Obesity, Self-Esteem and Wages

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I. Introduction

Starting with the seminal work of Mincer (1974), economists have developed theoretical models and empirical procedures to investigate the determinants of wages. In addition to the analysis of the impact of schooling, job tenure and experience, a huge literature investigated the impact on wages of market characteristics and establishment attributes, ranging from industry structure to firm-size (Ferrer and Lluis 2008, Guadalupe 2007, Parent 2004, Troske 1999, Nickell and Wadhwani 1994, Abowd and Lemieux 1993, Main and Reilly 1993, Kruger and Summers 1988). More recently, economists have identified the importance of non-cognitive factors in wage determination. These studies are primarily motivated by the fact that a significant portion of the variation in wages across individuals remains unexplained even after controlling for human capital characteristics as well as job and industry attributes. For example, it has been shown that beauty has a positive impact on wages (Mocan and Tekin, forthcoming, Harper 2000, Biddle and Hamermesh 1998, Hamermesh and Biddle 1994). Mocan and Tekin (in press) argue that the impact of beauty on criminal activity and wages works partly through human capital formation while in high school. They provide evidence indicating that less attractive high school students accumulate less human capital in comparison to their attractive counterparts, which has an influence on wages and labor market activity later in life, and that the impact is stronger for females. Persico, Postlewaite and Silverman (2004) demonstrate that taller workers receive higher wages. This effect can be traced back to their height in high school, and it can be attributed to the impact of height on participation in high school sports and clubs. Similarly, Kuhn and Weinberger (2005) show that leadership skills in high school generate positive wage effects later in life.

The rate of obesity among children aged 6 to 11 in the United States more than doubled in the past 20 years, rising from 6.5% in 1980 to 17.0% in 2006. The rate among adolescents aged 12 to 19 more than tripled, increasing from 5% to 17.6% (Ogden, Carroll, and Flegal, 2008). These epidemic proportions of obesity pose serious social and health problems for both these children and the society. For example, children who are obese are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem (Daniels et al., 2005; U.S. Surgeon General, 2001). About 61% of young people who are obese have at least one additional risk factor for heart disease, such as high cholesterol or high blood pressure (Freedman, 1999). Obese young people are more likely than their normal weight counterparts to become overweight or obese in adulthood, and therefore they are at greater risk for associated adult health problems, including heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis (U.S. Surgeon General, 2001).[1] Because of the public health significance of the problem, significant effort has been devoted to the investigation of the causes and consequences of obesity.

In addition to the health consequences, obesity and overweight are also associated with adverse economic outcomes, such as lower wages. Although research in this area has not reported uniformly robust results, the existing evidence indicates that obesity is usually associated with a wage penalty, especially for white females (Wada and Tekin 2007, Cawley 2004, Baum and Ford 2004, Averett and Korenman 1996). Obesity or overweight may impact wages through different channels. First, in some occupations obesity may have a direct detrimental impact on labor productivity. Second, obesity may cause discrimination by

[1] As a result, Healthy People 2010 - a document developed by leading federal agencies to set the health objectives of the United States for the first decade of the 21st Century - identifies obesity and overweight as one of the ten leading health indicators. The target is to reduce the prevalence of obesity among children and adolescents to less than 5% by 2010.

employers or by customers, which may generate a wage penalty even if there was no productivity difference between obese and non-obese individuals. Third, obesity may lower productivity through its impact on poor health. Furthermore, as obese individuals tend to be less healthy the incremental health care costs associated with obese workers are passed on to these workers by their firms in the form of lower wages (Bhattacharya and Bundorf 2005). Fourth, obesity may influence cognitive function, which in turn would impact productivity and wages. There is recent research which shows that obesity is associated with diminished cognitive function later in life.[2]

Obesity can also impact wages through self-esteem. Mobius and Rosenblat (2006) find that physically attractive workers are more confident, and confidence impacts wages positively. If higher self-esteem increases wages, and if obesity impacts self-esteem, then obesity can have an indirect effect on wages through its impact on self-esteem. As summarized by French, Story and Perry (1995), the relationship between self-esteem and obesity has not been investigated using strong research methodologies. Much of the earlier work relied on associations identified off of cross-sectional and small or non-representative samples. For example, Sallade (1973) analyzed 120 obese and 120 non-obese children in grades 3, 5, 8 and 11. She found that there was no difference between obese and non-obese children in terms of social adjustment, but obese children had poorer self-concept. Wadden et al. (1984) studied 210 obese and normal-weight

[2] For example, Whitmer et al. (2005) used data on more than 10,000 members of the Kaiser Permanente medical care program of northern California who underwent detailed health evaluations from 1964 to 1973 when they were aged 40-45. The results showed that obesity is associated with increased risk of future dementia. Cournot et al. (2006) analyzed more than 2,000 healthy workers aged 32 to 62 years at baseline in 1995 who lived in three southern French regions. In 1996 and 2001 data were collected, among other items, on cognitive function. The results showed that higher BMI was associated with lower cognitive function at baseline, and that higher baseline BMI was related to a greater decline in word-list recall at follow-up, after adjusting for confounding factors.

children in grades 3 to 8, and did not find significant differences in self-concept between obese and normal-weight children.

More recently, researchers utilized prospective longitudinal designs to determine the temporal sequence of obesity and self-esteem. Gortmaker et al. (1993) used a nationally-representative sample of 10,039 individuals who were 16 to 24 in 1981, and were followed-up in 1988. They could not find a relationship between overweight and self-esteem. Strauss (2000) analyzed the National Longitudinal Survey of Youth, and found that the global self-esteem scores were not significantly different among 9-to-10 year old obese and non-obese children. However, over a 4-year period obese Hispanic females and obese white females demonstrated lower levels of self-esteem in comparison to their non-obese counterparts; and small decreases in self-esteem were observed for boys. Biro at el. (2006) used data on 2,379 girls ages 9 and 10 who were recruited into the National Heath, Lung and Blood Institute Growth and Health Study, and who were followed to age 22 years. They found that BMI was an important predictor of self-esteem. Similarly, Hesketh, Wake and Waters (2004) reported that overweight/obesity precedes low self-esteem in a prospective cohort study of 1,157 elementary school children in Australia.

Although conceptually plausible, empirical evidence on the impact of low self-esteem on the development of obesity in children has not been established convincingly. As described by Hesketh, Wake and Waters (2004), longitudinal research on the causal impact of self-esteem on obesity is extremely limited. For example, in a small sample of white children, who were observed for three years after the baseline assessment, Klesges et al. (1992) reported that self-esteem did not predict future body fat levels. Along the same lines, Hesketh, Wake and Waters

(2004), found that after accounting for baseline BMI, poorer parent-reported baseline self-esteem did not predict higher BMI scores at follow-up.

In this paper we investigate whether obesity/overweight has an impact on the self-esteem of young adults. We also investigate the extent to which self esteem and obesity influence wages. Section II describes the empirical specifications employed in the paper. Section III provides information about the data. Section IV presents the results, and Section V is the conclusion.

II. Empirical Specification

The benchmark specification we estimate is of the following form:

$$(1) \qquad S_i = \alpha + \delta B_i + \mathbf{X}_i \boldsymbol{\beta} + \varepsilon_i,$$

where S_i stands for a measure of self-esteem for person *i*, B_i is a measure of obesity, and **X** stands for a vector of personal characteristics that may impact self-esteem. As explained in the data section below, we define self-esteem in a number of alternative ways. Similarly we employ multiple measures of obesity. Versions of Equation (1) will be estimated using data on young adults.

Although research could not identify an impact of self-esteem on body weight for children, we cannot rule out the possibility of reverse-causality from self-esteem to obesity. To address this potential confounding, models as depicted by equation (2) below are estimated

$$(2) \qquad S_i = \alpha + \delta B_{i,t-5} + \mathbf{X}_i \boldsymbol{\beta} + \varepsilon_i,$$

where $B_{i,t-5}$ stands for obesity measured 5-to-6 years earlier (baseline obesity). In this specification, past obesity impacts current self-esteem, but current self-esteem does not influence the extent of obesity five years earlier.

Equation (3A) below conjectures that the level of self-esteem in year *t* (S_{it}) is determined by obesity in the past ($B_{i,t-5}$), and the extent of obesity in more distant years. If $\lambda<1$, then the influence of past obesity is getting smaller in more distant past.

(3A) $S_{it} = \alpha + \pi B_{i,t-5} + \lambda \pi B_{i,t-6} + \lambda^2 \pi B_{i,t-7} + \lambda^3 \pi B_{i,t-8} + \ldots$

Multiplying (3A) by λ and lagging by one period gives

(3B) $\lambda S_{i,t-1} = \lambda\alpha + \lambda\pi B_{i,t-6} + \lambda^2 \pi B_{i,t-7} + \lambda^3 \pi_{i,t-8} + \ldots$

Subtracting (3B) from (3A) and re-arranging the terms yields

(4) $S_{it} = \gamma + \lambda S_{it-1} + \pi B_{i,t-5} + \omega_i$

where $\gamma=\alpha(1-\lambda)$, and ω captures the impact of very distant obesity. We augment equation (4) by individual-level control variables. As will be explained in the data section below, self-esteem is measured five years apart; thus we estimate equation (5) below.

(5) $S_{it} = \gamma + \lambda S_{i,t-5} + \pi B_{i,t-5} + \mathbf{X}_i \boldsymbol{\Omega} + \eta_i$

Finally, we estimate Equation (6),

(6) $W_i = \mu + \varphi S_i + \xi B_i + \mathbf{X}_i \boldsymbol{\Psi} + \nu_i$,

where W stands for the wage rate of the young adult. This specification analyzes the extent to which self-esteem has an impact of wages, controlling for the impact of obesity. As mentioned above, models will be estimated using different measures of self-esteem and obesity.

Convincing causal inference on obesity-wages relationship could be obtained from analysis of experimental data. However, in this context such data do not exist because it is obviously unethical to design such an experiment where obesity and self-esteem are exogenously manipulated. In the absence of an experimental design, potential endogeneity issues can be addressed in different ways. An instrumental variable that is correlated with the explanatory variable, but uncorrelated with the outcome variable is one potential solution. However, it is

difficult to find an instrument which is conceptually and empirically feasible. For example, it is plausible to think of a sibling's body mass index (BMI) as an instrument for the other sibling's BMI as they are likely to be correlated. However, if BMI is influenced by unobserved family, school and contextual factors that affect both siblings, then one sibling's BMI might proxy these factors and therefore would have a direct impact on the outcome (e.g. wages) of the other sibling, raising questions about the validity of the instrument.

Other potential instruments of BMI include school-based variables. For example, the existence of certain school programs and facilities, such as nutrition classes and athletic facilities, can be thought of as being correlated with the students' BMI but uncorrelated with their future economic outcomes. But even in this case it can be hypothesized that children are not distributed randomly across schools and certain difficult-to-observe family attributes, which may be correlated with school characteristics, may also have a direct impact on children's future wages. Nevertheless we used school characteristics as instruments for obesity. Unsurprisingly, the first-stage regressions did not have power, indicating that school characteristic are poor instruments for obesity in our data set.

An alternative procedure to control for unobserved heterogeneity that may be correlated with obesity is to include a large number of control variables in vector **X**. Following this strategy, our regressions includes variables such as age, gender, race and ethnicity, education, health status of the individual, whether the person was born in the U.S., and whether the respondent's father was every jailed. Also included are the scores obtained from the Add Health Peabody Picture Vocabulary Test as a measure of cognitive ability. We also control for state fixed effects that would capture any differences across states in policies towards children that may be correlated with both obesity and self-esteem. Controlling for these characteristics and

using lagged obesity as an explanatory variable should diminish the concerns for a bias, although it is unlikely that all unobserved heterogeneity is accounted for.

III. Data

The data are drawn from the National Longitudinal Study of Adolescent Health (Add Health). Add Health was specifically designed to study adolescents' health and risk behaviors and it is considered to be the largest and most comprehensive nationally representative survey of adolescents ever undertaken in the United States.[3] An in-school questionnaire was administered to 90,118 students in grades 7 through 12 between September 1994 and April 1995. All students who completed the in-school questionnaire and those who did not complete a questionnaire but were listed on a school roster were eligible for a more detailed in-home interview, which constituted the Wave I of Add Health. The Wave I in-home interviews were conducted with 20,745 adolescents and 17,700 parents between April 1995 and December 1995. Wave II was implemented with about 14,738 Wave –I respondents between April 1996 and August 1996. Between July 2001 and April 2002, a third wave was conducted with the original Wave I respondents who could be located and re-interviewed as well as a sample of the partners of the original respondents for a total of 15,197 young adults. [4] Our primary sample is drawn from Wave III respondents.

We construct multiple measures of self-esteem. Our first measure is based on replies to a series of questions that the respondents were asked about their self-image in Wave III. These

[3] The Add Health is a program project designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris, and funded by a grant P01-HD31921 from the National Institute of Child Health and Human Development, with cooperative funding from 17 other agencies. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Persons interested in obtaining data files from Add Health should contact Add Health, Carolina Population Center, 123 W. Franklin Street, Chapel Hill, NC 27516-2524 (addhealth@unc.edu).

[4] Finally, Wave IV is being conducted with the original Wave I respondents in 2007-2008. The data from Wave IV have not been released yet.

include questions about how satisfied the respondent was with his/her life as a whole, whether the respondent agreed or disagreed that he/she had many good qualities, whether the respondent agreed or disagreed that he/she had a lot to be proud of, whether the respondent agreed or disagreed that he/she liked himself/herself just the way he/she was, and whether the respondent agreed or disagreed that he/she felt he/she was doing things just about right. The answers to the first question included the following values: (1) if very satisfied; (2) if satisfied; (3) if neither satisfied nor dissatisfied; (4) if dissatisfied; and (5) if very dissatisfied. The possible responses to the other four questions were (1) if strongly agree; (2) if agree; (3) if neither agree nor disagree; (4) if disagree; and (5) if strongly disagree. We created a single scale from these items after reverse coding each of them, scores ranging from 5 to 25. Higher scores indicate higher self-esteem. The items used in constructing this scale are either identical or very similar to the Rosenberg Self-Esteem Scale, which is a 10-item self-report measure of global self-esteem (Rosenberg, 1965). The Rosenberg Self-Esteem Scale is one of the most extensively used instruments to assess self-esteem (Swallen et al. 2005; Martin-Albo et al., 2007; Galliher, Rostosky, and Hughes, 2004; Russell et al., 2008). We constructed a binary indicator that takes on the value of 1 if the respondent falls into the top 90^{th} percentile in the distribution of this scale, i.e., the respondent is in the top 10 percent with the highest self-esteem. This variable is called *Very High Self-Esteem*. We also created a binary indicator, called *High Self-Esteem*, to represent whether the respondent falls into the top 75^{th} percentile. We created one additional binary indicator to measure self-esteem. Each respondent was asked to assess his/her own confidence in a question "How confident are you of yourself?" Possible responses to this question included "very confident", "moderately confident", "slightly confident", and "not confident at all". We constructed a binary variable for being "very confident".

In some of our specifications, we use self-esteem measures from Wave II of the Add Health. Similar to Wave III, Cut-off values for the 90th and 75th percentiles of the Rosenberg Self-Esteem Scale are constructed using responses to the relevant questions asked in Wave II. These include questions about the respondents' assessment of whether he/she has a lot of good qualities, feels socially accepted, feels like he/she is doing everything just about right, feels loved and wanted, likes himself/herself just the way he/she is, and has a lot to be proud of.[5]

Our obesity measure is based on Body Mass Index (BMI). BMI is a universally accepted measure of obesity, defined as the ratio of weight in kilograms to height in meters squared. The main reason for the wide-spread use of BMI is its ease of calculation since most data sets used in socio-economic research contain the necessary information on height and weight. The World Health Organization (WHO) sets the universally accepted cut-off points for classification of overweight and obesity. An individual with a BMI of less than 18.5 is considered underweight, a BMI between 25 and 30 classifies the person as being overweight, while an individual with a BMI of 30 or higher is considered obese. Both self-reported and measured values of height and weight of respondents are available in Wave III of Add Health. Although the BMI values derived from self-reported and measured height and weight exhibit high correlation in our sample, we use the BMI derived from the measured height and weight. This allows us to avoid any spurious correlation that may result from respondents' misreporting their height and weight due to their self-esteem.

Note that for children and teens, the ranges of BMI that pertain to above a normal weight are defined so that they take into account normal differences in body fat between boys and girls and differences in body fat at various ages (Centers for Disease Control and Prevention (CDC, 2008). Therefore, although BMI is calculated the same way for children and adults, the criteria

[5] We could not construct a variable for being "very confident" because that question was not asked in Wave II.

used to classify children and teens (between ages 2 and 20) are different from those used for adults. Specifically, CDC recommends the use of CDC BMI-for-age growth charts for girls and boys for those 20 and younger. These are a series of percentile curves that illustrate the distribution of BMI for children and most of the data used to construct these charts come from the National Health and Nutrition Examination Survey (CDC, 2008). The Add Health respondents are between ages 18 and 26 in Wave III. Therefore, we limited our sample to those who are older than 20 when we employed data from Wave III. To classify the respondents by their weight when they were younger (in Wave II), we used the CDC growth charts for each person.

Table 1 displays the descriptive statistics. Test Score1-5 stand for dichotomous variables to indicate the quantile that the score belongs. For example, if the test score of the person is at the bottom 20% of the test score distribution, *Test Score 1* takes the value of 1, and zero otherwise. *Healthy* takes the value of one if the respondent indicated that he/she is in good health or better. *Father Jailed* is equal to one if the father was ever jailed, and zero otherwise. Table 1 also reports the means of the variables by self-esteem category. The stars next to the means indicate that the means are different between the groups. For example, the average hourly wage for the with very high self-esteem is $11.78, while the average wage for those who do not have very high self-esteem is $11.13 and the difference is statistically significant.
Males have higher self-esteem than females, regardless of the self-esteem measure, BMI and self-esteem are negatively correlated.

IV. Results

BMI and Self-Esteem

Table 2A displays the results obtained from the model depicted in equation (1), where self-esteem of young adults (ages 21 to 26) is explained by BMI and other explanatory variables. Each specification reported in this table and in all other tables includes state fixed-effects. Robust standard errors are reported in parentheses under the coefficients. Column I reports the results of the model where *Very High Self-esteem* is the dependent variable. This is a dichotomous variable that takes the value of 1 if the person is ranked in the top 10% of the self-esteem distribution, and zero otherwise. Race, age and test scores have no statistically significant impact on self-esteem. However, Hispanic ethnicity increases the probability of having high self-esteem by about 3 percentage points. Those with a junior college, bachelor's or master's degree have higher self-esteem in comparison to those who have a high school education or less. Healthier individuals have higher self-esteem. Males are 4 percentage points more likely to have very high self esteem than females.

An increase in BMI is associated with a decrease in high self-esteem. One-standard deviation increase in BMI (6.13) lowers the probability of having very high self-esteem by about 1 percentage point, which represents a 9% decline from the baseline. Column III displays the results of the model where *High Self-esteem* is the dependent variable, which is a dichotomous variable which takes the value of 1 if the if the person is ranked in the top 25% of the self-esteem distribution, and zero otherwise. The results are very similar to those reported in column I.

In alternative specifications, displayed in columns II and IV, we estimate models by including linear and quadratic BMI terms to investigate potential non-linear impact of BMI on self-esteem. In each case, the linear term has a negative coefficient and the quadratic term's

coefficient is positive, but neither is significantly different from zero. However the hypotheses of joint significance of the linear and quadratic BMI terms were rejected in each case. Columns V and VI present the results obtained from the models where the dependent variable is whether the person has very high confidence. As column V shows, an increase in BMI has a negative impact on confidence with the same magnitude as the ones reported in case of self-esteem.

To estimate a more flexible functional form, we classified BMI into 4 mutually-exclusive categories and used three of these indicators as explanatory variables. In table 2B we report estimation results obtained from these specifications. *Underweight* takes the value of 1 if the person's BMI is less than 18.5, and zero otherwise. *Overweight* is one if BMI is between 25 and 30, inclusive; and *Obese* takes the value of 1 if BMI is greater than 30. The results demonstrate that the most significant impact on self-esteem is obtained from belonging to the *Obese* category. Specifically, being obese (BMI>30) decreases the probability of having high or very high self-esteem by about 2.4 percentage points. Being obese also reduces the probability of being very confident by 2.1 percentage points.

To investigate the sensitivity of the results to the manner in which individuals are classified into high self-esteem and low self-esteem categories, we estimated two ordered-probit models. Each model contains the same set of explanatory variables as employed in Tables 2A and 2B. The first model categorizes self-esteem into four groups: i) if the person self-esteem score is less than 20, ii) if the self-esteem score is 20 or 21, iii) if the self-esteem score is 22 or 23, iv) if the self-esteem score is 24 or 25. Twenty-three percent of the observations belong to the first category, about 34 percent are in the second group, 21 percent are in the third group, and 23 percent are in the fourth group. In the second specification we categorized the young adults' self-esteem onto three groups: i) those with self-esteem score less than 20 (23 percent of the

sample), ii) those with a score of 20, 21 or 22 (44 percent of the sample) and iii) those with a score greater 23 or greater (33 percent of the sample).

Table 3A presents the marginal effects of the continuous measure of BMI (the top panel) and the marginal effects of the dichotomous BMI indicators (the bottom panel) that are calculated after estimating the ordered-probit models where self-esteem is classified into four categories. An increase in BMI increases the probability of belonging to the bottom two self-esteem categories, and it decreases the probability of being in the top two groups of self-esteem distribution. The same result in obtained when using the dichotomous BMI variables, and the statistically significant impact stems from being obese.

Table 3B displays the same information with one difference: the dependent variable is based on a 3-way categorization of self-esteem. As in Table 3A, an increase in BMI reduces the probability of having high self-esteem (being in the top 33% of the self-esteem distribution), and it increases the probability of belonging to low-self-esteem groups.

In Table 4 we display the results obtained from estimating versions of Equation (2). Here, to minimize the concern of reverse causality from self-esteem to BMI, we explain the current self-esteem of the young adult (measured in the third wave of the survey) with his/her BMI measured 5-to-6 years ago (in the second wave of the survey). Columns I, II and III reveal that past BMI has a statistically significant impact on current self-esteem. Furthermore, the magnitude of BMI coefficient is the same as those reported in Table 2A.

Columns IV and V of Table 4 display the results of the models depicted in Equation (5), where current self-esteem is expressed as a function of past self-esteem and past BMI. This specification cannot be estimated when *Very Confident* is the dependent variable because the variable *Very Confident* is not available in the second wave of the survey. Having high self-

esteem (very high self-esteem) in the past increases the likelihood of having high self-esteem (very high self-esteem) in the present. Keeping constant past self-esteem, an increase in BMI in the past is associated with a decrease in self-esteem today. The impact of past BMI on current self-esteem is smaller in specifications which control for past self-esteem (columns IV and V) in comparison to the models that do not control for past self-esteem (columns I, II and III).

The bottom panel of Table 4 presents the results obtained from models where self-esteem and confidence indicators are explained by weight indicators in the past (5-6 years earlier) as well as past self-esteem indicators. Past weight indicators are based on height and weight measured in Wave II when the subjects were 15 to 20 years of age. Thus, the classifications are based in CDC growth charts. Here, underweight indicates that the teenager belonged to the bottom 5% of the distribution for age in wave II. He/she is considered overweight if the BMI was between 85^{th} and 95^{th} percentiles; and obese if the BMI was equal to greater than the 95^{th} percentile. The left-out category in the regressions is health weight (BMI between 5^{th} and 85^{th} percentiles). The results demonstrate that obesity in the past has a negative impact on current self-esteem. Being overweight and being underweight also reduce self-esteem although the significance of the coefficients is spotty.

The Impact on Wages

Equation (6), which formulates the relationship between wages, obesity and self-esteem is estimated using the logarithm of wages reported by young adults in wave III. In addition to state fixed-effects, the wage regressions include 22 occupation dummies to control for the impact of individuals' occupations in their wages. Table 5 reports the benchmark specification where wages are explained by human capital attributes of the young adults as well as by their self-

esteem. The results show that having a GED degree increases wages by 6 percent in comparison to having no high school diploma, and high school diploma has an 8% wage premium. The impact of a junior college degree on wages is a 14 percent increase. Those with a bachelor's degree earn about 28 percent higher wages in comparison to those who have no high school degree and the premium associated with a master's degree is about 41 percent. Holding constant education, higher test scores have a positive monotonic impact on wages, indicating that cognitive ability, measured by test scores, is rewarded in the market, in addition to the level of education acquired. Having been born in the U.S. is associated with a 2.3 percent wage premium and being healthy increase wages by about 7 percent.

Table 5 also shows that holding all else constant, having high self-esteem is associated with wages that are 2-3 percent higher. This result is consistent with recent research that has demonstrated the important of non-cognitive skills in wage determination. Table 6A estimates the same models with one difference: in these models we include BMI as another explanatory variable. The results imply that a one-standard deviation increase in BMI is associated with a 1.2 percent reduction in wages. A comparison with Table 5 shows that adding BMI does not impact the coefficients of other variables meaningfully. When the impact of BMI is controlled for, the coefficients of self-esteem decline slightly. Specifically, the impact of self-esteem is 12-to-14 percent smaller when the model includes BMI. Table 6B is similar to table 6A, but instead of employing BMI as a continuous measure, we use three dichotomous variables that classify individuals into 4 weight categories, as was done before. This specification does not alter the estimated impact of self-esteem on wages, and the results show that the negative impact of BMI on wages is primarily due to being in the *Obese* category.

Table 7 display the results that are obtained from the models where logarithm of wages are regressed on the same set of explanatory variables, including current self-esteem measures, but that also control for past BMI (BMI measured 5-to-6 years ago). Past BMI has a negative impact on current wages and the positive impact of self-esteem on wages remains robust.

Race and Gender-specific Analyses

To investigate how the relationship between BMI, self-esteem and wages differ by race and gender, we estimated the models for the following four groups: black females, black males, white females, and white males. Each model contains the same set of explanatory variables as used in other models, including the indicator variable for Hispanic ethnicity. Such a breakdown is potentially important because previous research failed to find a consistent relationship between BMI and wages, other than those for white females, suggesting that the strength of the association between self-esteem, BMI and wages may differ between race and gender groups.

Table 8 summarizes the results of the race and gender-specific self-esteem regressions. The models include full set of controls as in previous regressions, but they are not reported in the interest of space. In each panel we report the estimated coefficients of BMI and the corresponding standard error. The top panel demonstrates that BMI has a negative and statistically significant impact on self-esteem in case of black females. BMI has a negative impact of Black men's self-esteem as well, although most of the estimates are not statistically significant at conventional levels. The bottom panel displays the BMI effects for whites. In case of while females, there is a negative association between BMI and self-esteem in every specification. For white males, BMI has no impact on self-esteem. When BMI is measured by a

set of dichotomous indicators in the bottom panel, it exhibits an unexpected positive coefficient for white males.

Table 9 reports the BMI and self-esteem estimates obtained from the specifications where self-esteem is explained by past BMI and past self-esteem. The results of this specification are largely consistent with those reported in Table 8. The impact of BMI is estimated with less precision for black females. But, the point estimates of BMI in the models for *High Self-Esteem* and *Very Confident* are almost the same as those reported in Table 8, and the coefficient of *Past BMI* in the High Self-Esteem equation that controls for *Past High Self-Esteem* is borderline significant (p=0.15). In case of black males, the specifications reveal a negative impact of BMI on self-esteem that is consistently significant. The same is true for white females. In case of white males, on the other hand, the estimated coefficients of BMI are mostly positive, small in absolute value and never statistically significant. Thus, the results presented in Tables 8 and 9 indicate that BMI has a negative impact on self-esteem in case of females (both white and black), as well as black males. BMI does not seem to influence the self-esteem of white males in a meaningful way.

Table 10 presents the results obtained from estimating wage regressions, separately for race and gender groups. As before, each regression includes a complete set of control variables, state and occupation dummies; but in the interest of space, we only report the BMI and self-esteem coefficients obtained from eight separate regressions. In each regression, the dependent variable is the logarithm of the wage rate of the young adult reported in Wave 3 of the survey. In the top two panels of the table the BMI and self-esteem variables pertain to those reported in Wave 3. The bottom two panels of the table report the specifications which employ past BMI or weight category dummies based on past BMI.

Columns I and II of Table 10 indicate that there is some evidence that deviations from "normal" body weight has a negative impact on wages of black females and black males. Note that, similar to the coefficients of obese, the coefficients of underweight are negative, indicating a wage penalty for being underweight, although the effect is statistically significant for males only in the top panel. The coefficients are estimated with less precision in regressions for black females. However, it should be noted that these race-and-gender specific samples are not large, and most of the coefficient are borderline significant. For example, the coefficient of BMI in the top panel for black females has a p-value of 0.147; and in the bottom panel, the coefficient of *Underweight in the Past* for black females has a p-value of 0.105.

Self-esteem has no meaningful impact on black wages. The estimated coefficients in columns I and II are never significant, their standard errors are large and the point estimates are negative in case of black females. Columns III and IV of Table 10 demonstrate that white females' wages are impacted by both self-esteem and BMI. Wages of white males, on the other hand, are influenced by their self-esteem, but not by their body weight.

These results indicate that, with exception of white men, deviations from a body weight that is considered healthy are associated with a wage penalty. Being obese is associated with lower wages, and there is some evidence indicating that the same is true for being underweight. Self-esteem has an impact on wages for white females, and obesity has an impact on self-esteem. Thus, for white females obesity has a direct impact on wages and an indirect impact through self-esteem.

V. Conclusion

The results indicate that among a nationally representative sample of young American adults who were in the age range of 21 to 26 in 2001-2002, body weight has an independent impact on self-esteem controlling for a host of personal attributes, including education, health status and test scores. Specifically, being overweight or obese has a negative influence on the probability of having high self-esteem for females (both white and black) and for black males. There is no evidence of an impact of body weight on self-esteem in case of white men.

Wages of black men and black women are influenced by their body weight. Although not uniformly statistically significant, there is a wage penalty for being obese and there is some evidence of a wage penalty for being underweight in case of blacks. Self-esteem has no impact on black wages.

The results indicate that for both white men and women, self-esteem has an impact on wages. Having high self-esteem is associated with a 3 percent wage premium. White women's wages are also influenced by their bodyweight, while body weight does not impact white men's wages. The results suggest that obesity has the most serious impact on white women's wages, because their wages are affected directly by obesity and indirectly through the impact of obesity on self-esteem, although the magnitude of the wage penalty that emerges through this second channel is small.

Table 1
Descriptive Statistics

	Whole Sample	Very High Self-Esteem=1	Very High Self-Esteem=0	High Self-Esteem=1	High Self-Esteem=0	Very Confident =1	Very Confident =0
	I	II	III	IV	V	VI	VII
High Self-Esteem	0.327	1.000***	0.241	1.000***	(0.000)	0.489***	0.179
	(0.469)	(0.000)	(0.428)	(0.000)	(0.000)	(0.500)	(0.383)
Very High Self Esteem	0.113	1.000***	(0.000)	0.345***	(0.000)	0.191***	0.042
	(0.316)	(0.000)	(0.000)	(0.475)	(0.000)	(0.393)	(0.201)
Rosenberg Index	21.053	25.000***	20.552	24.032***	19.609	22.138***	20.081
	(2.767)	(0.000)	(2.529)	(0.810)	(2.158)	(2.361)	(2.737)
Very Confident	0.475	0.804***	0.433	0.712***	0.360	1.000***	(0.000)
	(0.499)	(0.398)	(0.496)	(0.453)	(0.480)	(0.000)	(0.000)
Wage	11.200	11.780***	11.126	11.572***	11.013	11.317	11.126
	(5.500)	(6.057)	(5.422)	(5.745)	(5.364)	(5.621)	(5.420)
BMI	26.552	25.912***	26.633	26.280***	26.684	26.462	26.601
	(6.128)	(5.528)	(6.196)	(5.882)	(6.241)	(5.896)	(6.296)
Male	0.485	0.565***	0.475	0.521***	0.468	0.548***	0.428
	(0.500)	(0.496)	(0.499)	(0.500)	(0.499)	(0.498)	(0.495)
Age21	0.211	0.237**	0.207	0.212	0.210	0.219**	0.203
	(0.408)	(0.426)	(0.405)	(0.409)	(0.407)	(0.414)	(0.402)
Age22	0.250	0.236	0.252	0.253	0.249	0.253	0.246
	(0.433)	(0.425)	(0.434)	(0.435)	(0.433)	(0.435)	(0.431)
Age23	0.251	0.229*	0.254	0.244	0.254	0.241**	0.259
	(0.434)	(0.420)	(0.435)	(0.429)	(0.436)	(0.428)	(0.438)
Age24	0.210	0.214	0.210	0.212	0.209	0.203**	0.220
	(0.407)	(0.410)	(0.407)	(0.409)	(0.407)	(0.402)	(0.414)
Age25	0.067	0.073	0.067	0.069	0.066	0.072*	0.063
	(0.250)	(0.260)	(0.249)	(0.254)	(0.249)	(0.259)	(0.243)
Age26	0.009	0.010	0.009	0.008	0.009	0.009	0.009
	(0.095)	(0.099)	(0.094)	(0.092)	(0.096)	(0.095)	(0.093)

Table 1 Continued

	Whole Sample	Very High Self-Esteem=1	Very High Self-Esteem=0	High Self-Esteem=1	High Self-Esteem=0	Very Confident =1	Very Confident =0
	I	II	III	IV	V	VI	VII
Hispanic	0.177	0.193	0.175	0.180	0.176	0.192***	0.165
	(0.382)	(0.395)	(0.380)	(0.385)	(0.381)	(0.394)	(0.371)
Hispanic Missing	0.002	0.002	0.002	0.002	0.002	0.002	0.001
	(0.040)	(0.040)	(0.039)	(0.041)	(0.039)	(0.042)	(0.038)
White	0.650	0.637	0.652	0.615***	0.667	0.595***	0.707
	(0.477)	(0.481)	(0.476)	(0.487)	(0.471)	(0.491)	(0.455)
Black	0.216	0.239**	0.213	0.262***	0.194	0.280***	0.150
	(0.411)	(0.427)	(0.409)	(0.440)	(0.395)	(0.449)	(0.357)
Other Race	0.117	0.108	0.118	0.106**	0.122	0.104***	0.129
	(0.321)	(0.311)	(0.322)	(0.308)	(0.327)	(0.305)	(0.335)
Test Score 1	0.200	0.198	0.200	0.205	0.197	0.238***	0.162
	(0.400)	(0.399)	(0.400)	(0.404)	(0.398)	(0.426)	(0.368)
Test Score 2	0.207	0.169***	0.212	0.197*	0.212	0.216**	0.196
	(0.405)	(0.375)	(0.409)	(0.398)	(0.409)	(0.412)	(0.397)
Test Score 3	0.144	0.142	0.144	0.138	0.146	0.142	0.146
	(0.351)	(0.349)	(0.351)	(0.345)	(0.353)	(0.349)	(0.354)
Test Score 4	0.214	0.235*	0.211	0.213	0.214	0.193***	0.234
	(0.410)	(0.424)	(0.408)	(0.409)	(0.410)	(0.394)	(0.424)
Test Score 5	0.202	0.209	0.201	0.201	0.202	0.175***	0.230
	(0.401)	(0.407)	(0.401)	(0.401)	(0.402)	(0.380)	(0.421)
No degree	0.088	0.064***	0.091	0.070***	0.097	0.102***	0.074
	(0.284)	(0.245)	(0.288)	(0.255)	(0.296)	(0.302)	(0.262)

Table 1 Concluded

	Whole Sample	Very High Self-Esteem=1	Very High Self-Esteem=0	High Self-Esteem=1	High Self-Esteem=0	Very Confident =1	Very Confident =0
	I	II	III	IV	V	VI	VII
GED	0.073	0.064	0.074	0.062***	0.078	0.075	0.070
	(0.260)	(0.245)	(0.262)	(0.241)	(0.269)	(0.264)	(0.256)
High School Degree	0.606	0.603	0.607	0.608	0.605	0.604	0.607
	(0.489)	(0.489)	(0.489)	(0.488)	(0.489)	(0.489)	(0.489)
Junior College Degree	0.084	0.085	0.084	0.086	0.083	0.081	0.088
	(0.277)	(0.279)	(0.277)	(0.280)	(0.276)	(0.273)	(0.283)
Bachelors Degree	0.139	0.168***	0.136	0.163***	0.128	0.129***	0.151
	(0.346)	(0.374)	(0.342)	(0.369)	(0.334)	(0.335)	(0.358)
Masters Degree	0.009	0.016***	0.008	0.010	0.008	0.009	0.010
	(0.094)	(0.124)	(0.089)	(0.100)	(0.090)	(0.092)	(0.097)
Healthy	0.956	0.983***	0.952	0.977***	0.946	0.967***	0.944
	(0.205)	(0.130)	(0.213)	(0.150)	(0.227)	(0.177)	(0.229)
Father Jailed	0.134	0.114**	0.136	0.122**	0.139	0.142**	0.126
	(0.340)	(0.318)	(0.343)	(0.328)	(0.346)	(0.349)	(0.332)
U.S. Born	0.905	0.903	0.906	0.906	0.905	0.902	0.907
	(0.293)	(0.297)	(0.292)	(0.292)	(0.293)	(0.297)	(0.290)
N	10,843	1,222	9,621	3,541	7,302	5,042	5,578

Standard deviations are in parentheses. The number of observations for the variable *Very Confident* is 10,620, 1,196, 9,424, 3,467 and 7,153, respectively in columns I to V. It is equal to "N" in columns VI and VII. The number of observations for *Wage* is 7,089, 795, 6,294, 2,369, 4,720, 3,305 and 3,670 in I to VII, respectively. ***, ** and * indicate p-values less than 0.01, 0.05 and 0.1 for the test of the equality of means between groups in columns II & III, IV & V, and VI and VII.

Table 2A
Determinants of Self-Esteem

	Very High Self- Esteem		High Self-Esteem		Very Confident	
	I	II	III	IV	V	VI
BMI	-0.002***	-0.001	-0.002***	-0.001	-0.002**	0.008
	(0.0005)	(0.003)	(0.001)	(0.005)	(0.001)	(0.005)
BMI^2		0.00001		0.00001		-0.0002*
		(0.00005)		(0.00007)		(0.0001)
Male	0.040***	0.040***	0.057***	0.056***	0.126***	0.123***
	(0.006)	(0.006)	(0.009)	(0.009)	(0.010)	(0.010)
Age21	0.014	0.014	0.034	0.034	0.073	0.074
	(0.032)	(0.032)	(0.045)	(0.045)	(0.049)	(0.049)
Age22	-0.010	-0.010	0.029	0.029	0.058	0.059
	(0.031)	(0.031)	(0.045)	(0.045)	(0.049)	(0.049)
Age23	-0.015	-0.015	0.012	0.012	0.039	0.039
	(0.031)	(0.031)	(0.045)	(0.045)	(0.049)	(0.049)
Age24	-0.007	-0.007	0.018	0.018	0.036	0.036
	(0.032)	(0.032)	(0.045)	(0.045)	(0.049)	(0.049)
Age25	0.002	0.002	0.029	0.029	0.073	0.073
	(0.033)	(0.033)	(0.047)	(0.047)	(0.051)	(0.051)
Hispanic	0.028***	0.028***	0.035***	0.035***	0.050***	0.049***
	(0.010)	(0.010)	(0.014)	(0.014)	(0.015)	(0.015)
White	-0.008	-0.008	-0.009	-0.009	0.016	0.015
	(0.011)	(0.011)	(0.016)	(0.017)	(0.018)	(0.018)
Black	0.013	0.013	0.077***	0.077***	0.185***	0.185***
	(0.013)	(0.013)	(0.019)	(0.019)	(0.020)	(0.020)
Test Score 2	-0.019**	-0.019**	-0.016	-0.016	-0.036**	-0.036**
	(0.009)	(0.009)	(0.014)	(0.014)	(0.015)	(0.015)
Test Score 3	-0.001	-0.001	-0.012	-0.012	-0.045***	-0.045***
	(0.011)	(0.011)	(0.016)	(0.016)	(0.017)	(0.017)
Test Score 4	0.009	0.009	-0.009	-0.009	-0.087***	-0.087***
	(0.010)	(0.010)	(0.015)	(0.015)	(0.016)	(0.016)
Test Score 5	0.000	0.000	-0.013	-0.013	-0.098***	-0.098***
	(0.011)	(0.011)	(0.016)	(0.016)	(0.017)	(0.017)
GED	0.019	0.019	0.026	0.026	-0.027	-0.027
	(0.014)	(0.014)	(0.021)	(0.021)	(0.024)	(0.024)
High School Degree	0.032***	0.032***	0.076***	0.076***	-0.038**	-0.038**
	(0.010)	(0.010)	(0.016)	(0.016)	(0.018)	(0.018)
Junior College Degree	0.038***	0.038***	0.089***	0.089***	-0.032	-0.031
	(0.014)	(0.014)	(0.022)	(0.022)	(0.023)	(0.023)
Bachelors Degree	0.066***	0.066***	0.151***	0.151***	-0.008	-0.008
	(0.014)	(0.014)	(0.021)	(0.021)	(0.022)	(0.022)
Masters Degree	0.125***	0.125***	0.138***	0.139***	-0.020	-0.019
	(0.042)	(0.042)	(0.051)	(0.051)	(0.052)	(0.052)

Table 2A (concluded)

	Very High Self- Esteem		High Self-Esteem		Very Confident	
	I	II	III	IV	V	VI
Healthy	0.054	0.054***	0.135***	0.134***	0.136***	0.134***
	(0.010)	(0.010)	(0.018)	(0.018)	(0.022)	(0.022)
Father Jailed	-0.012	-0.012	-0.023	-0.023*	0.009	0.009
	(0.009)	(0.009)	(0.013)	(0.013)	(0.014)	(0.014)
U.S. Born	0.005	0.005	0.010	0.010	-0.004	-0.004
	(0.012)	(0.012)	(0.017)	(0.017)	(0.018)	(0.018)
N	10,843	10,843	10,843	10,843	10,631	10,631

Regressions include state-fixed effects. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively.

Table 2B
Determinants of Self-Esteem

	Very High Self-Esteem I	High Self-Esteem II	Very Confident III
Underweight	-0.005	0.014	-0.007
	(0.018)	(0.027)	(0.029)
Overweight	-0.005	0.002	0.017
	(0.007)	(0.011)	(0.011)
Obese	-0.024***	-0.024**	-0.021*
	(0.007)	(0.011)	(0.012)
Male	0.040***	0.056***	0.123***
	(0.006)	(0.009)	(0.010)
Age21	0.014	0.035	0.076
	(0.032)	(0.046)	(0.049)
Age22	-0.010	0.030	0.061
	(0.031)	(0.045)	(0.049)
Age23	-0.015	0.013	0.040
	(0.031)	(0.045)	(0.049)
Age24	-0.007	0.019	0.037
	(0.032)	(0.046)	(0.049)
Age25	0.002	0.029	0.075
	(0.033)	(0.048)	(0.051)
Hispanic	0.028***	0.034***	0.049***
	(0.010)	(0.014)	(0.015)
White	-0.008	-0.009	0.016
	(0.011)	(0.017)	(0.018)
Black	0.012	0.077***	0.185***
	(0.013)	(0.019)	(0.020)
Test Score 2	-0.019**	-0.016	-0.036**
	(0.009)	(0.014)	(0.015)
Test Score 3	-0.001	-0.012	-0.045***
	(0.011)	(0.016)	(0.017)
Test Score 4	0.009	-0.009	-0.087***
	(0.010)	(0.015)	(0.016)
Test Score 5	-0.001	-0.013	-0.098***
	(0.011)	(0.016)	(0.017)
GED	0.019	0.026	-0.027
	(0.014)	(0.021)	(0.024)
High School Degree	0.031***	0.076***	-0.039**
	(0.010)	(0.016)	(0.018)
Junior College Degree	0.038***	0.088***	-0.033
	(0.014)	(0.022)	(0.023)
Bachelors Degree	0.065***	0.152***	-0.009
	(0.014)	(0.021)	(0.022)

Table 2B (concluded)

	Very High Self-Esteem I	High Self-Esteem II	Very Confident III
Masters Degree	0.124***	0.139	-0.020
	(0.042)	(0.051)	(0.052)
Healthy	0.055***	0.135***	0.135***
	(0.010)	(0.018)	(0.022)
Father Jailed	-0.012	-0.023*	0.009
	(0.009)	(0.013)	(0.014)
U.S. Born	0.004	0.010	-0.005
	(0.012)	(0.017)	(0.018)
N	10,843	10,843	10,631

Regressions include state-fixed effects. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively.

Table 3A
Marginal Effects on the Probability of each Category of Self Esteem (4 Categories)

	Self-Esteem 1 I	Self-Esteem 2 II	Self-Esteem 3 III	Self-Esteem 4 IV
BMI	0.002***	0.0007***	-0.0007***	-0.002***
	(0.001)	(0.0002)	(0.0002)	(0.001)
Underweight	0.005	0.002	-0.002	-0.005
	(0.018)	(0.005)	(0.006)	(0.017)
Overweight	-0.007	-0.002	0.002	0.007
	(0.006)	(0.002)	(0.002)	(0.006)
Obese	0.027***	0.008**	-0.009***	-0.026***
	(0.010)	0.003	(0.004)	(0.010)
N	10,863	10,863	10,863	10,863

The entries are the marginal effects (standard errors) obtained from ordered-probit regressions.

Table 3B
Marginal Effects on the Probability of each Category of Self Esteem (3 Categories)

	Self-Esteem 1 I	Self-Esteem 2 II	Self-Esteem 3 III
BMI	0.002***	0.0004**	-0.002***
	(0.001)	(0.0002)	(0.001)
Underweight	0.002	0.0003	-0.002
	(0.018)	(0.004)	(0.022)
Overweight	-0.006	-0.001	0.008
	(0.006)	(0.001)	(0.007)
Obese	0.024***	0.004**	-0.029**
	(0.010)	(0.002)	(0.012)
N	10,863	10,863	10,863

The entries are the marginal effects (standard errors) obtained from ordered-probit regressions.

Table 4
The Determinants of Self-Esteem

	Very High Self-Esteem I	High Self-Esteem II	Very Confident III	Very High Self-Esteem IV	High Self-Esteem V
Past BMI	-0.002***	-0.003***	-0.002**	-0.001**	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Very High Self-Esteem in the Past				0.163***	
				(0.014)	
High Self-Esteem in the Past					0.224***
					(0.012)
N	8,106	8,106	7,919	8,090	8,090
Underweight in the Past	-0.014	-0.020	-0.046*	-0.012	-0.010
	(0.016)	(0.024)	(0.026)	(0.016)	(0.024)
Overweight in the Past	-0.020*	-0.022	-0.010	-0.019*	-0.020
	(0.010)	(0.015)	(0.017)	(0.010)	(0.015)
Obese in the Past	-0.021**	-0.038**	-0.033*	-0.018*	-0.030*
	(0.011)	(0.016)	(0.017)	(0.010)	(0.016)
Very High Self-Esteem in the Past				0.163***	
				(0.014)	
High Self-Esteem in the Past					0.224***
					(0.012)
N	8,106	8,106	7,919	8,090	8,090

Regressions include state-fixed effects and variables used in Tables 2A and 2B. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively. *Underweight in the Past, Overweight in the Past and Obese in the Past* are based on the BMI of the person in Wave II, when he/she was aged 15-20. For these classifications, underweight indicates that the person belonged to the bottom 5% of the distribution for age. Overweight indicates that the BMI is between 85th and 95th percentiles; and obese indicates that if BMI is equal to greater than the 95th percentile. See the text for further details.

Table 5
The Determinants of Wages

	I	II	III
Very High Self Esteem	0.023**		
	(0.012)		
High Self Esteem		0.033***	
		(0.008)	
Very Confident			0.021***
			(0.008)
Male	0.038***	0.036***	0.034***
	(0.009)	(0.009)	(0.009)
Age21	-0.063	-0.065	-0.064
	(0.042)	(0.042)	(0.042)
Age22	-0.013	-0.014	-0.016
	(0.042)	(0.042)	(0.041)
Age23	0.038	0.037	0.037
	(0.042)	(0.042)	(0.042)
Age24	0.083**	0.082**	0.083**
	(0.042)	(0.042)	(0.042)
Age25	0.083*	0.082*	0.084**
	(0.044)	(0.044)	(0.044)
Hispanic	0.030***	0.029***	0.030***
	(0.012)	(0.012)	(0.012)
White	-0.004	-0.004	-0.006
	(0.015)	(0.015)	(0.015)
Black	-0.014	-0.016	-0.022
	(0.017)	(0.017)	(0.017)
Test Score 2	0.043***	0.042***	0.039***
	(0.012)	(0.012)	(0.012)
Test Score 3	0.053***	0.052***	0.051***
	(0.014)	(0.014)	(0.014)
Test Score 4	0.061***	0.061***	0.059***
	(0.013)	(0.013)	(0.013)
Test Score 5	0.045***	0.044***	0.045***
	(0.014)	(0.014)	(0.014)
GED	0.061***	0.061***	0.060***
	(0.020)	(0.020)	(0.020)
High School Degree	0.078***	0.077***	0.077***
	(0.015)	(0.015)	(0.015)
Junior College Degree	0.144***	0.143***	0.143***
	(0.020)	(0.020)	(0.020)
Bachelors Degree	0.283***	0.281***	0.284***
	(0.020)	(0.020)	(0.020)
Masters Degree	0.406***	0.407***	0.409***
	(0.053)	(0.053)	(0.053)

Table 5 (concluded)

lnwage3	I	II	III
Healthy	0.069***	0.065***	0.068***
	(0.017)	(0.017)	(0.018)
Father Jailed	-0.011	-0.011	-0.009
	(0.012)	(0.012)	(0.012)
U.S. Born	0.023*	0.023*	0.024*
	(0.014)	(0.014)	(0.014)
N	7,444	7,444	7,316

Regressions include state-fixed effects, and 22 occupation dummies. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively.

Table 6A
The Determinants of Wages

	I	II	III
BMI	-0.002***	-0.002***	-0.002***
	(0.001)	(0.001)	(0.001)
Very High Self Esteem	0.020		
	(0.013)		
High Self Esteem		0.029***	
		(0.009)	
Very Confident			0.018**
			(0.008)
Male	0.043***	0.042***	0.041***
	(0.009)	(0.009)	(0.009)
Age21	-0.074	-0.075*	-0.075*
	(0.046)	(0.045)	(0.045)
Age22	-0.021	-0.023	-0.024
	(0.045)	(0.045)	(0.045)
Age23	0.031	0.029	0.029
	(0.045)	(0.045)	(0.045)
Age24	0.074	0.072	0.074*
	(0.046)	(0.045)	(0.045)
Age25	0.078*	0.076	0.079*
	(0.047)	(0.047)	(0.047)
Hispanic	0.024**	0.023*	0.024**
	(0.012)	(0.012)	(0.012)
White	-0.003	-0.003	-0.004
	(0.015)	(0.015)	(0.015)
Black	-0.015	-0.017	-0.021
	(0.017)	(0.017)	(0.017)
Test Score 2	0.041***	0.041***	0.039***
	(0.012)	(0.012)	(0.013)
Test Score 3	0.050***	0.049***	0.048***
	(0.014)	(0.014)	(0.015)
Test Score 4	0.056***	0.056***	0.054***
	(0.013)	(0.013)	(0.013)
Test Score 5	0.040***	0.040***	0.042***
	(0.014)	(0.014)	(0.014)
GED	0.064***	0.064***	0.062***
	(0.021)	(0.021)	(0.021)
High School Degree	0.079***	0.079***	0.079***
	(0.015)	(0.015)	(0.015)
Junior College Degree	0.144***	0.143***	0.142***
	(0.020)	(0.020)	(0.020)
Bachelors Degree	0.283***	0.281***	0.284***
	(0.020)	(0.020)	(0.020)

Table 6A (Concluded)

	I	II	III
Masters Degree	0.405***	0.406***	0.408***
	(0.054)	(0.054)	(0.054)
Healthy	0.064***	0.061***	0.063***
	(0.019)	(0.019)	(0.019)
Father Jailed	-0.013	-0.012	-0.011
	(0.012)	(0.012)	(0.012)
U.S. Born	0.025*	0.024*	0.025*
	(0.014)	(0.014)	(0.014)
N	7,015	7,015	6,904

Regressions include state-fixed effects, and 22 occupation dummies. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively.

Table 6B
The Determinants of Wages

	I	II	III
Underweight	0.029	0.029	0.020
	(0.026)	(0.025)	(0.025)
Overweight	0.004	0.004	0.004
	(0.010)	(0.010)	(0.010)
Obese	-0.032***	-0.032***	-0.032***
	(0.010)	(0.010)	(0.010)
Very High Self Esteem	0.020		
	(0.013)		
High Self Esteem		0.029***	
		(0.009)	
Very Confident			0.018**
			(0.008)
Male	0.042***	0.041***	0.039***
	(0.009)	(0.009)	(0.009)
Age21	-0.072	-0.074*	-0.073
	(0.046)	(0.045)	(0.045)
Age22	-0.020	-0.021	-0.023
	(0.045)	(0.045)	(0.045)
Age23	0.032	0.030	0.030
	(0.045)	(0.045)	(0.045)
Age24	0.075*	0.073*	0.074*
	(0.045)	(0.045)	(0.045)
Age25	0.079*	0.077*	0.080*
	(0.047)	(0.047)	(0.047)
Hispanic	0.023*	0.022*	0.024**
	(0.012)	(0.012)	(0.012)
White	-0.002	-0.002	-0.003
	(0.015)	(0.015)	(0.015)
Black	-0.015	-0.017	-0.021
	(0.017)	(0.017)	(0.017)
Test Score 2	0.041***	0.041***	0.039***
	(0.012)	(0.012)	(0.013)
Test Score 3	0.050***	0.049***	0.048***
	(0.014)	(0.014)	(0.015)
Test Score 4	0.057***	0.057***	0.055***
	(0.013)	(0.013)	(0.013)
Test Score 5	0.040***	0.040***	0.042***
	(0.014)	(0.014)	(0.014)
GED	0.064***	0.064***	0.062***
	(0.021)	(0.021)	(0.021)
High School Degree	0.078***	0.078***	0.078***
	(0.015)	(0.015)	(0.015)

Table 6B (concluded)

	I	II	III
Junior College Degree	0.142***	0.142***	0.141***
	(0.020)	(0.020)	(0.020)
Bachelors Degree	0.282***	0.281***	0.284***
	(0.020)	(0.020)	(0.020)
Masters Degree	0.405***	0.406***	0.407***
	(0.054)	(0.054)	(0.054)
Healthy	0.064***	0.061***	0.062***
	(0.019)	(0.019)	(0.019)
Father Jailed	-0.013	-0.012	-0.011
	(0.012)	(0.012)	(0.012)
U.S. Born	0.025*	0.024*	0.025*
	(0.014)	(0.014)	(0.014)
N	7,015	7,015	6,904

Regressions include state-fixed effects, and 22 occupation dummies. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively.

Table 7
The Determinants of Wages Controlling for Baseline BMI

	I	II	III
Past BMI	-0.002**	-0.002**	-0.002**
	(0.001)	(0.001)	(0.001)
Very High Self Esteem	0.024*		
	(0.014)		
High Self Esteem		0.026***	
		(0.010)	
Very Confident			0.034***
			(0.009)
Male	0.038***	0.037***	0.032***
	(0.010)	(0.010)	(0.010)
Age21	-0.222***	-0.200***	-0.242***
	(0.031)	(0.031)	(0.031)
Age22	-0.172***	-0.151***	-0.195***
	(0.031)	(0.031)	(0.031)
Age23	-0.119***	-0.098***	-0.140***
	(0.031)	(0.032)	(0.032)
Age24	-0.087***	-0.066**	-0.106***
	(0.031)	(0.032)	(0.032)
Age25	-0.054	-0.033	-0.072
	(0.052)	(0.052)	(0.052)
Hispanic	0.015	0.015	0.016
	(0.014)	(0.014)	(0.014)
White	-0.003	-0.003	-0.007
	(0.017)	(0.017)	(0.017)
Black	-0.017	-0.019	-0.030
	(0.019)	(0.019)	(0.019)
Test Score 2	0.044***	0.044***	0.043***
	(0.014)	(0.014)	(0.014)
Test Score 3	0.043***	0.043***	0.043***
	(0.016)	(0.016)	(0.016)
Test Score 4	0.045***	0.045***	0.047***
	(0.015)	(0.015)	(0.015)
Test Score 5	0.032**	0.032**	0.036**
	(0.016)	(0.016)	(0.016)
GED	0.040*	0.041*	0.040*
	(0.022)	(0.022)	(0.023)
High School Degree	0.070***	0.071***	0.068***
	(0.017)	(0.017)	(0.018)
Junior College Degree	0.136***	0.136***	0.133***
	(0.023)	(0.023)	(0.023)
Bachelors Degree	0.280***	0.280***	0.280***
	(0.024)	(0.024)	(0.024)

Table 7 (concluded)

	I	II	III
Masters Degree	0.344***	0.347***	0.345***
	(0.071)	(0.071)	(0.071)
Healthy	0.054***	0.052***	0.053***
	(0.021)	(0.021)	(0.021)
Father Jailed	-0.024*	-0.023*	-0.022*
	(0.013)	(0.013)	(0.013)
U.S. Born	0.001	0.001	0.003
	(0.017)	(0.017)	(0.017)
N	5,164	5,164	5,066

Regressions include state-fixed effects, and 22 occupation dummies. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively.

Table 8
Determinants of Self-Esteem

	Black Females			Black Males		
	Very High Self-Esteem	High Self-Esteem	Very Confident	Very High Self-Esteem	High Self-Esteem	Very Confident
BMI	-0.0016	-0.0040**	-0.0039**	-0.0026	-0.0026	-0.0023
	(0.0011)	(0.0018)	(0.0019)	(0.0019)	(0.0028)	(0.0029)
Underweight	-0.0439	0.0321	-0.0141	-0.0516	-0.0084	-0.1572
	(0.0449)	(0.0766)	(0.0788)	(0.0802)	(0.1420)	(0.1382)
Overweight	-0.0611***	-0.0389	0.0017	-0.0208	-0.0015	0.0245
	(0.0212)	(0.0356)	(0.0351)	(0.0275)	(0.0384)	(0.0366)
Obese	-0.0222	-0.0669**	-0.0698**	-0.0498*	-0.0568	-0.0230
	(0.0224)	(0.0331)	(0.0335)	(0.0279)	(0.0398)	(0.0396)
Observations	1,306	1,306	1,259	1,034	1,034	994

	White Females			White Males		
	Very High Self-Esteem	High Self-Esteem	Very Confident	Very High Self-Esteem	High Self-Esteem	Very Confident
BMI	-0.0035***	-0.0038***	-0.0045***	0.0010	0.0021	-0.0006
	(0.0007)	(0.0012)	(0.0013)	(0.0011)	(0.0015)	(0.0017)
Underweight	0.0226	0.0399	-0.0184	-0.0017	-0.0495	0.0490
	(0.0294)	(0.0420)	(0.0446)	(0.0403)	(0.0591)	(0.0660)
Overweight	-0.0168	-0.0244	-0.0323	0.0285**	0.0516***	0.0535***
	(0.0126)	(0.0189)	(0.0207)	(0.0137)	(0.0187)	(0.0197)
Obese	-0.0465***	-0.0457**	-0.0755***	0.0033	0.0197	0.0162
	(0.0110)	(0.0188)	(0.0204)	(0.0147)	(0.0214)	(0.0233)
Observations	3,568	3,568	3,518	3,483	3,483	3,430

Regressions include state-fixed effects and all variables used in other regressions. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively.

Table 9
The Determinants of Self-Esteem

Black Females

	High Self-Esteem	High Self-Esteem	Very High Self-Esteem	Very High Self-Esteem	Very Confident
Past BMI	-0.0046*	-0.0036	-0.0008	-0.0004	-0.0017
	(0.0025)	(0.0025)	(0.0016)	(0.0016)	(0.0027)
High Self-Esteem in the Past		0.2365***			
		(0.0339)			
Very High Self-Esteem in the Past				0.1515***	
				(0.0364)	
N	1,006	1,003	1,006	1,003	957

Black Males

	High Self-Esteem	High Self-Esteem	Very High Self-Esteem	Very High Self-Esteem	Very Confident
Past BMI	-0.0072**	-0.0069**	-0.0068***	-0.0067***	-0.0041
	(0.0036)	(0.0035)	(0.0025)	(0.0025)	(0.0040)
High Self-Esteem in the Past		0.2031***			
		(0.0390)			
Very High Self-Esteem in the Past				0.1833***	
				(0.0444)	
N	760	758	760	758	724

White Females

	High Self-Esteem	High Self-Esteem	Very High Self-Esteem	Very High Self-Esteem	Very Confident
Past BMI	-0.0031*	-0.0021	-0.0032***	-0.0026**	-0.0043**
	(0.0018)	(0.0017)	(0.0011)	(0.0011)	(0.0019)
High Self-Esteem in the Past		0.2388***			
		(0.0230)			
Very High Self-Esteem in the Past				0.1642***	
				(0.0281)	
N	2,644	2,642	2,644	2,642	2,600

White Males

	High Self-Esteem	High Self-Esteem	Very High Self-Esteem	Very High Self-Esteem	Very Confident
Past BMI	0.0003	0.0008	0.0004	0.0004	-0.0025
	(0.0020)	(0.0020)	(0.0014)	(0.0014)	(0.0022)
High Self-Esteem in the Past		0.2218***			
		(0.0209)			
Very High Self-Esteem in the Past				0.1697***	
				(0.0234)	
N	2,625	2,619	2,625	2,619	2,585

Table 10
Determinants of Wages: Race and Gender-Specific Regressions

	Black		White	
Variable	Female	Male	Female	Male
	I	II	III	IV
BMI	-0.002[b]	-0.002	-0.003***	0.001
	(0.002)	(0.002)	(0.001)	(0.001)
High Self Esteem	-0.023	0.031	0.034**	0.030**
	(0.024)	(0.030)	(0.015)	(0.015)
Underweight	-0.032	-0.178*	0.033	0.070
	(0.053)	(0.108)	(0.034)	(0.074)
Overweight	0.023	-0.010	-0.013	0.023
	(0.030)	(0.039)	(0.017)	(0.016)
Obese	-0.060**	-0.003	-0.056***	0.008
	(0.026)	(0.038)	(0.017)	(0.018)
High Self Esteem	-0.023	0.032	0.035**	0.030**
	(0.024)	(0.030)	(0.015)	(0.015)
N	715	569	2,301	2,487
Models with Baseline BMI				
Past BMI	-0.003	-0.004	-0.002***	-0.001
	(0.002)	(0.003)	(0.002)	(0.002)
High Self Esteem	-0.019	0.008	0.025***	0.028*
	(0.025)	(0.037)	(0.017)	(0.017)
Underweight in the Past	-0.070[a]	-0.013	-0.008	-0.011
	(0.043)	(0.073)	(0.033)	(0.036)
Overweight in the Past	0.030	-0.116**	-0.063***	-0.002
	(0.036)	(0.059)	(0.022)	(0.024)
Obese in the Past	-0.044	-0.076*	0.019	-0.033
	(0.035)	(0.044)	(0.032)	(0.022)
High Self Esteem	-0.019	0.006	0.025	0.028*
	(0.025)	(0.037)	(0.017)	(0.017)
N	549	399	1,690	1,856

Regressions include state-fixed effects, 22 occupation dummies and variables used in other specifications. Robust standard errors are clustered at the state level. . ***, ** and * indicate p-values less than 0.01, 0.05 and 0.10, respectively. a: significant at the 10.5% level, b: significant at the 14.7% level. *Underweight in the Past, Overweight in the Past and Obese in the Past* are based on the BMI of the person in Wave II, when he/she was aged 15-20. For these classifications, underweight indicates that the person belonged to the bottom 5% of the distribution for age. Overweight indicates that the BMI is between 85th and 95th percentiles; and obese indicates that if BMI is equal to greater than the 95th percentile. See the text for further details.

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