Published in final edited form as:

Rev Econ Stat. 2014 July ; 96(3): 577–580. doi:10.1162/REST_a_00377.

Who Marries Differently Aged Spouses? Ability, Education, Occupation, Earnings, 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 lower cognitive ability, lower educational attainment, lower occupational wages, lower earnings, and less attractive appearance among those married to a differently-aged spouse. These results, obtained using samples of first marriages and controlling for age of marriage, are consistent with a model in which individuals with more schooling and more upwardly-mobile occupations interact more heavily with similarly-aged peers and are ultimately more likely to marry similarly-aged spouses.

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 discussion of “Cougars,” older women paired with younger men, likewise suggests that the improving economic status of women has freed them to partner with younger men. Economic models of age of marriage and marital age gaps 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). In direct contrast, this paper presents robust empirical evidence of negative selection into differently-aged couples.

In National Longitudinal Survey of Youth 1979 cohort (NLSY79) data, men and women married to differently-aged spouses have lower cognitive skills scores compared to those with similarly-aged spouses. In Census data, men and women with differently-aged spouses have lower educational attainment, and, conditional on educational attainment, work in lower-wage occupations and have lower annual earnings. Finally, in the National Longitudinal Study of Adolescent Health (Add Health), men and women with differently-aged spouses received lower ratings of physical appearance in high school.[1]

[1]In the most closely related empirical research, Coles and Francesconi (2011) find women who are older than their husbands are more likely to be economically successful than their husbands. Raley, Mattingly and Bianchi (2006), and Bloemen and Stancanelli (2008) also find that in differently-aged couples, women’s economic status increases relative to men. Our results suggest these previous findings reflect the fact that men with differently-aged spouses on average have much lower earnings outcomes.

II. Marital Age Gap and Cognitive Ability

The NLSY79 is based on annual surveys of men and women who were 14–21 years old on January 1, 1979. This analysis uses data on first marriages through 2006. In 1980, NLSY79 respondents took a cognitive skills test that produced Armed Forces Qualifications Test (AFQT) scores. This cognitive skills measure is collected sufficiently early in the lifecycle that it is unlikely to be endogenous to marriage market outcomes.

A. Prevalence of Differently-Aged Couples

The first two columns of Table 1 report the distribution of within-couple age difference from the 1960 and 2000 Integrated Public Use Microdata Series (IPUMS) data using samples of married couples ages 25–60. We measure the age difference as the man's age minus the woman's. The category "+8 or more" contains couples in which the man is at least 8 years older than the woman, and the category "−8 or more" contains couples in which the man is at least 8 years younger than the woman. Marriages between older men and younger women have become less common over time, while marriages between older women and younger men have slightly increased.

The remaining columns of Table 1 provide unweighted descriptive statistics from the NLSY79. Column 3 reports the distribution of age difference for our sample of first marriages. Columns 4 and 5 report mean AFQT scores by age difference separately for males and females. Mean AFQT scores decline with age difference, regardless of whether the man is older or the woman is older.

B. Regression Analysis

The regression specification is:

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

AgeDiff is a vector of 6 indicator variables for the categories of age difference from Table 1 (the omitted category is +1 to −1). *HS*, *Coll* and *Adv* are categorical indicators for completion of high school, college or advanced degree. *Race* contains indicators for non-Hispanic white, non-Hispanic black and Hispanic. *AgeMarr* is the individual's age of first marriage. *YrBirth* contains year of birth indicators. The regression is weighted using 1979 sampling weights.

Table 2 reports estimates from equation (1) separately for men and women. Men and women married to differently-aged spouses on average have lower cognitive ability, although the effects are only statistically significant for men.

IIII. Marital Age Gap and Education, Occupation and Earnings

Analysis of education and labor market outcomes is conducted using the 1980, 1970 and 1960 Censuses. Data from these years contain controls for age of marriage and number of marriages, which are absent in later Census years.

Analysis is conducted separately for men and women using samples of married couples ages 25–60. The male regressions are estimated only using men in their first marriage (although their wife may be previously married), and the female regressions are estimated only using women in their first marriage (although their husband may be previously married).

For education outcomes, the logit model is specified as:

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

where Y is either an indicator for high school completion or college completion. *AgeDiff, Race*, and *AgeMarr* are the same as defined in equation (1). *Spouse_MarrNo* contains indicators for spouse previously married one, or two or more times. *Age* contains single-year age indicators. There are state fixed-effects and state fixed-effects interacted with an urban indicator.[2]

To test average hourly earnings in occupation, conditional on education, the regression is:

$$\begin{aligned} Occ\_Earn_i &= \beta_0 + \sum_{j=1}^{6}\beta_j * AgeDiff_{ij} + Race_i\alpha_1 + \alpha_2 AgeMarr_i + \alpha_3 AgeMarr_i^2 + Spouse\_MarrNo_i\alpha_4 \\ &+ \sum_{a=1}^{A}\gamma_a * Age_{ia} + \sum_{a=1}^{A}\delta_a * Age_{ia} * HS_i + \sum_{a=1}^{A}\eta_a * Age_{ia} * Coll_i \\ &+ \sum_{a=1}^{A}\lambda_a * Age_{ia} * Adv_i \\ &+ \sum_{s=1}^{S}\phi_s * State_{is} + \sum_{s=1}^{S}\psi_s * \left(State_{is} * Urban_i\right) \\ &+ \varepsilon_i \end{aligned} \tag{3}$$

where *Occ_Earn* is average earnings per hour (in 2000 dollars) in individual *i*'s occupation. γ_a, δ_a, η_a and λ_a trace out a flexible age-earnings profile for each level of educational attainment.[3]

[2]Individuals are excluded if own age, spouse's age, sex or education are allocated.
[3]We do not include controls for fertility as this is an outcome of within-couple age difference. Our findings are robust to adding fertility controls.

Samples of full-time workers in the 1980, 1970 and 1960 Censuses are used to calculate average hourly earnings by occupation using 3-digit SOC codes.[4] These are calculated separately by sex, college education and 10-year age interval, and are matched to each individual's report of occupation in most recent job in the past five years. [5] Individuals who have not worked in the past five years are excluded from the analysis.[6]

Column 1 of Table 3 reports the marginal effects from equation (2) for high school completion. 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 sample means. For both men and women in all census years, individuals married to differently-aged spouses, whether older or younger, are less likely to have a high school degree. Column 2 shows that, among high school graduates, individuals married to differently-aged spouses are less likely to have completed college. In results not reported here, we obtain very similar estimates using the 1990 and 2000 Census data.[7]

Column 3 of Table 3 reports the occupational wage results using equation (3). For men, all of the age-difference categories have lower occupational wages relative to the omitted similarly-aged group, and the wage gap increases with age difference. The results likewise show that women with differently-aged spouses tend to work in lower wage occupations than women married to similarly-aged spouses.

Column 4 of Table 3 re-estimates equation (3) using individual earnings. Observations with zero earnings are included and we estimate a standard Tobit model.[8] Men married to differently-aged spouses have lower earnings, and the effects are again surprisingly symmetric between men married to younger and older women.

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. Additional analysis, available in the online appendix, shows that these higher earnings are largely generated by higher hours of work, not by higher wages. These higher hours of work likely reflect the fact that these women married to older men on average have lower fertility and lower-earning husbands.

Estimates from equation (3) using the 1990 and 2000 Censuses are consistent with those in Table 3 and available in the online appendix.

IV. Marital Age Gap and Physical Appearance

The National Longitudinal Survey of Adolescent Health (Add Health) is a longitudinal study of a nationally representative sample of adolescents in grades 7–12 during the 1994–95

[4]In the 1960 and 1970 data, weekly hours of work are reported in intervals. We impute hours of work using individuals with the same sex, education and hours of work interval in the 1980 Census data.
[5]If 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.
[6]In addition to the sample exclusions in footnote 4, individuals are also excluded if occupation or earnings is allocated.
[7]We also estimated a Choo-Siow (2006) model of matching on educational and age difference that adjusts for supply side differences. These results, reported in the online appendix, are consistent with those in Table 3.
[8]The findings in column 4 are unchanged if we include non-earners who have not worked in the past 5 years.

school year. There have been four waves of interviews, the most recent in 2008, when the sample was aged 24–32.[9] Measures of physical appearance and Body Mass Index (BMI) recorded in the first round of the data predate entry into marriage, eliminating any concern about endogenous responses to marriage market outcomes.

Interviewers rated the respondent's appearance on a scale from 1 to 5, where 5 is "very attractive". We use a binary indicator for "Attractive", equaling 1 for 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. The control variables are the same as those in equation (1). A logit model is used for the "Attractive" indicator. Both models are weighted using Wave 4 grand sample weights.

The first column of Table 4 reports marginal effects for the attractive appearance rating.[10] Individuals married to differently-aged spouses are less attractive, with the possible exception of men married to older women. The estimates are only statistically significant for those in older man- younger woman marriages. The BMI estimates in Column 2 suggest that women married to differently-aged husbands had higher BMI in high school than those married to similarly-aged husbands.

V. Discussion

The disagreement between our results and the theoretical literature cannot be resolved solely by changing the specification of preferences from a preference for younger partners to a preference for similarly-aged partners. If individuals prefer similarly-aged spouses, then both high-quality and low-quality individuals should match with similarly-aged spouses. There is no way to explain why lower-quality individuals fail to match with similarly-aged spouses unless they are harder to meet.

We suggest that higher quality individuals spend more time in age-homogenous settings at ages when marriages most often form. They spend more years in school and are more likely to attend high-quality post-secondary schools with age-homogenous student populations. When they enter the workforce, they are often in jobs with high upward mobility, so that other individuals who share their same job description are similarly-aged. In contrast, lower quality individuals receive fewer years of education, and attend more age-heterogeneous post-secondary institutions (e.g. community colleges). Lower quality individuals tend to work in occupations with limited upward mobility, producing greater age variation among co-workers.

While we are not able to formally test this mechanism, we confirm several empirical facts that are consistent with this mechanism. First, in General Social Survey (GSS) data from 1985 and 2004, we find that individuals with lower educational attainment have more age-diverse social networks. Second, we find that the relationship between marital age gap and AFQT scores is weaker for those who marry at later ages, when this mechanism is likely less important. The same is true for the relationship between marital age gap and occupational

[9] 49.8% of Add Health respondents (45.6% of men and 53.5% of women) are ever married by wave 4.
[10] Marginal effects are calculated in the same manner as Columns 1–2 of Table 3.

wages. Third, consistent with the presence of job ladders, we confirm that higher wage occupations have less age heterogeneity in a given wage decile. Finally, we confirm that age dispersion in individual's own job is positively related to age gap with spouse. These results all appear in the online appendix.

In marriage models, education and occupational wage have traditionally affected matching through the marital surplus. Our findings suggest they may also affect matching through the social interactions they facilitate, by changing the set of prospective mates with whom one interacts at lowest cost.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

We gratefully acknowledge comments from Dan Hamermesh, Robert Pollak and Daniel Rees. Access to the Add Health data was supported by a grant to the University of Colorado Population Center (Award Number R24HD066613) from the Eunice Kennedy Shriver National Institute of Child Health & Human Development (NICHD). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NICHD or the National Institutes.

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Table 1:

Descriptive Statistics, Census and NLSY79

	Distribution of Age Difference			Mean AFQT Scores	
	2000 Census	1960 Census	NLSY79 1st Marriages	NLSY79 1st Marriages	
				Men	Women
Age Difference:					
+8 or more	0.093	0.128	0.082	33.2 (28.1)	37.1 (28.7)
+5 to 7	0.126	0.166	0.122	39.5 (30.2)	38.4 (28.9)
+2 to 4	0.300	0.315	0.319	40.5 (30.6)	39.6 (28.1)
+1 to −1	0.344	0.287	0.350	42.8 (31.3)	42.5 (29.7)
−2 to −4	0.087	0.068	0.090	39.6 (31.9)	37.9 (29.0)
−5 to −7	0.017	0.012	0.024	32.9 (30.4)	39.8 (28.5)
−8 or more	0.020	0.014	0.016	29.1 (26.2)	33.4 (27.0)
N	1,897,553	270,546	9,387	4,502	4,885

Notes: Age difference is man's age minus woman's age. Samples in columns 1–2 include married couples ages 25–60. Samples in columns 3–5 include first marriages in the NLSY79. Standard deviations are in parentheses.

Table 2:

AFQT Scores by Age Difference, 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 1st marriages in NLSY79. Table reports estimates from equation (1). 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 3:

Education and Labor Market Outcomes by Age Difference, Census Data

	High School Degree	College Degree Among HS Grads on	Avg Earnings/Hr In Occupation	Earnings
Age Difference				
Men				
1980				
+8 or more	−0.243 (0.003)	−0.227 (0.002)	−0.555 (0.025)	−3494.7 (138.1)
+5 to 7	−0.140 (0.001)	−0.192 (0.001)	−0.307 (0.016)	−2462.7 (90.3)
+2 to 4	−0.048 (0.001)	−0.108 (0.001)	−0.090 (0.010)	−956.6 (61.6)
−2 to −4	−0.055 (0.002)	−0.078 (0.002)	−0.161 (0.018)	−1989.9 (107.5)
−5 to −7	−0.094 (0.004)	−0.137 (0.004)	−0.392 (0.033)	−3466.1 (191.8)
−8 or more	−0.149 (0.005)	−0.179 (0.005)	−0.566 (0.041)	−4760.2 (238.3)
N	1,273,139	975,135	1,032,040	1,032,040
1970				
+8 or more	−0.250 (0.005)	−0.157 (0.005)	−0.798 (0.048)	−2882.1 (272.1)
+5 to 7	−0.158 (0.004)	−0.127 (0.004)	−0.442 (0.034)	−1938.6 (201.3)
+2 to 4	−0.057 (0.002)	−0.069 (0.003)	−0.177 (0.025)	−906.9 (152.5)
−2 to −4	−0.067 (0.005)	−0.070 (0.006)	−0.223 (0.044)	−1588.8 (254.9)
−5 to −7	−0.127 (0.009)	−0.115 (0.010)	−0.273 (0.078)	−2445.6 (448.7)
−8 or more	−0.176 (0.012)	−0.143 (0.012)	−0.632 (0.090)	−4088.7 (522.6)
N	242,043	150,899	228,338	228,338
1960				
+8 or more	−0.240 (0.004)	−0.114 (0.005)	−0.689 (0.039)	−2626.5 (209.4)
+5 to 7	−0.160 (0.004)	−0.084 (0.004)	−0.404 (0.029)	−1862.4 (166.8)
+2 to 4	−0.058 (0.003)	−0.036 (0.003)	−0.130 (0.022)	−523.2 (131.1)
−2 to −4	−0.058 (0.005)	−0.028 (0.006)	−0.150 (0.037)	−832.6 (210.6)
−5 to −7	−0.097 (0.009)	−0.079 (0.010)	−0.273 (0.061)	−1360.9 (339.8)
−8 or more	−0.164 (0.011)	−0.078 (0.014)	−0.513 (0.074)	−3226.4 (406.9)
N	237,247	112,253	228,316	228,316
Women				
1980	−0.106 (0.002)	−0.047 (0.002)	−0.095 (0.012)	504.9 (74.2)
+8 or more	−0.054 (0.001)	−0.031 (0.001)	−0.018 (0.009)	547.3 (54.8)
+5 to 7	−0.019 (0.001)	−0.016 (0.001)	0.022 (0.006)	299.3 (40.0)
+2 to 4	−0.106 (0.002)	−0.072 (0.001)	−0.171 (0.014)	−137.5 (87.5)
−2 to −4	−0.221 (0.009)	−0.099 (0.002)	−0.328 (0.034)	−747.3 (196.6)
−5 to −7	−0.221 (0.009)	−0.084 (0.005)	−0.382 (0.055)	−1885.5 (330.2)
−8 or moreXT	1,269,847	1,013,988	758,223	758.223
N				
1970				
+8 or more	−0.127 (0.005)	−0.028 (0.003)	−0.121 (0.025)	1159.6 (153.1)
+5 to 7	−0.062 (0.003)	−0.149 (0.002)	0.006 (0.020)	788.3 (133.0)
+2 to 4	−0.018 (0.002)	−0.009 (0.002)	0.043 (0.016)	195.0 (106.8)

	High School Degree	College Degree Among HS Grads on	Avg Earnings/Hr In Occupation	Earnings
−2 to −4	−0.126 (0.005)	−0.044 (0.003)	−0.134 (0.034)	−3.3 (212.6)
−5 to −7	−0.172 (0.010)	−0.051 (0.005)	−0.270 (0.071)	−1099.7 (434.8)
−8 or more	−0.163 (0.013)	−0.050 (0.008)	−0.409 (0.100)	−2735.0 (608.8)
N	240,502	159,343	156,517	156,517
1960				
+8 or more	−0.126 (0.004)	−0.010 (0.003)	−0.228 (0.022)	1083.6 (142.3)
+5 to 7	−0.051 (0.004)	−0.008 (0.003)	−0.048 (0.019)	710.2 (125.0)
+2 to 4	−0.009 (0.003)	0.000 (0.002)	0.026 (0.016)	152.6 (104.7)
−2 to −4	−0.096 (0.005)	−0.024 (0.003)	−0.104 (0.029)	−170.5 (188.6)
−5 to −7	−0.140 (0.009)	−0.031 (0.005)	−0.055 (0.290)	−507.4 (344.1)
−8 or more	−0.137 (0.002)	−0.023 (0.007)	−0.381 (0.079)	−1216.8 (474.8)
N	237,247	126,466	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. Column 2 is restricted to individuals with a high school degree. Columns 3 and 4 only include those reporting an occupation for most recent job in the past 5 years. Columns 1 and 2 report marginal effects from equation (2). Column 3 reports estimates from equation (3). Column 4 reports coefficient estimates in which the dependent variable in equation (3) is replaced with earnings and using a Tobit model. Robust standard errors are in parentheses.

Table 4:

Physical Appearance by Age Difference

	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 Add Health data. The variable *Attractive* equals one if the wave 1 interviewer rated respondent's appearance a 4 or 5 on a scale from 1 to 5. Wave 4 grand sample weights used. Robust standard errors in parentheses.

+ p-value<0.10

* p-value<0.05

** p-value<0.01.