Who Marries Differently-Aged Spouses? Education, Occupation, Earnings, Ability and Appearance*

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Abstract

In direct contrast to conventional wisdom and most economic models of marital age gaps, we present robust evidence that men and women who are married to differently-aged spouses are negatively selected. Empirical results show striking evidence of lower cognitive ability, lower educational attainment, lower occupational wages, lower earnings, and even less attractive appearance among those married to an older or younger spouse. These results, all obtained controlling for age of marriage in samples of first marriages, are consistent with a model in which individuals who obtain more years of formal schooling and enter occupations with greater upward mobility interact more heavily with similarly-aged peers and are ultimately more likely to marry similarly-aged spouses.

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I. Introduction

Conventional wisdom regarding marriages between older men and younger women assumes that financially successful men have the advantage of being able to attract and retain younger partners. Recent press accounts of so-called "Cougars," older women paired with younger men, likewise suggest that the improving economic status of women has freed them to partner with younger men.[1] Economic models of age of marriage and within-partner age difference mostly generate similar predictions, that pairings between an older and younger spouse require financial success on the part of the older partner (Bergstrom and Bagnoli, 1993; Siow, 1998; Coles and Francesconi, 2011). As a result, both the academic literature and popular perception suggest positive selection, at least on the part of the older partner, into differently-aged couples. In direct contrast, this paper presents robust empirical evidence of negative selection into differently-aged couples.

In Census data, men and women in differently-aged couples have lower educational attainment, and, conditional on educational attainment, work in lower-wage occupations than men and women married to similarly-aged spouses. The effects are larger for men than women, and are present both for men married to younger women and men married to older women. Annual earnings are also lower for men married to younger or older women compared to men in similarly-aged couples. Women married to older men have higher earnings than women in similarly-aged couples, but due largely to higher hours of work rather than higher wages. These findings are present in the 1960, 1970, 1980, 1990 and 2000 Decennial Censuses, but our preferred estimates are those prior to 1990, because controls for age of marriage and number of marriages are available in those years.

[1] An example is "Rethinking the Older Woman-Younger Man Relationship" *New York Times* 10/15/09.

We additionally test for negative selection into marriage with a differently-aged spouse using cognitive skills assessments from the National Longitudinal Survey of Youth 1979 cohort (NLSY79) and measures of physical appearance from the National Longitudinal Study of Adolescent Health (Add Health). The point estimates indicate negative selection on these characteristics, although statistical significance varies by outcome and sample.

Our findings are consistent with a model of differential search costs in which individuals who acquire more years of formal schooling at traditional post-secondary institutions, and enter careers with greater upward mobility, interact more heavily with similarly-aged peers and have more age-concentrated social networks. In contrast, individuals with fewer years of formal schooling, who attend more age-heterogeneous post-secondary institutions (such as community college) and enter occupations with less upward mobility, interact with a more age-heterogeneous group of peers and have social networks that are more age diverse. These differences in the age-heterogeneity of social networks are likely to be strongest over the period of the lifecyle when most marriages occur. Consistent with this hypothesis, we find weaker effects for those who marry later in the lifecycle.

Our findings are more broadly relevant to the literature on marital search and matching, because they suggest that who one meets affects whom one marries. The social interactions facilitated by different education and occupational settings affect marital matching in empirically important ways. While social interactions and physical proximity have not previously been investigated as a factor in differently-aged matches, there has been some consideration of propinquity in the literature on interracial and interethnic marriages (Wong, 2003; Gullickson, 2006; Fryer, 2007; Furtado, 2012). A related finding is that married individuals in work environments with a greater concentration of members of the

opposite sex are more likely to divorce, presumably due to the increased contact with alternative mates (Aberg, 2003; McKinnish, 2007; Svarer, 2007). In marriage models, education and occupational wage have traditionally affected matching through the marital surplus. Our findings suggest they also affect matching by changing the set of prospective mates with whom one interacts at lowest cost.

II. Marital Age Gaps and Marital Sorting

In this section, we review previous marriage models with predictions regarding marital age gap; review relevant empirical work; discuss our proposal that the age heterogeneity of social networks varies by educational attainment and occupational choice; and finally offer some preliminary evidence of the correlation between education and age heterogeneity of social networks.

A. Economic Models of Marital Age Gap

Historically, the average age of first marriage for men has been older than the average age of first marriage for women, and marriages have most commonly consisted of an older husband and younger wife. Bergstrom and Bagnoli (1993) develop a model in which these patterns are explained by differences in household specialization between men and women, and in which men's value in the marriage market, meaning their earnings potential, is revealed at later ages than women's value in household production. Women marry young, but higher quality women marry higher quality older men who have delayed marriage to reveal their high worth. Lower quality young women marry lower quality young men who

have no gains from marriage delay.[2] In this model, both men and women in differently-aged couples are higher quality than men and women in similarly aged couples.

Siow (1998) also has the theoretical prediction that older men who marry younger women are financially successful. His model has the feature that all women marry young, due to declining fecundity. Young men all have the same wage, but some exogenously experience labor market success and have high wages as older men. Never-married and divorced old men are only able to marry or remarry young women if they are high wage.

Coles and Francesconi (2011) assume that both men and women receive utility from their partner's "fitness", which decays with age. Both men and women start out low wage. If both men and women have similar probabilities of experiencing labor market success and receiving high wages at older ages, then we will observe both men and women who have experienced labor market success partnered with younger, fitter, but unsuccessful, spouses.[3]

Diaz-Gimenez and Giolito (forthcoming) analyze the marriage market implications of gender differentials in lifecycle declines in fecundity. Simply using these differences in fecundity, they replicate key features of the US Marriage market in terms of gender differences in age of marriage and marital age gap. In contrast to the prior literature, their model does not require lifecycle earnings differences to generate pairings between older and

[2] All women marry young in the model by Bergstrom and Bagnoli (1993) and Siow (1998). Loughran (2002) offers an alternative model and empirical evidence that suggests that women will delay marriage and search longer as male wage inequality increases.

[3] Mahony (1995) counsels women to strategically choose men younger than themselves to reduce the earnings gap with their husband and increase their bargaining power in marriage. Her argument is that this will allow them to more effectively bargain for household decisions that benefit their career (such as timing of children, division of household labor and geographic location). In this case, the strategic choice of a younger spouse generates financial success.

younger spouses.[4] On the other hand, their model does not explain why earnings are lower for men in differently-aged couples.

Much of the theory literature assumes that, conditional on income, individuals receive higher utility from younger, more fecund or more attractive, partners. Other research suggests that individuals might receive utility from similarly-aged spouses. Recent work by Hitsch, Hortascu and Ariely (2010) using data from online dating suggests that both men and women are more likely to contact similarly-aged prospective mates. Choo and Siow (2005) estimate a structural model of age of marriage in which positive assortative matching by spousal age is driven by the desire to accumulate marriage specific capital. Preferences for similarly-aged spouses could also be generated by complementarities in consumption. If men and women prefer, for example, having children at similar points in their lifecycle, then they will best be able to optimally time this consumption if they marry similarly aged spouses. Finally, there is also evidence that the age difference between spouses is negatively related to marital stability (Cherlin, 1977; Lillard et al, 1995)

B. Empirical Findings on Marital Age Gaps

Most recent empirical work on marital age gaps has focused on the relative earnings of the husband and wife. Coles and Francesconi (2011) find using US and British data that women who have higher income, higher education or higher occupational status than their husbands are more likely to be at least five years older than their husbands. They also find, in the British data, that women who are in professional or managerial occupations are more likely to be at least 5 years older than their spouse. Raley, Mattingly and Bianchi (2006), using Current Population Surveys from 1970-2001, find that dual-earner couples in which the

[4] Like Diaz-Gimenez and Giolito, England and McClintock (2009) also note that the age gap with spouse rises much more steeply with age of marriage for men than women. They argue, however, that this has to do with social norms regarding women's appearance rather than declining fecundity.

husband is at least 5 years older than the wife are slightly more likely to have the wife be the majority earner. Bloemen and Stancanelli (2008), in analysis of French Labor Force Surveys from 1990-2002, find that couples in which the husband is at least 5 years older or the wife is at least 3 years older are more likely to have a sole-provider wife, but among dual-earner couples these couples are less likely to have female earnings that exceed male earnings. Among the papers that study absolute rather than relative outcomes, both Atkinson and Glass (1985) and Vera et al (1985) report relatively descriptive analysis showing that couples with large age differences have lower family income on average. Grossbard-Shechtman and Newman (1988) find in 1974 Israeli Census data that marriage to a husband who is more than three years older is associated with lower labor force participation, even conditional on husband's income.

It is important to distinguish between the unconditional relationship between individual quality and within-couple age difference and the relationship conditional on age of marriage and or re-marriage. It has been observed that average age difference with spouse increases with age of marriage (e.g. Oppenheimer 1988), and we confirm this descriptive relationship in Appendix A. If age of marriage is correlated with individual quality due to factors such as career investment, divorce and remarriage, this will generate a relationship between age difference and quality in the absence of controls for age of marriage. The primary interest in this paper is in the empirical relationship between quality and age-difference controlling for age of marriage and number of marriages.

C. Marital Search with Frictions

One feature not considered in previous models is that search costs may vary with individual characteristics in ways that affect age difference with spouse. Higher quality

individuals likely spend more of their time in education and employment settings in which they interact most heavily with similarly-aged peers.[5] This is particularly true at the ages at which marriage is most common. They spend more years in formal schooling and are more likely to attend high-quality post-secondary schools where the student body is fairly age homogenous. Moreover, when they first enter the workforce, they are more likely to work in jobs with high upward mobility, so that other individuals who share their same job description are likely to be similarly-aged. In contrast, lower quality individuals receive fewer years of education and are more likely to enroll in post-secondary institutions in which the age mix is more diverse (e.g. community colleges). Additionally, lower quality individuals tend to work in occupations with limited upward mobility. As a result, there is likely greater age variation among co-workers with whom they interact most heavily compared to higher-quality individuals working in more upwardly mobile occupations.

Because of these differences in years of schooling, type of post-secondary institution, and upward mobility in occupation, individuals with higher earnings potential interact less with differently-aged peers than those with lower earnings potential. As a result, search costs rise much more steeply across age difference with partner for high-quality individuals than low-quality individuals. Therefore, we would expect individuals with lower educational attainment and with lower-wage occupations to have greater martial age gaps, even conditional on age of marriage. It is important to note that even in the case in which individuals do not meet their spouse at their school or on their job, the age-heterogeneity of their social network should affect the age-heterogeneity of their contacts outside school or work as well.

[5] We would like to thank Daniel Hamermesh for first suggesting this mechanism.

Our empirical results confirm that individuals married to differently-aged spouses on average have lower cognitive ability, lower educational attainment, and, conditional on educational attainment, work in lower wage occupations. We also confirm that these effects are weaker for those who marry later in the lifecycle. Before proceeding to our primary empirical analysis, we first present some preliminary evidence that age-heterogeneity of social networks varies by education.

D. Age-Dispersion of Social Networks by Educational Attainment

Data on the age diversity of individuals' social networks are scarce. The 1985 and the 2004 General Social Survey (GSS) data, however, contain a topical module in which the respondent is asked: "From time to time, most people discuss important matters with other people. Looking back over the last six months, who are the people with whom you discussed matters important to you?" Information on age, sex, education and family relationship are recorded for up to five members of the respondent's "discussion network."

Many members of the respondents' discussion networks are spouses, parents, siblings and children. We calculate age dispersion measures for non-family members of the discussion network.[6] Two measures are used. For the first measure, the first listed non-family member of the discussion network is used to calculate the age difference between the respondent and that network member. The second measure uses all respondents who have at least two non-family members of their discussion network to calculate the standard deviation of age of non-family discussion network members.

These age dispersion measures are regressed on years of education with controls for sex, race, age and age-squared, and the number of people listed in the discussion network.

[6] Marsden (1987) uses the 1985 GSS data to analyze the age, race and education heterogeneity of discussion networks, but does not calculate these measures separately for non-family members of the network.

The results are reported in Table 1. In all cases, there is a negative relationship between education and age-dispersion of the network, indicating that individuals with higher levels of education have non-family networks that are less age diverse than those with lower levels of education. The coefficient estimates are, however, only statistically significant in the 2004 data.

III. Marital Age Gap and Educational Attainment

We first test whether individuals in differently-aged couples on average have lower levels of schooling than those married to similarly-aged spouses. Because educational attainment is highly correlated with labor market success, most previous models would predict that individuals with high levels of education would be more likely to attract younger spouses than those with low levels of education. In contrast, if whom one interacts with, particularly over a certain period of the lifecycle, affects choice of spouse, then we would expect those who spend more time in traditional, age-homogenous, formal education environments to be more likely to marry a similarly-aged spouse.

A. Prevalence of Differently-Aged Couples

Table 2 reports descriptive statistics regarding the distribution of within-couple age difference over time and by educational attainment. Samples of married couples ages 25-60 in the 1960, 1970, 1980, 1990 and 2000 Decennial Censuses were obtained from the IPUMS database.[7] The top panel of Table 2 reports the distribution of within-couple age difference for the full samples from each Census. The convention used throughout this paper is to take the age difference as the man's age minus the woman's. Therefore, the category labeled "+8 or more" contains couples in which the man is at least 8 years older than the woman, and the

[7] Couples are excluded if age, sex, or husband's education is allocated.

category labeled "-8 or more" contains couples in which the man is at least 8 years younger than the woman.

The most common marriages involve men who are the same age or a few years older than the woman. As expected, the fraction of marriages with the husband older than the wife is much larger than the fraction with the wife older than the husband. But the pairings with older men have become less common over time and the pairings with same aged and older women have become more common over time.[8] This likely reflects in part rising age of first marriage for women. While the fraction of women partnered with younger men has increased over time, the increase is not as dramatic as recent popular discussion might lead one to believe.

Table 2 also reports the distribution of within-couple age difference by husband's college completion for each census year. Husbands with college degrees are much more likely to be married to a similarly-aged wife than husbands without a college degree.

B. Educational Attainment

This section tests whether individuals who marry differently-aged spouses have on average lower levels of education. Analysis is conducted using the 1980, 1970 and 1960 Censuses in order to allow controls for age of marriage and number of marriages. The 1990 and 2000 data do not contain these variables. Table A1 in Appendix A reports the joint distribution of age of first marriage and within-couple age difference for the 1980 Census, confirming that there is a strong relationship between age of marriage and age difference. Because there is also a strong relationship between educational attainment and age of marriage, age of marriage is an important control in the analysis.

[8] Interestingly, Atkinson and Glass (1985) show using 1900 Census data that 47.1% of married couples had a husband at least 5 years older than the wife, and 15.8% had a wife at least 5 years older than the husband, but that these percentages had dropped to 33% and 3.7% by the 1960 Census.

Analysis is conducted separately for men and women using the samples of married couples ages 25-60 used in Table 2. The male earnings regression is estimated only using men in their first marriage (although their wife may be previously married), and the female earnings regression is estimated only using women in their first marriage (although their husband may be previously married). These sample restrictions are necessary because individuals only report age of first marriage in the Census.

The logit model is specified as:

(1)

$$Log(\Pr(Y_i = 1) / \Pr(Y_i = 0)) = \beta_0 + \sum_{j=1}^{6} \beta_j * AgeDiff_{ij} + Race_i\alpha_1 + \alpha_2 AgeMarr_i + \alpha_3 AgeMarr_i^2$$
$$+ Spouse\_MarrNo_i\alpha_4 + \sum_{a=1}^{A} \gamma_a * Age_{ia} + \sum_{s=1}^{S} \phi_s * State_{is} + \sum_{s=1}^{S} \psi_s * (State_{is} * Urban_i)$$

where *Y* is an indicator for educational attainment (high school completion, college completion, or advanced degree completion) and *AgeDiff* is a vector of 6 indicator variables for the same categories of within-couple age difference used in Table 2 (the omitted category is age difference +1 to -1). *Race* contains indicators for non-Hispanic white, non-Hispanic black and Hispanic. *AgeMarr* is the individual's age of first marriage and it's square is also included. *Spouse_MarrNo* contains indicator variables for whether the spouse has been previously married one or two or more times. *Age* is a vector of single-year age indicators or, equivalently, birth cohort indicators. The model also includes state fixed-effects and state fixed-effects interacted with an indicator for urban location.

The first column of Table 3 reports the marginal effects from equation (1) using high school completion as the outcome variable. Marginal effects are calculated as the difference in predicted probability between an age-difference category and the omitted (+1 to –1) category, with control variables set at their sample means. For both men and women and all

census years, individuals married to differently-aged spouses, whether older or younger, are clearly less likely to have a high school degree than those married to similarly-aged spouses. The second column restricts the sample to high school graduates and uses college completion as the outcome. Among high school graduates, individuals married to differently-aged spouses are less likely to have completed college than those married to similarly-aged spouses, although the relationship is weaker for women than men. Finally, in the third column, the sample is restricted to college graduates and the outcome is attainment of a graduate degree. These results differ from the first two columns in that there is only weak evidence of a negative relationship for men, and the coefficient estimates are positive for women.

Overall, Table 3 suggests a strong relationship between within-couple age difference and educational attainment, except perhaps at the very top of the educational distribution. The relationship is sizeable in magnitude. In the 1980 Census data, men who are married to women who are at least 8 years younger (older) are 24.3 (14.9) percentage points less likely to have completed high school than those married to similarly-aged women. Among high school graduates, men who are married to women who are at least 8 years younger (older) than them are 22.8 (17.9) percentage points less likely to have completed college than those married to similarly-aged women. The marginal effects for women are smaller in magnitude, particularly at the college level, but the same patterns are present. In results not reported here, we obtain very similar estimates using the 1990 and 2000 Census data.

One concern is that equation (1) does not adjust for differences in the population supply of different partners. In other words, it could be the case that among individuals with lower educational attainment, the relative supply of differently-aged partners with similar

educational attainment is large compared to individuals with higher education. Appendix B addresses this concern by estimating a Choo-Siow (2006) model of matching on educational attainment and age difference that adjusts for supply side differences. The results in Table A2 are consistent with those in Table 3.[9]

IV. Marital Age Gap, Occupation and Earnings

Having demonstrated the relationship between education and within-couple age difference, we now consider the relationship between marital age gap and labor market characteristics, conditional on education. The proposed search cost mechanism suggests that not only should differently-aged couples have lower educational attainment on average, but conditional on education they should also on average work in lower paying occupations. This should be true for two reasons. First, lower quality postsecondary institutions, such as community colleges, are more age heterogeneous than high quality post-secondary institutions. Therefore, conditional on years of education, individuals who attend lower quality institutions should be both more likely to match with a differently-aged spouse and have poorer labor market earnings than individuals with similar years of schooling who attended higher quality institutions. Second, conditional on years of education, individuals who enter occupations with limited upward mobility will experience greater age variation among co-workers with whom they interact most heavily compared to individuals who enter occupations with higher upward mobility.

A. Average hourly earnings in occupation

[9] Because the Choo-Siow model does not lend itself well to matching on continuous variables or to the use of individual-level controls such as age of marriage, and because we confirm the robustness of our results to supply-side adjustments in the analysis of educational attainment, we use individual-level regressions for the remainder of our analysis.

We test whether, conditional on education, individuals married to differently-aged spouses tend to work in occupations with lower average earnings per hour compared to those married to similarly-aged spouses. Analysis is conducted using the same samples used in Table 3, with an additional sample restriction due to the fact that there is no reported occupation for individuals who have not worked in the past five years.[10]

The regression is specified as:

(2)

$$Occ\_Earn_i = \beta_0 + \sum_{j=1}^{6} \beta_j * AgeDiff_{ij} + Race_i\alpha_1 + \alpha_2 AgeMarr_i + \alpha_3 AgeMarr_i^2 + Spouse\_MarrNo_i\alpha_4 + \sum_{a=1}^{A} \gamma_a * Age_{ia} + \sum_{a=1}^{A} \delta_a * Age_{ia} * HS_i + \sum_{a=1}^{A} \eta_a * Age_{ia} * Coll_i + \sum_{a=1}^{A} \lambda_a * Age_{ia} * Advanced_i + \sum_{s=1}^{S} \phi_s * State_{is} + \sum_{s=1}^{S} \psi_s * (State_{is} * Urban_i) + \varepsilon_i$$

where *Occ_Earn* is average earnings per hour (in 2000 dollars) in individual *i*'s occupation and *AgeDiff, Race, AgeMarr*, and *Spouse_MarrNo* are the same as defined in equation (1).[11] *Age* is a vector of single-year age indicators and *HS*, *Coll* and *Advanced* are categorical indicators for completion of high school, college or advanced degree. The estimates of γ_a, δ_a, η_a and λ_a therefore trace out a flexible age-earnings profile for each level of educational attainment.

Samples of full-time workers in the 1980, 1970 and 1960 Censuses are used to calculate average hourly earnings, in 2000 dollars, by occupation using 3-digit SOC codes.[12]

[10] Individuals are also excluded if occupation or earnings is allocated.

[11] We do not include controls for fertility in our primary regression specification, despite it's relationship with labor market outcomes for women, as fertility is an outcome of within-couple age differences. Fertility is lower among couples with greater age differences. We did, however, confirm that our findings are robust to the addition of these controls.

[12] In the 1960 and 1970 data, weekly hours of work are only reported in intervals. We impute a point estimate of hours of work for each individual using individuals with the same sex, education and hours of work interval in the 1980 Census data. In other words, if a female college graduate in 1970 reports 30-34 hours of work, then we

Average earnings per hour are calculated separately by sex, college education and 10-year age interval.[13] Average hourly earnings in occupation are matched to each individual's report of occupation in most recent job worked in the past five years.

The first column of Table 4 reports the age-difference coefficients from equation (2) for men. All of the age-difference categories have lower occupational wages relative to the omitted similarly-aged group, and this gap increases with the size of the age difference. These results indicate that men in differently-aged couples on average work in lower wage occupations than men in similarly-aged couples. This is true both for men married to younger women and men married to older women, and surprisingly symmetric. In the 1980 Census, Men married to women who are 8 or more years younger (older) work in occupations where hourly earnings are on average 55.5 (56.6) cents per hour lower than those for men married to women who are no more than a year younger or older than they are.

The third column of Table 4 reports the results for women. These results likewise show that women with differently-aged spouses tend to work in lower wage occupations than women married to similarly-aged spouses.[14]

B. Annual Earnings

Columns 2 and 4 replace average hourly earnings in occupation with the individual's own annual wage and salary earnings. It must be kept in mind that current earnings are a

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use the 1980 Census to calculate the mean hours of work for female college graduates working 30-34 hours per week. In both 1970 and 1960, 40 hours per week is its own category and requires no imputation. This imputation introduces some measurement error at the individual level that should largely average out when we aggregate up to average earnings per hour at the occupation level.

[13] Hourly earnings are calculated for each worker by the standard census data convention: multiplying weeks worked last year times usual hours of work per week to obtain annual hours, and dividing total annual earnings by annual hours to obtain earnings per hour. For cases in which over 90% of workers in the occupation do not have a college degree, we calculate an overall wage rather than a separate wage for college-educated.

[14] If the sample is restricted to those who have married in the past 5 years, to better match occupational characteristics to that around the time of the marriage, the negative relationship remains. The coefficient estimates remain similar in magnitude for women, and become smaller in magnitude for men.

function of current hours of work, and that current work effort responds endogenously to partner characteristics, particularly for women.

Observations with zero earnings are included in the sample, and therefore estimation is performed using a standard Tobit model.[15] For men, the results are consistent with those for occupational wages; men married to differently-aged spouses earn less than those married to similarly-aged spouses. The effects are again surprisingly symmetric between men married to younger women and men married to older women. The earnings differentials are quite large. In the 1980 Census, Men married to women who are 8 or more years younger (older) earn on average $3,495 ($4,760) less per year than men married to women who are no more than a year younger or older.

For women, the estimates indicate that women married to older men earn more than women married to similarly-aged husbands, despite the fact that they do not work in higher-earning occupations. Table A3 in Appendix C shows that for women with positive earnings in the 1980 Census, the higher earnings of women in differently-aged couples are largely generated by higher hours of work, not by higher wages.[16] Part of this additional work effort can be explained by the lower fertility of these women. Additionally, because wife's labor market effort is more responsive to husband's earnings than the reverse, we would expect to see higher hours of work for the women in differently-aged couples given that their spouses are on average lower earning (Lundberg, 1988).

[15] In order to maintain a consistent sample, individuals with zero earnings who have not worked in the past 5 years, and therefore do not report an occupation, are not included in the earnings regressions. But the findings are unchanged if they are included.

[16] The decomposition into hours and earnings/hour in Appendix C is not performed on the 1960 and 1970 data. For those years, weekly hours of work are only reported in intervals. While imputed hours of work can be used to calculate earnings per hour at the occupation level without too much concern, this introduces too much measurement error for analysis of hours of work at the individual level.

C. Additional results

In the analysis of educational attainment reported in the third column of Table 3, the relationship between within-couple age difference and educational attainment weakens when the sample is restricted to college graduates. In contrast, when the analysis in Table 4 is performed separately for those with and without college degrees, the negative coefficients are of equal or greater magnitude in the college sample. Conditional on educational attainment, the relationship between earnings and age difference is just as strong at the top of the educational distribution as the bottom. These estimates are not reported here to manage the volume of results.

Table A4 in Appendix D reports results using the 1990 and 2000 Censuses, the years in which we have no controls for age of marriage and number of marriages. The results are consistent with those in Table 4. The decomposition of earnings into hours and earnings per hour for these years are also reported in Table A3 in Appendix C, and once again confirm that the higher earnings for women married to older men largely result from higher hours of work.

D. Interactions with age of marriage

If, at ages when marriages are most likely to occur, individuals in lower wage occupations typically interact with a wider age distribution than those in higher paying occupations, then we expect to observe a relationship between occupation and marital age gap. Because it is likely that the networks of higher ability individuals become more diverse in age over the lifecycle, we would expect the relationship to be weaker among those who marry at later ages.

Table 5 therefore tests whether the relationship between age difference and occupational wages is weaker for those who marry at older ages. In order to manage the

number of coefficient estimates, the categorical age difference specification in equation (2) is replaced with two linear age-difference variables: *AgeDiffPos* is the number of years the man is older than the woman, and equals zero if the woman is older; *AgeDiffNeg* is the number of years the women is older than the man, and equals zero the man is older.

Because average age of first marriage is younger for those with lower educational attainment, this analysis is performed separately for individuals with and without a college degree. For college-educated individuals, the age difference variables are interacted with indicators for marriage by or after age 26.[17] For those with less than a college degree, the age difference variables are instead interacted with indicators for marriage by or after age 23.[18]

The majority of the point estimates in Table 5 are consistent with our hypothesis that the relationship between occupational wage and age difference is weaker for those who marry at older ages. Coefficient pairs are in bold if there is a statistically significant difference between the coefficients for early marriages and late marriages, and among the statistically significant pairs the strong majority are also consistent with a weakening relationship.

V. Negative Selection into Differently-Aged Couples: Ability and Appearance

Unfortunately, the Census data do not allow us to observe the attributes of a previous spouse if the couple has divorced. Therefore, our Census samples are to a certain extent select samples of surviving marriages in any given Census year. We turn our attention to two longitudinal surveys, the NLSY79 and the AddHealth, which collect full marital histories and therefore allow us to analyze the full sample of first marriages. An additional benefit of these

[17] The main effects of the age of marriage indicators are included as well, while still retaining the linear and quadratic age of marriage controls.

[18] In the 1980 analysis sample, 21% of first marriages by college-educated individuals occur after age 26 and 29% of first-marriages for those with less than a college degree occur after age 29.

data sets is that they each contain a measure of quality, a cognitive skills measure in the case of the NLSY79 and an appearance measure in the case of the AddHealth, that is collected sufficiently early in the lifecycle that it is unlikely to be endogenous to marriage market outcomes. In contrast, there is the concern that current occupation and earnings in the Census data are endogenous to current partner characteristics. The analyses using the NLSY79 and ADD Health data test for negative selection, based on the two quality measures, into first marriage with a differently-aged partner, rather than exploring a particular search mechanism that operates through education or occupation.

A. AFQT analysis, NLSY79 Data

The NLSY79 is a panel data set based on annual surveys of men and women who were 14-21 years old on January 1, 1979. Respondents were first interviewed in 1979, re-interviewed each year through 1994, and have been interviewed every two years since 1994. This analysis uses data from 1979-2006. In 1980, NLSY79 respondents took the Armed Services Vocational Aptitude Battery (ASVAB), a battery of tests designed to measure a range of knowledge and skills. The Armed Forces Qualifications Test (AFQT) scores reported in the data are created from the verbal, math and arithmetic reasoning sections of the ASVAB.

The AFQT scores are used to investigate whether men and women in differently-aged couples on average have higher or lower cognitive ability than those in similarly-aged couples. Table 6 provides unweighted descriptive statistics.[19] The first column reports the distribution of within-couple age difference for the sample of first marriages used in this analysis. The remaining two columns of Table 6 report raw means of AFQT scores by

[19] The NLSY79 is a stratified sample, that, in particular, oversamples black and Hispanic respondents. Sampling weights are therefore used in the regression analysis. Table 6 provides unweighted statistics to illustrate the distribution of observations in the raw data.

within-couple age difference separately for male and female respondents. For both men and women, there is a clear pattern of declining AFQT scores with age difference, regardless of whether the man is older than the woman or the woman is older than the man.

The regression specification that is used to test for differences in AFQT score by within-couple age difference is:

$$AFQT_i = \beta_0 + \sum_{j=1}^{6} \beta_j * AgeDiff_{ij} + \alpha_1 HS_i + \alpha_2 Coll_i + \alpha_3 Adv_i + \alpha_4 AgeofMarr_i + \alpha_4 AgeofMarr_i^2 + Race_i \alpha_5 + YrBirth_i \delta + \varepsilon_i \quad (3)$$

The regression includes a vector of year of birth indicators, and is weighted using 1979 sampling weights.

Table 7 reports estimates from equation (3) separately for men and women. The coefficients confirm that men and women married to differently-aged spouses on average have lower cognitive ability than those married to similarly-aged spouses, although they are only statistically significant for men. As was the case with occupational wages, the relationship is stronger for men than for women. Men married to women who are at least eight younger on average have AFQT scores that are 8.4 points lower than men married to similarly aged women. Displaying the same symmetry observed in the Census results, men married to women who are at least 8 years younger on average have AFQT scores that are 9.5 points lower than men married to similarly aged women. For men in our sample, the mean AFQT scores is 40.2 and the standard deviation is 30.8. The estimates therefore imply a sizeable difference of a quarter to a third of a standard deviation.

B. Interaction effects with age of marriage

Table 8, like Table 5, allows the coefficients on the age difference variables to vary by age of marriage. Once again, the categorical variables are replaced with the linear

AgeDiffPos and *AgeDiffNeg* variables, and interacted with indicators for marriage by or after age 26 for college-educated individuals and with indicators for marriage by or after age 23 for those without a college degree.

For men, the coefficient estimates on the age difference variables are, as predicted, weaker for men who married at later marriages. The differences in the coefficients are, however, not statistically significant. The coefficients for women are smaller and show no clear pattern.

C. Physical Appearance, Add Health Data

This section estimates the relationship between within-couple age difference and physical appearance using data from the National Longitudinal Survey of Adolescent Health (Add Health), which is a longitudinal study of a nationally representative sample of adolescents who were in grades 7-12 during the 1994-95 school year. There have been four waves of interviews, the most recent in 2008, when the sample was aged 24-32.

The primary advantage of this data is that measures of physical appearance and Body Mass Index (BMI) were recorded in the first round of the data. Not only is it unique to have measures of physical appearance in the same data set that records marital history information, but these measures of appearance predate entry into marriage, and therefore there is no concern about endogenous changes in appearance in response to marriage market outcomes. The main drawback of the Add Health data is that the respondents are still relatively young in the last wave of the data, and so many have not yet entered their first marriage.[20]

The measure of physical appearance in the Add Health data is a subjective report by the interviewer, who rates the respondent's appearance on a scale from 1 to 5. A rating of 1

[20] 49.8% of Add Health respondents are ever married by wave 4. When broken down by sex, the percentages are 45.6 for men and 53.5% for women. Of respondents who had ever been married by the wave 4 of the Add Health, 92% had only been married once.

is "very unattractive" and a rating of 5 is "very attractive".[21] The vast majority of respondents are given a rating of 3 or 4.[22]

Two measures of appearance are used as dependent variables in the regression analysis. The first is a binary indicator for "Attractive", which equals 1 for those who receive ratings of 4 or 5. Roughly 45% of men and 60% of women in the sample are rated as "Attractive." BMI is also used as an appearance measure. High values of BMI correspond to overweight or obese appearance. These are not independent tests, as individuals rated as attractive have lower BMI on average than those not rated attractive, although, not surprisingly, the differences are larger for women than men. The control variables are the same as those listed in equation (3). A logit model is used for the "Attractive" indicator. Both models are weighted using Wave 4 grand sample weights.

The results appear in Table 9. The first column reports marginal effects for the attractive appearance rating.[23] Overall the estimates indicate that individuals married to differently-aged spouses are less attractive than those married to similarly aged spouses, with the possible exception of men married to older women. The estimates are only statistically significant for those in older man- younger woman marriages. Similar results are obtained if the outcome is changed to an indicator for "Very Attractive" (receiving a rating of 5). The final column reports the results for BMI. The estimates suggest that women married to differently-aged husbands were higher BMI in high school than those married to similarly aged husbands.

[21] Appearance ratings are also provided in Waves 3 and 4. The rating from Wave 1 is used in this analysis because it precedes entry into marriage. French et al (2009) find that the appearance rates are highly stable across the three reports.

[22] Women receive higher ratings on average than men, and consistent with previous research are both more likely to be rated "very attractive" and "very unattractive" (Hamermesh and Abrevaya, 2011; Hamermesh 2011)

[23] The reported marginal effects are calculated as the difference in the predicted probability of a rating of "attractive" for an age-difference category versus the omitted similarly-aged category, with control variables set at their sample means.

VI. Conclusions

The results in this paper call into question much of the conventional wisdom regarding differently aged couples. Our results are not inconsistent with papers such as Coles and Francesconi (2011) and Raley, Mattingly and Bianchi (2006), both of which find that women who are several years older than their spouse are more likely to have higher earnings relative to their spouse. Our findings, however, suggest that their results are in large part driven by the fact that the men in these relationships tend to have much lower earnings, rather than by the financial success of the women.

The empirical results in this paper are inconsistent with most existing economic models of age of marriage and marital age gap. It is important to point out that this disagreement with the theoretical literature cannot be resolved solely by changing the specification of preferences from a case in which individuals prefer younger partners to one in which they prefer similarly-aged partners. If individuals prefer similarly-aged spouses, then both high-quality and low-quality individuals should match with similarly-aged spouses. Such preferences would not generate a match between two low-quality differently-aged partners. There is no way to explain why lower-quality individuals fail to match with similarly-aged spouses unless they are harder to meet. It may therefore be the case that previous models lack an important feature of marriage markets for the purposes of this empirical relationship, specifically, that age-heterogeneity of day-to-day contacts vary by education and occupation.

In marriage models, education and occupational wage have traditionally affected matching through the marital surplus. Our findings suggest they also may affect matching

through the social interactions they facilitate, by changing the set of prospective mates with whom one interacts at lowest cost.

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Appendix A—Relationship between age of marriage and age difference

Table A1 below is produced using the sample of men and women in their first marriages in the 1980 Census. The first column reports the breakdown of the sample by age of marriage separately for men and women. Columns 2-6 provide the breakdown of within-couple age difference separately for each age of marriage category. This analysis was replicated on the 1960 and 1970 Censuses, not reported here, with very similar patterns.

Table A1: Age Difference by Age of Marriage, First Marriages Only, 1980 Census

	Age of Marriage: (column %ages)	Age Difference by Age of Marriage: (row percentages)				
		5 or more	4 to 2	1 to -1	-2 to -4	-5 or more
Women						
<20	35.4%	25.4	45.8	28.0	0.7	0.1
20-22	35.8	17.8	36.0	42.9	3.1	0.2
23-25	17.1	18.8	28.9	42.3	9.1	0.8
26-29	7.7	20.9	22.8	34.8	16.6	5.0
30+	4.0	23.3	17.9	24.8	17.3	16.6
	100.0%					
Men						
<20	12.6%	0.9	24.8	63.3	8.6	2.4
20-22	34.8	5.2	40.9	47.0	5.5	1.5
23-25	27.9	18.6	42.8	30.9	5.4	2.2
26-29	16.2	38.2	33.0	20.2	5.6	2.9
30+	8.6	55.7	20.4	14.4	5.6	3.9
	100.0%					

Notes: There are 991,081 women in the 1980 Census who are ages 25-60 and in their first marriage. There are 988,079 men in the 1980 Census who are ages 25-60 and in their first marriage.

Appendix B- Choo-Siow Model Estimates

Table A2 reports estimates of matching by age-difference and education using the Choo-Siow (2006) framework to adjust for differences in the population supplies of different partner types. Following Choo and Siow (2006), let:

$$\pi_{ij} = \frac{\mu_{ij}}{\sqrt{\mu_{oi}}\sqrt{\mu_{oj}}}$$

where μ_{ij} is the number type *i* men married to type *j* women, μ_{i0} is the number of unmarried type *i* men of type *i* and μ_{0j} is the number of unmarried type *j* women. In this analysis, couple types are categorized based on age and education. This standardization by μ_{i0} and μ_{0j} tests whether the results in Table 3 are an artifact of supply side differences. In order to investigate matching by education and age-difference, the model specification is:

$$\pi_{ij} = \alpha_0 + \alpha_1 age_i + \alpha_2 age_i^2 + \alpha_3 age_i^3 + \beta_1 age_j + \beta_2 age_j^2 + \beta_3 age_j^3 + \sum_{k=1}^{15} \delta_k * EdCat_{kij} + \gamma(age_i - age_j)^2 + \sum_{k=1}^{15} \delta_k * EdCat_{kij} * (age_i - age_j)^2 + \varepsilon_{ij}$$

where *EdCat* is a vector of 15 indicator variables for all possible combinations of husband and wife education using four education categories: no high school, high school, college and advanced degree. The omitted 16th category is neither has a high school degree. We expect our estimate of γ to be negative, indicating that among couples in which neither spouse completed high school, pairings become less common as with-in couple age difference increases. Our interest is in the estimates of δ_k. If differently-aged couples are even less common in couples with higher education, we expect the δ_k estimates to be negative, and the magnitude to be larger for couples with higher educational attainment.

The estimates are reported below in Table A2. The couple type cells are calculated on the same age range, ages 25-60, as the rest of the analysis in the paper. Small cells, those with fewer than 20 couples in the 1960 and 1970 Census, and those with fewer than 100 couples in the 1980 Census, are dropped from the sample. This eliminates, in all three Census years, all cells in which an individual with a college or advance degree is partnered with a spouse without a high school degree, leaving at most 11 coefficient estimates.

The results are consistent with those in Table 3, indicating that differently-aged couples are less prevalent among couples with higher education, with a mild reversal at the advanced degree level. This reduces any concern that the results in Table 3 are due to differences in population supply across partner types.

Table A2: Choo-Siow Matching Estimates for Educational Attainment and Age-Difference

	1960	1970	1980
$(age_i - age_j)^2$ *			
Education Category:			
H: HS W: no HS	-0.0008 (0.0001)	-0.0007 (0.0001)	-0.0003 (0.0001)
H: no HS W: HS	-0.0003 (0.0001)	-0.0004 (0.0001)	0.0000 (0.0001)
H: HS W: HS	-0.0019 (0.0001)	-0.0017 (0.0001)	-0.0003 (0.0001)
H: Coll W: HS	-0.0028 (0.0002)	-0.0030 (0.0002)	-0.0015 (0.0001)
H: HS W: Coll	-0.0053 (0.0010)	-0.0042 (0.0010)	-0.0022 (0.0003)
H: Coll W: Coll	-0.0059 (0.0011)	-0.0083 (0.0013)	-0.0059 (0.0005)
H: Adv W: HS	-0.0029 (0.0003)	-0.0027 (0.0001)	-0.0011 (0.0001
H: HS W: Adv	-	-	-0.0034 (0.0008)
H: Adv W: Coll	-0.0060 (0.0017)	-0.0074 (0.008)	-0.0050 (0.0003)
H: Coll W: Adv	-	-	-0.0062 (0.0007)
H: Adv W: Adv	-	-0.0061 (0.0015)	-0.0041 (0.0003)
N	2514	2720	3209

Notes: First row reports δ_k for couples in which husband has a high school degree and wife has less than a high school degree. Remaining rows report other δ_k estimates. Robust standard errors in parentheses. Missing coefficients in 1960 and 1970 due to small cells.

Appendix C- Decomposing women's earnings into hours and wages

Table A3 estimates equation (2) on the subsample of women in Table 4 with positive earnings using logged earnings, logged hours, and logged earnings per hour as dependent variables. This decomposes earnings into hours and earnings/hour:

Log(Earnings)=log((Earnings/Hours) *(Hours))=log(Earnings/Hours)+log(Hours).

Table A3: Earnings, Hours and Earnings per Hour for Women with Positive Earnings

	Log (Earnings)	Log(Hours)	Log(Earnings/Hr)
Age Difference:			
1980			
+8 or more	0.047 (0.006)	0.051 (0.005)	-0.004 (0.003)
+5 to 7	0.039 (0.004)	0.027 (0.004)	0.011 (0.003)
+2 to 4	0.014 (0.003)	0.009 (0.003)	0.010 (0.002)
-2 to -4	0.013 (0.007)	0.037 (0.006)	-0.010 (0.013)
-5 to –7	-0.011 (0.015)	0.054 (0.013)	-0.011 (0.004)
-8 or more	-0.097 (0.023)	-0.008 (0.019)	-0.031 (0.005)
N	600,883	600,883	600,883
1990			
+8 or more	0.083 (0.004)	0.064 (0.003)	0.019 (0.002)
+5 to 7	0.038 (0.004)	0.031 (0.003)	0.007 (0.002)
+2 to 4	0.008 (0.003)	0.007 (0.002)	0.002 (0.002)
-2 to -4	0.053 (0.005)	0.053 (0.004)	0.000 (0.003)
-5 to –7	0.087 (0.008)	0.079 (0.006)	0.009 (0.004)
-8 or more	0.071 (0.009)	0.080 (0.007)	-0.009 (0.005)
N	954,447	954,447	954,447
2000			
+8 or more	0.048 (0.004)	0.050 (0.003)	-0.001 (0.003)
+5 to 7	0.028 (0.004)	0.023 (0.003)	0.005 (0.002)
+2 to 4	0.008 (0.003)	0.008 (0.002)	0.001 (0.002)
-2 to -4	0.017 (0.004)	0.025 (0.003)	-0.008 (0.003)
-5 to –7	0.037 (0.006)	0.045 (0.005)	-0.008 (0.004)
-8 or more	0.029 (0.008)	0.060 (0.006)	-0.031 (0.005)
N	986,196	986,196	986,196

otes: For 1990 and 2000, regressions are weighteed using Census person weights. Robust standard errors in parentheses.

Appendix D- 1990 and 2000 Census results

Table A4: Average Earnings in Occupation and Earnings by Age Difference with Spouse, 2000 and 1990 Census Data

	Men		Women	
	Avg Earnings/Hr in Occupation	Earnings	Avg Earnings/Hr in Occupation	Earnings
Age Difference:				
2000				
+8 or more	-0.609 (0.029)	-5355.5 (178.7)	0.002 (0.017)	1031.8 (112.8)
+5 to 7	-0.542 (0.024)	-4717.6 (149.5)	0.000 (0.015)	732.2 (97.2)
+2 to 4	-0.264 (0.018)	-2259.9 (114.2)	-0.020 (0.011)	232.2 (71.9)
-2 to -4	-0.321 (0.024)	-3082.9 (156.0)	-0.077 (0.018)	426.1 (111.3)
-5 to –7	-0.605 (0.036)	-5474.5 (222.8)	-0.079 (0.028)	625.1 (176.8)
-8 or more	-0.777 (0.039)	-7894.4 (231.4)	-0.182 (0.034)	273.1 (218.5)
N	1,486,287	1,486,287	1,283,405	1,283,405
1990				
+8 or more	-0.457 (0.021)	-5148.3 (129.1)	0.010 (0.012)	1532.8 (76.0)
+5 to 7	-0.410 (0.017)	-4098.9 (103.5)	-0.014 (0.010)	784.2 (65.1)
+2 to 4	-0.163 (0.012)	-1762.0 (77.6)	0.001 (0.008)	238.1 (47.7)
-2 to -4	-0.270 (0.018)	-2835.0 (116.7)	-0.046 (0.014)	866.8 (81.2)
-5 to –7	-0.478 (0.028)	-4718.4 (174.5)	-0.054 (0.023)	1381.1 (134.4)
-8 or more	-0.591 (0.032)	-6071.1 (196.8)	-0.125 (0.028)	1281.3 (177.0)
N	1,432,619	1,432,619	1,231,439	1,231,439

Notes: Sample is married couples with both spouses ages 25-60 in the 1990 and 2000 Decennial Censuses who report an occupation for most recent job in the past 5 years. Age difference categories measure the number of years the man is older than the woman, and omitted categories is 1 to -1. Columns 1 and 3 report coefficient estimates from equation (2). Columns 2 and 4 report coefficient estimates in which the dependent variable in equation (2) is replaced with earnings and estimated using a Tobit model. All regressions weighted using Census person weights. Robust standard errors in parentheses.

Table 1: Age Dispersion of Discussion Network by Education, GSS 2004 and 1985 data

	Absolute Age Difference	Age Standard Deviation
2004		
Years of Education	-0.426 (0.002) ***	-0.233 (0.117)*
N	732	419
1985		
Years of Education	-0.158 (0.101)	-0.040 (0.075)
N	1060	755

Notes: First column samples contain those who report at least one non-family member of their discussion network. Second column samples contain those who report at least two non-family members of their discussion network. The dependent variable in column 1 is the absolute value of the age difference between the respondent and the first listed non-family member of the discussion network. The dependent variable in column 2 is the standard deviation of age for non-family members of the discussion network. All regressions control for sex, race, age, age-squared, and number of members of the discussion network. Robust standard errors in parentheses.

Table 2: Distribution of Within-Couple Age Difference, Census Data

	2000	1990	1980	1970	1960
Age Difference:					
Full Sample					
+8 or more	0.093	0.095	0.091	0.103	0.128
+5 to 7	0.126	0.131	0.140	0.160	0.166
+2 to 4	0.300	0.321	0.340	0.338	0.315
+1 to -1	0.344	0.345	0.339	0.303	0.287
-2 to -4	0.087	0.070	0.062	0.063	0.068
-5 to -7	0.017	0.013	0.010	0.010	0.012
- 8 or more	0.020	0.015	0.011	0.012	0.014
N	1,897,553	1,753,240	1,515,300	276,500	270,546
Husband w/o college					
+8 or more	0.096	0.098	0.094	0.106	0.130
+5 to 7	0.128	0.134	0.142	0.162	0.168
+2 to 4	0.301	0.322	0.340	0.337	0.314
+1 to -1	0.333	0.335	0.331	0.298	0.283
-2 to -4	0.088	0.071	0.063	0.064	0.069
-5 to -7	0.018	0.013	0.010	0.010	0.012
- 8 or more	0.021	0.016	0.011	0.013	0.014
N	1,551,721	1,469,608	1,339,307	253,513	253,670
Husband w/ college					
+8 or more	0.079	0.079	0.068	0.074	0.086
+5 to 7	0.116	0.118	0.120	0.137	0.146
+2 to 4	0.295	0.313	0.338	0.351	0.341
+1 to -1	0.392	0.394	0.401	0368	0.343
-2 to -4	0.083	0.067	0.054	0.052	0.061
-5 to -7	0.013	0.010	0.007	0.006	0.007
- 8 or more	0.012	0.010	0.006	0.006	0.007
N	345,832	283,632	175,993	22,987	16,876

Notes: Samples of all married couples ages 25-60 in the 2000, 1990, 1980, 1970 and 1960 Census IPUMS data. Age difference is man's age minus the woman's age.

Table 3: Educational Attainment by Age Difference with Spouse, Census Data

	High School Degree	College Degree Among HS Grads	Advanced Degree Among College Grads
Age Difference:			
Men			
1980			
+8 or more	-0.243 (0.003)	-0.227 (0.002)	-0.046 (0.005)
+5 to 7	-0.140 (0.001)	-0.192 (0.001)	-0.054 (0.003)
+2 to 4	-0.048 (0.001)	-0.108 (0.001)	-0.036 (0.002)
-2 to -4	-0.055 (0.002)	-0.078 (0.002)	0.003 (0.004)
-5 to –7	-0.094 (0.004)	-0.137 (0.004)	-0.023 (0.009)
-8 or more	-0.149 (0.005)	-0.179 (0.005)	-0.008 (0.014)
N	1,273,139	975,135	322,730
1970			
+8 or more	-0.250 (0.005)	-0.157 (0.005)	-0.000 (0.013)
+5 to 7	-0.158 (0.004)	-0.127 (0.004)	-0.011 (0.009)
+2 to 4	-0.057 (0.002)	-0.069 (0.003)	-0.011 (0.006)
-2 to -4	-0.067 (0.005)	-0.070 (0.006)	0.016 (0.012)
-5 to –7	-0.127 (0.009)	-0.115 (0.010)	0.003 (0.024)
-8 or more	-0.176 (0.012)	-0.143 (0.012)	-0.041 (0.034)
N	242,043	150,899	42,548
1960			
+8 or more	-0.240 (0.004)	-0.114 (0.005)	-0.021 (0.014)
+5 to 7	-0.160 (0.004)	-0.084 (0.004)	-0.016 (0.010)
+2 to 4	-0.058 (0.003)	-0.036 (0.003)	-0.012 (0.007)
-2 to -4	-0.058 (0.005)	-0.028 (0.006)	0.032 (0.026)
-5 to –7	-0.097 (0.009)	-0.079 (0.010)	0.032 (0.026)
-8 or more	-0.164 (0.011)	-0.078 (0.014)	0.045 (0.036)
N	237,247	112,253	28,858
Women			
1980			
+8 or more	-0.106 (0.002)	-0.047 (0.002)	0.031 (0.005)
+5 to 7	-0.054 (0.001)	-0.031 (0.001)	0.015 (0.004)
+2 to 4	-0.019 (0.001)	-0.016 (0.001)	0.010 (0.003)
-2 to -4	-0.106 (0.002)	-0.072 (0.001)	0.004 (0.005)
-5 to –7	-0.221 (0.009)	-0.099 (0.002)	0.010 (0.012)
-8 or more	-0.221 (0.009)	-0.084 (0.005)	-0.021 (0.019)
N	1,269,847	1,013,988	208,673
1970			
+8 or more	-0.127 (0.005)	-0.028 (0.003)	0.063 (0.014)
+5 to 7	-0.062 (0.003)	-0.149 (0.002)	0.040 (0.010)
+2 to 4	-0.018 (0.002)	-0.009 (0.002)	0.014 (0.007)
-2 to -4	-0.126 (0.005)	-0.044 (0.003)	0.031 (0.013)

-5 to –7	-0.172 (0.010)	-0.051 (0.005)	0.069 (0.027)
-8 or more	-0.163 (0.013)	-0.050 (0.008)	0.011 (0.043)
N	240,502	159,343	23,455
1960			
+8 or more	-0.126 (0.004)	-0.010 (0.003)	0.057 (0.015)
+5 to 7	-0.051 (0.004)	-0.008 (0.003)	0.045 (0.011)
+2 to 4	-0.009 (0.003)	0.000 (0.002)	0.006 (0.008)
-2 to -4	-0.096 (0.005)	-0.024 (0.003)	0.028 (0.013)
-5 to –7	-0.140 (0.009)	-0.031 (0.005)	0.052 (0.025)
-8 or more	-0.137 (0.002)	-0.023 (0.007)	0.063 (0.035)
N	237,247	126,466	15,179

Notes: Sample is married individuals in the 1980, 1970 and 1960 Decennial Censuses in their first marriage, both spouses ages 25-60. Age difference categories measure the number of years the man is older than the woman, and omitted categories is 1 to -1. Columns 1 reports marginal effects from logit model in equation (1). Marginal effects are the difference in predicted probability between the age-difference category and the omitted (+1 to –1) category, with control variables set at sample means. Robust standard errors in parentheses.

Table 4: Average Earnings in Occupation and Annual Earnings by Age Difference with Spouse, Census Data

	Men		Women	
	Avg Earnings/Hr in Occupation	Earnings	Avg Earnings/Hr in Occupation	Earnings
Age Difference:				
1980				
+8 or more	-0.555 (0.025)	-3494.7 (138.1)	-0.095 (0.012)	504.9 (74.2)
+5 to 7	-0.307 (0.016)	-2462.7 (90.3)	-0.018 (0.009)	547.3 (54.8)
+2 to 4	-0.090 (0.010)	-956.6 (61.6)	0.022 (0.006)	299.3 (40.0)
-2 to -4	-0.161 (0.018)	-1989.9 (107.5)	-0.171 (0.014)	-137.5 (87.5)
-5 to –7	-0.392 (0.033)	-3466.1 (191.8)	-0.328 (0.034)	-747.3 (196.6)
-8 or more	-0.566 (0.041)	-4760.2 (238.3)	-0.382 (0.055)	-1885.5 (330.2)
N	1,032,040	1,032,040	758,223	758.223
1970				
+8 or more	-0.798 (0.048)	-2882.1 (272.1)	-0.121 (0.025)	1159.6 (153.1)
+5 to 7	-0.442 (0.034)	-1938.6 (201.3)	0.006 (0.020)	788.3 (133.0)
+2 to 4	-0.177 (0.025)	-906.9 (152.5)	0.043 (0.016)	195.0 (106.8)
-2 to -4	-0.223 (0.044)	-1588.8 (254.9)	-0.134 (0.034)	-3.3 (212.6)
-5 to –7	-0.273 (0.078)	-2445.6 (448.7)	-0.270 (0.071)	-1099.7 (434.8)
-8 or more	-0.632 (0.090)	-4088.7 (522.6)	-0.409 (0.100)	-2735.0 (608.8)
N	228,338	228,338	156,517	156,517
1960				
+8 or more	-0.689 (0.039)	-2626.5 (209.4)	-0.228 (0.022)	1083.6 (142.3)
+5 to 7	-0.404 (0.029)	-1862.4 (166.8)	-0.048 (0.019)	710.2 (125.0)
+2 to 4	-0.130 (0.022)	-523.2 (131.1)	0.026 (0.016)	152.6 (104.7)
-2 to -4	-0.150 (0.037)	-832.6 (210.6)	-0.104 (0.029)	-170.5 (188.6)
-5 to –7	-0.273 (0.061)	-1360.9 (339.8)	-0.055 (0.290)	-507.4 (344.1)
-8 or more	-0.513 (0.074)	-3226.4 (406.9)	-0.381 (0.079)	-1216.8 (474.8)
N	228,316	228,316	141,570	141,570

Notes: Sample is married individuals in the 1980, 1970 and 1960 Decennial Censuses in their first marriage, both spouses ages 25-60, who report an occupation for most recent job in the past 5 years. Age difference categories measure the number of years the man is older than the woman, and omitted categories is 1 to -1. Columns 1 and 3 report coefficient estimates from equation (2). Columns 2 and 4 report coefficient estimates in which the dependent variable in equation (2) is replaced with earnings and estimated using a Tobit model. Robust standard errors in parentheses.

Table 5: Average Earnings per Hour in Occupation by Age Difference with Spouse Interacted with Age of Marriage Interactions, 1980 Census

	1980	1970	1960
Men			
W/ College			
AgeDiffPos*AgeMarr ≤ 26	**-0.120 (0.008)**	**-0.087 (0.021)**	**-0.072 (0.021)**
AgeDiffPos*AgeMarr>26	**-0.029 (0.007)**	**0.028 (0.019)**	**0.006 (0.016)**
AgeDiffNeg*AgeMarr ≤ 26	-0.106 (0.011)	-0.082 (0.031)	**-0.103 (0.027)**
AgeDiffNeg*AgeMarr>26	-0.083 (0.016)	-0.102 (0.045)	**-0.017 (0.036)**
N	275,659	40,299	27,756
W/o College			
AgeDiffPos*AgeMarr ≤ 23	**-0.067 (0.004)**	**-0.136 (0.008)**	**-0.119 (0.007)**
AgeDiffPos*AgeMarr>23	**-0.051 (0.003)**	**-0.076 (0.005)**	**-0.062 (0.009)**
AgeDiffNeg*AgeMarr ≤ 23	-0.052 (0.004)	**-0.043 (0.008)**	**-0.042 (0.008)**
AgeDiffNeg*AgeMarr>23	-0.062 (0.004)	**-0.083 (0.009)**	**-0.067 (0.008)**
N	756,381	188,039	200,560
Women			
/w College			
AgeDiffPos*AgeMarr ≤ 26	**-0.011 (0.003)**	-0.008 (0.010)	-0.018 (0.010)
AgeDiffPos*AgeMarr>26	**0.006 (0.006)**	0.015 (0.019)	0.005 (0.016)
AgeDiffNeg*AgeMarr ≤ 26	**-0.107 (0.017)**	-0.045 (0.046)	-0.039 (0.045)
AgeDiffNeg*AgeMarr>26	**-0.041 (0.014)**	-0.045 (0.036)	0.021 (0.028)
N	153,426	19,389	11,877
W/o College			
AgeDiffPos*AgeMarr ≤ 23	-0.009 (0.001)	**-0.009 (0.002)**	**-0.021 (0.002)**
AgeDiffPos*AgeMarr>23	-0.007 (0.002)	**-0.019 (0.004)**	**-0.029 (0.003)**
AgeDiffNeg*AgeMarr ≤ 23	**-0.074 (0.006)**	-0.046 (0.012)	**-0.095 (0.014)**
AgeDiffNeg*AgeMarr>23	**-0.045 (0.003)**	-0.057 (0.008)	**-0.046 (0.006)**
N	604,797	137,128	129,693

Notes: Samples are the same as used in Table 4. Dependent variable is average earnings per hour in occupation. *AgeDiffPos* is the number of years the man is older than the woman, and equals zero if the woman is older; *AgeDiffNeg* is the number of years the women is older than the man, and equals zero the man is older. Interactions of these age difference measures with age of marriage indicators, as well as the age of marriage main effects, replace the age-difference categories in equation (2). Robust standard errors in parentheses. Coefficients in bold indicate a statistically significant difference (p-value<0.05) between the coefficient for those married early and those married late.

Table 6: Descriptive Statistics, Within-Couple Age Differences and AFQT Scores, NLSY Data

	Distribution of Age Difference 1st Marriage	Mean AFQT Scores 1st Marriage	
		Men	Women
Age Difference:			
+8 or more	770	33.2	37.1
	[8.2]	(28.1)	(28.7)
+5 to 7	1141	39.5	38.4
	[12.2]	(30.2)	(28.9)
+2 to 4	2992	40.5	39.6
	[31.9]	(30.6)	(28.1)
+1 to -1	3181	42.8	42.5
	[35.0]	(31.3)	(29.7)
-2 to - 4	824	39.6	37.9
	[8.8]	(31.9)	(29.0)
- 5 to -7	228	32.9	39.8
	[2.5]	(30.4)	(28.5)
- 8 or more	151	29.1	33.4
	[1.6]	(26.2)	(27.0)
N	9,387	4,502	4,885

Notes: Samples of first marriages in the NLSY79 data through the 2006 survey. Age difference is man's age minus woman's age. First columns report distribution of observations by age difference category with column percentages in brackets. Remaining two columns report mean AFQT scores by age difference category, with standard deviations in parentheses. All statistics are unweighted.

Table 7: AFQT Scores by Age Difference with Spouse, NLSY79

	Men	Women
Age Difference:		
+8 or more	-8.43 (2.55)***	-2.61 (1.53)+
+5 to 7	-4.37 (1.73)*	-0.238 (1.41)
+2 to 4	-3.66 (1.13)***	-1.63 (1.10)
-2 to -4	-3.25 (1.69)+	-2.32 (1.81)
-5 to –7	-4.05 (2.90)	-2.79 (3.18)
-8 or more	-9.45 (3.09)**	-4.04 (5.92)
N	4,502	4,885

Notes: Sample is first marriages in NLSY79. Dependent variable is AFQT score. Table reports coefficient estimates from equation (3). 1979 Sampling weights are used. Robust standard errors in parentheses.
+ p-value<0.10 *p-value<0.05 ** p-value<0.01 ***p-value<0.001

Table 8: AFQT Scores by Age Difference with Spouse and Age of Marriage Interactions, NLSY79

	Men	Women
W/ College		
AgeDiffPos*AgeMarr ≤ 26	-1.736 (1.11)	-0.267 (0.289)
AgeDiffPos*AgeMarr>26	-0.837 (0.538)	-0.313 (0.252)
AgeDiffNeg*AgeMarr ≤ 26	-1.598 (1.071)	-0.081 (1.398)
AgeDiffNeg*AgeMarr>26	0.021 (0.883)	0.192 (0.694)
N	981	1141
W/O College		
AgeDiffPos*AgeMarr ≤ 23	-1.296 (0.487)**	-0.082 (0.186)
AgeDiffPos*AgeMarr>23	-0.452 (0.253)+	-0.213 (0.176)
AgeDiffNeg*AgeMarr ≤ 23	-1.055 (0.392)**	-0.362 (1.09)
AgeDiffNeg*AgeMarr>23	-0.406 (0.240)+	-0.254 (0.479)
N	3521	3744

Notes: Sample of first marriages in NLSY79. Dependent variable is AFQT score. AgeDiffPos is the number of years the man is older than the woman, and equals zero if the woman is older. AgeDiffNeg is the number of years the woman is older than the man, and equals zero if the man is older. 1979 Sampling weights are used, as are the same controls as in equation (3). Robust standard errors in parentheses.

Table 9: Physical Appearance by Age Difference with Spouse, AdHealth Data

	Attractive	BMI
Age Difference:		
Men		
+5 or more	-0.153 (0.053)**	-0.577 (0.582)
+2 to 4	-0.049 (0.034)	-0.200 (0.303)
-2 to -4	-0.008 (0.053)	0.375 (0.485)
-5 or more	0.043 (0.069)	0.208 (0.688)
N	2376	2360
Women		
+5 or more	-0.225 (0.134)+	0.801 (0.266)**
+2 to 4	-0.050 (0.124)	0.106 (0.230)
-2 to -4	0.025 (0.174)	0.479 (0.390)
-5 or more	-0.457 (0.486)	1.24 (1.39)
N	3247	3154

Notes: Sample of first marriages from first four waves of Add Health data. Column 1 reports marginal effects from a logit model using an attractive indicator that equals 1 for appearance rating of 4 or 5. Column 2 is a linear regression model with BMI as the dependent variable. Controls are the same as in equation (3). Marginal effects are the difference in predicted probability between that age-difference category and the omitted category, with control variables set at their sample means. Wave 4 grand sample weights used. Robust standard errors in parentheses.
+ p-value<0.10 *p-value<0.05 ** p-value<0.01 ***p-value<0.001