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ABSTRACT

Body-Weight and Women's Hours of Work: More Evidence That Marriage Markets Matter*

Higher body-weight (BMI) can affect labor supply via its effects on outcomes in both labor markets and marriage markets. To the extent that it is associated with lower prospects of being in couple and obtaining intra-couple transfers, we expect that higher BMI will increase willingness to supply labor in labor markets, especially for women. We use US panel data from the NLSY79 and NLSY97 to examine whether body weight influences hours of work in the labor market. We use sibling BMI as an instrument for own BMI to address potential endogeneity of BMI in hours worked. We find that White women with higher BMI work more. This is true for both single and married White women. Results for other groups of women and men produce mixed results. The extended analysis suggests that what drives the relationship between BMI and hours worked is not lower market wages earned by high-BMI women, but rather lower spousal transfers to married women or lower expected intra-marriage transfers to single women.

JEL Classification: J22, I12, J12

Keywords: obesity, labor supply, marriage prospects, intra-household division of resources

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1. Introduction

Obesity is a major problem in the industrialized world, including the US. Its health and health costs consequences have been well documented, e.g. in Strum (2002) and Cawley and Meyerhoefer (2012). In addition, higher body weight may have negative social and economic consequences. Several studies (Register & Williams, 1980; Averett & Korenman, 1996; Pagan & Davilla, 1997; Behrman and Rosenzweig, 2001; Cawley, 2004; Atella et al., 2008; Johar & Katayama, 2012; Cawley & Meyerhoefer, 2012; Sabia and Rees, 2012; Larose et al, 2016 among others) have found an inverse relationship between earnings and body weight for females. There is a related but smaller literature that explores the effects of BMI on employment status. Lindeboom et al. (2010) do not find any significant effect of obesity on employment in the U.K. Morris (2007) on the other hand find that obese women are less likely to participate in the labor market in the U.K. Two experimental studies, Rooth (2009) and Reichert (2015), find a negative effect of BMI on employment. Caliendo and Gehrsitz (2016) provide semi-parametric estimates for the relationship between BMI and employment and find evidence of non-linearity.

Furthermore, body-weight has negative consequences for a number of outcomes related to couple formation. It reduces: (1) women's dating and matching opportunities (Lemennicier 1988, Hitsch, Hortacsu and Ariely 2010, Vaillant and Wolff 2011; Chiappori, Oreffice and Quintana-Domeque 2012), (2) their likelihood of cohabitation and marriage (Mukhopadhyay 2008) but not in a linear way (Malcolm and Kaya 2016), and (3) a wife's relative influence on how the couple's resources are internally distributed (Oreffice and Quintana-Domeque 2012). Singles with higher BMI may expect less from marriage. For instance, Vaillant and Wolff (2011) show that French obese women are less likely to expect men to be tall and charming and more willing to accept a violent mate. In fact, obese women are less likely to be married to men with higher income and education (Oreffice and Quintana-Domeque 2010).

Given all this evidence, it is conceivable that there may be a relationship between BMI and hours of work. However, the relation between BMI and hours of work remains surprisingly under-explored. Oreffice and Quintana-Domeque (2012) (hereafter OQD) is an important exception and they show that married White men and women who are heavy relative to their spouse, work more hours. However, they do not establish a causal relation and they do not find any relation between BMI and hours of work for single White women.

Our research focus is on the impact of BMI on market hours of work and on whether this impact works via its effects on outcomes related to intra-family resource allocation. For example, do hours of work vary with BMI because of reduced opportunities to cohabit, marry, find desirable matches or get access to marital resources? Alternatively, is the effect of BMI on hours of work a byproduct of wage-related consequences of higher weight? Our empirical work uses data from two cohorts of the National Longitudinal Survey of Youth: the 1979 cohort and the 1997 cohort (the NLSY79 and the NLSY97 from now on), and examines the effects of BMI on hours of work regardless of marital status. The paper that is most closely related to our work is Oreffice and Quintana-Domeque (2012; hence OQD). They establish an association of relative BMI (defined as own BMI divided by spouse's BMI) on hours worked and we focus on the effect of BMI on hours worked.

We expand on OQD on several dimensions. First, we estimate causal effect of BMI on hours worked by using sibling BMI as instrument for own BMI in line with the work of Cawley (2004). There are reasons to suspect that OLS estimates are not consistent in this context. For example there may be unobserved traits (such as value of leisure) that affect both BMI and hours of work. For example, individuals who value leisure more may work less and have higher BMI. Another potential problem is reverse causality. Individuals who choose sedentary types of jobs may become high BMI over time (Lakdawalla and Phillipson, 2007). We use sibling BMI as an instrument to address the endogeneity problem. While sibling BMI has been used as an instrument for own BMI before (Cawley 2004), there are some concerns about the validity because sibling BMI represents household environment that both the respondent and her sibling shared. However, current evidence suggests that the role of shared environment may not be very important, especially given that the association between the non-biological sibling's BMI (i.e. the correlation between an individual and her step/adopted siblings) is insignificant (Cawley, 2004; Lindeboom et al., 2010; Cawley and Meyerhoefer, 2012; Cawley, 2015). Second, while the initial literature on social and economic consequences of higher body-weight focused on obese women, a number of recent papers have shown that the negative economic consequences of higher body-weight is not limited to obese (or even overweight) women (Kline and Tobias 2008; Gregory and Rhum 2011; Caliendo and Gehrsitz 2016). These papers show that wages of White women start to decline even when their BMI is in the healthy range. To estimate the exact nature of the relationship between BMI and hours of work we semi-parametrically estimate the effect of BMI on hours worked. Third, we use data on expectations about marriage, and occupational task intensity to explore whether intra-family transfers (or expected transfers for single women) drives the relationship between BMI and hours of work. Fourth, we provide OLS, IV, and semi-parametric estimates for Black and Hispanic women for comparison purposes.

To the best of our knowledge, this is the first paper to establish a causal relationship between BMI and hours of work and to provide semi-parametric estimates for the relationship between BMI and hours of work. Our results show that for White women a higher BMI leads to more hours of work. This is true for single and married White women. More specifically, our IV estimates suggest that one unit increase in BMI leads to a 1.5% (2.1%) increase in hours worked among White single (married) women. Semi-parametric estimates suggest that the relationship between BMI and hours worked is nonlinear but for single White women the nonlinearities do not become practically important until relatively high levels of BMI (about 40). Non-linearity is more of an issue for married White women. Overall, our results suggest that linear BMI models provide reasonably accurate approximations and qualitatively correct results.. In contrast to our results for women, we do not find a causal relationship between BMI and White men's hours of work. We do not find a consistent pattern of results for Black and Hispanic respondents.

We do not find any systematic effect of BMI on employment. Our results for married White women are consistent with OQD. Moreover, we provide evidence that the relation between BMI and hours worked is indeed causal. In contrast to OQD's results we find that a causal relation between BMI and hours worked exists for single White women as well. Further analyses suggest that the reason behind the extra work performed by higher-BMI-women is lower intra-marital transfers (or expected transfers for single women), an explanation consistent with both OQD's explanation that high BMI women obtain lower Pareto-weight and an explanation based on marital transfers as a function of value in marriage markets based on Becker (1973) and Grossbard-Shechtman (1984).

This paper is organized as follows. Section 2 presents the conceptual framework, section 3 describes the data, section 4 presents the empirical results and section 5 concludes.

2. Conceptual framework: BMI and marriage markets

Labor supply may be a function of BMI via BMI's effects on outcomes related to couple formation and intra-household transfers. We do expect likelihood of couple formation to vary with body-weight in view of the findings reported in the previous section. The negative value of higher weight in marriage markets also follows from research by Wanchuan Lin, Kathryn McEvilly and Juan Pantano (2016) that has shown that a worsening of marriage market conditions faced by Black women in the USA relative to those faced by White women helps explain changes in the racial gap in female obesity. Individuals with higher body-weight may have lower marriage prospects due to lower demand on the part of members of the other sex. For instance, men may be less willing to establish relationships with high-BMI women. To the extent that marriage markets establish prices, as posited in the economic theories of marriage of Becker (1973) and Grossbard-Shechtman (1984), a lower demand implies that high-BMI women will command a lower price in marriage markets relative to that of thin women. Likewise, one expects that women will have a lower demand for high-BMI men, and therefore that high-BMI men's value in marriage markets will be lower than that of their thinner counterparts.

A lower value in marriage markets may take the form of fewer financial transfers from a spouse and less personal access to consumption.[1] Consequently, high-BMI people may work more in the labor force than low-BMI people do, in order to reach the same disposable personal income and personal consumption. Regardless of whether or not they are single or married, individuals' value in marriage markets will influence their net present value, a function of their current and future disposable income. We therefore

[1] This insight also follows from McElroy and Horney (1981) and Chiappori (1992).

predict that: *There will be a positive effect of body weight on individual labor supply*. We expect this prediction to hold regardless of marital status, to the extent that value in marriage markets affects both those who are already 'employed' in marriage and those who are single and looking for a spouse. (Similarly, in labor markets low wages affect the allocation of time of both the employed and the unemployed looking for a job).

Body weight is more likely to affect women's hours of work than men's, to the extent that women's marriage market prospects vary more with body weight than men's (Mukhopadhyay 2008) and that we expect intra-marriage income transfers to be more likely to flow from men to women than vice-versa. The latter expectation comes from the observation that relative to married men, married women tend to earn less and to do more household work than men do, and on the idea that in-marriage income transfers may partially be compensations for household production work (Grossbard 2015).

There may also be different effects of body weight on labor supply for different ethnic groups. Some empirical studies possibly indicate that Black women are penalized in marriage markets (e.g. Grossbard, Gimenez and Molina 2014; Goldsmith, Hamilton and Darity 2007), and this may have implications for marriage market effects of body-weight. Averett and Korenman (1999) found that self-esteem is associated with body-weight for White women but not for Black women. In turn, body-weight may have different effects on labor supply for different ethnic groups due to possible variation in the effect of body-weight on marriage prospects and intra-marriage transfers.

3. Data

We use data from two cohorts of National Longitudinal Survey of Youth (NLSY): the 1979 cohort (NLSY79) and the 1997 cohort (NLSY97). The NLSY79 started interviewing 12,686 respondents in 1979 when they were 14-22 years old. These individuals were interviewed every year until 1994, and after that on a biannual basis. The most recent wave (2014) included 9964 of the original respondents. The NLSY97 cohort started with 8984 respondents who were between the ages of 12 and 17 when they were first interviewed in 1997. Since then they have been interviewed annually until 2011, and biannually thereafter. The most recent round of interviews for this cohort was conducted in 2013.

NLSY contains information about height, weight, work choices, wages, marital status, and a plethora of other information about the respondents, including our principal outcome of interest: total hours worked by a respondent during the year before interview. We use self-reported height and weight to compute BMI. Since NLSY interviews all eligible youths in an eligible household we know the BMI of siblings of respondents, if they were also eligible for interview. This allows us to use a sibling's BMI as an instrument for BMI of a respondent. Table 1 contains the summary statistics for the female sample for the variables used in this paper, separated by marital status, and race.

We restrict our analysis to adult respondents (>=18 years) for whom the relevant variables are available. In the case of women, they are included if they have not been pregnant during the year before the survey given that pregnancy can cause weight changes irrelevant to our analysis. The first three columns in Table 1 are for single (never married) women and the last three columns for married women. Column 1 presents summary statistics for White women. Since our primary interest is in causal estimates, and we use sibling BMI as instrument, we further restrict our sample to individuals who have an eligible sibling[2]. After imposing the above criteria, we have 8940 person-year observations for single White women. Out of them 8214 (92%) are employed (i.e. have non-zero hours of work). The average hours of work (including the zero hours for those who are not working) is 1393 hours per year. Out of 8214 person-year observations who report non-zero hours of work, 7419 observations also have valid wage information. Therefore 7419 person-year observations constitute our sample for single White women for whom we can run hours regressions. The average hours of work in this sample after conditioning on non-zero hours is 1571 hours per year. Average real wage (in 2003 dollars) is $10.65.

Average BMI is 23.70. Average age is 24.89 years and on average work-experience is 6.47 years. About 36% are enrolled in school/college, about 11% have at least one child and for 7% the youngest child is below the age of six. We also use whether a woman believes in traditional gender roles as one of our control variables. The

[2] We report the OLS estimates for the largest possible sample (i.e. including individuals who do not have a sibling) in the Appendix.

NLSY79 respondents were asked whether they agree or not with the following statement: *"A woman's place is in the home, not in the office or shop."* If the answer was "strongly agree" or "agree" then the variable was coded as one and zero otherwise. We refer to this variable as "trad_NLSY79". Unfortunately, this question was not asked in the NLSY97 cohort. However, the NLSY97 respondents were asked whether they agree or disagree with the following statement: *"I support long-established rules and traditions."* If the answer was *"Agree a little", "Agree moderately", or "Agree strongly"* then the variable was coded as one and zero otherwise. We refer to this variable as "trad_NLSY97". Trad_NLSY79 was coded as zero for all NLSY97 respondents and vice-versa.

Employment rate and average hours of work are lower among the Black and Hispanic samples (Columns 2 and 3). Single Black (Hispanic) women work on average about 1101 (1200) hours per year. Average BMI for single Black (Hispanic) women is 27.4 (25.4). In both cases, the average BMI falls in the "overweight" category. Single Black and Hispanic women have less education, are more likely to have children relative to single White women.

The last three column of Table 1 present summary statistics for married women. NLSY97 identifies the cohabitation status of women in each survey but the NLSY79 does not. Therefore, we group women into single and married women and place cohabiting women among single never-married women. The employment rate is lower for married (82%) than for single White women but average hours of work per year are similar. Average age for this group is 33.6 years and, as expected, married women are more likely to have children (75%). They also have higher BMI (24.69) compared to their single (23.70) counterparts. Summary statistics for the male sample are presented in Appendix Table A1.

4. <u>Empirical Results</u>

In Section 4.1 we first report OLS and then IV models. We estimate models separately for each race/ethnicity. Within race, we estimate them separately by marital status as labor supply decisions of married women may differ from those of single (never married) women. To decipher whether the relation between BMI and hours of work is driven by labor markets (i.e. lower wage for high BMI individuals) or through marriage markets (i.e. lower intra-household transfers to high BMI individuals), we follow several strategies. First, we run regressions that either include market wage or not. Wage tends to be lower for high-BMI people (Cawley 2004). Own wage effects can generate both a substitution effect and an income effect on hours of work. Second, normal BMI is associated with higher income (in part, because that may lead to higher actual or potential transfers from spouse), this will also cause a positive income effect that is expected to lead to lower hours of work. If wage is included in the regression, we can expect that the entire effect of body weight operates via marriage markets. In contrast, if own wage is not controlled for, body weight can affect hours of work via marriage market effects as well as wage effects.

This strategy, however, has a shortcoming: wages and hours are likely to be jointly determined. To address this we use two more strategies in Section 4.2. One uses data on expectations about marriage to establish that the relation between BMI and hours worked is driven by intra-household transfers. Another strategy involves analyzing whether the effects of BMI on hours worked for women who work in occupations that require high amount of interpersonal tasks, differ from those for women who work in occupations that do not require as many interpersonal tasks. If lower wage for high BMI women drives the relation between BMI and hours worked, then we expect to see a stronger relationship in the former group. This follows from the result that the wage effect is stronger in occupations with social interactions (Pagan and Davila 1997; Baum and Ford 2004; Han, Norton, and Stearns 2009; Caliendo and Gehrsitz 2016; Han, Norton, and Powell 2011).

In our baseline models we assume that BMI enters the wage equation linearly, which may not be accurate given that a number of papers (Kline and Tobias 2008; Gregory and Rhum 2011; Caliendo and Gehrsitz 2016) have found substantial evidence of non-linearity in the relationship between wage and BMI. Therefore, in Section 4.3 we test whether our results are robust to a semiparametric specification where BMI enters the wage equation non-parametrically.

Section 4.1: OLS and IV results

Table 2 presents OLS and IV estimates for women. To keep these estimates comparable we use the same sample for OLS and IV regressions. We use BMI of a sibling to instrument own BMI. [3] Panel A of Table 2 presents the OLS results for single women. First two columns are for White women, next two for Black women, and last two are for Hispanic women. Columns 1, 3, and 5 do not include hourly wage rate as a control, but Columns 2, 4, and 6 do. The results from Column 1 suggest that among White women a one unit increase in BMI is associated with a statistically significant 0.72% increase in hours worked. In Column 2, we add (log of) hourly wage as an additional control. The estimates in Column 2 suggest that when we control for wage a one-unit increase in BMI is associated with a 0.81% increase in hours worked. Controlling for wage does not significantly change the association between BMI and hours worked, suggesting that the primary mechanism behind the higher hours of work of heavier women operates via the marriage market channel. We suspect that in this case, lower intra-marital income transfers expected by women with higher BMI induces them to work more. Results in Columns 3 to 6 suggest that for single Black women the association between BMI and hours of work is positive and significant, and that BMI is not associated with hours of work for Hispanic women.

Panel B of Table 2 presents results of IV regressions for single women. The first stage F-stats range from 30.45 (for single Hispanic women) to 104.8 (for single White women), suggesting that the instrument is strong by conventional standards. Column 1 of panel B indicates that a one-unit increase in BMI leads to a 1.49% increase in hours worked for single White women. In Column 2, we add (log of) hourly wage as an additional control. A one-unit increase in BMI then leads to a 1.75% increase in hours

[3] OLS estimates for the biggest possible sample sizes (i.e. sample including women who do not have qany sibling) for single women are presented in Table A2 in Appendix. The results are qualitatively similar to those reported in Panel A of Table 2 for White women. For Black women we do not find any association in the larger sample and in for Hispanic sample we find negative associations that are marginally significant. Table A2 in appendix also shows the coefficient estimates for control variables. Age and work-experience increases the number of hours worked in a concave way. Wage is positively associated with number of hours worked. Women who are enrolled in school or college work less and so do women with children. We do not find any additional negative effect of having a child below the age of six. Women who believe in traditional gender roles work less compared to women who do not share that belief. We do not find any significant association between education and hours of work for single White women, but we do for Black and Hispanic women.

worked. The IV estimates for single Black women are similar in size but they are not statistically significant at conventional levels. The IV estimates for Hispanic women are neither economically nor statistically significant.

Panel C presents the OLS estimates for married women.[4] In Column 1, when we are not controlling for wage, a one-unit increase in BMI is associated with a 0.40% increase in hours worked. In Column 2, once we add the wage as a control, one unit increase in BMI is associated with a 0.46% increase in hours worked. Columns 3-6 present results for Black and Hispanic married women. Here the coefficient estimates are negative but they are not statistically significant.

Panel D presents the IV estimates for married women. The IV estimates for married White women are positive and significant, suggesting a causal effect of BMI on hours worked for married White women. IV estimates suggest that a one-unit increase in BMI leads to a 2.1% increase in hours worked. Furthermore, the IV estimates exceed the OLS estimates. This is similar to the pattern we observed for single White women. Columns 3-6 present IV results for married Black and Hispanic women. We do not find any significant causal relationship in these groups. Unlike its counterpart for single Black women, the IV estimate for married Black women is negative and small in magnitude. However, it is not significant. We find that the effect of BMI on married White women's hours of work is significantly stronger than that effect for married Black women. This is consistent with Black-White cultural difference theory (Averett and Korenenman, 1999) and smaller marital transfers for Black women relative to those obtained by their White counterparts.

Three results and their implications are worth noting. First, whether or not we control for market wage makes little difference for the coefficient of BMI in hours of work regressions. It is well-established (Cawley, 2004 among others) that White women with higher BMI earn less than their lower BMI counterparts, and we find that higher BMI women work more compared to their lower BMI counterparts. Therefore, if lower

[4] Again, the OLS estimates for the biggest possible sample sizes for married women are presented in Appendix Table A3. The results are qualitatively similar to those reported in Panel C of Table 2 for all groups.

market wage were the primary reason behind the relationship between BMI and hours worked, then it would have to imply a downward sloping labor supply curve. While this is theoretically possible, most of the empirical literature suggests that women's labor supply elasticity is positive (Blundell and MaCurdy, 1999). Therefore, the primary mechanism behind the increased hours of work of heavier women seems to operate via marriage markets, and the ensuing lower intra-marital income transfers that women with higher BMI possibly obtain from husbands or expect from potential husbands. Second, for single women the effect of BMI on hours worked (i.e. the IV estimates) is similar to that we observe for married women. This suggests high-BMI single women expect lower future in-marriage income transfers and adjust their labor supply accordingly. We further explore these two findings in Section 4.2.

Third, the IV estimates are larger in magnitude than the corresponding OLS estimates, suggesting that OLS underestimates the effect of BMI on hours worked. One possible explanation for this pattern may be the following: suppose women with higher BMI value leisure more (i.e. work less). Since we do not observe preference for leisure, this is going to create a negative correlation between hours worked and BMI, thereby creating a downward bias in the OLS estimate. In IV regressions, we are using sibling's BMI to predict the BMI of a woman, and therefore IV estimates do not suffer from this omitted-variable induced endogeneity bias.

Table 3 presents similar results for hours of work for men. OLS estimates (Panel A) suggest a statistically significant positive association between BMI and hours worked for single Black Males. The association is positive but marginally insignificant for single White men. However, estimates based on all men (including those without any sibling) and presented in appendix Table A4 show that the association is positive and significant for both White and Black single men. The IV estimate is only marginally significant for single White men, once we add wage as a control. It is marginally insignificant without wage as a control. For married men BMI effects are never significant. The IV estimates for married White are also smaller in magnitude than the corresponding estimates for single White men. Therefore, unlike women, no clear pattern emerges for men. However, the gender differences in the causal effect of BMI on hours of work, based on IV estimates, are not always statistically significant.

Since our outcome variable is log (hours), so far our analysis has ignored the extensive margin or labor-force participation decision. It is also conceivable that BMI affects the labor-force participation decision. We estimated Probit (and IV-Probit) regressions to check the association (causality) between BMI and employment status. Panel A of Table 4 presents marginal effects for the employment decision for women. OLS estimates suggest that BMI is only marginally (t-stat=1.66) positively associated with the participation decision for single White women and negatively associated with participation decision for married Hispanic women. There is no significant association for other groups. IV estimates on the other hand suggest a marginally significant relationship only for married White women.

Panel C of Table 4 presents the marginal effects from Probit regressions for single and married males. OLS estimates suggest a negative association for married White men and no association between BMI for any of the other groups. The IV-Probit estimation (Panel D) for men indicates a marginally significant negative causal effect of BMI on employment of single White men. One potential explanation could be that the same traditional gender role expectations are behind the contrasting IV results for men and women: heavy single men may anticipate a lower likelihood of marriage and therefore less of a need to pay future wives in the form of intra-marriage transfers. They may thus be less motivated to participate in the labor force. We do not find any causal relation between BMI and employment for any of the other groups.

Section 4.2: Is marriage market the reason?

In our analysis reported in section 4.1 we found that for White women a higher BMI leads to more hours of work in the case of both single and married women. While our result for married women is consistent with OQD results, our results for single White women are not. OQD argue that higher BMI leads to lower Pareto weight in the family. Our results so far point in the same direction. In addition, assuming rational expectations, we argue that single women expect that higher BMI leads to lower transfers from future husbands and therefore they respond by working more while single. To explore whether the marriage market is the primary channel behind the negative association between BMI and hours of work we perform two further tests. Since we only found a consistent relation between BMI and hours worked for White women, we restrict these exercises to the sample of White women.

A. The first analysis pertains specifically to single women. We use a unique question about marriage expectations that was asked to the single NLSY97 respondents in some of the waves (2000, 2001, 2009, 2010, and 2011). The respondents were asked *"Now think about five years from now, you will be [{AGE IN 5YRS}]. What is the percent chance that you will be married?"* This question was not asked in the NLSY79 and therefore this analysis can only be performed on NLSY97 women. As we discussed earlier our hypothesis is that single women with high BMI expect smaller future income transfer from husbands, and therefore they work more in the labor force while they are still single. It follows that the effect of BMI will be stronger in single women who expect to get married in the next five years, compared to their counterparts who do not expect to get married in the next five years. That marriage expectations can affect single women's decisions has been shown e.g. by Kureishi and Wakabayashi (2013) who found that single women who expect to get married save significantly less that single women who do not expect to get married in the next three years.

To test this we re-estimate the OLS regressions for single women, controlling for expected probability of marriage. We add an interaction term between the probability of marriage and BMI. This regression has the same set of control variables (including log wage) as in Table 2. However, sample sizes are smaller given that only selected waves of NLSY97 included the question about marriage expectations.

Figure 1 shows the coefficients of BMI for single White women, and how it varies with the expected probability of marriage along with the 95% confidence interval. Figure 1 suggests that for single White women the coefficient of BMI is negative but insignificant when the expected probability of marriage is zero. The association between BMI and hours of work remains statistically insignificant as long the expected probability of marriage is below 0.5. However, the association becomes positive and significant for all single women whose expected probability of marriage in the next five years exceeds 0.5.

B. A second strategy we use to examine the degree to which marriage market opportunities are driving our main results is a test of whether the relationship between hours worked and BMI depends on women's occupation. Several authors have found that women who work in professions that require substantial interaction with the public are penalized more for being obese than women who work in occupations not requiring much interaction with people (Pagan and Davila 1997; Baum and Ford 2004; Han, Norton, and Stearns 2009; Caliendo and Gehrsitz 2016; Han, Norton, and Powell 2011). Therefore, if the positive relation between hours worked and BMI is being driven by lower wage, then we should observe the positive relationship between BMI and hours of work to be stronger in occupations that require high levels of social interaction.

To quantify the social interaction content of an occupation we use the task approach developed by Acemoglu and Autor (2011). They consider that each occupation involves five different types of tasks: Analytical (NRCA), Non-Routine Cognitive: Interpersonal (NRCI), Routine Cognitive (RCOG), Routine Manual (RMAN), and Non-Routine Manual: Physical Adaptability (NRMPHYS). The importance of a particular task in a particular occupation can be measured by constructing a Z-score for each task in each occupation using O*NET data.[5] We use the Z-score for Non-Routine Cognitive: Interpersonal (NRCI) to separate between occupations with high and low interpersonal communication tasks. Then we test whether the effect of BMI is different for women who work in occupations where the Z-score for NRCI task is above or below zero.

The results presented in Table 5 suggest that for single White women the association between BMI and hours worked is similar for both types of occupations when using OLS (Panel A) and possibly stronger for low interaction occupations when using IV regressions (Panel B). For married women we find the association is stronger in occupations with low social interaction than in high interaction occupations (when using OLS and IV, though it is marginally insignificant in the case of IV (with a t-stat of 1.61). If anything, there are stronger effects for the occupations in which it is less likely that wage is associated with weight, suggesting that variation in marriage

[5] Please see Autor and Handel (2013) and Autor (2013) for further details.

market conditions (leading to different intra-marriage transfers) is more likely to be the real reason behind the association between BMI and hours of work.

Section 4.3: Robustness to functional form

In our analysis above we assumed that the relation between BMI and hours worked is linear. This assumption may not be accurate, and if the true relationship is non-linear this may introduce bias in our estimates. To address this issue we estimate a partially linear model where BMI enters the "hours worked" equation non-parametrically. We use Robinson's (1988) double residual estimator.[6] Figure 2 presents the results from semi-parametric regressions in which BMI was treated as an exogenous variable. The left panel shows the results for single women and the right panel for married women. To show the difference in the semi-parametric fit across races, we do not include the 95% confidence interval in this figure. A figure with the semi-parametric fits along with the 95% confidence intervals is presented in Appendix Figure A1. The left panel in Figure 2 indicates that the relationship is broadly linear (and monotonic) until a BMI of 40 in the case of both White and Black single women. Beyond that, an increase in BMI is associated with a decline in hours worked, most likely because the health effects dominate other economic incentives. We should note that only about 5% of single White women in our sample have a BMI above 36. Further, the semi-parametric estimates for single White women suggest that an increase of BMI from 20 to 40 is associated with an increase of around 15% in hours worked[7], which is close to the increase in hours worked implied by the corresponding linear OLS estimate (about 14.4%) based on the results of Table 2.[8] The semi-parametric estimates for married women (right panel of Figure 2) suggest more evidence of non-linearity. In this case, an increase of BMI from 20 to 40 is associated with a 12% increase in hours worked, which is lower than that implied by the corresponding OLS estimate (about 8%). However, these estimates are not statistically different at a 5% level of confidence. In the case of married women, the linear

[6] For estimation we use the Stata command "semipar" developed by Verardi and Debarsy (2012)

[7] We obtain this by subtracting the non-parametric component around BMI 20 from the non-parametric component around BMI 40.

[8] Given the OLS coefficient estimate of BMI (0.0072), a twenty-unit increase in BMI implies a 14.4% increase in hours worked.

assumptions led us to under-estimate the true effect because the linear OLS models cannot account for the non-linearity.

Figure 3 presents the results from semi-parametric estimations, controlling for potential endogeneity of BMI.[9] Again, the left panel shows the results for single women and right panel for married women. To control for endogeneity, we use a control function approach. We first regress own BMI on sibling BMI and a full set of controls. Then we include the predicted error term from that regression in our semi-parametric estimation. IV semi-parametric estimates suggest that for single White women an increase of BMI from 20 to 40 leads to a 38% increase in hours worked, which is somewhat higher than the increase in hours worked implied by the corresponding linear IV estimate (about 35%) reported in Table 2. The results from the semi-parametric IV estimations for married women (right panel) show more evidence of non-linearity but again, the linear IV regressions provide the same qualitative results as semiparametric regressions. Therefore, our results suggest that while the linear BMI models cannot capture all the nuances in the relationship between BMI and hours of work, qualitative results derived from linear models (OLS and IV) are not sensitive to mis-specified functional form.

We also implemented an alternative that involves using dummies for weight categories as opposed to a linear BMI variable. We followed the literature and created four weight categories: underweight (BMI<18.5), healthy weight (18.5<=BMI<25), overweight (25<=BMI<30) and obese (BMI>=30). Then we estimated OLS regressions with weight categories as our independent variables of interest, with healthy weight as omitted category and controlling for wage. The results from these regressions are presented in appendix Tables A5 (for hours worked regressions) and A5 (for employment regressions). Results suggest single White women (Table A5, Panel A) who are either overweight or obese work more than their healthy weight counterparts, and that single Black women who are obese also work more hours than their healthy weight counterparts. For married White women we find statistically significant effect only for overweight Black and White women, but not for obese women. These results suggest that

[9] The 95% CI shown are based on standard errors clustered at the individual level.

non-linearity is more of an important factor for married women, which is clear from Figure 2 as well. Results for Black single men (Table A5, Panel B) are also consistent with the OLS results of Panel A in Table 3. However, it was shown in Panel B of Table 3 that these results don't hold when IV estimation is used.[10]

The results on employment suggest that single White women who are obese and single Black women who are overweight are more likely to be employed (Table A6, Panel A). For single White men, the IV results of Table 4, panel B, and the results of Table A6 both indicate a negative relationship between BMI and likelihood of being employed. Overall, the regressions using weight category dummies provide results that are mostly consistent with those of regressions assuming linear BMI.

5. Conclusion

Higher body-weight (BMI) could possibly affect labor supply via effects on outcomes in both labor markets and marriage markets. To the extent that it is associated with lower prospects of being in couple and obtaining intra-couple transfers, we expect that body-weight will increase willingness to work in labor markets. This is especially likely to hold for women who are more likely to be the lower earners in their couples and, given traditional gender roles, more likely to receive intra-marriage income transfers if they are married.

We use US panel data from the NLSY79 and NLSY97 to examine whether body weight is associated with women's hours of work in the labor market. We use sibling BMI as an instrument for own-BMI to address potential endogeneity and test for a causal relation between higher body weight and labor supply. For White women we find a causal relationship: higher BMI leads them to work more hours in the case of both single and married women. Further analysis confirms our conclusion that what drives the relationship between BMI and hours worked are marriage market conditions, possibly due to lower actual in-marriage transfers from husbands (in the case of married women) and to lower expected in-marriage transfers (in the case of single women). These results

[10] IV estimation with categorical endogenous variables is not possible since we have only one instrument.

do not depend on whether we control for wage or not.   While we find evidence of non-linearity in the relationship between BMI and hours worked, conclusions based on linear models are qualitatively correct. Results for non-White women and for men produce mixed results.

If confirmed by further research, the causal connection that we detected between labor supply and excessive body-weight carries implications for policy. Exercising and good nutrition may not only be beneficial in view of their well-known effects on health outcomes, they may also contribute to the personal disposable income of individuals planning to get married and obtain intra-marital income transfers. Given the threat of divorce and well-functioning marriage markets for divorcees, married people's personal disposable income may also benefit from optimal weight: intra-marriage transfers may then be higher. In traditional societies with a focus on heterosexual marriage, women have been more likely to obtain such transfers and as long as traditional gender roles dominate, women's financial gains from being thin are likely to exceed those of men.

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Table 1: Summary statistics for women.

	Single			Married		
	White	Black	Hispanic	White	Black	Hispanic
% employed	0.92	0.73	0.82	0.82	0.83	0.79
	(0.27)	(0.45)	(0.38)	(0.39)	(0.37)	(0.41)
Annual hours worked (all)	1393.38	1101.66	1200.15	1358.72	1488.05	1319.84
	(881.16)	(1004.03)	(914.12)	(953.97)	(973.13)	(968.07)
Annual hours worked (emp.)	1571.42	1581.72	1523.67	1720.17	1821.20	1751.53
[7419]	(792.02)	(848.22)	(778.38)	(736.64)	(731.08)	(699.55)
Hourly wage (emp.)	10.65	9.66	10.38	13.57	12.18	12.63
[7419]	(5.53)	(4.76)	(5.14)	(6.79)	(5.93)	(6.34)
BMI	23.70	27.44	25.37	24.69	28.11	26.72
	(5.29)	(6.98)	(5.69)	(5.34)	(6.47)	(5.44)
Underweight	0.07	0.03	0.04	0.04	0.02	0.02
	(0.25)	(0.17)	(0.20)	(0.20)	(0.14)	(0.13)
Healthy weight	0.66	0.43	0.54	0.59	0.36	0.42
	(0.47)	(0.49)	(0.50)	(0.49)	(0.48)	(0.49)
Over weight	0.16	0.24	0.24	0.22	0.30	0.32
	(0.36)	(0.43)	(0.43)	(0.42)	(0.46)	(0.47)
Obese	0.12	0.30	0.18	0.15	0.33	0.24
	(0.32)	(0.46)	(0.38)	(0.36)	(0.47)	(0.43)
Sibling BMI	24.25	26.78	26.15	25.72	26.85	27.08
	(4.85)	(6.10)	(5.52)	(5.11)	(5.57)	(5.29)
% enrolled	0.36	0.20	0.32	0.06	0.06	0.06
	(0.48)	(0.40)	(0.46)	(0.23)	(0.24)	(0.23)
Work experience (in years)	6.47	6.82	6.24	12.12	11.58	10.71
	(4.52)	(5.57)	(4.98)	(5.87)	(5.98)	(6.08)
Age (in years)	24.09	28.17	24.94	33.65	34.65	33.04
	(6.35)	(8.81)	(7.51)	(8.79)	(8.70)	(8.92)
Education (in years)	13.46	12.52	12.56	13.60	13.21	12.42
	(2.32)	(2.07)	(2.08)	(2.46)	(2.09)	(2.45)
% with children	0.11	0.54	0.25	0.75	0.81	0.84
	(0.31)	(0.50)	(0.43)	(0.43)	(0.39)	(0.37)
% with children below six	0.07	0.29	0.15	0.34	0.32	0.39
	(0.26)	(0.45)	(0.36)	(0.47)	(0.47)	(0.49)
Trad_NLSY79	0.10	0.09	0.08	0.11	0.09	0.12
	(0.30)	(0.28)	(0.28)	(0.31)	(0.28)	(0.33)
Trad_NLSY97	0.23	0.64	0.39	0.29	0.72	0.38
	(0.42)	(0.48)	(0.49)	(0.45)	(0.45)	(0.49)
NLSY97	0.39	0.28	0.48	0.08	0.05	0.13
	(0.49)	(0.45)	(0.50)	(0.27)	(0.23)	(0.34)
# of observations	8940	8111	3169	12863	3714	3723

Table 2: Summary of OLS and IV estimates for women with sibling.

Panel A: OLS estimates for single women						
	White	White	Black	Black	Hispanic	Hispanic
BMI	0.00720***	0.00811***	0.00551***	0.00546***	-0.00295	-0.00264
	(3.308)	(3.771)	(2.710)	(2.746)	(-0.634)	(-0.594)
Control for wage	Yes	No	Yes	No	Yes	No
Observations	7,419	7,419	5,333	5,333	2,329	2,329
Panel B: IV estimates for single women						
BMI	0.0149**	0.0175***	0.0103	0.0112	0.00259	0.00284
	(2.256)	(2.634)	(1.188)	(1.315)	(0.173)	(0.200)
Control for wage	Yes	No	Yes	No	Yes	No
Observations	7,419	7,419	5,333	5,333	2,329	2,329
First stage F-stat	104.8	101.9	50.20	50.27	30.38	30.45
Panel C: OLS estimates for married women						
BMI	0.00400*	0.00458**	-0.00153	-0.000531	-0.00315	-0.00273
	(1.748)	(2.064)	(-0.483)	(-0.174)	(-0.780)	(-0.674)
Control for wage	Yes	No	Yes	No	Yes	No
Observations	8,099	8,099	2,247	2,247	2,074	2,074
Panel D: IV estimates for married women						
BMI	0.0209**	0.0216**	-0.00204	-0.000617	8.62e-05	0.00209
	(2.098)	(2.225)	(-0.216)	(-0.0666)	(0.00675)	(0.163)
Control for wage	Yes	No	Yes	No	Yes	No
Observations	8,099	8,099	2,247	2,247	2,074	2,074
First stage F-stat	58.08	58.09	42.19	42.19	30.42	29.13

Note 1: Control variables include for age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Note 2: All t-stats reported are based on standard errors clustered at the individual level.

Table 3: Summary of OLS and IV estimates for men with sibling.

Panel A: OLS estimates for single men						
	White	White	Black	Black	Hispanic	Hispanic
BMI	0.00365	0.00337	0.0105***	0.00984***	0.000446	0.000859
	(1.613)	(1.517)	(3.193)	(3.013)	(0.145)	(0.290)
Observations	9,789	9,789	5,931	5,931	3,505	3,505
Panel B: IV estimates for single men						
BMI	0.0144	0.0153*	0.000109	0.000447	-0.0157	-0.0139
	(1.634)	(1.747)	(0.0110)	(0.0452)	(-1.105)	(-1.009)
Observations	9,789	9,789	5,931	5,931	3,505	3,505
First stage F-stat	64.29	64.25	87.70	88.46	39.40	39.18
Panel C: OLS estimates for married men						
BMI	0.00294	0.00312	0.00151	0.00154	0.00160	0.00211
	(1.565)	(1.642)	(0.552)	(0.578)	(0.719)	(0.954)
Observations	8,367	8,367	2,383	2,383	2,340	2,340
Panel D: IV estimates for married men						
BMI	0.00587	0.00747	0.00988	0.0103	0.00830	0.00885
	(0.978)	(1.231)	(1.413)	(1.512)	(0.968)	(1.041)
Observations	8,367	8,367	2,383	2,383	2,340	2,340
First stage F-stat	74.17	73.60	37.29	37.34	20.16	20.16

Note 1: Control variables include for age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Note 2: All t-stats reported are based on standard errors clustered at the individual level.

Table 4: Employment Regression: Men and Women

Panel A: OLS estimates for women						
	Single	Single	Single	Married	Married	Married
	White	Black	Hispanic	White	Black	Hispanic
BMI	0.000797*	0.000560	-0.000575	5.27e-05	0.00113	-0.00396*
	(1.663)	(0.407)	(-0.404)	(0.0469)	(0.739)	(-1.750)
Observations	8,940	8,111	3,169	12,863	3,713	3,723
Panel B: IV estimates for women						
BMI	-0.00122	0.00213	-0.00259	0.00709*	0.00251	0.00429
	(-0.490)	(0.567)	(-0.538)	(1.695)	(0.504)	(0.604)
Observations	8,940	8,111	3,169	12,863	3,714	3,723
Panel C: OLS estimates for men						
BMI	-0.000827	0.00151	0.00126	-0.000784*	0.000453	-0.000553
	(-1.507)	(0.979)	(1.096)	(-1.748)	(0.366)	(-0.514)
Observations	12,120	8,842	4,643	11,801	3,825	3,588
Panel D: IV estimates for men						
BMI	-0.00841**	-0.000406	-0.00663	-0.00497	0.00101	-0.00939
	(-2.184)	(-0.0921)	(-1.397)	(-1.516)	(0.239)	(-1.389)
Observations	12,120	8,842	4,643	11,803	3,834	3,595

Note 1: Control variables include for age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Note 2: All t-stats reported are based on standard errors clustered at the individual level.

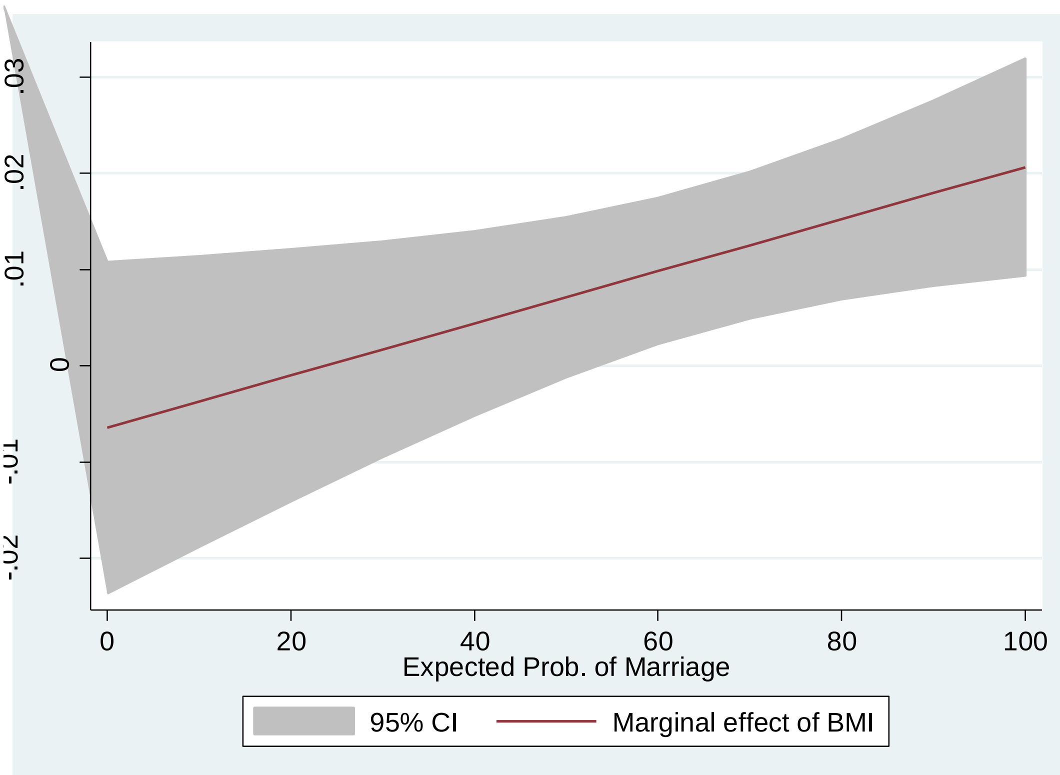
Table 5: Effects of BMI on hours for White women: by type of job

Panel A: OLS estimates for White women				
	Low NRCI	High NRCI	Low NRCI	High NRCI
	Single	Single	Married	Married
BMI	0.00755***	0.00814***	0.00728***	0.00251
	(3.021)	(2.960)	(2.607)	(0.861)
Observations	4,257	3,162	3,940	4,159
Panel B: IV estimates for White women				
BMI	0.0193**	0.0142	0.0249	0.0175*
	(2.489)	(1.519)	(1.610)	(1.688)
Observations	4,257	3,162	3,940	4,159
First stage F-stat	104.5	48.92	25.95	53.89

Note 1: Control variables include for hourly wage, age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Note 2: All t-stats reported are based on standard errors clustered at the individual level.

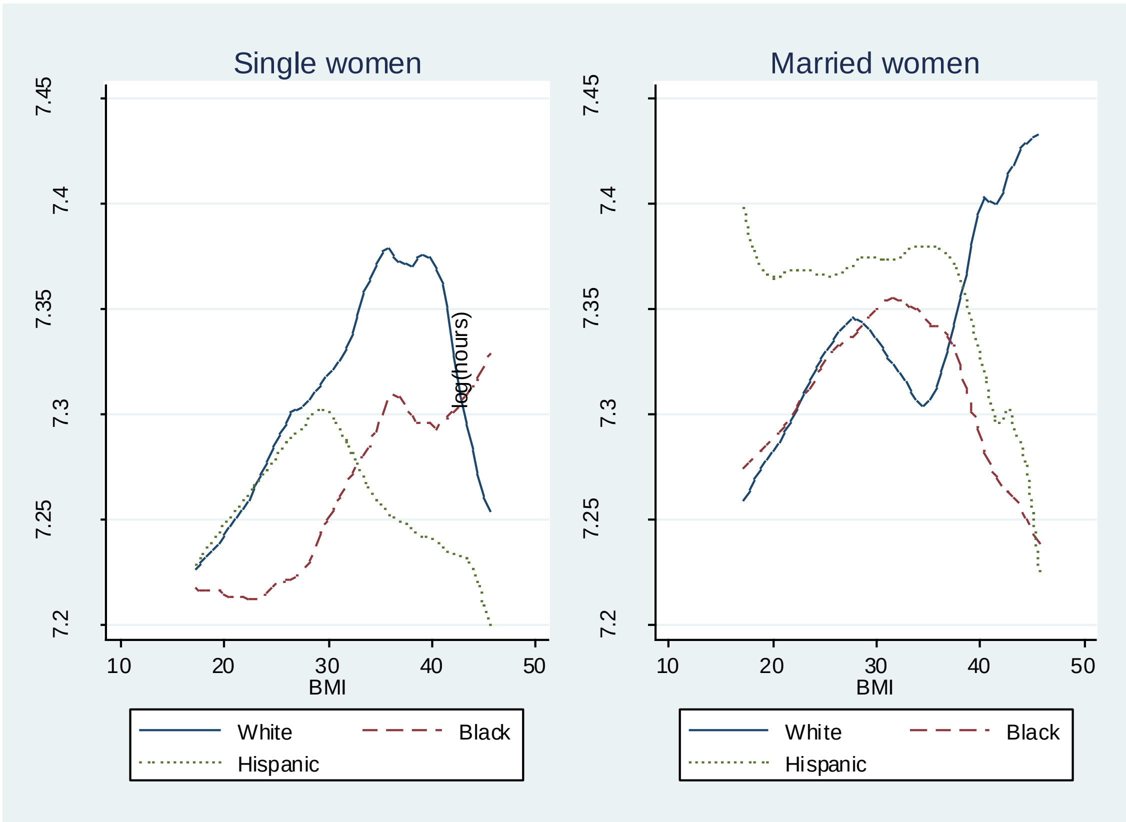
Figure 1: Effect of BMI on hours worked by single white women: by expected probability of marriage



Note 1: Control variables include for hourly wage, age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

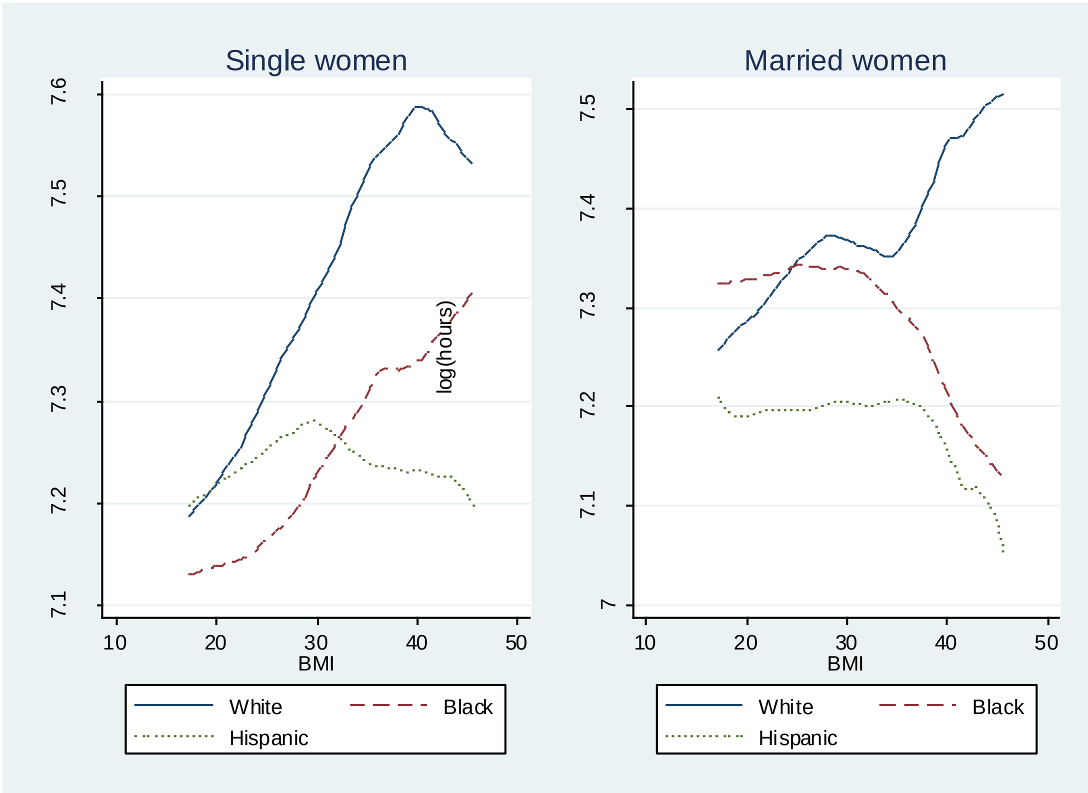
Note 2: 95% CI reported are based on standard errors clustered at the individual level.

Figure 2: Semi-parametric regressions without endogeneity: association between BMI and hours worked for single and married women



Note: Control variables include for hourly wage, age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Figure 3: Semi-parametric IV regressions: effect of BMI and hours worked for single and married women



Note: Control variables include for hourly wage, age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Appendix

Table A1: Summary statistics for men.

	Single			Married		
	White	Black	Hispanic	White	Black	Hispanic
% employed	0.90	0.76	0.85	0.95	0.90	0.92
	(0.29)	(0.43)	(0.35)	(0.23)	(0.29)	(0.27)
Annual hours worked (all)	1490.32	1182.35	1397.00	2180.25	2006.12	2022.70
	(962.35)	(1024.81)	(974.74)	(866.23)	(968.05)	(900.53)
Annual hours worked (emp.)	1700.93	1635.92	1699.86	2284.69	2242.77	2211.34
	(847.04)	(859.29)	(810.95)	(663.27)	(700.94)	(636.87)
Hourly wage (emp.)	11.64	9.98	11.11	17.33	15.03	16.39
	(5.88)	(4.95)	(5.41)	(6.90)	(6.31)	(6.88)
BMI	24.99	25.54	26.29	26.85	27.88	28.22
	(4.42)	(4.75)	(5.21)	(4.37)	(4.98)	(5.18)
Underweight	0.02	0.02	0.02	0.00	0.00	0.01
	(0.13)	(0.14)	(0.13)	(0.07)	(0.05)	(0.08)
Healthy weight	0.57	0.51	0.44	0.36	0.29	0.25
	(0.50)	(0.50)	(0.50)	(0.48)	(0.46)	(0.43)
Over weight	0.29	0.32	0.36	0.43	0.42	0.46
	(0.46)	(0.47)	(0.48)	(0.50)	(0.49)	(0.50)
Obese	0.12	0.15	0.18	0.21	0.28	0.29
	(0.33)	(0.35)	(0.39)	(0.40)	(0.45)	(0.45)
Sibling BMI	24.35	26.32	25.78	25.76	28.01	27.56
	(4.74)	(5.78)	(5.24)	(5.19)	(5.82)	(5.75)
% enrolled	0.29	0.15	0.22	0.05	0.03	0.05
	(0.45)	(0.36)	(0.41)	(0.22)	(0.17)	(0.21)
Work experience (in years)	7.04	7.30	6.77	13.64	13.37	13.11
	(4.83)	(5.39)	(4.98)	(5.90)	(5.79)	(5.78)
Age (in years)	24.73	27.55	25.27	34.61	35.76	34.17
	(6.76)	(8.59)	(7.42)	(8.63)	(8.52)	(8.66)
Education (in years)	13.04	11.94	12.18	13.38	12.92	12.23
	(2.37)	(1.92)	(2.17)	(2.68)	(2.09)	(2.48)
% with children	0.02	0.08	0.07	0.75	0.80	0.83
	(0.15)	(0.27)	(0.25)	(0.43)	(0.40)	(0.38)
% with children below six	0.01	0.04	0.03	0.34	0.33	0.39
	(0.12)	(0.19)	(0.18)	(0.47)	(0.47)	(0.49)
Trad_NLSY79	0.17	0.18	0.27	0.15	0.12	0.20
	(0.37)	(0.39)	(0.44)	(0.36)	(0.32)	(0.40)
Trad_NLSY97	0.25	0.67	0.43	0.30	0.54	0.56
	(0.43)	(0.47)	(0.50)	(0.46)	(0.50)	(0.50)
NLSY97	0.37	0.27	0.42	0.06	0.04	0.09
	(0.48)	(0.44)	(0.49)	(0.24)	(0.19)	(0.28)
# of observations	12120	8842	4643	11803	3834	3595

Table A2: OLS results for all single women (including women without sibling)

	White	White	Black	Black	Hispanic	Hispanic
BMI	0.00417***	0.00519***	-0.000977	-0.000769	-0.00509*	-0.00478*
	(2.653)	(3.395)	(-0.592)	(-0.477)	(-1.759)	(-1.721)
Log(hr. wage)		0.119***		0.181***		0.208***
		(8.701)		(7.616)		(6.282)
Enrolled	-0.432***	-0.416***	-0.306***	-0.289***	-0.320***	-0.304***
	(-27.90)	(-26.71)	(-13.05)	(-12.34)	(-11.65)	(-11.24)
Exp	0.183***	0.180***	0.157***	0.149***	0.147***	0.142***
	(15.71)	(15.43)	(16.54)	(15.56)	(8.175)	(8.000)
Exp sq.	-0.00602***	-0.00608***	-0.00466***	-0.00461***	-0.00409***	-0.00420***
	(-11.78)	(-11.72)	(-12.41)	(-12.34)	(-4.989)	(-5.293)
Age	0.0329**	0.0246*	0.0298**	0.0260*	0.0633**	0.0542**
	(2.205)	(1.649)	(2.038)	(1.780)	(2.510)	(2.217)
Age sq.	-0.000512**	-0.000385	-0.000483**	-0.000411*	-0.00110***	-0.000940**
	(-2.196)	(-1.639)	(-2.195)	(-1.869)	(-2.735)	(-2.442)
Education	0.00435	-0.00196	0.0388***	0.0267***	0.0163**	0.00666
	(0.949)	(-0.427)	(7.142)	(4.792)	(2.236)	(0.941)
Has child	-0.251***	-0.241***	-0.0671**	-0.0679**	-0.155***	-0.143***
	(-5.420)	(-5.255)	(-2.449)	(-2.534)	(-2.801)	(-2.644)
Child <6	0.0258	0.0224	-0.0828***	-0.0796***	-0.123**	-0.135**
	(0.496)	(0.432)	(-2.901)	(-2.835)	(-2.162)	(-2.412)
Trad_NLSY79	-0.0875**	-0.0742**	-0.00638	-0.00480	0.0888	0.0956
	(-2.289)	(-1.982)	(-0.136)	(-0.106)	(1.434)	(1.584)
Trad_NLSY97	-0.0340	-0.0331	0.0137	0.00999	0.0188	0.0249
	(-1.178)	(-1.158)	(0.404)	(0.298)	(0.415)	(0.567)
Constant	6.062***	5.977***	5.310***	5.173***	5.867***	5.613***
	(38.20)	(38.16)	(23.61)	(23.35)	(20.83)	(20.33)
Observations	14,961	14,961	10,596	10,596	4,919	4,919
R-squared	0.264	0.271	0.218	0.228	0.213	0.230

Robust t-statistics in parentheses (clustered at the individual level); *** p<0.01, ** p<0.05, * p<0.1
Control variables included but not shown: census region and year dummies

Table A3: OLS results for all married women (including women without sibling)

	White	White	Black	Black	Hispanic	Hispanic
BMI	0.00226	0.00276*	-0.00181	-0.000738	0.000631	0.00102
	(1.472)	(1.845)	(-0.813)	(-0.340)	(0.276)	(0.445)
Log(hr. wage)		0.104***		0.127***		0.0395**
		(7.593)		(4.916)		(2.134)
Enrolled	-0.140***	-0.131***	-0.0144	-0.00461	-0.0608	-0.0560
	(-4.800)	(-4.595)	(-0.365)	(-0.118)	(-1.165)	(-1.085)
Exp	0.121***	0.116***	0.0806***	0.0774***	0.120***	0.119***
	(11.35)	(11.03)	(5.652)	(5.478)	(6.393)	(6.308)
Exp sq.	-0.00232***	-0.00233***	-0.00175***	-0.00179***	-0.00316***	-0.00318***
	(-6.506)	(-6.584)	(-3.571)	(-3.706)	(-5.283)	(-5.330)
Age	-0.00761	-0.0121	0.0244	0.0147	-0.0199	-0.0181
	(-0.563)	(-0.895)	(0.902)	(0.551)	(-0.805)	(-0.726)
Age sq.	-0.000153	-8.43e-05	-0.000290	-0.000158	0.000222	0.000200
	(-0.794)	(-0.438)	(-0.799)	(-0.440)	(0.692)	(0.618)
Education	0.00987***	0.00418	0.0243***	0.0166**	0.00892	0.00709
	(2.667)	(1.107)	(3.309)	(2.191)	(1.399)	(1.107)
Has child	-0.153***	-0.142***	-0.0722***	-0.0653**	-0.103***	-0.104***
	(-8.823)	(-8.279)	(-2.628)	(-2.416)	(-3.316)	(-3.363)
Child <6	-0.218***	-0.221***	-0.0803***	-0.0842***	-0.129***	-0.128***
	(-13.08)	(-13.24)	(-3.034)	(-3.202)	(-4.704)	(-4.650)
Trad_NLSY79	-0.137***	-0.128***	-0.0808	-0.0725	-0.109	-0.105
	(-4.298)	(-4.074)	(-1.547)	(-1.387)	(-1.635)	(-1.587)
Trad_NLSY97	-0.0234	-0.0283	0.115	0.109	-0.0251	-0.0268
	(-0.357)	(-0.436)	(1.131)	(1.082)	(-0.290)	(-0.310)
Marriage Dur.	0.00523**	0.00610***	-3.27e-05	-2.50e-05	-0.00317	-0.00291
	(2.278)	(2.694)	(-0.0114)	(-0.00895)	(-1.061)	(-0.974)
Log(Spouse Inc.)	-0.0194***	-0.0208***	-0.00426	-0.00506	-0.00232	-0.00263
	(-6.119)	(-6.598)	(-1.236)	(-1.484)	(-0.414)	(-0.470)
Constant	6.652***	6.599***	6.294***	6.234***	6.823***	6.724***
	(28.40)	(28.23)	(14.85)	(14.85)	(15.91)	(15.40)
Observations	16,507	16,507	4,284	4,284	4,349	4,349
R-squared	0.129	0.138	0.127	0.139	0.134	0.135

Robust t-statistics in parentheses (clustered at the individual level); *** p<0.01, ** p<0.05, * p<0.1
Control variables included but not shown: census region and year dummies

Table A4: OLS results for men (including men without sibling)

Panel A: OLS results for single men						
	White	White	Black	Black	Hispanic	Hispanic
BMI	0.00469***	0.00459***	0.00596***	0.00550***	-0.000930	-0.000420
	(3.070)	(3.054)	(2.771)	(2.599)	(-0.397)	(-0.184)
Control for wage	No	Yes	No	Yes	No	Yes
Observations	18,140	18,140	9,957	9,957	5,830	5,830
Panel A: OLS results for married men						
BMI	0.00232*	0.00245*	0.00160	0.00170	-0.000150	0.000281
	(1.835)	(1.932)	(0.829)	(0.875)	(-0.0835)	(0.157)
Control for wage	No	Yes	No	Yes	No	Yes
Observations	15,739	15,739	4,203	4,203	4,303	4,303

Note 1: Control variables include for age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Note 2: All t-stats reported are based on standard errors clustered at the individual level.

Table A5: OLS regressions of hours of work using categories based on BMI

Panel A: Women						
	Single White	Single Black	Single Hispanic	Married White	Married Black	Married Hispanic
Obese	0.105***	0.0663**	-0.0442	0.0420	0.0279	-0.0175
	(3.440)	(2.011)	(-0.751)	(1.280)	(0.606)	(-0.331)
Overweight	0.0661***	0.0384	0.0342	0.0500**	0.0644*	0.0130
	(2.765)	(1.251)	(0.765)	(2.193)	(1.659)	(0.304)
Underweight	-0.0415	0.0187	0.00425	-0.0252	0.106	0.0231
	(-0.996)	(0.262)	(0.0358)	(-0.571)	(1.218)	(0.185)
Control for Wage	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,419	5,333	2,329	8,099	2,247	2,074
Panel B: Men						
Obese	0.0309	0.103***	0.0132	0.0319*	0.0300	0.0447
	(1.038)	(2.618)	(0.313)	(1.800)	(0.922)	(1.378)
Overweight	0.0340*	0.128***	0.00544	0.00138	0.0201	0.0717**
	(1.792)	(4.556)	(0.169)	(0.111)	(0.689)	(2.573)
Underweight	-0.0370	0.0391	-0.131	-0.224	0.381	-0.0243
	(-0.504)	(0.442)	(-1.033)	(-1.285)	(1.613)	(-0.241)
Control for Wage	Yes	Yes	Yes	Yes	Yes	Yes
observations	9,789	5,931	3,505	8,367	2,383	2,340

Note 1: Control variables include for hourly wage, age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Note 2: All t-stats reported are based on standard errors clustered at the individual level.

Table A6: Employment regressions of employment using categories based on BMI

Panel A: Women						
	Single	Single	Single	Married	Married	Married
	White	Black	Hispanic	White	Black	Hispanic
Obese	0.0260**	0.0132	0.0130	0.00666	0.0205	-0.0147
	(2.210)	(0.872)	(0.709)	(0.457)	(1.004)	(-0.613)
Overweight	-0.00665	0.0277**	-0.00201	-0.00943	0.0338*	0.0159
	(-0.797)	(2.188)	(-0.111)	(-0.938)	(1.932)	(0.940)
Underweight	-0.0134	-0.00962	0.0350	0.00132	0.0196	0.00247
	(-1.137)	(-0.354)	(1.332)	(0.0679)	(0.537)	(0.0380)
Observations	8,940	8,111	3,169	12,863	3,714	3,723
Panel B: Men						
Obese	-0.0159	0.0186	0.0238	-0.00751	-0.00496	0.0119
	(-1.512)	(1.145)	(1.362)	(-0.957)	(-0.294)	(0.595)
Overweight	-0.0158**	0.00944	-0.00245	-0.00909	-0.0168	0.00993
	(-2.413)	(0.801)	(-0.189)	(-1.607)	(-1.163)	(0.662)
Underweight	-0.0183	-0.0475	-0.0588	0.00218	-0.0385	0.0403
	(-0.764)	(-1.587)	(-1.439)	(0.0572)	(-0.312)	(0.604)
Observations	12,120	8,842	4,643	11,803	3,834	3,595

Note 1: Control variables include for age (quadratic), work experience (quadratic), education, dummies for whether the woman believes in traditional gender roles, whether the woman has any children, if the youngest child is below six, census region and years.

Note 2: All t-stats reported are based on standard errors clustered at the individual level.

Figure A1: semi-parametric regression results with 95% CI