HIGH SCHOOL EDUCATION AND OBESITY:
Is a GED Equal to a High School Degree?

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By

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This thesis is dedicated to
my family, friends, mentors, and professors
who helped me with prayers and great patience along the way.

With many thanks and gratitude,
Lynn Sha
HIGH SCHOOL EDUCATION AND OBESITY:  
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ABSTRACT

Past research has shown that growing rates of obesity may be caused by a wide set of societal factors, ranging from educational attainment to the level of urban sprawl. This paper explores the effect of different levels and types of high school education on adult obesity, as measured through an individual’s Body Mass Index (BMI). Its objective is to determine whether high school education levels could serve as a meaningful predictor of adult obesity.

Using data from the 2005 cohort of the Panel Study of Income Dynamics (PSID), BMI is regressed on an individual male household head’s high school education type and level. Specifically, these categories include: completing high school, passing the General Educational Development (GED) test, or dropping out of high school.

Results demonstrate a complex relationship between education and obesity, particularly among different racial and ethnic groups. Individuals with higher levels of education do appear to experience lower rates of obesity. However, those who obtained a high school degree or GED appear to have a significantly higher chance of becoming overweight compared to those who did not finish high school. This effect is particularly strong for African-Americans.
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INTRODUCTION

Over 60 percent of U.S. adults are considered overweight. At least 30 percent of (59 million) U.S. adults are obese and over 15 percent of children and adolescents are overweight or obese. Linked to 400,000 deaths per year, obesity among adults and children represents one of the most significant public health challenges in the United States and other developed countries (Blackburn, 2005). Obesity is also expensive. The Centers for Disease Control and Prevention (CDC) estimated that in 2000, obesity was directly responsible for $61 billion in medical costs and indirectly responsibly for $56 billion (CDC, 2008).

In the face of such high levels of overweight and obesity throughout the country, public health efforts to lower obesity rates have often focused on educational campaigns to promote healthier diets and increase physical activity. However, these efforts have experienced limited success and as a result, researchers now point to a broader set of potential culprits, including disparities in education, income, and even public transportation as potential factors that can increase the likelihood that certain populations will become overweight or obese.

This study uses data on male household heads from the 2005 cohort of the Panel Study on Income Dynamics (PSID) to show that men with higher levels of educational attainment at the college level generally experience lower rates of obesity. However, male high school graduates and GED-holders appear to
have higher levels of BMI than high school dropouts. This study focuses on male household heads because this population is predominantly male in the PSID.

Researchers have consistently found lower rates of obesity in individuals with college education relative to those with a high school education. But given the wide disparities in education at the high school level, with a growing number of students dropping out of school entirely, more work is needed on adults without college educations and their levels of overweight or obesity.

Understanding the experiences of individuals who do not pursue a college education becomes more important in light of the ambiguous relationship between education, gender, and weight gain. Figure 1 contains a subset of the results from a recent study of 2007 data from the Behavioral Risk Factor Surveillance System by the CDC showed that among men, those with some college education or a high school degree experience the highest rates of obesity. The study also found that more educated women tended to be less overweight while women with less than a high school education experience the highest rates of obesity (CDC, 2008).
Individuals with different types of education at the high school level do seem to experience varying levels of obesity. Disparities in education, skill levels, and other characteristics among high school graduates, recipients of general education development certification (GED), and high school dropouts may lead to significant differences in their BMI levels.

One potential reason for the variations in weight gain in this population could be that individuals who receive a GED or who do not complete high school may face other socioeconomic challenges that may limit their probability of overeating or exercising too infrequently. Previous research has shown that GED holders are generally better off in terms of their overall education, skill level, and parental education than high school dropouts who do not attempt to receive the certification. However, the results in this study indicate that people with GEDs may experience higher rates of obesity than high school dropouts, but slightly lower rates of obesity than high school graduates. These effects also appear to differ significantly by race and ethnicity.

It remains unclear how the obesity rates among GED holders differs with the levels of obesity among high school graduates. While research has shown that school interventions to improve healthy eating and increase exercise can lower obesity rates, schools can also serve as significant contributors to weight gain through their easy access to soft drinks and high-calorie snack foods. Some researchers have
found that the vast majority of high schools in the United States sell soda and junk foods through vending machines and students who are more consistently exposed to these types of food may experience higher levels of obesity.

This paper explores the variation in the level of obesity among male high school dropouts, high school graduates who do not enroll in a college or university, and recipients of GED certificates. The results indicate that men with a GED or a high school degree experience higher rates of obesity than individuals who did not finish high school. These education effects differ significantly by racial and ethnic background and such disparities are particularly strong for African-American men.

**BACKGROUND**

An individual is considered obese when they accumulate body fat of 20 percent or more over their typical body weight. The condition is usually measured by an individual’s Body Mass Index (BMI), a calculation based on their weight and height. Overweight adults typically have a BMI score between 25 and 29.9. Adults with a BMI of 30 or higher are considered obese (CDC, 2009).

Obesity has become a major policy focus because the population of overweight Americans has grown significantly over the last thirty years, increasing the incidence of several chronic diseases, cancers, and other illnesses. As shown in Figure 2, health care costs from obesity represented over 3% to 5% of
medical expenses, or approximately $26.8 to $47.5 billion in 1998; Medicare and Medicaid together paid for almost half of those costs (Finkelstein, et al, 2003).¹

As the percentage of the obese and overweight population in the United States remains high relative to other developed countries, researchers seek to identify the underlying factors affecting an individual’s decisions towards their diet and level of physical activity. While a number of potential characteristics, including race and income, may help to determine the probability of weight gain, the connection between an individual’s level of education and their health status remains unclear.

Studies show that people with college degrees have a lower probability of becoming obese (Lopez, 2004). However, researchers do not yet fully understand

¹ The numbers for the light gray columns are based on data from the 1998 Medical Expenditure Panel Survey combined with the 1996 and 1997 National Health Interview Surveys. The black column is based on health care expenditures data from National Health Accounts (NHA). The MEPS estimates are much lower because they do not include spending for institutionalized populations such as nursing home residents.
how and to what degree a person’s educational attainment affects their future weight gain. Do individuals with more education at any level, including their number of high school years, have a better chance of maintaining a healthy weight? If high school graduates, or individuals with an equivalent level of education (if they possess a GED) have lower weight levels than those individuals who do not complete high school, policymakers may be able to address growing obesity levels by finding ways to give more individuals the opportunity to finish high school or gain a similar level of education.

Given the growing disparity in the quality of U.S. high schools, the potentially difficult task of passing the GED exam, and the many socioeconomic factors that might compel a student to drop out of school, the effects of high school education on weight gain may vary based on the amount and the type of schooling received. If high school graduates, school dropouts, and GED recipients do experience significantly different levels of weight gain or obesity, the underlying reasons for such variations in educational attainment become critical for health care policy as well as educational and economic concerns.

GED recipients represent a distinct population for study in regards to obesity and weight gain. The tests, first developed in 1942 for the military and veterans, are seen as opportunities for individuals who do not finish high school to demonstrate their proficiency of high-school level academic knowledge and skills (Tyler et al, 2000). By 1974, the GED was held in every state. Currently, over 95 percent
of universities and businesses will accept the GED in lieu of a high school diploma (Tyler et al, 2000).

The General Educational Development Testing Service (GEDTS), the administrator of the exam, and state education departments jointly manage the GED program. Most states set higher standards than the minimum established by GEDTS. In 2007, 70 percent of GED test-takers reached 10th grade or higher in their high school education (GEDTS). However, studies indicate that only 60 percent of high school graduates would pass the test on their first try (GEDTS).

The effect of the GED on an individual’s economic status appears to vary significantly by race, perhaps leading to significant effects on their health status. A little over 50 percent of U.S. test-takers are Caucasian and over a third of the test-takers are African-American or Hispanic American. Tyler et al (2000) found that the impact of the GED differed by race, and that Caucasians may see more positive benefits as compared to African-Americans. These disparities may translate into better economic prospects, and improved health outcomes for Caucasians overall.

**Literature Review**

The probability that an individual will become overweight or obese is affected by a wide set of socioeconomic factors, including one’s ethnic background.

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2 Caucasians may experience more economic benefits from the GED than African-Americans in part because more African-Americans may have records of incarceration, thus making them less attractive to employers, regardless of their educational achievements.
geographic location, income level, and living arrangements. Egger and Swinburn (1997) argued for an “ecological” approach to dealing with rising obesity levels that would focus on potential causes beyond biological reasons by including behavioral and environmental perspectives as well.

In 2006, Kenkel et al added to the “ecological” research on obesity by focusing on how variations in high school education effect health outcomes in smoking and obesity. Using data from the National Longitudinal Survey of Youth 1979, they looked at the smoking behavior and obesity levels of high school graduates and GED holders with both two-stage least squares regressions and instrumental variables models. By using education policy variables such as high school graduation requirements and GED policies as their instrumental variables, Kenkel et al were able to test for the effect of high school education and GEDs on their subjects’ behaviors after 20 years. Controlling for social and family backgrounds, as well as cognitive ability, they found that high school graduates did better than GED-holders in reducing their smoking behavior, but that these education levels did not have a statistically significant effect on their obesity levels.

Within the last 15 years, researchers have dramatically broadened their search to look beyond normal risk factors. Mehta and Chang (2008) identified potential causes of obesity outside the typical set of demographic variables, such as the number and type of restaurants in an area as a way of determining whether a neighborhood has a greater proportion of overweight individuals. Lopez
(2000) found a positive correlation between urban sprawl and obesity. More specifically, the connection between education and health has been described by Lleras-Muney (2002), using a quasi-natural experiment showing that education directly affected mortality rates to a larger degree than earlier research had found.

The potential effect of education on obesity is studied or mentioned by a number of researchers in related work. For example, Maher et al (2008) looked at how different types of preschool affected the obesity levels in children before they enter kindergarten. Using a sample of 15,691 first-time kindergarten students from the Early Childhood Longitudinal Study, they regressed the children’s type of primary care on their probability of becoming obese at the beginning of kindergarten. To better understand the effects of child care for children in high risk groups for obesity, they also looked at interactions between ethnicity and income with the type of child care. Except for Latino children, they found that children who attend preschool or daycare have a greater probability of being obese than their counterparts who remain home with their parents.

Obesity levels in the United States vary by race, gender, and age. The National Center for Health Statistics, based in the CDC, found that the populations of Mexican-American and African-American girls were more overweight than Caucasian girls. However, Mexican-American boys were more overweight than both African-American and Caucasian boys. These findings were similar for the adult population, where 45% of African-American adults and 36.8% of
Mexican-Americans are obese, whereas 30% of Caucasian adults are considered obese (CDC, 2006).

A study of over 2,600 students conducted in New York City public schools by Thorpe et al (2004) found that obesity rates were significantly higher among Black and Hispanic children as compared to Caucasian or Asian children. Their results are similar to findings from national studies, but the reasons for the disparities are unclear.

Income and parental education may also play an influential role in determining obesity levels. In a study of obesity and children’s diets, activities, parents, household incomes, and schools, Veugelers and Fitzgerald (2005) surveyed over 4,000 5th grade children, their parents, and their principals in Nova Scotia, Canada to determine the significance of each risk factor for obesity. They found that children in low-income neighborhoods experienced obesity twice as often as their counterparts in high-income areas. They also found that children with parents with relatively higher levels of income and education were less likely to be obese. As a result, they argued that children and schools in low-income areas should receive a greater emphasis in public efforts aimed towards health inequalities. These findings were echoed by Lamerz et al (2005) in Germany who found that the education of a child’s parents was the best predictor of childhood obesity.

A connection between education and obesity was also found by Lewis et al (2005) in a study of middle-aged women. However, they did not see
significant differences by racial groups. Instead, they concluded that education levels were more important in determining obesity rates among women. Using data from the Study of Women’s Health Across the Nation, they analyzed interactions between race and education in three categories (high school or less, some college, and college degree or more) from over 2,000 middle-aged African-American and Caucasian women. Differences in BMI by race were largely determined by the women’s amount of education, with similar BMI levels for both African-American and Caucasian women at the lowest education levels. A study conducted by Molarius et al (2000) in Finland found somewhat similar results. They found that there was an inverse relationship between education and obesity for women; however, for men, lower education was only related to higher body weight in about half of the male sample.

While the mechanism by which education translates into better (or worse) health is not as clearly defined, researchers do believe that school policies can affect the eating habits of their students, and their health as a result. For instance, Flodmark, Marcus, and Britton (2006) reviewed several studies on the role of schools in preventing weight gain and determined that school interventions can have a meaningful impact on the decisions by their students by encouraging them to eat healthier diets and participate in physical activities. At the same time, Finkelstein, Hill, and Whitaker (2008) concluded that high school students could be increasingly exposed to unhealthy foods as they grow older due to the high probability
that there would be easily accessible soft drinks and snacks of low nutritional value within their schools.

Perhaps not surprisingly, proximity to school and parents does have a significant effect of obesity levels. Looking at only higher education populations, Brunt and Rhee (2008) found that obesity rates in students increased if they lived off campus and away from their parents. Their results indicate that the effects of education on obesity rates are not so much a product of more education but may instead result from a different set of social and cultural interactions that college students and graduates experience more often than their counterparts who do not choose to pursue higher education.

Individuals with different levels of educational attainment at the high school level experience variations in their wages and also (theoretically) possess unique social and health experiences as well. For example, Tyler et al (2000) noted that over one million people drop out of school every year and that a third of those individuals will obtain a GED. They observe that the people who have received a GED tend to do better economically than their counterparts who have dropped out of school. Thus, they typically finish more grades before dropping out, have better cognitive skills, and have more educated parents. However, the beneficial effects that might be gained by passing the GED test appear to vary by racial groups, in part because many African-Americans receive their GEDs during a prison sentence,
which could cancel out some of the positive effects of passing the exam (Tyler et al, 2000).

   Education may also affect a person’s perception of their environment by enabling them to earn a higher income and secure better living conditions in a more pleasant neighborhood. Poortinga (2006) found that certain environments, viewed positively, may be more conducive to exercise or any kind of physical activity. Conversely, those who struggle to get by economically might be more likely to see their environments in a negative light. As a result, they might be unwilling to engage in outdoor activities, lowering their overall level of physical activity.

   In the following sections of this paper, I describe the conceptual framework, the data and analysis, and the results of the study. The study concludes with a discussion of the potential policy implications of the findings.

**CONCEPTUAL FRAMEWORK AND HYPOTHESIS**

   Even as a number of studies have identified links between obesity levels and low levels of educational attainment, many questions remain unexplored or misunderstood. For example, previous work has shown that college graduates are less likely to be obese. However, the ways in which education affects a person’s ability to control their health and body weight remains unclear. This study attempts to explain the relationship between education and obesity in more depth by
analyzing the effect of different types and levels of high school education on weight gain by performing an analysis of cross-sectional data from the 2005 cohort of the Panel Study of Income Dynamics.

This analysis estimates predictors of individual obesity for male household heads by using variables that describe an individual’s type and degree of education, income, geographic type (urban/rural), and race in a least-squares regression model. The measure of obesity used in the model is the Body Mass Index (BMI), a widely used measure of body fat based on an individual’s height and weight.\(^3\) This study builds on previous work by further decomposing educational attainment into five categories:

- less than high school (control) individuals who do not enter high school and do not obtain a GED
- senior individuals who drop out of high school during or before their senior year and do not obtain a GED
- high school graduate high school graduates who do not go to college
- GED individuals with a GED
- college high school graduates who go to college

While previous work has focused on general categories of educational attainment, the model presented here is particularly interested in discerning the differences among those who fail to graduate high school, those who graduate high school and those who earn a GED. The analysis is conducted by regressing

\(^3\) BMI is calculated as \((\text{weight(lb)}\times 703)/(\text{height}^2(\text{in}^2))\).
individual BMI (calculated by height and weight variables) on the level and type of high school education, controlling for income, spousal BMI, parental education, state of residence, urban status, and race (Black, Hispanic, or White). Alternative models use a full set of interactions between education, race, and gender variables:

\[ \text{BMI} = \beta_0 + \beta_1(\text{senior}) + \beta_2(\text{high school graduate}) + \beta_3(\text{GED}) + \beta_4(\text{college}) + \beta_5(\text{income level}) + \beta_6(\text{spousal BMI}) + \beta_7(\text{parental education}) + \beta_8(\text{state}) + \beta_9(\text{urban}) + \beta_{10}(\text{Black}) + \beta_{11}(\text{Hispanic}) + \epsilon \]

These models take into account the differences in obesity among racial and ethnic groups found by previous studies. They may demonstrate how educational attainment at the high school level could serve as a good predictor of obesity, controlling for race, ethnicity and income.

Because GED standards can vary from state-to-state, state dummy variables are added to control for state differences and may help eliminate potential biases and correlations with omitted variables.

**DATA AND ANALYSIS**

This study uses data from the 2005 cohort of the Panel Study of Income Dynamics (PSID), a survey based at the Survey Research Center, Institute for Social Research (University of Michigan) that has gathered data on U.S. families and individuals since 1968. The sample size of the PSID has increased from 4,800 families to more than 8,000 records in 2005.
The overall PSID sample is made up of two samples: a cross-sectional national sample and a sample of low-income families. The national sample, conducted by the Survey Research Center (SRC), contains household data from the contiguous 48 states (Hawaii and Alaska are excluded). The sample focused on low-income families is drawn from the Survey of Economic Opportunity (SEO), which is conducted by the Bureau of the Census for the Office of Economic Opportunity. The sample is limited to the Standard Metropolitan Statistical Areas (SMSA’s) in the North and the non-SMSA’s in the Southern region.

While the PSID focuses on families, it also contains detailed information on an individual’s basic health status (such as BMI) and educational attainment, including whether the subject holds a GED. Only men over age 25 are used in the models in this study, to ensure that the results describe the potential relationship between one’s type and level of educational attainment, and their health status in terms of BMI at a later stage of his/her life. However, the data does not preclude the possibility that obesity may cause lower levels of educational attainment.

Summary statistics for the main variables of interest are presented in Table 1. The average BMI for household heads is about 28 which is in between the range of weights considered overweight and approaching levels where individuals are considered obese. The average spousal BMI is 25.65, which is considered overweight. The standard deviation for spousal BMI is quite high at 5.8. However,
the estimates for spousal BMI are subject to reporting error because they are estimated by the household heads on behalf of their spouses.

The three main groups of interest—high school dropouts, high school graduates, and GED recipients—make up 37.5% of the survey participants. High school graduates who do not pursue a college education make up over two-thirds of this population, an overwhelming majority.

Indicator variables are used to measure the effects from state-level influence, urban area residence, and parental education. State dummy variables are included to control for GED requirements which differ by state. The urban residence indicator measures the type of environment where each individual resides (urban versus rural) and is captured through the Beale rural-urban code with 12 categories based on population density and environment. Nearly three-quarters (74%) of the sample population live in an urban area.

Indicator variables are also used to control for parental education levels; 30% of the sample have fathers with some college education and 26% of the subjects have mothers with some college education.

The indicators for race and ethnicity focus on African-Americans and Hispanic Americans since earlier research indicates that these groups face a greater likelihood of obesity. Of the sample included in the regression models, 6% is African-American and 2% are Hispanic or Hispanic-American.
Figure 3 shows the educational backgrounds of these two groups. Among both high school graduates and high school dropouts, African-Americans disproportionately outnumber Hispanic-Americans. However, the opposite
is true for individuals with no high school education, indicating that Hispanics in this sample receive significantly less education compared to other racial groups.

While researchers have shown how a wide range of societal factors may affect an individual’s probability of becoming overweight or obese, several other independent variables and a full set of interacted terms are also included. The data for the other independent variables are drawn directly from the existing sample. Family taxable income is calculated as the sum of total income, transfer income, and social security income in 2004.

**FINDINGS**

Table 2 contains results from the four linear models that estimate the effects of education on BMI. The first two models focus only on the individual’s level of education and do not take into account the educational attainment of the
survey respondents’ parents. The second two models include a dummy variable for
the education levels of the subject’s parents in an attempt to compare the effects of
individual education as compared to parental education, and to eliminate potential
bias in the education coefficients. Model 4 is also the most comprehensive model,
including both parental education and state dummy variables.

All of the models indicate that education has a statistically significant and
negative effect on an individual’s weight. These effects vary considerably by racial
or ethnic group, with noticeably stronger effects for African-American men
compared to Hispanic men. These effects appear to be strongest for individuals who
attended college or dropped out of high school (p=0.01 for every model).

This paper does not examine specific state-level effects, although their
importance is evident when state dummy variables are included in models 2 and 4.
In these models, the coefficients on the education variables increase and the
coefficients on spousal BMI become significant at the 5% level. At the same time,
the coefficients for African-Americans actually decreases by almost a full BMI
point. These effects are similar regardless of whether parental education variables
are included. These models also have a R-squared of 0.15, four percentage points
higher than the models that do not include state indicator variables.

The results are somewhat inconsistent with other research on obesity. At the
high school level, the differences in BMI between high school graduates and GED-
holders are less statistically significant, and may be suspect because of the
small number of individuals with GEDs in the sample. On average, high school graduates appear to have higher BMI levels by 0.55 to 0.92 coefficient points, as compared to GED-holders. However, a joint t-test between GED-holders and high school graduates indicate that the effects of earning a GED or completing high school on BMI are not jointly significant (p = 0.6390).

In comparison to high school dropouts, GED-holders and high school graduates have much higher levels of BMI. While these results are counterintuitive, they are not entirely inconsistent with earlier findings. While high school graduates may be more overweight than high school dropouts is unclear, the economic prospects and future earnings potential for dropouts may have a negative effect on their food intake and require them to engage in less sedentary employment. The more unusual result is the high BMI levels over 32, implicit in the constant in every model, which represents the population of adults who did not attend any high school.

While the results for education and race are similar throughout the four models, the effects of education on obesity appear to be slightly lower for African-American men as compared to the rest of the sample population, except for those who attend college. High school education appears to result in a higher body weight for African-American men; however, they are not overweight or obese. Results from the first model show that those who drop out of high school appear to have an average BMI of 20.01 (p=0.01). African-American high school graduates seem to have a higher BMI of 23.4 and African-American GED holders have a
slightly lower BMI of 23.3. African-American men with some college education have an average BMI of 21.8, slightly higher than high school dropouts but significantly lower than those with high school educations or a GED. The coefficients for African-Americans high school graduates and dropouts are all statistically significant at the 1% level while the coefficients for African-American GED-holders and college attendees are significant at the 5% level.

In every model, the coefficients for the interactions between spousal BMI and education level are statistically significant at the 1 percent level regardless of the subject’s education or racial background. Except for high school dropouts, spousal BMI has a positive effect on BMI. Spousal BMI also has a stronger effect among individuals who have attended college, as compared to every other education group, resulting in nearly a 0.5 increase in BMI.

Models 3 and 4 show that including dummy variables for parental education has a statistically significant effect on BMI. When parental education is present in the model, the coefficients on the education variables decrease, indicating that the education variables appear to be biased upwards. When state variables are included in model 4, the education levels of the father and mother both cause a 0.326 decrease in BMI levels (p=0.05). These findings are consistent with research indicating that parental education has a significant impact on BMI. Previous studies show that this effect is particularly strong for mothers and daughters, an area that is beyond the scope of this paper.
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<td></td>
<td>(3.31)**</td>
<td>(3.47)**</td>
<td>(3.25)**</td>
<td>(3.41)**</td>
</tr>
<tr>
<td>GED-holder and spousal BMI</td>
<td>0.383</td>
<td>0.39</td>
<td>0.372</td>
<td>0.379</td>
</tr>
<tr>
<td></td>
<td>(3.24)**</td>
<td>(3.34)**</td>
<td>(3.15)**</td>
<td>(3.24)**</td>
</tr>
<tr>
<td>possesses some college education and spousal BMI</td>
<td>0.501</td>
<td>0.507</td>
<td>0.487</td>
<td>0.492</td>
</tr>
<tr>
<td></td>
<td>(4.39)**</td>
<td>(4.49)**</td>
<td>(4.26)**</td>
<td>(4.35)**</td>
</tr>
<tr>
<td></td>
<td>(2.83)**</td>
<td>(2.83)**</td>
<td>(2.85)**</td>
<td>(2.79)**</td>
</tr>
<tr>
<td>African-American high school graduate</td>
<td>-7.08</td>
<td>-6.605</td>
<td>-7.021</td>
<td>-6.536</td>
</tr>
<tr>
<td></td>
<td>(3.11)**</td>
<td>(3.13)**</td>
<td>(3.29)**</td>
<td>(3.10)**</td>
</tr>
<tr>
<td>African-American GED-holder</td>
<td>-6.459</td>
<td>-5.76</td>
<td>-6.405</td>
<td>-5.665</td>
</tr>
<tr>
<td></td>
<td>(2.43)*</td>
<td>(2.19)*</td>
<td>(2.41)*</td>
<td>(2.16)*</td>
</tr>
<tr>
<td>African-American with some college education or more</td>
<td>-4.625</td>
<td>-4.158</td>
<td>-4.637</td>
<td>-4.157</td>
</tr>
<tr>
<td></td>
<td>(2.17)*</td>
<td>(1.98)*</td>
<td>(2.18)*</td>
<td>(1.98)*</td>
</tr>
<tr>
<td>Hispanic or Hispanic-American high school dropout</td>
<td>6.052</td>
<td>6.122</td>
<td>6.113</td>
<td>6.179</td>
</tr>
<tr>
<td></td>
<td>(2.41)*</td>
<td>(2.45)*</td>
<td>(2.44)*</td>
<td>(2.48)*</td>
</tr>
<tr>
<td>Hispanic or Hispanic-American high school graduate</td>
<td>3.077</td>
<td>3.613</td>
<td>3.154</td>
<td>3.692</td>
</tr>
<tr>
<td></td>
<td>(1.67)</td>
<td>(1.97)*</td>
<td>(1.71)</td>
<td>(2.02)*</td>
</tr>
<tr>
<td>Hispanic or Hispanic-American GED-holder</td>
<td>10.299</td>
<td>10.906</td>
<td>10.436</td>
<td>11.064</td>
</tr>
<tr>
<td></td>
<td>(4.25)**</td>
<td>(4.53)**</td>
<td>(4.31)**</td>
<td>(4.60)**</td>
</tr>
<tr>
<td>Hispanic or Hispanic-American with some college education or more</td>
<td>1.873</td>
<td>2.436</td>
<td>1.977</td>
<td>2.576</td>
</tr>
<tr>
<td></td>
<td>(1.03)</td>
<td>(1.36)</td>
<td>(1.09)</td>
<td>(1.43)</td>
</tr>
<tr>
<td>high school dropout and lives in an urban setting</td>
<td>1.503</td>
<td>1.62</td>
<td>1.484</td>
<td>1.594</td>
</tr>
<tr>
<td></td>
<td>(1.15)</td>
<td>(1.25)</td>
<td>(1.13)</td>
<td>(1.23)</td>
</tr>
<tr>
<td>high school graduate and lives in an urban setting</td>
<td>-0.399</td>
<td>-0.303</td>
<td>-0.401</td>
<td>-0.306</td>
</tr>
<tr>
<td></td>
<td>(0.33)</td>
<td>(0.25)</td>
<td>(0.33)</td>
<td>(0.25)</td>
</tr>
<tr>
<td>GED-holder and lives in an urban setting</td>
<td>0.325</td>
<td>0.755</td>
<td>0.171</td>
<td>0.593</td>
</tr>
<tr>
<td></td>
<td>(0.24)</td>
<td>(0.56)</td>
<td>(0.12)</td>
<td>(0.44)</td>
</tr>
<tr>
<td>possesses some college education and lives in an urban setting</td>
<td>0.27</td>
<td>0.306</td>
<td>0.277</td>
<td>0.316</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
<td>(0.25)</td>
<td>(0.23)</td>
<td>(0.26)</td>
</tr>
<tr>
<td>father has some college education or more</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-0.265</td>
</tr>
<tr>
<td></td>
<td>-----</td>
<td>-----</td>
<td>(1.65)</td>
<td>(2.02)*</td>
</tr>
<tr>
<td>mother has some college education or more</td>
<td>-----</td>
<td>-----</td>
<td>-0.361</td>
<td>-0.326</td>
</tr>
<tr>
<td></td>
<td>-----</td>
<td>-----</td>
<td>(2.20)*</td>
<td>(1.98)*</td>
</tr>
<tr>
<td>constant</td>
<td>32.238</td>
<td>32.799</td>
<td>32.054</td>
<td>32.661</td>
</tr>
<tr>
<td></td>
<td>(9.96)**</td>
<td>(10.03)**</td>
<td>(9.91)**</td>
<td>(10.00)**</td>
</tr>
<tr>
<td>state dummy variables</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>number of observations</td>
<td>5414</td>
<td>5414</td>
<td>5414</td>
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</tr>
</tbody>
</table>

R-squared 0.11 0.15 0.11 0.15

†Data is reported by spouse and may be subject to reporting error
Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%
POLICY IMPLICATIONS

Nearly a third of all Americans are obese. A larger percentage of the population is overweight. The health care costs associated with obesity and overweight are growing, and most likely unsustainable. The United States will spend roughly over $2 trillion on health care in 2009. Chronic diseases, many of them associated with obesity, lead to 70% of U.S. deaths and represent 75% of these costs. In 2000, the estimated costs from obesity totaled $117 billion (CDC, 2008).

Efforts to restrain health care costs, particularly in Medicaid and Medicare, will most likely increase the focus on preventative measures such as decreasing levels of obesity and overweight. While increasing levels of physical activity and lowering caloric intake remain the most reliable ways of helping people lose weight, public institutions such as local community centers, public libraries, and schools in particular, could play significant roles in helping people to make better choices about what kinds of food to buy, portion sizes, and ways to monitor and prevent weight gain.

More importantly, because both male and female college graduates generally experience lower rates of obesity and overweight, more attention should given to helping students remain in school and pursue other avenues of educational achievement, such as vocational schools or community colleges. Children who remain in school through college or who pursue other advanced training also
have a better opportunity for receiving more health education on how to manage their weight.

A broad perspective towards the connection between health and education could also take into account that increasing participation in higher education while also decreasing the obese population would help to improve the country’s prospects for economic growth by increasing productivity and reducing overall health care costs.

**CONCLUSION AND NEXT STEPS**

This study provides further evidence that levels of education may have a negative correlation with obesity. However, these effects vary significantly by ethnicity and education level. In general, high school graduates seem to have slightly higher levels of obesity as compared to GED holders. For African-American men in particular, the effects of a GED, high school education, and college have varied effects on their levels of weight gain and obesity. Hispanic men, in contrast, may actually be gaining weight as they become more educated.

Further research on obesity and its effect on different population categories is also necessary. A better understanding of obesity trends by gender will help explain why men and women of different racial and education backgrounds have such notable differences in their obesity levels.
As a growing number of individuals pursue a GED as a substitute for a high school diploma, more research on this specific population is necessary to understand what kinds of economic and social returns the certification truly yields. The number of GED-holders in the PSID is quite small in comparison to other education groups, making thorough examination of this population more challenging. For example, specific GED scores may be useful in comparing the certification’s effects across state borders, assuming that the variations in each state’s requirements can be taken into account.

More focused study on state level effects would also be helpful in determining the effects of specific state policies. This is especially important given the differences in how the Medicaid program is administered in each state, and the vulnerable populations targeted by the populations. A two-way fixed effects model, holding states and time constant, may prove to be more effective in cancelling out unobservable characteristics among the population. If this issue becomes important, more work will be required to determine which cohorts may be appropriate to use in addition to the 2005 data.


