Determinants of the U.S. Divorce Rate: The Impact of Geography and Demography

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Abstract

"While marrying the girl or boy next door is an endearing ideal, it is less and less common in today's society. Where we live has more effect on our chances of meeting our life partner than ever before."

- Richard Florida, life observer and author of "Who's Your City?"

We live in a rapidly evolving society that is becoming more educated, more mobile and more interconnected. Despite all of our progress, a steadily increasing divorce rate indicates that we are missing the mark when it comes to the selection of a life partner. There appear to be many demographic factors which may influence the divorce rate. Commonly cited factors include the age at which people first get married and the sex ratio of the immediate population. However, these variables cannot be considered in isolation; *where we live* is a central factor that influences all aspects of our lives, personal relationships included. This study aims to consider both demographics and geography with the goal of quantifying their influence on the U.S. Divorce Rate. By applying regression analysis with divorce rate as the dependent variable and several independent variables, we find a tangible impact attributed to the interplay of both of these factors. By identifying factors that affect the divorce rate, our findings provide insight on the direction society is moving with respect to marriage and divorce.

INTRODUCTION

Media reports suggest often enough that approximately 50% of marriages in the U.S. will end in divorce. This statistic is a complex interaction of several changing demographic trends in American society. It is unclear whether this is a progressive figure or a pessimistic one. Has U.S. Society become ineffective at selecting a spouse for a lifetime? Within the United States, there are persistent subcultures related to regions of the country; this is likely true in most countries in the world. In the U.S., these subcultures include everything from southern hospitality to the fast-paced rhythm of life common in the Northeast. These subcultures influence most aspects of life, including the development of personal relationships; thus, it is not unreasonable to suggest that they would affect marriage and divorce rates. For example, it is common practice for individuals to enter marriage in the year following college graduation in the southern United States; it is far less common in other parts of the country.

Nationally, single males and single females are not evenly distributed. This effect could be evident in a peak in the divorce rate in the areas where singles are concentrated and sex ratio is unbalanced. Several theories suggest that a couple is more likely to divorce if there is a significant availability of singles in the society where the couple lives (e.g., Florida, 2008). Also, beyond the *number* of singles, a sex-ratio imbalance influences the utility distribution within a marriage in favor of the underrepresented sex.

Above and beyond these demographics, it has been suggested that there is a less quantifiable, but potentially strong, effect of geographic location on marital choices and divorce rate (Florida, 2008). Whether or not an individual is tech-savvy affects matching in Silicon Valley in the same way that someone's tendency to be neurotic might have an effect on the matching in the New York City metropolitan area. Richard Florida (2008) uses demographic statistics to study the impact of "place" (i.e., geography) on the formation of personal relationships. He writes that, "Where we live is increasingly important to every facet of our lives.

We owe it to ourselves to think about the relationship between place and our economic future, as well as our personal happiness, in a more systematic - if different - way". To build upon Florida's findings, we include this geographic element in our analysis as a potential determinant of the variation in divorce rate from state to state. In general, we have heterosexual marriages in mind when we refer to a *marriage*. However, if the data were available, much of what we find can be applied to homosexual marriages/civil-unions with minor changes in vocabulary.

LITERATURE REVIEW

Becker (1991) provides pertinent insights on the notion of the "marriage market" or "mating market," which represents the relative availability of marriageable men or women. In his view, the marriage market depends directly on the sex ratio; for example, when there are relatively few females in the marriage market, bargaining power shifts towards women. In this situation, men must compete more aggressively for a mate, leading to a shift in the relative gains from divorce to favor the prospective wife, who is then (at least in theory!!) able to select the most desirable companion.

Geographic distribution has served as a primary barrier to an efficient marriage market. The dispersion of single men and women is not evenly distributed throughout the United States. Florida's (2008) findings evaluate the implications of living in different cities throughout the U.S. The following map (Figure 1) clearly portrays this polarity in gender distribution, where blue circles represent a surplus of single males and red circles represent a surplus of single females:

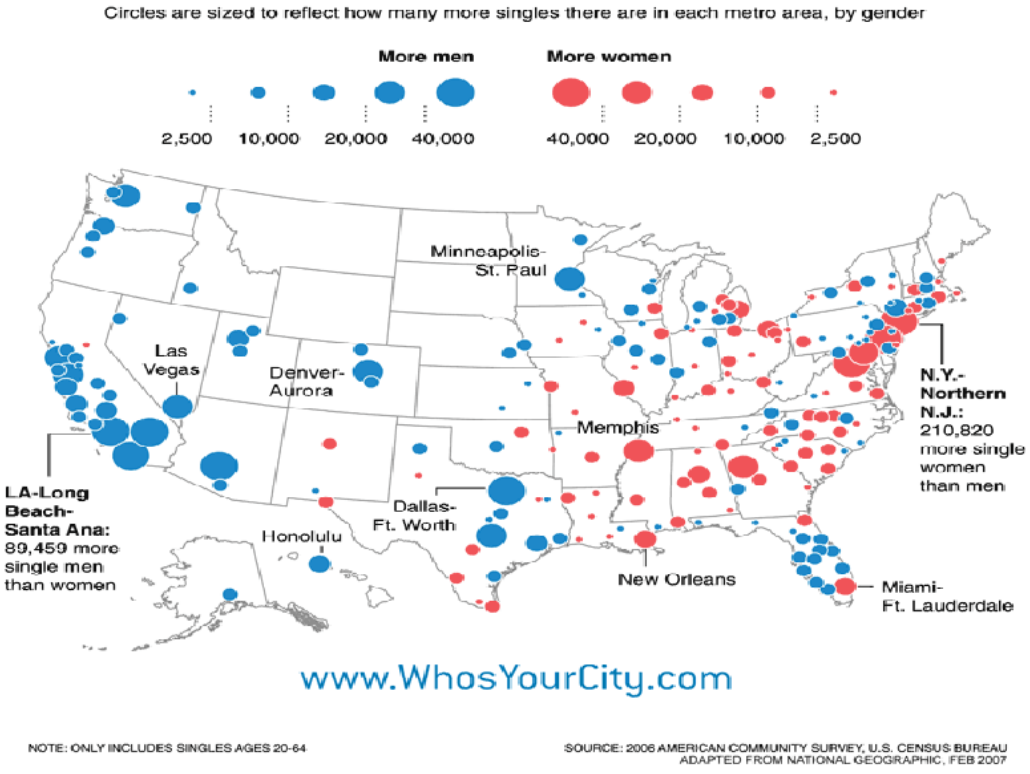


Figure 1: Surplus of Females and Males in Different Parts of the U.S

Based upon Florida's theory, one would conclude that the most ideal location for heterosexual men is the Northeast where the sex ratio is most in their favor. This area includes New York City, Long Island, Westchester (New York), and parts of New Jersey and Connecticut (Florida, 2008, p230). In the Northeast, as of 2008, there were 165,000 more single women than single men, making it an ideal mating market for single heterosexual men. Alternatively, the "best" region for single heterosexual women is Los Angeles, where, in 2008, single women were outnumbered by single men by 40,000. Additionally, San Diego, Portland (Oregon), Seattle, Dallas, Houston and Austin rank high as ideal mating markets for single heterosexual women. One might expect that in areas where the mating market is less balanced, the increased availability of singles of the opposite sex would cause an increase in the divorce rate relative to the areas where the sex ratio is more balanced.

Florida's (2008) research suggests that geographic location is the single most significant determinant of "well being" - specifically regarding the development of personal relationships. It is his conviction that:

> *"The place we choose to live affects every aspect of our being. It can determine the income we earn, the people we meet, the friends we make, the partners we choose, and the options available to our children and families. People are not equally happy everywhere, and some places do a better job of providing a high quality of life than others. Some places offer us more vibrant labor markets, better career prospects, higher real estate appreciation, and stronger investment and earnings opportunities. Some places offer more promising mating markets. Others are better environments for raising children."* (Florida, 2008, p5-6)

These findings are particularly fascinating because not only does he address the effect of the sex- ratio balance on mating markets and utility distribution but he also examines the implication of geographic region, itself. He does this by providing "personality maps" (Figure 2) such as the fourbelow, where the darker the color, the higher the proportion of a corresponding personality trait.

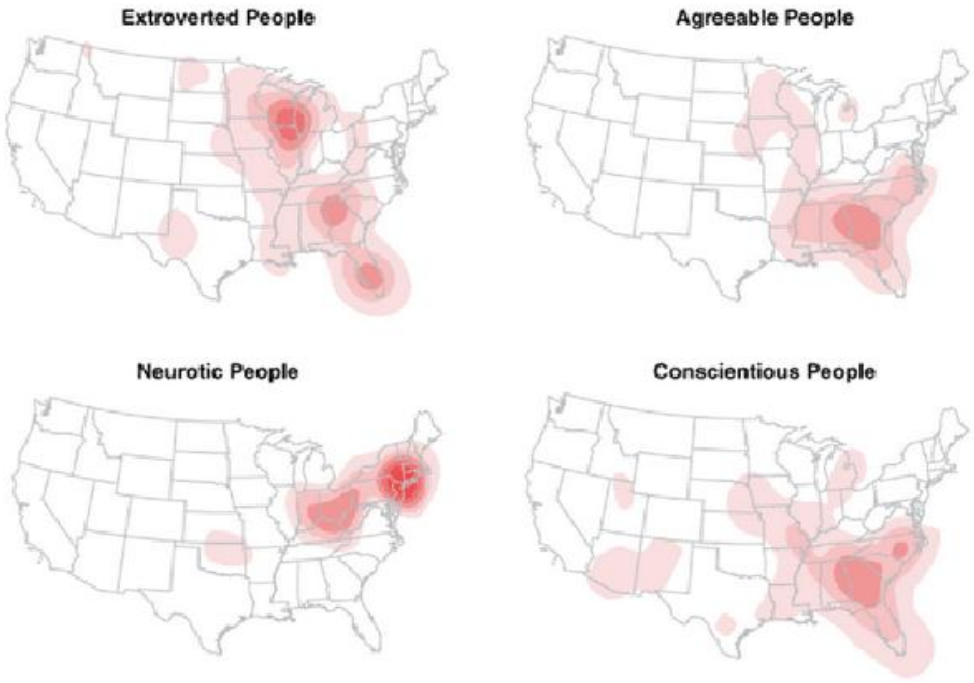


Figure 2: Example Personality Maps

Based upon these findings, it is conceivable that certain geographic regions, due to the *type* of people who live there, experience different divorce rates. Of course, geography and demography are intertwined and their impacts potentially confounded. McKinnish (2003) points to an increasingly sexually-integrated workplace as an important factor in providing greater opportunities for men and women to meet. Analyzing data from the 1990 census, she showed that if a spouse is working in an industry or occupation composed of a larger share of members of the opposite sex, there is a higher probability that the marriage will end in divorce. A similar effect has occurred on college campuses; Goldin, Katz, and Kuziemko (2006) report that there has been a shift in which women now represent the majority on college campuses, when they previously were the distinct minority, and frequency of relationship breakups have followed the aforementioned pattern.

If the sex ratio is more balanced (i.e., the ratio of marriageable males to marriageable females is nearer to 1), the mating market should become more efficient. For instance, online dating has been noted as a force which contributes to mating-market efficiency by making men and women more available to one another across geographic boundaries. According to Griscom (2002):

> *"Twenty years from now, the idea that someone looking for love won't look for it online will be silly, akin to skipping the card catalog to instead wander the stacks because 'the right books are found only by accident'. ... serendipity is the hallmark of inefficient markets, and the marketplace of love, like it or not, is becoming more efficient."*

Chadwick, Martin, Bailey, in a joint study with Match.com (2010), report that 20% of people have dated someone that they met through an online dating service, and that 17% of people had met their spouse through an online dating site. Online dating expands the potential set of partners as well as affording a degree of anonymity. This is an interesting consequence of the theory that the likelihood of divorce depends on the relative availability of single men and single women. Married individuals who see divorce as a potential option may first go online to affirm that they can access an efficient mating market. The availability of these matches could reinforce their intentions to end their current marriage.

Weiss (2005) used economic models to evaluate the increase in marital turnover. He viewed marriage in economic terms, a voluntary partnership for the purpose of joint production and joint consumption, and considered motivations for entering marriage as sharing goods, division of labor, child rearing and risk pooling. He concluded that the gains from marriage based on the above are not sufficient to sustain a partnership. He further concluded that the reason for this is that prospective mates are concerned not only whether potential gains will be realized, but also *how* the gains are divided. In the absence of an official "marriage contract," it is unclear what enforces cooperation within a marital unit. It was suggested by Becker (1991) that marriage is forged by the long-term investment in children and family capital, and that a dissolution of marriage diminishes the value of these investments.

Furthermore, Weiss (2005) went on to examine the effect of the mating market on the marriage bond. He concluded that "…in an 'ideal' frictionless case, where partners are free to break marriages and swap partners at will, the outcome depends on the joint distribution of male and female characteristics in the market at large. Traits of the partners in a particular marriage have no direct impact on the shares of the two partners, because these traits are endogenously determined by the requirement of stable matching." Based on this, he reinforced the idea that the sex ratio affects the utility and bargaining power of the underrepresented sex. He indicated that a marginal decrease in the proportion of single women to single men in the marriage market improves the marriage welfare of all men, and reduces the marriage welfare of all women.

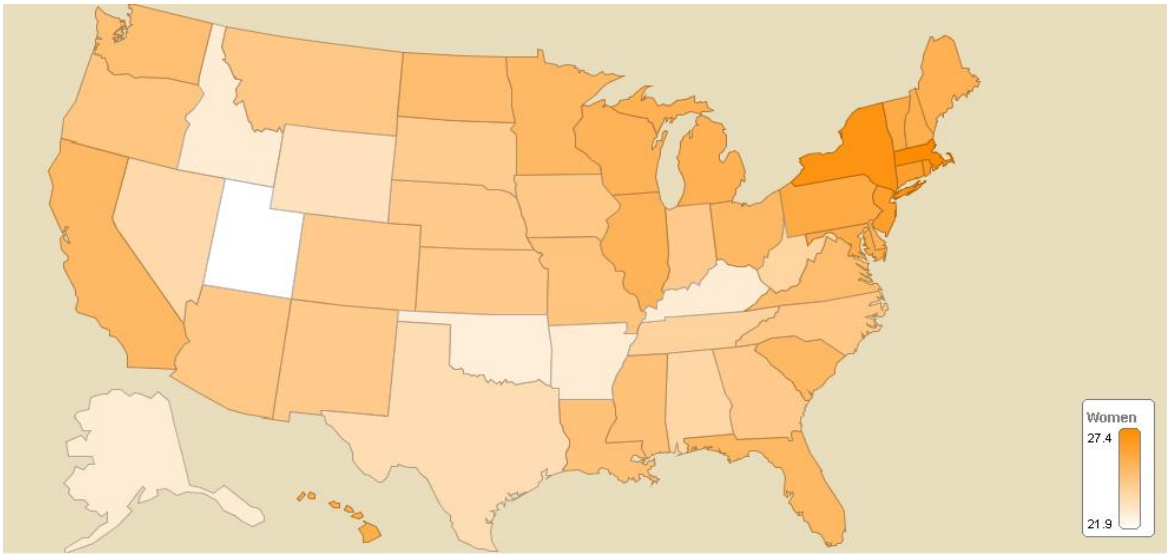
Edlund (2005) conducted a study titled "Sex and the City" which examined the implications of a woman's parental investment in marriage. One implication she put forth is that because women bear children, the female parental investment is greater than that of the male, and that although a woman cannot reproduce in isolation, beyond the first male with whom she procreates, the presence of subsequent males does not add value to the production of offspring. Conversely, a man needs to attract a partner in order to gain parental status. The male is dependent upon the presence of a female because in the absence of a marriage, the mother is the de facto parent. Thus, the payoff for having additional partners is greater for men than for women. Viewed in this context, marriage is a clear contract for the transfer of rights for which men are expected to pay. Therefore, men with a higher annual income have an advantage. Edlund (2005) found that geographical areas with a higher average male income have a higher single-female/single-male ratio. Furthermore, her study determined that the relationship between male income and sex ratio is even stronger in the age group with the highest frequency of getting married.

Age at marriage has been extensively researched as a factor influencing divorce rate. For example, Kiernan and Eldridge (1987) documented several studies that found an inverse relationship between age at marriage and the probability of divorce. This relationship has been attributed to a lack of maturity, less time spent searching for a partner, and emotional, educational, and economic resources available to younger people. Table 1 below, produced by Kiernan and Eldridge (1987), shows the rising levels of divorce ("marital disruption") in every 5 year period after the onset of marriage. Other variables that are addressed in the table include the presence of children before marriage, ethnicity and education level.

Table 1. Life Table Estimates of the Proportion of First Marriages Disrupted Within Five Years, for First Marriage Cohorts

	Marriage cohort			*N*		
Variable	1970–1974	1975–1979	1980–1985	1970–1974	1975–1979	1980–1985
Age at marriage						
14–19	0.23	0.30	0.31	2,266	1,849	1,477
20–22	0.14	0.18	0.26	1,733	1,641	1,680
23–29	0.11	0.15	0.15	1,126	1,282	1,978
30+	0.14	0.16	0.14	220	256	421
Education						
0–11	0.21	0.29	0.33	709	707	765
12	0.18	0.23	0.26	2,408	2,251	2,421
13+	0.16	0.18	0.16	2,228	2,070	2,370
Children before marriage						
0	0.17	0.21	0.21	4,799	4,411	4,799
1+	0.22	0.31	0.36	546	617	757
Region						
Northeast	0.13	0.17	0.21	1,179	1,064	1,159
North Central	0.16	0.20	0.23	1,307	1,226	1,298
South	0.18	0.25	0.25	1,694	1,528	1,766
West	0.23	0.24	0.22	1,165	1,210	1,333
Race/ethnicity						
White	0.17	0.21	0.22	4,290	4,058	4,403
Black	0.24	0.30	0.36	490	431	472
Hispanic	0.15	0.21	0.24	337	341	447
Total	0.18	0.22	0.23	5,345	5,028	5,556

Additionally, the following maps in Figure 3, from IBM: *Many Eyes* (2011), detail the national distribution of age of first marriage for women and men with deepness of color increasing with average age:
Women:



Men:

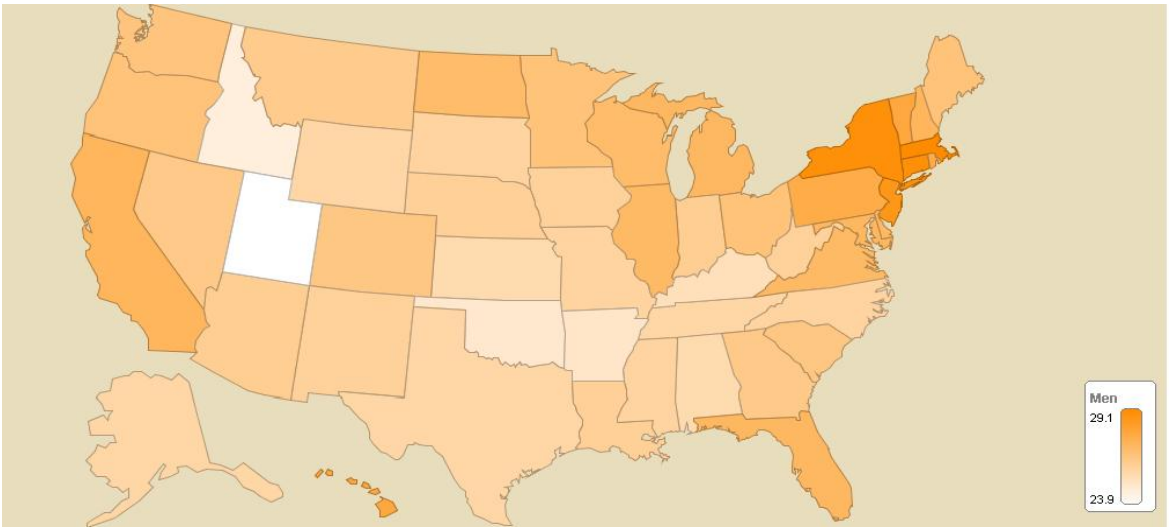


Figure 3: Distribution of Age of First Marriage for Women and Men in the U.S.

Kiernan and Eldridge's (1987) study is consistent with the demographics portrayed on this map; divorce rates have generally been lower in the East where average age of first marriage is higher, and higher in the West, where average age of first marriage is lower. Lehrer (2006) expands on the conclusion that there is an inverse relationship between age at marriage and divorce rate. She argues that the maturity effect is broader than just emotional maturity. There is also a "different type" of maturity effect, in that an individual who marries later in life has a deeper awareness of the benefits of being in a married union after having spent a longer time single. She then argues that this is another reason why, *ceterus paribus*, an individual who marries later in life is less likely to choose to divorce.

Age at first marriage has been increasing for many years. This can be, in part, attributed to changing female demographics. Today, young adult women are 20% more likely than young adult men to have completed a four-year college degree. Women presently aged 25-34 comprise the first generation of women that is quantifiably better educated than men. This, along with females occupying an increasing economic role in the family unit, as well as evolving social values, has pushed up female age at first marriage. In the 1960s, 80 percent of women were married by the time they were 24; as of 2005, it is not until age 32 that the same 80 percent of women are married (Cortright, 2005).

The way individuals have gone about making location decisions is rapidly evolving. Before the late 20th century, people stayed close to home or moved once. This shift to a more mobile society is paralleled by marital trends. In the 1950s and 60s, when it was common to marry young, couples would most often move from their parent's home directly into a permanent residence (Florida, 2008, p226). The more recent trend of marrying later in life allows people the mobility to move several times throughout their life and find the location which best suits them. Young adults, defined as ages 25-34, are the most mobile demographic in America. In the five years between 1995 and 2000, 6.6 million of these individuals made a major move from one metropolitan area to another (Cortright, 2005). Because there is a relationship between age and mobility, one can argue that there may be a relationship between age and divorce rate.We believe that we have made the case for consideration of the independent variables used in this study, discussed in the next section.

VARIABLES

This study assesses whether there is a quantifiable relationship between geographic and demographic variables and divorce rate. It would be less useful to examine each set of variables separately, as both coexist and are likely intertwined (statistically speaking, "exhibit a degree of collinearity") as drivers of the divorce rate.

Dependent variable

The dependent variable in this study is the divorce rate (DR), the number of divorces per 1000 total population residing in each state as reported by the American Community Survey of the US Census Bureau (2011a). To minimize year-to-year variation, we computed DR as an average of the divorce rates for 2007, 2008 and 2009 (the latest time periods covered by the aforementioned Census Bureau report. However, there were incomplete data on divorce over this period for six states: California, Georgia, Hawaii, Indiana, Louisiana and Minnesota. In these instances the most recent data value available was considered. Divorce rates for Georgia and Louisiana are from 2003, while Hawaii's and Minnesota's are from 2002 and 2004, respectively. Indiana and California were eliminated from the data set because the most recent divorce rates were at least 20 years old. The District of Columbia reported all figures as a separate entity, and was included as if it were its own state. Thus, there are 49 data points in the study.

Independent variables

The seven independent variables are listed in Table 2:

INDEPENDENT VARIABLES
Ratio of Unmarried Men 15-44 Years Old Per 100 Unmarried Women 15-44 Years Old
Median Age at First Marriage - Women
Median Age at First Marriage - Men
Percent of Women ≥15 Years Old Who Were Never Married
Median Income For Male Full-Time, Year-Round Workers
Median Age of the Total Population
Sex Ratio of the Total Population

Table 2: Independent Variables

This independent-variable selection was based upon the previous literature review. Many sources suggest that there is a gender difference in influencing marriage and divorce. For example, Edlund (2005) states, "Women's greater parental investment makes them bottlenecks in reproduction. The female parental investment is greater than that of the male." She goes on to suggest that males, essentially, pay women for parental rights. Hence, we have the single gender variables: "Percent of Women ≥15 Years Old Who Were Never Married" and "Median Income For Male Full-Time, Year-Round Workers."

In order to analyze the effect of "Age at First Marriage," we developed two models. In the first model, we had data for males and females *averaged*, to produce "Age at First Marriage" overall (i.e., for the general population.) A second model was run keeping two separate variables for "Age at First Marriage" one for each gender, as described in Table 2.

METHODOLOGY

Our analysis uses a two-step process. Step 1 includes running a simple regression between DR and each independent variable. These results will determine which independent variables, by itself, have a relationship with DR. Based upon these results we will eliminate insignificant variables from any further consideration. Step 2 consists of a stepwise regression to determine which independent variables have a "larger role" in providing incremental predictive value of DR. Step 2 will provide results that display which variables, taken together, explain variation in DR, with the elimination of any variable that may be a useful predictor if the only variable available, but has so much redundancy with the other variables that it does not add statistically significant incremental (i.e., unique) value in predicting/explaining DR.

In order to test for influence of geographic region (e.g., does being from the West make you more inclined to get divorced?), we will appropriately use 3 dummy variables to represent the four regions: Northeast, South, Midwest and West regions of the United States. The region denoted "West" will be used as the base variable (i.e., "dummy category"). States were divided into regions based upon the official categorization by the U.S. Census Bureau (2011b). These regions depicted in Figure 4, below:

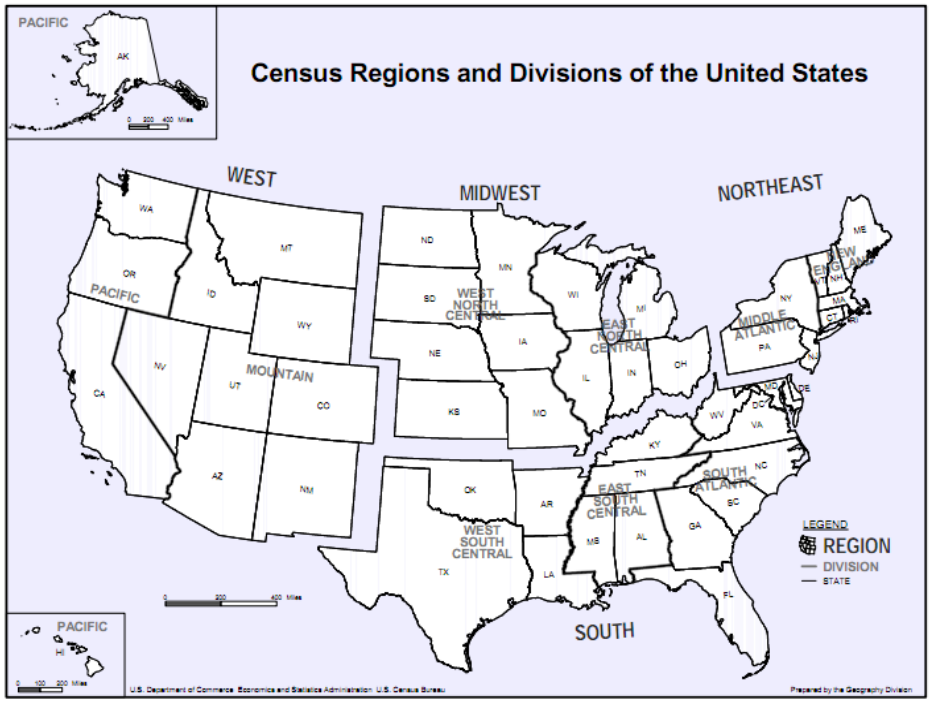


Figure 4: Official Geographical Regions of the U.S.

There is *potentially* a considerable degree of collinearity among the three region variables and the original seven variables listed in Table 2; for example, if an individual is from the Northeast region, and is also more likely to get divorced, perhaps it is due to the sex ratio in the Northeast region. The Northeast region dummy variable is, of course, capturing ALL differences between the Northeast region and the dummy category – the West region, and, thus, the principal source of collinearity, if present at all, would not be immediately clear. However, the prime purpose of stepwise regression (indeed, the *raison d'etre* of its invention) is to choose a set of variables that do not exhibit substantial (i.e., statistically significant) redundancy. When the final equation/model is produced by the stepwise regression, it will be possible to quantify the impact of living in Region X (compared to living in the West), above and beyond (i.e., incremental to) all other variables in the model.

ANALYSIS AND RESULTS

Simple regression analyses

Using the data and methodology outlined above, we first ran a series of simple regressions (each with DR as the dependent variable) to test the impact of each independent variable in isolation. We included "Age at First Marriage" overall (i.e., for the general population), as well as the two "Age at First Marriage" variables separately for females and males. Thus, there were a total of 11 simple regressions run (the 7 variables in Table 2, the overall Age at First Marriage, and the 3 geographic-region dummy variables.) The variables determined to be **significant** were: "Ratio of Unmarried Men 15 to 44 Years Old per 100 Unmarried Women 15 to 44 Years Old," "Average Age at First Marriage for Total Population," "Median Age at First Marriage - Men", "Median Age at First Marriage - Women", "Percent of Women ≥15 Years Old Who Were Never Married," "Median Earnings for Male Full-Time, Year-Round Workers," "Sex Ratio of the Total population," "Northeast," and "Midwest."

The regression results were as follows:

1. **Ratio of Unmarried Men 15 to 44 Years Old per 100 Unmarried Women 15 to 44 Years Old**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.427[a]	.182	.165	.81521

a. Predictors: (Constant), UnmarriedMalestoFemalesRatio

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.948	1	6.948	10.455	.002[a]
	Residual	31.235	47	.665		
	Total	38.182	48			

2. Average Age at First Marriage for Total Population

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.599[a]	.359	.345	.72190

a. Predictors: (Constant), AgeFirstMarriageTotalPopulation

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.689	1	13.689	26.268	.000[a]
	Residual	24.493	47	.521		
	Total	38.182	48			

3. **Median Age at First Marriage – Men**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.545[a]	.297	.282	.75598

a. Predictors: (Constant), AgeFirstMarriageMales

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.322	1	11.322	19.810	.000[a]
	Residual	26.861	47	.572		
	Total	38.182	48			

4. Median Age at First Marriage - Women

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.635[a]	.404	.391	.69592

a. Predictors: (Constant), AgeFirstMarriageFemales

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.420	1	15.420	31.839	.000[a]
	Residual	22.762	47	.484		
	Total	38.182	48			

5. **Percent of Women ≥15 Years Old Who Were Never Married**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.573[a]	.328	.314	.73864

a. Predictors: (Constant), FemalesNeverMarried

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.540	1	12.540	22.984	.000[a]
	Residual	25.643	47	.546		
	Total	38.182	48			

6.

7. Median Income for Male Full-Time, Year-Round Workers

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.463[a]	.214	.197	.79908

a. Predictors: (Constant), MaleEarnings

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.172	1	8.172	12.798	.001[a]
	Residual	30.011	47	.639		
	Total	38.182	48			

8. Sex Ratio of the Total Population

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.394[a]	.155	.137	.82836

a. Predictors: (Constant), SexRatioTotalPopulation

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.932	1	5.932	8.644	.005[a]
	Residual	32.251	47	.686		
	Total	38.182	48			

9. Dummy- Northeast

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.310[a]	.096	.077	.85703

a. Predictors: (Constant), DummyNorthEast

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.661	1	3.661	4.985	.030[a]
	Residual	34.521	47	.734		
	Total	38.182	48			

10. Dummy- Midwest

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.363[a]	.132	.113	.83980

a. Predictors: (Constant), DummyMidWest

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.035	1	5.035	7.139	.010[a]
	Residual	33.148	47	.705		
	Total	38.182	48			

There were two variables determined to be **insignificant**: "Median Age Total Population" (p = .498) and "Dummy-South" (p = .180). These two variables were no longer considered in any capacity.

Stepwise regression analyses

We now take into account that the 9 aforementioned significant variables above likely do not influence DR in isolation (i.e., *additively*) and therefore use stepwise regression to take redundancy into account.

Model 1 – Age of First Marriage *averaged* over Females and Males (i.e., for the Total Population)

The stepwise regression output from Model 1 is shown below:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.599[a]	.359	.345	.72190
2	.742[b]	.551	.531	.61080
3	.768[c]	.590	.562	.59015

a. Predictors: (Constant), AgeFirstMarriageTotalPopulation

b. Predictors: (Constant), AgeFirstMarriageTotalPopulation, DummyMidWest

c. Predictors: (Constant), AgeFirstMarriageTotalPopulation, DummyMidWest, FemalesNeverMarried

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.663	2.333		6.713	.000
	AgeFirstMarriageTotal Population	-.445	.087	-.599	-5.125	.000
2	(Constant)	16.930	1.995		8.488	.000
	AgeFirstMarriageTotal Population	-.484	.074	-.652	-6.546	.000
	DummyMidWest	-.934	.211	-.441	-4.433	.000
3	(Constant)	14.230	2.328		6.113	.000
	AgeFirstMarriageTotal Population	-.327	.104	-.440	-3.133	.003
	DummyMidWest	-.933	.204	-.441	-4.584	.000
	FemalesNeverMarried	-.057	.027	-.289	-2.068	.044

a. Dependent Variable: DivorceRate

The sign of the coefficients suggest the following:

● Increased age at first marriage (Total Population) is associated with a lower divorce rate (negative coefficient), holding other variables in the model constant (i.e., above and beyond other variables in the model). This finding is consistent with the literature.

● Living in the Midwest is associated with a lower divorce rate (negative coefficient) than living in the West, holding other variables in the model constant. This has been anecdotally believed by many, and, indeed, is now demonstrated (statistically) to be true.

● An increase in the percent of women ≥15 years old who were never married is associated with a lower divorce rate, holding other variables in the model constant. The reasoning behind this finding may be straightforward, but may also be somewhat subtle. The simple explanation is that the higher the percent of never-married women (or, for that matter, men), the lower the percent of the total population in the state "eligible" for divorce, and, hence, the lower the divorce rate (recall that DR is the number of divorces per 1000 people living in that state). However, there are at least two more subtle possibilities. Perhaps, on average, those women who never marry (or have not married yet!) are not a random sample of women, but, rather, is biased in favor of women who are not interested as much as the average person in the institution of marriage; and, if married, they would be more likely to get divorced. If this were true, it, indeed, would lower the value of DR. Another possibility, a bias of a different source, relates to Becker's work (1991). Suppose that a particular state has a higher than average percent of women who are, for whatever reason, not as intensely looking to match for marriage; that is, they are not "competing" and hence are not creating a "more competitive" environment. In spirit, this creates a more balanced environment than what appears on the surface, thus lowering DR. This might be due to career aspirations (within a certain age range), or, having no interest in having children, or a host of other reasons. Some states afford women more career opportunities, while others might be more "reputationally-tolerant" of women staying single.

Research suggests that female demographics are even more influential than male demographics in the formation and dissolution of marriage (e.g., Edlund, 2005). Indeed, a single gender female variable was included in the final step of Model 1. Also, it can be noted in the simple regression results that the adjusted R^2 for Median Age at First Marriage – **Women** equals .391, while the adjusted R^2 for Median Age at First Marriage – **Men** equals ("only") .282. In Model 2, this effect will be further examined by splitting "Age at First Marriage Total Population" into separate variables, as noted in Table 2.

Model 2 – Age of First Marriage with separate variables for Females and Males

The stepwise regression output from Model 2 is shown below:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.635[a]	.404	.391	.69592
2	.756[b]	.571	.553	.59641

a. Predictors: (Constant), AgeFirstMarriageFemales

b. Predictors: (Constant), AgeFirstMarriageFemales, DummyMidWest

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.500	2.091		7.414	.000
	AgeFirstMarriageFemales	-.453	.080	-.635	-5.643	.000
2	(Constant)	16.237	1.800		9.020	.000
	AgeFirstMarriageFemales	-.473	.069	-.665	-6.869	.000
	DummyMidWest	-.868	.205	-.410	-4.242	.000

a. Dependent Variable: DivorceRate

The difference between the last step of Model 1 and Model 2 is noteworthy. When Age at First Marriage was split by gender, only the variable for females entered into the equation. At the same time, "Percent of Women ≥15 Years Old Who Were Never Married," which was (only) marginally significant in Model 1 (p = .044), was rendered redundant.

Model 2 was then repeated with a p-value-to-enter of .10 as opposed to .05. This was to ensure that we were not missing any important insights to be realized from variables that were "close" to entering the final stepwise model, but did "not quite meet" the p-value-to-enter-of-.05 requirement. However, results were identical to those produced by Model 2; that is, increasing the p-value-to-enter to .10 did not change the stepwise regression results at all. This result can be interpreted as evidence that the variables that were significant in the simple regressions, but did not enter into the stepwise regression, are sufficiently redundant, that even after loosening the criterion to enter those variables, they still did not (statistically) provide added value above and beyond the variables that were in the final model.

SUMMARY AND DISCUSSION

Running the simple regressions generated the following results in Table 3:

VARIABLE	ADJUSTED R^2
Ratio of Unmarried Men 15 to 44 Years Old per 100 Unmarried Women 15 to 44 Years Old	**.165****
Average Age at First Marriage for Total Population	**.345****
Median Age at First Marriage - Men	**.282****
Median Age at First Marriage - Women	**.391****
Percent of Women ≥15 Years Old Who Were Never Married	**.314****
Median Income for Male Full-Time, Year-Round Workers	**.197****
Sex Ratio of the Total Population	**.137****
Dummy - Northeast	**.077***
Dummy - Midwest	**.113***
Median Age of the Total Population	**-.011**
Dummy - South	**.017**

**$p < .01$
*$p < .05$

Table 3: Summary of Selected Results from the Simple Regressions

As previously mentioned, and can be seen in the above Table, the simple regressions suggested the elimination of two variables: "Median Age of the Total Population" and "Dummy – South." Three stepwise regressions were run, producing the following results in Table 4:

Model	Adjusted R^2
1	**.562*****
2	**.553*****
3 (Model 2 with *p*-to-enter =.10)	**.553*****

***$p < .001$

Table 4: Summary of Selected Stepwise Regression Results

Both Model 1 and Model 2 were highly significant. The overall percent of variability in DR explained in Model 1 and Model 2 is very close, at (adjusted R^2) 56.2% and 55.3%, respectively. The 0.9% difference in adjusted R-Squared value (1.7% in actual R^2 value) occurred because of the splitting of the input for Age at First Marriage by gender; this was the only difference between the input of the two models. By examining Model 2, it is possible to determine that when regarding age at first marriage, the age at which females first get married is significant, while the age at which males first get married is not. Despite this, the aggregate effect of "Age at First Marriage-Total Population" and "Marriageable Women Available" accounts for slightly more variation in DR than just "Age at First Marriage-Females" alone.

Thus, we put forth Model 1, having the highest adjusted R^2 value, as expressing the relationship between DR and the independent variables examined:

$DR = .23 – 0.327 \bullet X_1 - 0.933 \bullet X_2 - 0.057 \bullet X_3$
where

X_1= Age at First Marriage of the Total Population
X_2= Dummy - Midwest
X_3= Percent of Women ≥15 Years Old Who Were Never Married

As noted earlier, because all three (slope) coefficients are negative, we can conclude that each variable has an inverse relationship with DR. Thus, if "Age at First Marriage of the Total Population" increases by 1 year, and the other two variables are held constant, DR (which, to recall, is the divorce rate – number of divorces per 1000 people who live in the state) is predicted to drop by about one-third (.327) of a divorce per number of 1000's of people in the total population of a state (e.g., 1635 in a state of 5 million people). If the percent of women ≥15 years old who were never married increases 1 percent, and the other two variables are held constant, DR is predicted to drop by about $1/20^{th}$ of a divorce (.057) per number of 1000's of people in the total population of a state. If we compare a state in the Midwest with a state in the West, holding the other two variables constant, the DR is predicted to be about one divorce fewer (.933) per number of 1000's of people in the total population of a state.

Florida's (2008) map of polarity in gender distribution (Figure 1) indicates that there is an uneven distribution of single males and females throughout the United States. It is clear that the West is male dominated while the Midwest has fairly balanced gender dispersion. Therefore, it may be that the significant difference in DR between the West and Midwest, evidenced by the significant "dummy – Midwest," has sex ratio as its underlying basis; we would speculate that Florida would argue this way.

LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

This study was conducted in light of certain data limitations. Obviously, the study might have produced even stronger results if the most current divorce rate for each state were available. In some cases it was necessary to use data from as far back as 2002, which is 7 years earlier than the most recent year used in forming the other states' values of divorce rate. In addition, this study was limited in terms of sample size, in that the sample could be only as large as the amount of states there are in the U.S. – and, indeed, two states were dropped due to insufficient data availability. Although the results show a relationship between geographic location and propensity for divorce, it might be useful to find and use other (i.e., additional) variables to quantify the "personality" impact of these different regions. We mentioned the question: "*Where is the best place for me to live?"* Due to limited data, there was no way to include a variable *strictly* representing regional personality. As we earlier noted, the dummy variables represent the implications of living in a region - whether differences are due to sex ratio, culture or personality, or other, less-obvious variables, was not identified by (or accounted for in) our study.

Additionally, it would be useful to examine these factors on an *international* level to determine whether they are specific to the U.S. or if they are somewhat universal. One would expect that certain variables (such as age at first marriage) may have a consistent influence across nations. Yet, there are other variables that would likely be very specialized to one country or region of the world. In China, more than half of its high-savings rate can be explained by a skewed marriage market. In areas of China in which there is a higher ratio of males to females (a legacy of family planning policies and sex-selective abortions), households with sons tend to save more money to help the males compete in the marriage market (Wei and Zhang, 2011); to an extent, this variable mirrors the role of median male income. Still, again, an international study would likely be limited by the amount of available data. However, there is hope that in an increasingly globalized world there will come a time when such information will become available.

Such studies could be useful in urban-planning contexts. As people becomes more mobile, it is possible that the distribution of gender throughout a country will become more efficient. Urban planners may be able to take into consideration exactly what demographics are or are not drawn to a region, and, being aware of a location's shortcomings, may be able to suggest investments in aspects of the region that attract the underrepresented gender.

REFERENCES

Becker, Gary S. (1991), *A Treatise on the Family*, Cambridge, MA: Harvard University Press.

Chadwick, Martin, Bailey, Match.com (2010), Match.com and Chadwick Martin Bailey 2009 - 2010 Studies: Recent Trends: Online Dating, Available online at http://blog.cmbinfo.com/press-center-content/bid/46915/The-Evolution-of-Dating-Match-com-and-Chadwick-Martin-Bailey-Behavioral-Studies-Uncover-a-Fundamental-Shift.

Cortright, Joseph (2005), "The Young and Restless in a Knowledge Economy." *CEOs for Cities*.

Edlund, Lena (2005), "Sex and the City," *Scandinavian Journal of Economics* 107(1), pp. 25-44.

Florida, Richard L., (2008), *Who's Your City?: How the Creative Economy Is Making Where to Live the Most Important Decision of Your Life*. New York: Basic Books.

Goldin, Claudia, Lawrence F. Katz, and Ilyana Kuziemko (2006), "The Homecoming of American College Women: The Reversal of the College Gender Gap," *Journal of Economic Perspectives* 20(4), pp. 133-56.

Griscom, Rufus (2002), "Why Are Online Personals So Hot?" *Wired.com*, Nov. 2002. Web, May 8, 2011, <http://www.wired.com/wired/archive/10.11/view.html?pg=2>.

IBM (2011), "Many Eyes: Map of Age at First Marriage in US," Web, May 8, 2011. <http://www-958.ibm.com/software/data/cognos/manyeyes/visualizations/map-of-age-at-first-marriage-in-us>.

Kiernan, K. and Eldridge S. (1987), "Age at Marriage: Inter and Intra Cohort," *The British Journal of Sociology*, 38(1), pp. 44-65.

Lehrer, Evelyn L. (2008), "Age at Marriage and Marital Instability: Revisiting the Becker–Landes–Michael Hypothesis," *Journal of Population Economics*, 21(2), 463-84.

McKinnish, Terra (2003), *Sexually-Integrated Workplaces and Divorce: Another Form of On-the-Job Search*, Thesis, University of Colorado-Boulder, 2003.

U.S. Census Bureau (2011a), "2005-2009 American Community Survey 5-Year Estimates," *American FactFinder*, <http://factfinder.census.gov/servlet/GCTTable?_bm=y>.

U.S. Census Bureau (2011b), "Census Regions and Divisions of the United State," <http://www.census.gov/geo/www/us_regdiv.pdf>.

Wei, S. and Zhang, X (2011), "The Competitive Saving Motive: Evidence From Rising Sex Ratios and Savings Rates in China," *Journal of Political Economy*, 19(3), pp.511-564.

Weiss, Yoram (2005), "Marriage and Divorce," Palgrave Dictionary of Economics, 2nd edition.