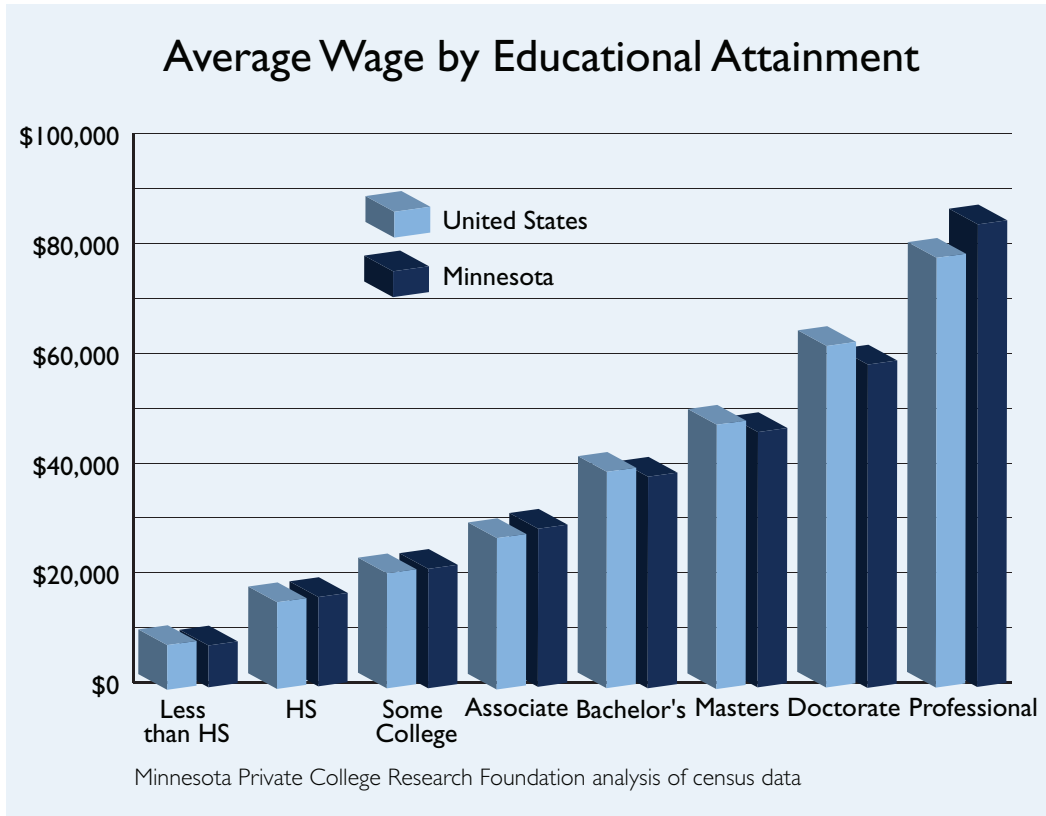
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One reason for differences in mean wages between Minnesota and the rest of the country could be effects of a higher cost of living and corresponding difference in wages. Likewise, differences in wages earned by Minnesotans with a professional degree could be due to the large number of residents employed in medical device and engineering fields.

**Figure 1:**



Generally, more education corresponds with greater yearly earnings. However, discovering that these earnings are statistically different provides some insight as to the value of the decision to invest in higher education. Thus, the difference between attainment of a high school credential and attainment of at least some college were tested to see if wages are truly different. Findings for Minnesota indicate that mean wages earned between these two education levels are statistically significant, indicating that at least some college participation corresponds to increased mean wages.

### **Wages by Educational Attainment by Race/Ethnicity**

Figures 2 and 3 provide data breaking out average wages by educational attainment by race/ethnicity. Figure 2 provides the same information shown in figure 1, but also includes break outs by race/ethnicity. As shown, the pattern is generally the same as the entire population.

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Figure 2:

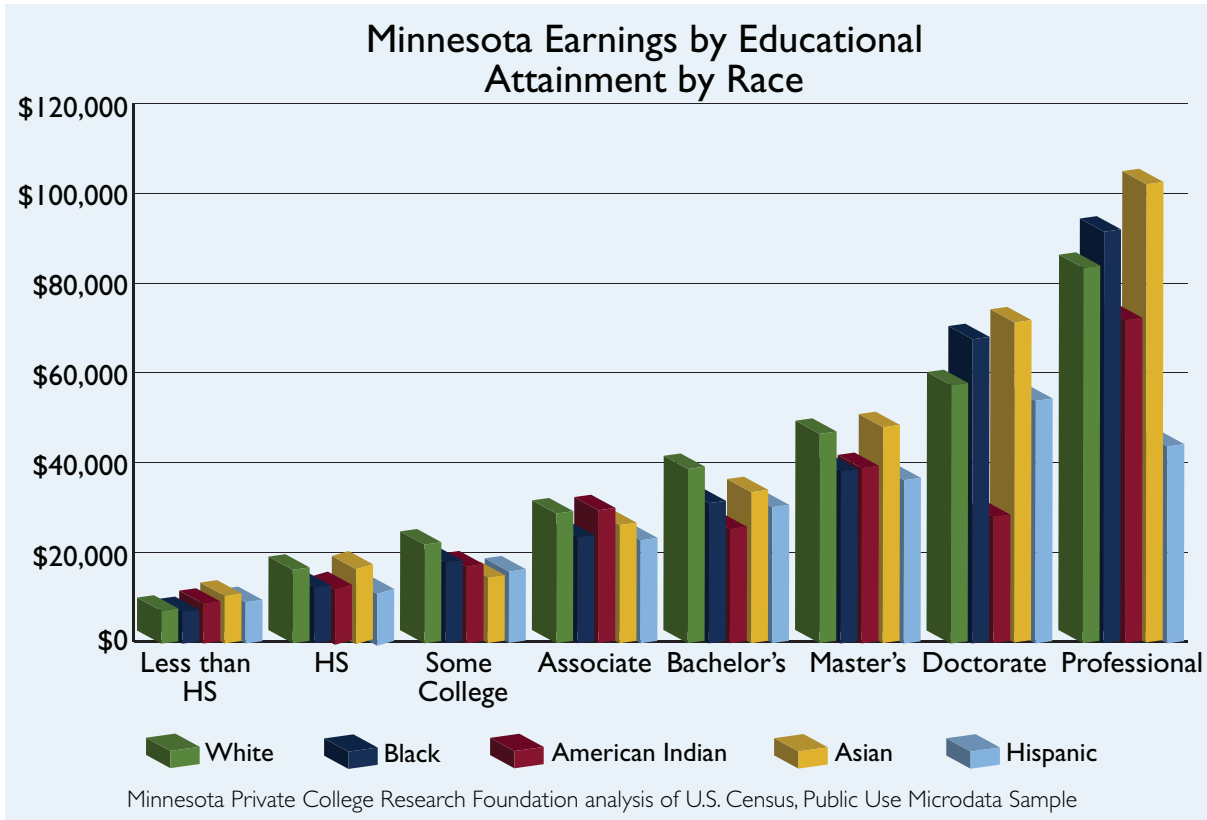


Table 1 presents a correlation matrix estimating the relationship between education and annual earnings by race. Results indicate a statistically significant, albeit small, positive correlation between increases in education and mean wages.

**Table 1:**  
Correlation Statistics: Minnesota Educational Attainment and Mean Wages

	Correlation	Number	Percent of Sample
White	0.32	111,150	94.1%
Black	0.35	2,085	1.8%
American Indian	0.28	806	0.7%
Asian	0.35	2,200	1.9%
Hispanic	0.21	1,462	1.2%

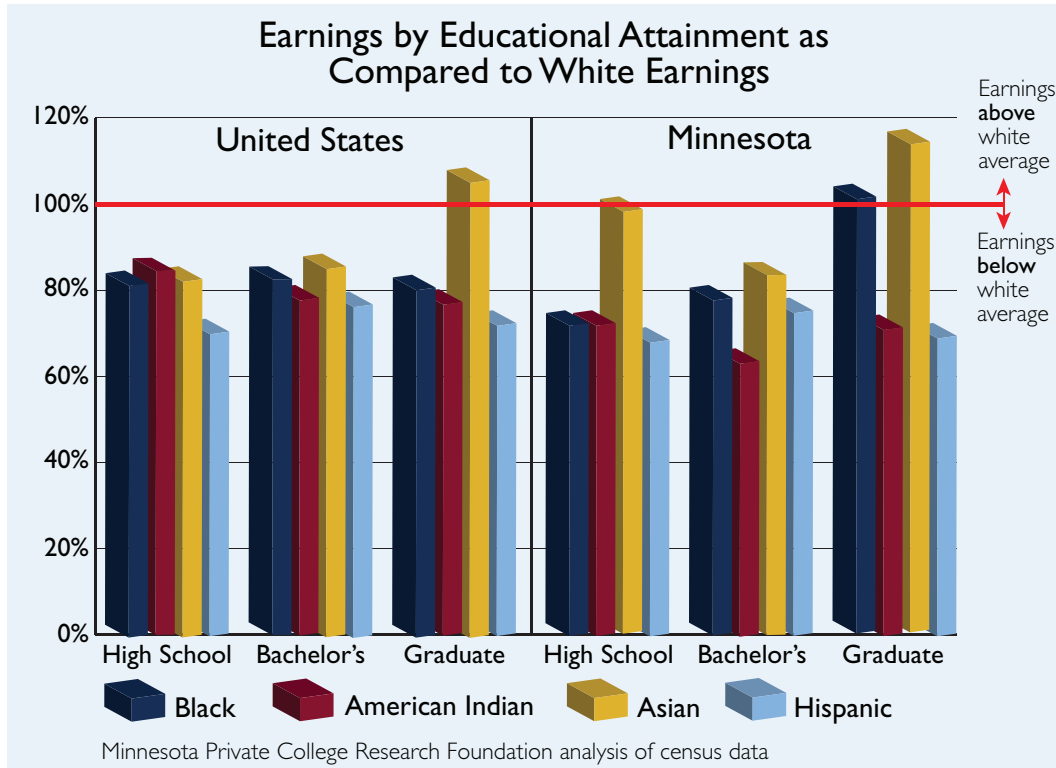
However, there are two interesting discrepancies when looking at racial/ethnic subgroups. For instance, American Indian average wages generally increase as education increases, until bachelor's degree attainment. Wages for this group again break the trend for doctorate recipients. Similarly, Hispanic average wages follow the normal pattern until analyzing the wages of professional degree recipients.

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It might be expected that when analyzing average wages within each educational category, there would be gaps between whites and individuals of color, as this is generally the case in research on earnings and/or education. White earnings are most often the highest through the master’s degree, but doctorate and professional degree earnings by Asians and blacks are noticeably higher than whites.<sup>2</sup>

Another depiction of the gaps between whites and individuals of color is presented in *figure 3*. It presents wages of each race/ethnicity as a percent of white average wages. The red line (100%) is the average white earnings for the corresponding educational attainment for the United States and Minnesota.

**Figure 3:**



As shown, Asian average wages exceed white wages for a graduate degree both in Minnesota and the remaining states.<sup>3</sup> Asian average wages for a high school credential are also higher than white wages in Minnesota. For the remaining U.S. comparisons, no other race/ethnicity exceeds the white wage average. However, in Minnesota, black wages exceed white wages for graduate degree attainment.

*Figure 3* also shows a higher average percent for individuals of color compared to whites in Minnesota. For instance, non-white bachelor’s recipients in the United States, on average earn 84% of the mean white earnings compared to 78% in Minnesota. The same difference is apparent for high school credential earnings and would be for graduate earnings if earnings for blacks and Asians were not so much higher.

<sup>2</sup> Though not found to be a statistically significant difference in mean wages.

<sup>3</sup> “Graduate Degree” was consolidated into one category for figure 3 taking the unweighted average wages of master’s, doctorate, and professional degrees.

## CONCLUSION

As suspected, increased educational attainment corresponds to higher annual earnings. What is not captured here is the investment (or cost) to attain higher education, and the corresponding return on investment in earnings over a lifetime. While the exact return on investment is up for debate, it can be thousands if not hundreds of thousands of dollars more, depending on the degree attained.

While general patterns hold for Minnesota, these data show an increased benefit for Asian and black Minnesotans attaining a graduate degree — specifically a professional or doctorate degree. These groups show increased earnings over white earnings, while American Indians and Hispanics are lagging. This gap may be the result of other social phenomena such as relatively recent entry into the Minnesota job market.

A combination of factors may be creating this difference in wages. For instance, the types of professional degrees blacks hold may be associated with higher earnings compared with the types of professional degrees whites hold. Low earnings for Hispanics with professional degrees compared with the rest of the population could be due to a sampling issue. It could be that the number of blacks and Hispanics with professional degrees in the sample is relatively small. That could trigger a wide variance in earnings for blacks and Hispanics with professional degrees in our sample. Additionally, more women than men may earn higher degrees (vice versa for blacks) which leads to questions regarding gender equity in earnings.

The additional questions raised by these findings warrant future research using this dataset. As it becomes possible to test multiple years or do longitudinal analysis, it could be determined if there are fluctuations in these results over time.

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### Acknowledgements:

The Minnesota Private College Research Foundation thanks the Federal Reserve Bank of Minneapolis for their review and suggestions.