

For Better or Worse: Relationship Status and Body Mass Index

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Abstract

Recent increases in the incidence of obesity and declines in marriage have prompted policymakers to implement policies to mitigate these trends. There are four hypotheses (selection, protection, social obligation and marriage market) that might explain the relationship between marital status transitions and changes in BMI. The selection hypothesis indicates that those with a lower BMI are more likely to be selected into marriage. The protection hypothesis states that married adults will have better physical health due to the increased social support and marriage and reduced incidence of risky behavior among married individuals. The social obligation hypothesis states that those in relationships may eat more regular meals and/or richer and denser foods due to social obligations one of which may be marriage. Finally, the marriage market hypothesis, as we term it, indicates that when adults are no longer in the marriage market they may not maintain a healthy BMI because doing so is costly and they are in a stable union—or on the other hand, adults may prepare for the marriage market by losing weight. Taking advantage of the longitudinal aspect and complete marriage histories provided in the National Longitudinal Survey of Youth 1979, we estimate individual fixed effects model to examine the change in log body mass index (BMI) and the incidence of overweight and obesity, as a function of changes in relationship status controlling for the effects of aging and other respondent characteristics. We find no support for the marriage protection hypothesis. Rather we find evidence supporting the social obligation and marriage market hypotheses--BMI increases for both men and women during marriage and the course of a cohabiting relationship. Separate analyses by race and ethnicity reveal substantial differences in the response of BMI to relationship status.

Introduction

Recent decades have seen significant changes in the prevalence of obesity and overweight nationally and internationally.¹ In the United States the prevalence of obesity for adults twenty to 74 years of age has increased from fifteen percent in the late 1970s to 32.2 percent in 2003-2004 (Flegal et al., 2002, Ogden et al., 2006). From 2000 to 2005 alone, the prevalence of obesity rose 24 percent (Strum, 2007), and increases in obesity differ substantially by race, ethnicity and gender. From 1990 to 2004, obesity prevalence rose 6.6 percent for non-Hispanic whites, 13 percent for non-Hispanic blacks and seven percent for Mexican Americans, with larger increases for men than women (Ogden et al., 2006). Globally, while obesity is still fairly uncommon in African and Asian countries (about five percent), the majority of European countries have experienced an increase in obesity from ten to forty percent in the last decade and prevalence as high as 75% in urban Samoa (AOA, 2005, WHO, 2007). The World Health Organizations estimates that over one billion people are now overweight and at least 300 million are obese (WHO, 2007).

These drastic demographic changes in the distribution of weight have significant consequences. Body Mass Index (BMI) cutoff points were originally constructed to reflect mortality risk and obesity is implicated in a host of medical problems (Daniels, 2006, Finkelstein et al. 2003). Obesity is linked to chronic illnesses including diabetes, hypertension, asthma, heart disease, and cancer and it is estimated that these chronic conditions are more prevalent among the obese than they are among smokers, drinkers or those living in poverty. Obesity is also estimated to affect more people than smoking, heavy drinking or poverty (Sturm 2002; Sturm and Wells, 2001).

The economic costs of obesity are substantial. For example, medical expenses for the obese have been estimated to be 36 percent higher than for their non-obese counterparts (Sturm, 2002). Wolf and Colditz (1998) estimate that spending on obesity was about 6 percent of national health care expenditures in 1995. Given the rise in obesity since these data were collected in the 1980s this percent has risen. Finkelstein et al. (2003), using data from the late 1990s data estimate the total expenditures from overweight and obesity related diseases to have been about 9.1% in 1998 or about \$78.5 billion, a portion of which is paid by taxpayers for Medicaid and Medicare enrollees. There is no doubt that managing health problems associated with obesity is costly and that the increased prevalence of obesity in the U.S. population (including a sharp rise in the proportion of overweight children—18.8 percent in 2004 according to the CDC) will increase such costs in the future.

From a strictly accounting perspective, individuals gain weight when their caloric intake is greater than the calories that they expend. This suggests that the percent of obese adults is rising either because caloric intake is rising or because activity levels have fallen off, or some combination of the two. Many researchers have used this framework to examine how eating patterns and activity levels have changed among adults. Philipson and Posner (2003) argue, for example, that technological changes allow us to expend far fewer calories than we take in, leading to a rise in obesity over time. Other researchers

¹ A BMI (defined as weight in kilograms divided by height in meters squared) between 18.5 and 25 is considered healthy weight, a BMI under 18.5 is considered underweight and a BMI between 25 and 29 is considered overweight. A BMI 30 and over is considered obese and a BMI 40 and over extremely (or morbidly) obese, roughly 100 pounds overweight (Strum, 2007).

implicate anti-smoking campaigns, the falling prices of food, increasing prevalence of fast food restaurants, job strenuousness and unemployment as predictors of the upward trend in adult obesity (Rashad and Grossman, 2004; Lakdawalla and Philipson, 2002; Chou et al, 2002; Philipson, 2001; Ruhm, 2000).

Marriage (and in many cases divorce) has been found to be associated with changes in labor market productivity and compensation. Married men are found to earn more than unmarried men, even controlling for education, age, occupation and industry, and person-specific fixed effects to control for selection into marriage. This marriage-wage premium is a phenomenon observed not only in the U.S. (recent empirical studies using U.S. data include Averett et al., 2006; Hersch and Stratton, 2000; Light, 2004; Stratton, 2002; Chun and Lee, 2001) but also in other countries (see Richardson, 2000; Gupta et al., 2005.)

There is also a growing literature that links marital status to health outcomes and longevity (Wilson and Oswald, 2005 provide a recent review of this literature). In addition there is evidence that individuals (men in particular) reduce risky behaviors after marriage (Duncan et al, 2006). The evidence that cohabitation confers these same benefits is mixed and there are a number of studies that establish that the financial and health benefits of relationship status are somewhat unique to marriage (Waite and Gallagher, 2000 for example). This may be because in marriage, which in the U.S. is a more stable relationship than cohabitation, individuals are more likely to invest by specializing. However, there are others whose research suggests that the type of relationship does not matter (Lillard and Panis, 1996).

In this paper, we add to the literature by estimating the relationship between relationship status and one important indicator of health—the Body Mass Index (BMI). We broaden previous work on marriage and health by explicitly considering cohabitation as a separate relationship status. We use data from the 1979 cohort of the National Longitudinal Survey of Youth (NLSY79), a longer panel data set than used previously, to sort out the effect of relationship status on BMI. Although our results do not inform us about the route through which relationship status affects BMI, they provide important evidence about the link between relationship status and obesity. We might expect systematic associations between marriage and BMI because marriage confers protective effects, because individuals alter their BMI as they move in and out of the marriage market, because partnered individuals alter their social eating behaviors and activities or because individuals who marry are a select group, inherently different from those who do not marry. We expand on these explanations in the next section.

The Theoretical Link between Marriage and Health:

There are competing, but not mutually exclusive theories that have been offered to explain the well-documented positive correlation between marriage and various measures of health status and mortality. The marriage selection hypothesis purports that the healthy are selected into marriage because they make better marriage partners. According to this argument, an observed correlation between marital status and health is not causal—i.e. not a function of marriage *per se* but rather a function of the process by which marriage partners are selected; such a process favors the healthy. This observation is consistent with Becker's (1981) marriage model where comparative advantage is important if there are to be gains realized from marriage. This is also consistent with the positive assortative mating hypothesis where health status is a criterion—healthy people will marry other healthy people. It also suggests that healthier people may have an easier time finding a

partner and maintaining a relationship (Lillard and Panis, 1996). Theory suggests a clear sign for the selection effect—those who are healthy (i.e. thinner) are most likely to be selected into marriage. Because 90 percent of Americans eventually marry, obesity does not necessarily prevent marriage but it may influence marital timing and mate quality. For example, Averett and Korenman (1996) found that obese women were less likely to marry and when they did marry they married spouses with lower earnings.

Another explanation linking marital status to health outcomes is that marriage confers health benefits by providing protection—this is termed the marriage protection hypothesis in the literature (e.g. Waldron et al., 1996). Under this hypothesis, married people are healthier because they have a spouse who can monitor their health behaviors, who can care for them when they are ill and who will likely discourage them from engaging in risky behaviors. They also, by virtue of economies of scale and specialization in labor market and home production activities, have access to more material resources on a per capita basis than they would single. Thus marriage provides social support and financial resources that themselves promote health by providing access to better nutrition and health care. In contrast to the selection hypothesis, the marriage protection hypothesis purports that married people are healthier precisely because they are married; i.e. being married is the cause of better health. In this case, we would expect to see that married people have BMIs in the recommended range rather than in the overweight range.

However, as Lillard and Panis (1996) note, the existence of the protective effect introduces the possibility of adverse selection: those in poor health have an incentive to marry. In other words, those who are most likely to benefit from marriage in terms of better health are most likely to marry and least likely to exit the marriage; i.e. they are most likely to “purchase” the marriage protective effect. There are also theories that emphasize that positive assortative mating will lead to better health because partners with similar traits share values and beliefs that may facilitate a supportive relationship (Stutzer and Frey, 2003).²

In addition to the selection and protection hypotheses, which generally hold for most measures of health, there is a third route through which BMI in particular might be related to marital status. In American society (as in many other developed nations) obese persons, especially women, are stigmatized (Sobal, 1999). Individuals who are not as socially desirable are less likely to have an opportunity to attract a potential mate (Jo, 2005). Carmalt et al. (2007) using BMI and other physical and behavioral covariates find that both heavier men and women are less likely to be matched with a physically attractive partner, though greater personality attractiveness and grooming increases the likelihood of being matched with a physically attractive partner. This is especially true for women because physical attractiveness has traditionally played a more important role in attracting a mate. Because maintaining a low weight is costly, once a relationship has been established, vigilance in the monitoring of one’s weight may relax. This ‘marriage market hypothesis’ suggests that married individuals, who are no longer concerned about

2. There are, however, some studies that cast doubt on the protection hypothesis and the possibility that marriage would lead to healthier BMI. Goldman and Smith (2002), investigating adherence to self-treatment health regimens for HIV and insulin-dependent diabetes, also found that men who went from married to single were significantly less likely to adhere to their health regimen suggesting that wives provide a protective role in their husbands, with the presence of a wife being more beneficial for more educated men. However, they did not find that married men provided the same protection for their wives. Furthermore, as Duncan et al. (2006) find, marriage reduces the incidence of smoking and smoking cessation is strongly correlated with weight gain (Jo, 2004; Sobal, 2003)

attracting a mate may allow their BMI to rise. Similarly, individuals may lower their BMI in the event of a divorce. Theoretical models of marriage and divorce posit that individuals compare their utility in marriage to their utility in the single state (Becker, 1981). Utility in marriage includes the characteristics of one's spouse. Because the utility-maximizing conditions for entering marriage are the same as the conditions for remaining married, the validity of this marriage market hypothesis in explaining a link between marriage and BMI relies on the assumption that there are some transactions costs associated with exiting marriage (i.e. divorce costs are non-trivial). Under this scenario, partners will tolerate some amount of weight gain before they see their own benefits from the union fall enough to make divorce the preferred option.

Another explanation offered for a positive correlation between marriage and BMI is that married couples may face marital role obligations that often encourage them to eat – perhaps more than they might as single individuals because they may eat more regular meals or eat out more as a married couple and thus ingest more calories (Sobal, 2003; Jo, 2004). Recent evidence indicates that this may hold for social networks in general (Christakis and Fowler, 2007).

Naturally, these hypothesized explanations for the relationship between marriage and health are not mutually exclusive. One can easily imagine that while marriage *per se* might reduce risky behavior, selection suggests that those who engage in risky behaviors might not be selected into marriage and that at least part of the observed relationship between marriage and risky behavior is due to selection. Thus, in order to understand the relationship between relationship status and BMI, an empirical investigation is warranted.

In addition to marriage, cohabitation may impact partners' health, though perhaps to a lesser extent than among married partners. Cohabitors have some security in the presence of a partner but also have a lower cost of union dissolution and therefore may feel that they are still in the “marriage market”. Thus, cohabiting partners may feel greater pressure to maintain a lower BMI. They also may be less likely to provide the protective effect if it is particularly time consuming. Divorced individuals may view themselves as back in the marriage market and thus we might expect them to lose weight.

Our discussion of the possible routes through which relationship status might result in changes in BMI highlights the fact that theory is ambiguous as to the effect of relationship status on BMI. Our analysis allows us to empirically evaluate the relative strengths of these competing effects.

We expect that the relationship between marital status and BMI may be different for men and women and we estimate our models separately for these two groups. Because physical attractiveness has been shown to be a more important factor for women in the marriage market than for men (Averett and Korenman, 1996; Conley and Glauber, 2005), and because there is some evidence that women are more likely to take care of men rather than vice versa (Goldman and Smith, 2002) we hypothesize that the protective effect of marriage may dominate for men, and the marriage market effect may be strongest for women. We also expect that as the duration of the marriage increases and the probability of divorce decreases that BMI will go up for both men and women reflecting the marriage market hypothesis. In the next section we review the extant literature on this topic followed by a discussion of our method and data.

Previous Empirical Research on the Link between Marriage and Health

A consistent finding in previous cross-sectional studies is that married people enjoy better health and live longer than their unmarried counterparts. Only relatively recently have researchers tried to disentangle the selection and protection effects of marriage by using longitudinal data. A recent review by Wilson and Oswald (2005) provides an excellent summary of this literature and a more comprehensive review than is included here. Interestingly, Wilson and Oswald note, that although economists have been contributing to the marriage wage premium literature for years, they have had relatively less to say about other benefits of marriage, including health, despite the fact that there are potential cost savings if marriage *per se* is the cause of better health.

Researchers have used a variety of methods to control for the selection of the healthy into marriage: prospective models, difference models and simultaneous equation models. In an example of the latter, Lillard and Panis (1996) use data from the Panel Study of Income Dynamics to jointly estimate determinants of marital status, health and mortality. Using a self-reported measure of health status they find evidence of positive selection into marriage based on health but also some evidence for adverse selection—i.e. some evidence to suggest that unhealthy men are more likely to marry. They also find some support for the protection effect hypothesis resulting from marriage.

Other researchers find support for both the selection and protection effects of marriage by exploiting the timing of events available from longitudinal data to estimate prospective models. Controlling for pre-marriage behaviors, Duncan et al. (2006) find that both marriage and cohabitation reduce the incidence of some substance use and that the protective effect of marriage is greater than that of cohabitation. Similarly Waldron and Hughes (1996) find a strong protective effect of marriage on later health outcomes among women even after controlling for initial health status. The association between marriage and health was found to be much weaker for women who were employed full time.

Similar to the analysis that we conduct, a number of earlier studies relied on individual fixed effects or difference models to net out the selection effect of marriage. Wu and Hart (2002) estimate the effects of marital and non-marital union transitions within a two-year period on three measures of health—a self-reported health indicator, a measure of depression and a generic health status index. They found that after netting out selection by estimating a difference model and controlling for protection effects by including measures of social networks and social contacts, staying married or cohabiting resulted, counterintuitively, in poorer physical and mental health compared to those who remained single. In contrast, Stutzer and Frey (2004) estimated fixed effects models using 17 years of data from the German socio-economic panel and found a protective effects of marriage on happiness. Similarly, Blanchflower and Oswald (2004) in their study of happiness in the U.S. and Britain estimate the utility value of a lasting marriage is worth around \$100,000 per year on average (compared to being widowed or separated).

The marriage and health literature identifies a selection effect of marriage among the healthy, but also concludes that there is support for a protection effect of marriage, in that marriage, and to a lesser extent, cohabitation increases longevity, reduces risky behaviors, and makes people healthier. Though marriage is shown to positively affect the health of both men and women, there is some evidence that men benefit more than women.

Less attention has been paid to the relationship between marital status and BMI, although several researchers have found that there is a negative selection effect into marriage associated with BMI. Specifically, the obese are less likely to be married. For example, Averett and Korenman (1994) and Conley and Glauber (2005) both report that obese women fare far worse in the marriage market than their peers in the recommended BMI range.

A considerable amount of research that shows that the BMIs of spouses are highly correlated (See Jeffery and Rick, 2002 and the citations within). Furthermore, a recent paper by Jeffery and Rick (2002) examined the longitudinal associations between body mass index and marriage-related factors. They found that those who married during their study gained weight while those who ended a marriage lost weight. They did not find any evidence that obesity reduced the likelihood of getting married (though the authors noted that their sample consisted of relatively older adults and they observed very new marriages).

Several papers by medical and nutrition researchers and sociologists examine the link between marital status and weight in a longitudinal framework. These papers used data from the 1980s and the early 1990s (and hence often did not control for cohabitation). Generally they had only two time points and could not estimate effects for a long marital history. These papers provide mixed evidence regarding the association between marriage and weight (for a review of these papers see Sobal et al., 1993). To our knowledge only two recent papers employed techniques that allowed one to evaluate a causal relationship between marital status and weight changes. Sobal et al. (2003) use longitudinal data to examine the relationship between weight and marriage transitions and find that women who were unmarried at baseline and married before the follow-up survey had greater weight gain than those who were married at both times. In contrast, men who remained divorced/separated and men who became widowed lost more weight than men married at both baseline and follow-up. They interpret their findings as indicative that changes in social roles, such as entering or leaving marriage, influence physical characteristics such as body weight. One drawback of their method is that they only observe their sample in two time points which are 10 years apart, introducing the possibility that they miss multiple intervening marriage transitions.

Jo (2004) uses NLSY data to estimate a bivariate probit model of the effect of marriage on the probability of being obese. His empirical method has the potential to identify the causal effect running from marriage to the BMI. The bivariate probit typically relies on the identification of valid instruments, but Jo relies on an alternative identification strategy that is achieved by constraining the value of the correlation coefficient between the two error terms, the unobservables that determine obesity and the unobservables that determine the probability of marriage. He reports that “[t]hese findings support and even confirm the operation of a marital causation model among men...” (Jo, 2004, p. 57). He notes also that for women, the results do not support the marital causation model.

Data and Econometric Model

To examine the link between relationship status and BMI we use data from the 1979 cohort of the National Longitudinal Survey of Work Experience of Youth (NLSY79). These data are a nationally representative sample, including a weighted oversample of Hispanics, African-Americans and low-income whites. The survey respondents, over 12,000 young men and women, were between the ages of 14 and 22 in 1979. The

advantage of the NLSY79 data is that respondents were surveyed annually between 1979 until 1994 and biannually thereafter. Respondents provided information on their transitions from school to employment, marriage and fertility histories, family structure, and detailed information on income and labor market variables, as well as periodic reports of height and weight. We begin our analysis with data from the 1981 survey because this is the first year height and weight data were recorded.

We extract a sample of individuals over the age of 18 that consists of respondents who had complete and chronological marriage histories based on marriage and divorce dates. Our sample is divided into sub-samples by relationship status: never married, married and divorced. To examine the impact of informal relationships, for those who are never married or divorced we also identify the presence of a cohabiting partner. We define a cohabiter as an unmarried individual who reported the presence of a partner other than a spouse in the household record. For those respondents who were married or divorced at the time of the survey, we generated duration variables that calculated the length of the marriage or divorce based on the interval of time between the interview date and the most recent marriage or divorce date. This allows us to determine whether relationship duration has an effect on the BMI over and above the effect of relationship status *per se*. Unfortunately, though marriage and divorce dates are recorded in the data, cohabitation dates are not. For cohabiting relationships we use the sum of the number of consecutive years an individual reports partner in the household; it is not possible to precisely identify the length of cohabiting relationships and identify different cohabiting partners with certainty. To estimate an unbiased duration effect, we control for age (and age squared) in our models since it is true for both married and single individuals that BMI increases as part of the aging process.

We follow an empirical approach that is fairly standard in the literature on marriage and health which aims to disentangle selection from potential protection and marriage market effects (see, for example, Wilson and Oswald, 2005; Sobal et al., 2003; Wu and Hart, 2002). Our interest lies in untangling the selection effect to determine if there is an effect of the type of relationship on BMI after netting out selection. Thus, we estimate individual-level fixed-effects models. Our econometric model is:

$$\ln(BMI_{it}) = \alpha + \beta' R_{it} + \gamma X_{it} + \delta_i + \varepsilon_{it} \quad (1)$$

where the dependent variable is the natural log of the predicted BMI of individual i at survey t .^{3,4} The independent variables of interests are R_{it} , a vector of dichotomous variables indicating the individual's relationship status at time t . Relationship status variables are classified into one of five categories: 1) never married and not cohabiting; 2) unmarried and currently cohabiting; 3) currently married; 4) divorced and not cohabiting; or 5) divorced and currently cohabiting. The omitted category in our analysis is *Never Married and Not Cohabiting*. The vector X includes other potentially important sociodemographic determinants of BMI such as education, region of residence,

3 The distribution of the Body Mass Index is positively skewed, thus to minimize the impact of positive outliers we estimate models of logged BMI. We re-estimate all of our models using linear BMI and obtain similar, though less precise results. Eleven individuals whose weight was outside the "measurable range" of 50 to 400 pounds, as used by the NLSY79, were dropped.

4 Due to the potential measurement error in self-reported height and weight data we use the coefficients estimated from the NHANESIII data by Cawley and Burkhauser (2006) to predict a measurement error corrected height and weight of respondents. While this does not correct for all potential measurement error, the goodness of fit for their models by race and sex have an R-squared of 0.91 to 0.95.

and various fertility measures. Because of the effect of pregnancy on BMI for women⁵, we include an indicator of a current pregnancy, age at pregnancy, the presence of any children, the number of children, the birth of a child within the past year, and the age of the most recent child born. Because of the positive correlation between BMI and age, and because an individual is necessarily older when divorced than during their marriage, it is important to control for age. We include both age and age-squared to allow for non-linearities in the relationship between BMI and age. Finally, our models include δ_i , a vector of individual-level fixed-effects. As explained above, the inclusion of these fixed-effects allows us to estimate β' parameters that are unbiased by any time invariant individual characteristics correlated with marital status. We are cognizant of the limitations of the fixed-effects models as summarized by Antonovic and Town (2004).⁶ However, given that we lack credible instrumental variables for relationship status and we know that OLS models do not allow us to untangle selection from protection and marriage market effects; fixed-effects models are our preferred empirical method.

To estimate individual fixed effects models, we arrange our data in a person-year format. Each respondent contributes one observation in every year in which he or she reports weight data to allow the calculation of their BMI. Height data were collected in 1981, 1982, and finally in 1985 when respondents are between the ages of 20 and 28.⁷ For the years after 1985, we use height measured in 1985.⁸ Weight data were collected in those same three years, and then in eleven of the 14 survey years after 1985.

Table 1a presents the unadjusted sample means for women for the entire sample (n=56,643 person years) and by marital status. The average woman in our sample has a BMI that is just over upper bound of the “recommended” range (over 25 is considered overweight or obese). BMIs are highest for single cohabiting and divorced women though the means are not statistically different. We see that the BMI of never married women is, on average, slightly higher than that for women in formal or informal (cohabiting) relationships. Table 1b reports the means for our sample of men (n=54,867 person years). Divorced men who cohabit and married men have the highest BMIs. As shown in Table 1, the vector X includes demographic and socioeconomic covariates, all of which are time varying except for dichotomous variables identifying race and ethnicity and whether the respondent lived with both parents at age 14.

Results

Given the important role of selection in marriage decisions, we begin our empirical analysis by estimating a model of logged BMI in 1981 on whether an individual ever marries using as our sample all individuals who reported having never been married in of

5 We also include these measures to control for any potential “sympathy weight” gain during a spouse’s/partner’s pregnancy.

6 We concede that our methods do not take into account any potential structural endogeneity (reverse causality between marriage and BMI), which could potentially be solved with instrumental variables (IV). We have already attempted to use religion and religious attendance as instruments; however, due to the infrequency in the data of these variables, they provide us with no statistical power. We have not identified other valid instruments—i.e. variables which affect BMI only through their effect on marriage. Given the well-known problems with weak and/or invalid instruments as summarized in Murray, 2005, we do not pursue an IV approach.

7 Height and weight information was also gathered in 1983, but only for ever-pregnant females. We do not use data from this year.

8 Given that the denominator of the BMI equation is constant from 1985 forward, change in BMI is thus a result of weight change.

1981—the first year of our panel. The first column of Table 2 indicates that women who are single in 1981 and who subsequently marry have a 1981 BMI 6.3 percent lower than those who do not ever marry. This finding is indicative of selection into marriage for women with lower BMIs.⁹ For men (in column 2), those who ever marry have a 1981 BMI 1.4 percent higher than those who remain single indicating selection into marriage of slightly heavier men. The second panel of Table 2, estimated on the sample of those who have ever been married at some point in the survey, examines the effect of BMI at the time of marriage on the probability of eventually divorcing. We find no evidence that weight plays a significant role in selecting into divorce. These results highlight the importance of controlling for selection into marriage in the subsequent analyses.

Table 3 presents the OLS and Fixed Effects (FE) estimates of logged BMI on relationship status controlling for our set of sociodemographic covariates. For women the OLS results indicate lower BMIs in any relationship status compared to being single and never married. For example, being married is associated with a 2.6 percent lower BMI than women who are single and never married. Divorce is associated with a 4.6 percent lower BMI compared to being single never married. This result is consistent with the notion that women with lower BMIs are more likely to form relationships. But in an OLS model, the selection effects are combined with other possibly causal associations between relationship status and BMI.

In keeping with findings from other studies, these OLS results also reveal that BMI increases at a decreasing rate with age and is higher for black and Hispanic women and for women with less education. Interestingly, women with any children have slightly lower BMIs than women without children—this effect occurs while holding marital status and pregnancy status constant. These OLS results are only estimates of the gross relationship between relationship status and BMI. As such, they combine the selection effect and any causal effect of marriage on BMI. The adjusted R-squared indicates that these covariates explain 17 percent of the variation in log BMI. F-tests indicate that the coefficient estimates on marriage is significantly different from that of other types of relationships.

For men we find a different pattern of results by relationship status in the OLS models. Married men, compared to single never married men, have a BMI which is 3.1 percent higher while the BMI of divorced men who are currently cohabiting is 2.2 percent higher than that of single never married men. However, men who are divorced and not cohabiting have significantly lower BMIs than their single never-married counterparts. In contrast, men who are divorced but cohabiting have BMIs that are not significantly different from those of single never-married men. The same relationships with respect to age, education, race and ethnicity hold for men as they did for women.

To purge our estimates of the marriage selection effect we examine individual fixed-effects (FE) models. These estimates are presented in columns 2 and 4 of Table 3. In contrast to the negative cross-section results for women, we find that being married is associated with a BMI that is 1.8 percent greater than during her single, never married years. Becoming divorced continues to be associated with a lower BMI but the magnitude has fallen from 4.6 percent lower in the OLS model to a modest 0.5 percent lower BMI in the FE model. Single cohabiting women have slightly higher BMIs (coefficient = .008).

⁹ 1981 is the first year BMI is available. This estimate is calculated on the mean height of all women in the sample, 64.3 inches or about 5'4".

Clearly netting out selection reveals a very different pattern than seen in our OLS results. These findings are inconsistent with the idea that marriage confers a protective effect for women by lowering their BMI.

For men, the FE models indicate that the positive effect of marriage seen in the cross section remains and it is still significant at the 1 percent level, but the magnitude of the effect drops by nearly half—becoming married is associated with a 1.6 percent increase in a man’s BMI. We see that divorce is associated with a lower BMI but this is not statistically significant. Men who cohabit have BMIs about 1 to 1.5 percent higher than single never married men.¹⁰ Clearly, for men, being in a relationship with a partner, whether formalized through marriage or not is associated with a BMI increase.

Our comparison of the OLS and the FE results reveal that for women there is significant selection into marriage with women of lower BMI being most likely to marry as evidenced by the negative coefficients on marriage in the cross section models and the complete elimination of a negative effect of marriage in the FE model. This is consistent with the findings in Table 2 that women who will eventually marry have lower BMIs. Fixed effects models, which remove time invariant heterogeneity, reveal that for women there is a positive effect of marriage on the BMI though the coefficient is not particularly large (this is a weight gain of 2.7 pounds for the average woman in our sample). There is a smaller, but significant positive effect of cohabitation on BMI. This suggests a potentially causal effect of marriage and cohabitation on women’s BMI. Whether this is a marriage market effect or caused by changes in eating and activity patterns in a relationship cannot be disentangled with our data. However, the size of the effect is small indicating selection plays an important role for women. For men, after netting out selection we find that married men and divorced cohabiting men are only slightly heavier (about 1.75 pounds for the average man).¹¹

The model estimated in Table 3 assumes that the effect of relationship status is constant in all years (i.e. our estimates assume a single average relationship status effect regardless of the duration in each status). To facilitate our understanding of the relationship between marital status and BMI over time, we map out BMI trajectories for women and men before and after relationship status transitions. Figure 1 illustrates BMI changes for men and women in the two years before marriage and in the three years following marriage relative to the individual’s BMI at the time of marriage. This figure is constructed from fixed effects models that control for age and all of the sociodemographic variables included in the models in Table 3. Figure 1 shows clearly that both men and women gain weight after marriage. Women begin at lower BMIs in the year before marriage, and then gain weight steadily after marriage occurs. The initial drop in BMI for women may result from the desire to lose weight prior to the wedding. The trajectory for men shows a similar pattern of weight gain, but it is smaller and less precisely estimated.

In similar fashion to Figure 1, Figures 2-5 illustrate the BMI trajectories for men and women prior to and subsequent to single cohabitation, divorce, divorce cohabitation and pregnancy. BMI patterns for never married men and women who enter cohabiting relationships (Figure 2) indicate some weight gain with entrance to cohabitation but it is

¹⁰ F-tests indicate that statistically the effect of marriage and being a divorced cohabiter are the same but the effect of being married is statistically different from being divorced or cohabiting and never married.

¹¹ This estimate is calculated on the mean height of all men in the sample, 69.7 inches or about 5’10”.

smaller in magnitude than marriage, suggesting that given the lower cost of relationship exit, or lower levels of commitment cohabiters may more carefully monitor their BMI. Figure 3 indicates an irregular pattern of BMI changes for divorced and cohabiting men and women that are not significantly different from the initial cohabitation year.

Figure 4 illustrates the extent to which divorce negates marriage-related weight gain. There is some weight loss in the period just prior to divorce and significant loss after divorce. Women's BMIs drop by nearly 1.2% and men's drop by .6% in the year following divorce. BMI's for divorced women reach their low point 2 years after divorce, but for both men and women the post divorce weight loss is short lived. Though the observed decreases in BMI during the years in which an individual is divorced are consistent with the marriage market hypothesis, yet another factor could be at work. The process of divorce, both the emotional upheaval, property settlements, and the physical move to two separate households are likely to affect one's emotional well-being. Physical responses to anxiety and depression often include weight changes. The fact that BMI's are found to be lower than in the single state may be explained by the emotional stress of divorce (Sobal et al, 2003; Hobson, 1998). This avenue of causality is supported by our findings that the decreases in BMI upon divorce are most sharply felt in the years immediately following divorce.

Finally, Figure 5 confirms what we expect regarding the impact of pregnancy on BMI for women. Women experience weight increases during pregnancy and residual weight gain which eventually levels out. For men whose wives or partners are pregnant there is no evidence of sympathy weight gain.

Until now, we have examined the effect of relationship status on a continuous measure of the BMI. However, small changes in BMI for individuals within the normal range are not expected to have serious health consequences. On the other hand, if the changes in BMI cause individuals to cross into the unhealthy range of the BMI, the health consequences may be much more serious. In tables 4a we present results from a model in which the dependent variable is a binary indicator that an individual is overweight or obese; i.e. a binary indicator equal to one if an individual's BMI is greater than 25. In table 6b we present a model in which the dependent variable is an indicator of obesity (a BMI greater than 30).¹² The OLS models confirm the selection of women who are not overweight into marriage. For women, the FE results indicate that married (divorced) women have a higher (lower) probability of overweight and obesity than do single, never married women. Interestingly, in contrast to our linear indicator of BMI, we find no evidence that there is an effect of cohabiting on women's BMI. The results for men are also of interest. Our OLS models in Table 3 indicated that men with higher BMIs were selected into marriage and cohabitation, and Tables 4a and 4b indicate that even men whose BMI places them in the overweight and obese category are selected into marriage. The FE models in Tables 4a and 4b suggest that men with partners are more likely to be overweight and obese. These results clearly indicate that any protective health effects of marriage and cohabitation do not occur through healthy weight management.

Marital Status and BMI by Race and Ethnicity

¹² We also estimate these models using a dependent variable that indicates that an individual is morbidly obese (BMI > 40). There is no significant relationship between relationship status and morbid obesity, in large part because of the very low incidence of morbid obesity (2%) in our samples.

Marriage and cohabitation rates vary considerably by race. Data from the 1995 round of the National Survey of Family Growth, for example, reveal that 47.4 percent of Hispanics were currently married compared to 54.3 percent of whites and 25.2 percent of blacks. Hispanics are slightly more likely to cohabit (8.2 percent) when compared to whites (6.9 percent) and blacks (7.0 percent) (Bramlett and Mosher, 2002). For this reason, we examine the patterns of BMI changes and marital status separately for non-Hispanic blacks, non-Hispanic whites and Hispanics. The results of this exercise are reported in Tables 5a, b and c.

The pattern for white women is similar to what we found for all women which we might expect since they are the majority of our sample. The FE results indicate that married white women are heavier than single never married white women while divorced white women (cohabiting or not) have lower BMIs than their single, never married counterparts. The increase in BMI for white women during marriage is consistent with a withdrawal from the marriage market or that the unobserved responsibilities associated with marriage such as increased caloric intake due to more frequent or regular meals have resulted in weight gain. We see declines in BMI for white women after divorce that are consistent with the notion that she is currently not in a partnered arrangement and is keeping her marriage market options open. In contrast, married black women have slightly higher BMI's than single, never married black women but the other relationship statuses have no significant effect on BMI. When we compare the OLS and FE results for black women, we find no evidence of selection into marriage for thinner black women perhaps indicating different cultural norms for attractiveness (Thompson et al., 1996). For Hispanic women we see that married and divorced women who cohabit both have higher BMIs than their single never married counterparts—i.e. Hispanic women in any type of relationship are heavier.

White men in any type of relationship tend to be heavier whereas black men who have never been married or cohabited have significantly lower BMIs than those who are or have been in a relationship. In contrast, Hispanic married and divorced men have higher BMIs but there is not effect of cohabitation on the BMI of Hispanic men. The marriage effect for men is similar across racial and ethnic groups; after marrying, all men experience an increase in BMI. We suspect the reasons for this are likely the same as those for women which were discussed above.

Conclusions

Our research aims to discover the effect of relationship status on BMI., and on important measures of health such as the likelihood of overweight and obesity. We use data from the National Longitudinal Survey of Youth 1979 cohort to examine the impact of changes in formal (marriage and divorce) and informal (cohabitation) relationships between 1981 and 2004. The panel nature of our data allows us to look longitudinally at changes over time thus differencing out individual time-invariant heterogeneity.

Our results support the hypothesis that thinner women are more likely to be selected into romantic relationships. When disaggregated by race, this finding holds for white and Hispanic women but not for black women. OLS models consistently find that women in any relationship status are thinner than their never married counterparts. This supports the argument that thinness (attractiveness) among women is valued in the marriage market. However, fixed effects models reveal that once selection is netted out by the use of person-specific fixed effects, married women are generally heavier than during their

never married years. Weight gain after marriage may occur in part due to the fact that married couples eat more as a couple due to shared meals and social obligations and perhaps less participation in individualistic activities such as sports and exercise (Sobal et al, 2003). Never married cohabiting women are also heavier than their never married non-cohabiting counterparts. These findings are consistent with the fact that partnered women are not participating in the marriage market and may not monitor their weight as carefully as when they are single. The fact that these effects are smaller for cohabiting women than for married women is consistent with the idea that cohabiting unions are not perceived to be as stable or permanent as marriage. We see no evidence of the protective effects of being in a relationship through healthier weight for women.

For men, we consistently find, as have others, that married men are more likely to be heavier than their single, never married counterparts in the cross-section. Our results for married males hold in the FE specification as well though the effect is about half the size of the OLS effect. This result holds across all three of our race/ethnic groups.

For both men and women the increase in BMI associated with marriage (and associated with cohabitation for men) translates into increases in the likelihood that an individual is considered overweight and obese. These increases are substantial. Marriage, and to a lesser extent cohabitation, is associated with higher probabilities of overweight and obesity. Our findings suggest that although others have found marriage to be beneficial to health in other dimensions, marriage, and to a much lesser extent cohabitation, may exact a small price in the form of increased BMI. These changes in BMI can have important implications for health as they increase the probability of unhealthy weight, although the precise behaviors that lead to these changes in BMI cannot not identified in this study. One explanation is that married individuals are less likely to smoke (Duncan et al, 2000) and smoking cessation is associated with weight gain. It is also likely that married people (or those in a relationship) may have more social obligations and/or eat more regular meals leading to weight gain. It is also possible that these changes occur through a reduction in physical activity in marriage and cohabitation.

Finally, our results suggest that the dissolution of a marriage is associated with reductions in BMI and the incidence of overweight and obesity among women. These health benefits associated with divorce, however, are short-lived. Women return to their pre-divorce level of BMI within two years of their divorce.

By estimating individual-level fixed effects models on a longitudinal data set that provides data on relationship histories over a 24-year period, we are able to net out time invariant factors that lead to selection into marriage, divorce and cohabitation. Our estimates suggest that changes in relationship status lead to predictable and significant changes in BMI that can have important health consequences. What remains is to identify the route through which these changes occur.

Table 1a: Sample Statistics – Means and Standard Deviations for Women

	Full Sample	Never Married	Single Cohabiting	Married	Divorced	Divorced Cohabiting
Predicted BMI	26.063 (6.31)	25.987 (6.777)	26.074 (6.54)	25.969 (5.903)	26.653 (6.659)	25.858 (5.9)
BMI > 25	0.409	0.466	0.385	0.398	0.454	0.422
BMI > 30	0.180	0.185	0.186	0.170	0.210	0.204
Never Married	0.307	1	0	0	0	0
Single Cohabiting	0.039	0	1	0	0	0
Married	0.503	0	0	1	0	0
Divorced	0.128	0	0	0	1	0
Divorced Cohabiting	0.024	0	0	0	0	1
Single Cohabiting Duration	0.125 (0.854)	0	3.207 (2.981)	0	0	0
Marriage Duration	4.197 (6.045)	0	0	8.348 (6.167)	0	0
Divorce Duration	0.413 (1.914)	0	0	0	3.235 (4.418)	0
Divorced Cohabiting Duration	0.057 (0.476)	0	0	0	0	2.356 (2.003)
Any Children	0.648	0.345	0.535	0.79	0.825	0.806
Number of Children at Interview	1.378 (1.339)	0.674 (1.176)	1.111 (1.386)	1.678 (1.24)	1.872 (1.363)	1.882 (1.388)
Age of Youngest Child	3.973 (5.338)	2.095 (4.38)	2.687 (4.499)	4.394 (5.263)	6.814 (6.068)	6.086 (5.847)
Currently Pregnant	0.043	0.023	0.049	0.06	0.02	0.043
Age at Pregnancy if Pregnant	27.065 (5.096)	24.414 (5.032)	25.741 (4.633)	27.567 (4.962)	28.451 (4.744)	29.310 (4.547)
Child Less than 12 Mos. Old	0.154 (0.361)	0.081 (0.273)	0.165 (0.371)	0.216 (0.412)	0.086 (0.28)	0.118 (0.323)
White	0.551	0.423	0.489	0.651	0.459	0.657
Black	0.293	0.45	0.338	0.177	0.379	0.175
Hispanic	0.156	0.126	0.172	0.172	0.162	0.168
Highest Grade Completed	12.886 (2.316)	12.963 (2.222)	12.45 (2.205)	13.034 (2.406)	12.412 (2.149)	12.01 (1.97)
Age	30.211 (7.000)	26.84 (6.764)	28.333 (6.118)	31.585 (6.581)	33.009 (6.378)	32.633 (5.929)
Age Over 35	0.278	0.151	0.161	0.327	0.410	0.361
Lived With Two Parents at 14	0.682	0.638	0.579	0.735	0.622	0.632
Urban	0.796	0.842	0.837	0.76	0.818	0.758
Northeast	0.179	0.211	0.239	0.168	0.137	0.14
Midwest	0.237	0.23	0.225	0.243	0.228	0.258
South	0.399	0.406	0.301	0.391	0.446	0.367
West	0.185	0.153	0.236	0.198	0.189	0.236
Sample Size	56643	17363	2199	28480	7240	1361
Sample Percentage	1.000	0.307	0.039	0.503	0.128	0.024

Table 1b: Sample Statistics – Means and Standard Deviations for Men

	Full Sample	Never Married	Single Cohabiting	Married	Divorced	Divorced Cohabiting
Predicted BMI	26.201 (4.812)	25.071 (4.606)	25.758 (4.633)	27.158 (4.799)	26.491 (4.755)	27.239 (4.848)
BMI > 25	0.548	0.429	0.505	0.647	0.598	0.654
BMI > 30	0.167	0.117	0.150	0.209	0.169	0.204
Never Married	0.397	1	0	0	0	0
Single Cohabiting	0.051	0	1	0	0	0
Married	0.442	0	0	1	0	0
Divorced	0.088	0	0	0	1	0
Divorced Cohabiting	0.022	0	0	0	0	1
Single Cohabiting Duration	0.15 (0.854)	0	2.923 (2.611)	0	0	0
Marriage Duration	3.442 (5.477)	0	0	7.794 (5.83)	0	0
Divorce Duration	0.286 (1.572)	0	0	0	3.247 (4.291)	0
Divorced Cohabiting Duration	0.052 (0.457)	0	0	0	0	2.363 (2.019)
Any Children	0.531	0.19	0.565	0.773	0.758	0.82
Number of Children at Interview	1.088 (1.309)	0.333 (0.838)	1.159 (1.426)	1.611 (1.281)	1.616 (1.366)	1.953 (1.553)
Age of Youngest Child	2.934 (4.667)	1.147 (3.381)	2.561 (4.169)	3.886 (4.845)	5.807 (5.647)	5.452 (5.377)
Currently Pregnant	0.041	0.015	0.057	0.067	0.016	0.043
Age at Pregnancy if Pregnant	28.503 (5.497)	24.637 (4.817)	27.438 (5.195)	29.327 (5.355)	28.921 (4.979)	29.373 (4.800)
Child Less than 12 Mos. Old	0.14 (0.347)	0.046 (0.209)	0.193 (0.394)	0.231 (0.422)	0.074 (0.262)	0.152 (0.359)
White	0.549	0.484	0.373	0.639	0.495	0.544
Black	0.292	0.375	0.458	0.19	0.337	0.279
Hispanic	0.159	0.142	0.169	0.17	0.168	0.177
Highest Grade Completed	12.662 (2.399)	12.565 (2.265)	11.982 (2.12)	12.976 (2.562)	12.172 (2.122)	11.633 (1.897)
Age	30.26 (6.985)	26.807 (6.535)	29.746 (5.904)	32.558 (6.309)	33.76 (6.127)	33.623 (5.837)
Age Over 35	0.281	0.142	0.210	0.374	0.450	0.421
Lived With Two Parents at 14	0.682	0.649	0.568	0.741	0.635	0.556
Urban	0.8	0.836	0.865	0.759	0.805	0.799
Northeast	0.182	0.215	0.226	0.159	0.13	0.158
Midwest	0.245	0.238	0.219	0.261	0.214	0.236
South	0.374	0.362	0.318	0.376	0.448	0.393
West	0.199	0.185	0.238	0.205	0.208	0.213
Sample Size	54867	21788	2808	24234	4837	1200
Sample Percentage	1.000	0.397	0.051	0.442	0.088	0.022

Table 2: Determinants of Log Body Mass Index: OLS of Ever Marrying or Divorcing at Baseline

	Women	Men		Women	Men
Ever Marry	-0.063*** (0.008)	0.014** (0.006)	Ever Divorce	0.002 (0.010)	-0.007 (0.008)
Black	0.033*** (0.008)	-0.019*** (0.007)	Black	0.089*** (0.010)	0.023** (0.009)
Hispanic	0.025** (0.011)	0.029*** (0.008)	Hispanic	0.056*** (0.012)	0.050*** (0.010)
Highest Grade Completed	-0.008*** (0.002)	0.001 (0.002)	Highest Grade Completed	-0.011*** (0.002)	-0.003* (0.002)
Age	0.077 (0.049)	0.106*** (0.037)	Age	0.011 (0.008)	0.028*** (0.006)
Age Squared	-0.002 (0.001)	-0.002*** (0.001)	Age Squared	0.00002 (0.00001)	-0.0004*** (0.0001)
Lived w/ 2 Parents at 14	-0.004 (0.008)	0.006 (0.006)	Lived w/ 2 Parents at 14	-0.005 (0.009)	0.014* (0.007)
Age Over 35	-- --	-- --	Age Over 35	-0.013 (0.024)	0.040** (0.018)
Any Children	0.014 (0.037)	-0.111*** (0.04)	Any Children	0.014 (0.02)	0.006 (0.018)
Number of Children	-0.020 (0.013)	0.005 (0.015)	Number of Children	-0.006 (0.007)	-0.002 (0.005)
Age of Youngest Child	0.006 (0.009)	0.032*** (0.01)	Age of Youngest Child	-0.003* (0.002)	0.00002 (0.002)
Currently Pregnant	0.138 (0.256)	0.132 (0.202)	Currently Pregnant	0.065 (0.073)	-0.010 (0.056)
Age at Pregnancy	-0.007 (0.013)	-0.005 (0.010)	Age at Pregnancy	-0.001 (0.003)	0.001 (0.002)
Child Less than 12 Months Old	0.001 (0.029)	0.075** (0.032)	Child Less than 12 Months Old	-0.032 (0.02)	-0.001 (0.017)
Urban	-0.015* (0.009)	-0.017** (0.007)	Urban	-0.007 (0.010)	-0.001 (0.008)
Northeast	-0.014 (0.011)	0.013 (0.008)	Northeast	0.004 (0.013)	0.026** (0.011)
Midwest	0.002 (0.011)	0.018** (0.008)	Midwest	0.005 (0.012)	0.024** (0.010)
South	-0.009 (0.010)	0.007 (0.008)	South	0.009 (0.011)	0.010 (0.009)
Constant	2.405*** (0.496)	1.946*** (0.381)	Constant	2.989*** (0.100)	2.729*** (0.087)
Sample Size	2524	2968	Sample Size	2202	2056
Adjusted R-Squared	0.0531	0.0307	Adjusted R-Squared	0.1508	0.1272

Note: ***: p<0.01; **: p<0.05; *: p<0.10. Standard Errors in parentheses.

Baseline for ever marrying is 1981; the first year height and weight are available. Baseline for ever divorcing is the first year that the respondent reports being married.

Table 3: Determinants of Log Body Mass Index: OLS & Fixed Effects Models

	Women		Men	
	OLS	FE	OLS	FE
Single Cohabiting	-0.014*** (0.005)	0.008*** (0.003)	-0.004 (0.003)	0.010*** (0.002)
Married	-0.026*** (0.002)	0.018*** (0.002)	0.031*** (0.002)	0.016*** (0.001)
Divorced	-0.046*** (0.003)	-0.005** (0.002)	-0.004 (0.003)	-0.001 (0.002)
Divorced Cohabiting	-0.056*** (0.006)	0.001 (0.003)	0.022*** (0.005)	0.015*** (0.003)
Black	0.1*** (0.002)	--	0.006*** (0.002)	--
Hispanic	0.064*** (0.003)	--	0.053*** (0.002)	--
Highest Grade Completed	-0.011*** (0.0004)	-0.003*** (0.001)	-0.001*** (0.0003)	-0.002*** (0.0005)
Age	0.027*** (0.002)	0.006*** (0.002)	0.018*** (0.002)	0.017*** (0.001)
Age Squared	0.0004*** (0.00003)	0.0002*** (0.00002)	0.0002*** (0.00002)	0.0003*** (0.00001)
Lived w/ 2 Parents at 14	0.005** (0.002)	--	0.002 (0.002)	--
Age Over 35	0.0005 (0.004)	0.003 (0.002)	-0.001 (0.003)	-0.003* (0.002)
Any Children	-0.011*** (0.004)	-0.004* (0.002)	-0.018*** (0.003)	-0.010*** (0.002)
Number of Children	0.00004 (0.001)	-0.002* (0.001)	0.006*** (0.001)	0.004*** (0.001)
Age of Youngest Child	0.0004 (0.0003)	0.0003* (0.0002)	-0.00002 (0.0003)	0.001*** (0.0002)
Currently Pregnant	0.07*** (0.023)	-0.001 (0.011)	0.002 (0.018)	-0.004 (0.009)
Age at Pregnancy	-0.002** (0.001)	0.001** (0.0004)	0.00003 (0.001)	0.0002 (0.0003)
Child Less Than 12 Months Old	0.005 (0.003)	0.003 (0.002)	-0.002 (0.003)	-0.00001 (0.001)
Urban	-0.019*** (0.002)	0.0003 (0.001)	-0.010*** (0.002)	0.003** (0.001)
Northeast	0.001 (0.003)	0.010** (0.005)	0.020*** (0.002)	0.006 (0.004)
Midwest	0.009*** (0.003)	0.014*** (0.004)	0.017*** (0.002)	0.010*** (0.003)
South	0.01*** (0.003)	0.002 (0.004)	0.009*** (0.002)	0.014*** (0.003)
Sample Size	56643	56643	54867	54867
Adjusted R-Squared	0.1705	0.8327	0.1636	0.8333
F-Stat Single Cohabiting=Married	7.53***	13.66***	119.26***	9.59***
F-Stat Divorced=Married	50.64***	29.48***	21.59***	128.63***
F-Stat Divorced Cohabiting=Married	28.09***	32.18***	4.38**	0.04

Note: ***: p<0.01; **: p<0.05; *: p<0.10. Standard Errors in parentheses.

Table 4a: Determinants of Being Overweight, BMI \geq 25

	Women		Men	
	OLS	FE	OLS	FE
Single Cohabiting	-0.027*** (0.010)	0.007 (0.008)	-0.013 (0.010)	0.027*** (0.008)
Married	-0.040*** (0.005)	0.034*** (0.006)	0.092*** (0.006)	0.058*** (0.006)
Divorced	-0.084*** (0.007)	-0.02*** (0.007)	0.002 (0.008)	0.011 (0.008)
Divorced Cohabiting	-0.085*** (0.013)	0.013 (0.011)	0.064*** (0.014)	0.035*** (0.012)
Sample Size	56643	56643	54867	54867
Adjusted R-Squared	0.1405	0.6266	0.1327	0.6193
F-Stat Single Cohabiting=Married	1.61	8.69***	21.99***	14.2***
F-Stat Divorced=Married	49.46***	97.02***	45.61***	53.14***
F-Stat Divorced Cohabiting=Married	12.5***	4.18**	4.3**	4.47**

Table 4b: Determinants of Being Overweight, BMI $>$ 30

	Women		Men	
	OLS	FE	OLS	FE
Single Cohabiting	-0.018** (0.008)	0.008 (0.007)	-0.009 (0.007)	0.015*** (0.006)
Married	-0.049*** (0.004)	0.011** (0.005)	0.037*** (0.004)	0.032*** (0.005)
Divorced	-0.066*** (0.006)	-0.015** (0.006)	-0.030*** (0.006)	0.001 (0.006)
Divorced Cohabiting	-0.093*** (0.011)	-0.008 (0.009)	0.001 (0.011)	0.033*** (0.010)
Sample Size	56643	56643	54867	54867
Adjusted R-Squared	0.0989	0.6008	0.0705	0.5792
F-Stat Single Cohabiting=Married	14.63***	0.22	38.23***	6.93***
F-Stat Divorced=Married	11.25***	35.74***	131.41***	39.02***
F-Stat Divorced Cohabiting=Married	18.64***	5.87**	11.28***	0.01

Note: ***: $p < 0.01$; **: $p < 0.05$; *: $p < 0.10$. Standard Errors in parentheses.
Regressions include dichotomous year indicators and control variables in table 3.

Table 5a: Determinants of Log Body Mass Index for Whites

	Women		Men	
	OLS	FE	OLS	FE
Single Cohabiting	-0.032*** (0.006)	0.004 (0.003)	-0.019*** (0.005)	0.006** (0.002)
Married	-0.046*** (0.003)	0.014*** (0.002)	0.028*** (0.003)	0.012*** (0.002)
Divorced	-0.070*** (0.005)	-0.020*** (0.003)	-0.018*** (0.004)	-0.008*** (0.002)
Divorced Cohabiting	-0.085*** (0.007)	-0.014*** (0.004)	0.005 (0.006)	0.007* (0.003)
Sample Size	31183	31183	30123	30123
Adjusted R-Squared	0.1069	0.8256	0.1482	0.8447
F-Stat Single Cohabiting=Married	5.23**	7.01***	92.41***	6.38**
F-Stat Divorced=Married	43.47***	244.91***	188.66***	119.08***
F-Stat Divorced Cohabiting=Married	34.42***	63.36***	14.8***	3.29*

Table 5b: Determinants of Log Body Mass Index for African Americans

	Women		Men	
	OLS	FE	OLS	FE
Single Cohabiting	-0.011 (0.008)	0.007 (0.005)	0.004 (0.005)	0.011*** (0.003)
Married	-0.002 (0.004)	0.019*** (0.003)	0.033*** (0.004)	0.023*** (0.003)
Divorced	-0.028*** (0.005)	-0.0004 (0.004)	0.014*** (0.005)	0.006* (0.004)
Divorced Cohabiting	-0.015 (0.015)	0.012 (0.008)	0.044*** (0.009)	0.022*** (0.006)
Sample Size	16599	16599	16024	16024
Adjusted R-Squared	0.1541	0.8311	0.1861	0.8161
F-Stat Single Cohabiting=Married	1.06	5.79**	30.44***	14.15***
F-Stat Divorced=Married	23.67***	36.84***	15.01***	33.62***
F-Stat Divorced Cohabiting=Married	0.73	0.98	1.53	0.11

Table 5c: Determinants of Log Body Mass Index for Hispanics

	Women		Men	
	OLS	FE	OLS	FE
Single Cohabiting	0.004 (0.011)	0.010 (0.006)	0.004 (0.009)	0.016*** (0.005)
Married	-0.035*** (0.006)	0.025*** (0.005)	0.025*** (0.005)	0.018*** (0.004)
Divorced	-0.057*** (0.008)	0.004 (0.006)	-0.025*** (0.007)	0.007 (0.005)
Divorced Cohabiting	-0.054*** (0.014)	0.034*** (0.008)	0.005 (0.012)	0.032*** (0.007)
Sample Size	8861	8861	8720	8720
Adjusted R-Squared	0.1363	0.8235	0.168	0.834
F-Stat Single Cohabiting=Married	13.01***	4.50**	6.82***	0.22
F-Stat Divorced=Married	11.47***	29.63***	3.05*	8.15***
F-Stat Divorced Cohabiting=Married	2.01	1.78	59.72***	4.93**

Note: ***: $p < 0.01$; **: $p < 0.05$; *: $p < 0.10$. Standard Errors in parentheses.
Regressions include dichotomous year indicators and control variables in table 3.

Figure 1: BMI Trajectory for Married Respondents

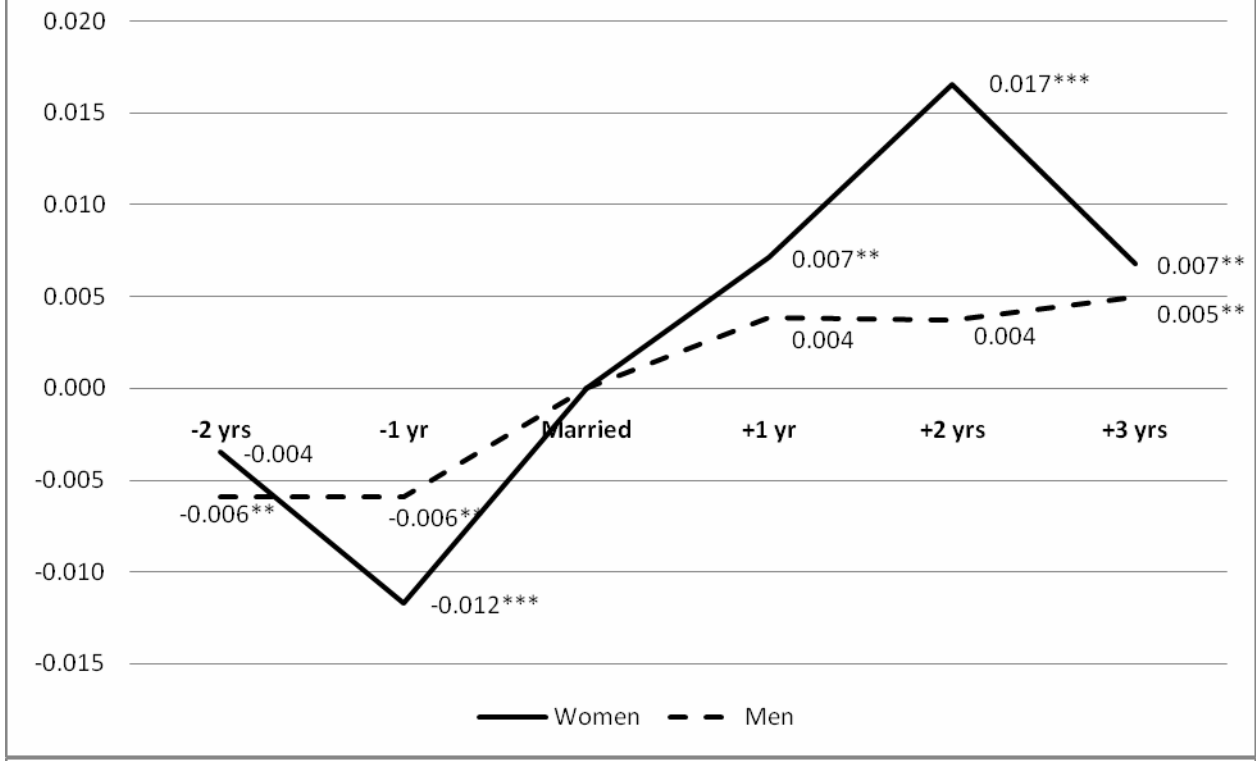


Figure 2: BMI Trajectory for Single Cohabiting Respondents

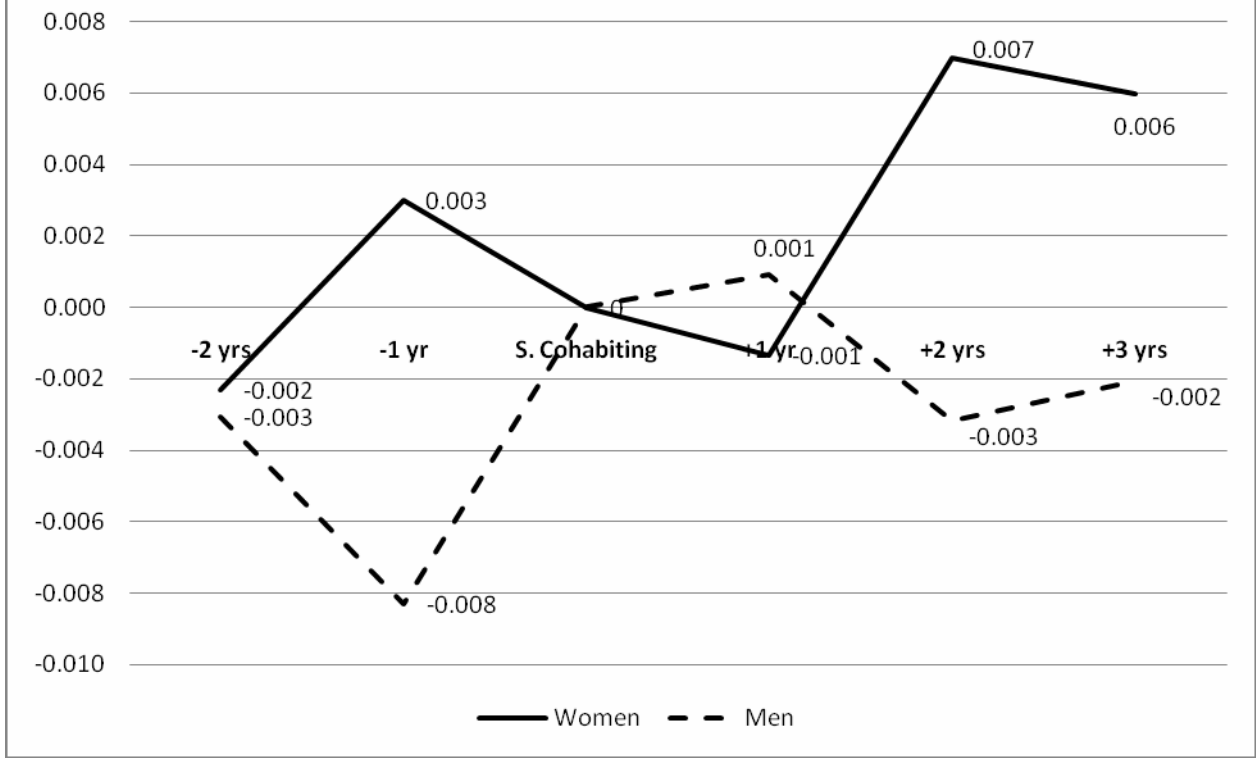


Figure 3: BMI Trajectory for Divorced Cohabiting Respondents

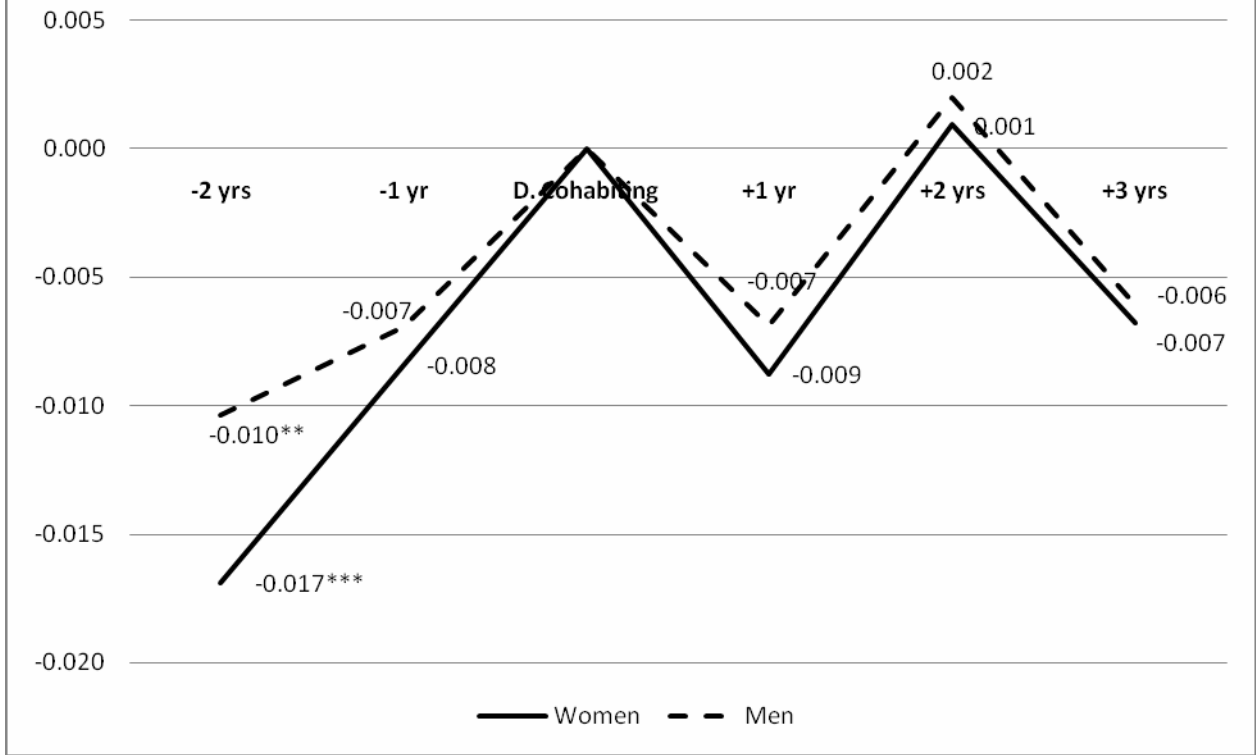


Figure 4: BMI Trajectory for Divorced Respondents

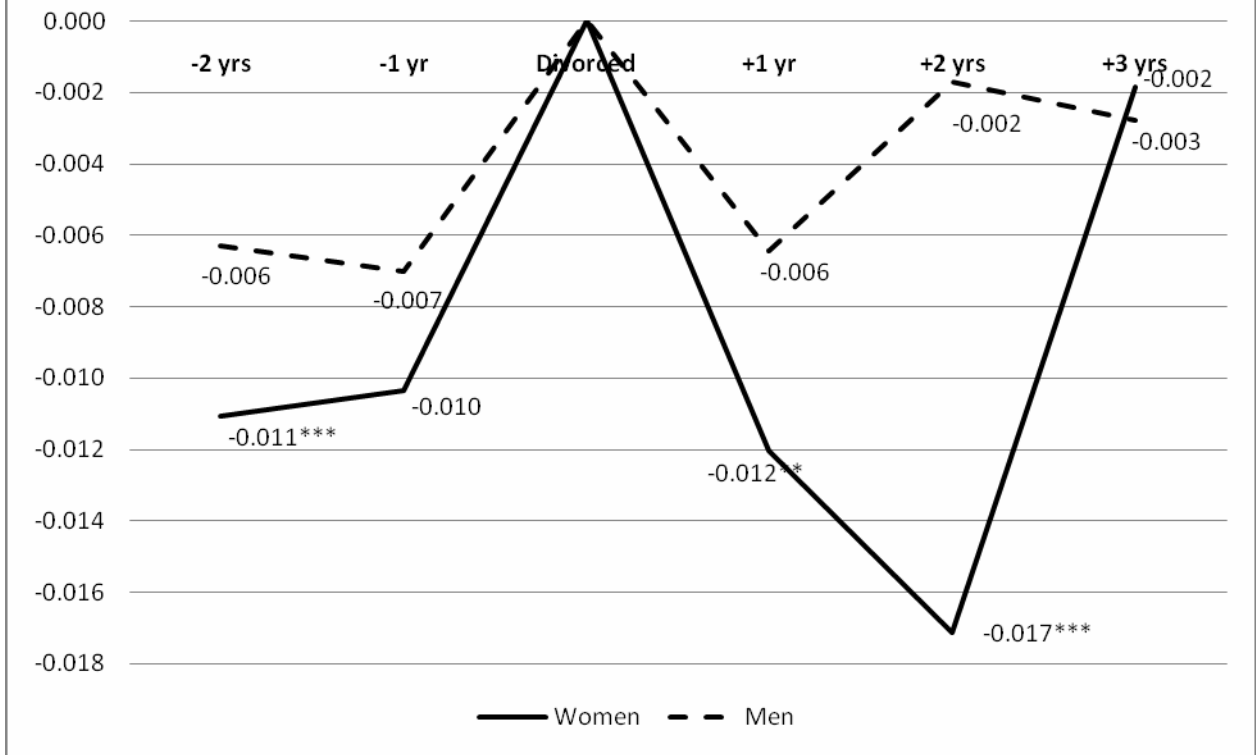
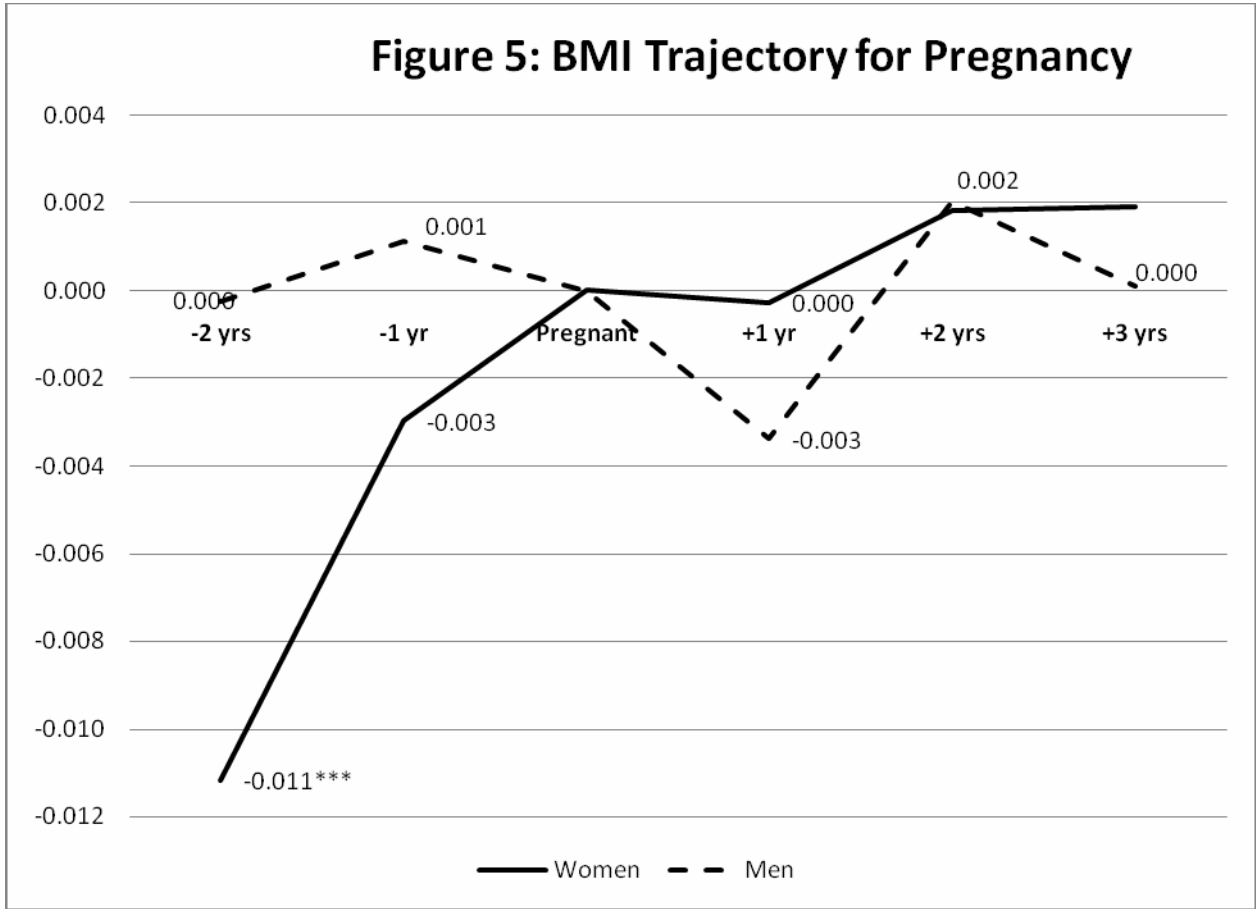


Figure 5: BMI Trajectory for Pregnancy



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