Stability and Change in Predictors of Marital Dissolution in the US 1950-2015: The Rise of Family Inequality

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Abstract:

In this paper, we examine change and stability in the predictors of marital dissolution using 7 decades of data from the National Survey of Family Growth. We find interraciality and premarital cohabitation to have had a stable association with marital dissolution over time. In the post-2000 era, marital dissolution rates between some high status groups (women with college degrees and women from intact families) have diverged from the marital dissolution rates of lower status groups, indicating increasing inequality in the family system. The divorce gap between black women and white women narrowed after the Civil Rights gains of the 1960s, but after 2000 the racial divorce gap has seemed to widen again.

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Introduction:

From the 1950s to 2015, American patterns of marriage and divorce have undergone enormous change. Among many changes, the age at first marriage has risen, educational attainment has grown, interracial unions are more common, and extramarital cohabitation has become dramatically more common; in other words, the mate selection system has diversified and changed in several important regards (Rosenfeld 2007).

US attitudes about such things as premarital cohabitation and interracial marriage have become more tolerant over time. Interracial marriage and premarital cohabitation were rare and stigmatized before 1970 in the US, but by the 2000s the novelty of and stigma against premarital cohabitation and interracial marriage had both worn off (Schuman et al. 1997; Smock 2000). Premarital cohabitation and interracial marriage have both been associated with higher divorce rates in the past (Bramlett and Mosher 2002). The decline in stigma against premarital cohabitation and interracial unions might lead one to expect a decline in the divorce premium for the formerly stigmatized statuses. We show, however, that the data do not generally support a convergence of divorce risk as formerly stigmatized statuses have lost their stigma and become more commonplace.

In contrast, we find that the divorce gap is increasing in recent years between some high status groups (women with college degrees, women from stable families of origin) and lower status groups (women without college degrees, women from unstable families of origin). The divergence in marital outcomes for high status and low status groups reflects an increase in family inequality in the U.S.

The Normalization Hypothesis:

The Normalization Hypothesis presumes that as individual or couple characteristics become more common and less stigmatized, the cost (in terms of higher divorce rates) for carrying the formerly stigmatized characteristic should decline. For example, as premarital cohabitation has gone from about 10% of first marriages in 1970 to more than 60% of first marriages after 2000, and as the percentage of

Americans who say that premarital sex is "always wrong" has declined (Treas 2002), the stigma of having cohabited before marriage should have declined or disappeared (Liefbroer and Dourleijn 2006).

Similarly, interracial marriage has become more common and less stigmatized over the last few decades. Interracial couples were barred from marriage in the U.S. in some states prior to the *Loving v. Virginia* (1967) Supreme Court decision which struck down the remaining state bans against interracial marriage across the U.S. Subsequent to the *Loving* decision, American opposition to interracial marriage declined since the 1970s (Schuman et al. 1997; Bobo et al. 2012) as the number of interracial married couples has increased (Rosenfeld 2007). In Figure 1 below, using smoothed weighted data from the National Survey of Family Growth (NSFG), interraciality (across the NSFG's 3 racial categories) among newlywed heterosexual couples increased from 5% in 1975 to 12% in 2013. The risk to Americans of being disowned by one's own family for marrying someone of another race was presumably higher in the past. Interracial couples have had a higher rate of divorce than same-race couples in the past. According to the Normalization Hypothesis, we should see a convergence in the divorce rates of interracial and same-race couples as the stigma against interraciality has declined.

Black structural disadvantage in the U.S. was greater before the Civil Rights revolution of the mid 1960s (Wilson 1980; Schuman et al. 1997). As a consequence of the Civil Rights movement, and the Civil Rights Act of 1964, the Voting Rights Act of 1965 and the Fair Housing Act of 1968, black Americans had new rights and new economic opportunities, and white Americans' attitudes toward blacks liberalized substantially (Bobo et al. 2012; Hyman and Sheatsley 1964; Rosenfeld 2017).[1] To the extent that racial oppression against black Americans would have been associated with higher marital dissolution rates before Civil Rights, the Normalization Hypothesis predicts a convergence in black and white marital dissolution rates during and after the 1960s, as the citizenship and rights of black Americans were partly normalized after the 1960s. Stigma and discrimination have been shown to affect individuals' physical and mental health (Riggle and Rostosky 2007; Hatzenbuehler, Phelan and Link 2013) and might reasonably affect their marital satisfaction as well. The liberalization of white attitudes toward blacks in the era of Civil Rights in the U.S. should have (and did) reduce the elevated divorce rate of black couples. The high divorce rate for black couples in the pre-Civil Rights era of the U.S. was

[1] Massey and Denton (1993) point out, correctly, that unlike the immediately impactful Civil Rights Act of 1964 and the Voting Rights Act of 1965, the 1968 Fair Housing Act lacked implementation efficacy. The effect of Fair Housing Act of 1968 was associated, however, with an immediate and sharp drop in the number of Americans who advocated legal segregation between blacks and whites (Rosenfeld 2017). Also, the 1960s and 1970s white liberalization in attitudes toward blacks in the U.S. has, by some measures, been partly reversed in recent years by a retrenchment of white attitudes against, for instance affirmative action (Bobo et al. 2012; Hochschild 2016).

associated with low status of black individuals in U.S. society, rather than stigma against black marriages per se. White elites were critical of the low marriage rates in black families, and the high rates of black marital dissolution (Moynihan 1965).

A generation after the great American divorce rate surge of the 1970s, the percentage of married women who were raised by divorced parents also increased. As divorce went from rare to more common in the U.S., Andrew Cherlin (1978) predicted that the negative effects of divorce on families would dissipate, as he predicted American families would develop new norms and rules to govern divorce, remarriage, and step-parenthood. In a later essay, Cherlin (2004) argued that instead of remarriages in the U.S. becoming more like first marriages, first marriages were becoming de-institutionalized like second marriages. Whether first marriages became less institutionalized or whether second marriages have become more institutionalized, the Normalization Hypothesis predicts that the surge in the U.S. divorce rate in the 1970s (and the corresponding decline in the selectivity of divorce) should have made parents' divorces less impactful on children's marital outcomes over time. We compare women from intact families, to women from divorced families of origin, to assess the stability or change in the intergenerational impact of divorce over time. The Normalization Hypothesis predicts convergence in divorce rates over time, as older social stigmas and divisions have become less salient over time, consistent with a long term liberalization of attitudes toward divorce in the most developed countries (van de Kaa 2002).

The Family Inequality Hypothesis:

The United States is among the most unequal high income countries in the world by income, wealth, and assets (Brandolini and Smeedling 2006). Importantly for our study, economic inequalities in the U.S. have risen dramatically since 1980 (Piketty 2014; Autor, Katz and Kearney 2006). The family system is implicated in economic inequalities in several ways. Economic challenges for working class people mean that work life for the working class is increasingly unstable, and increasingly fails to provide benefits, stability and satisfaction (Kalleberg 2009). We hypothesize (but cannot directly test) the proposition that the strains of falling behind economically make it more difficult for people with lower socioeconomic status to keep their marriages intact. People with negative net financial assets make worse marriage (and financial) partners than do people with positive financial assets.

Secondly, socioeconomic status in the U.S. has a strong intergenerational component as inheritance increases the advantage of children born into well-to-do families (Piketty 2014). Third, educated and well-to-do families in the U.S. appear to have become better in recent decades at passing their educational advantages on to their children (Reardon 2011). The relatively higher divorce rates and lower marriage rates among working class families compared to middle and upper class families (Cherlin 2014) is one way that economic inequalities manifest themselves into the family system.

The college degree has generally been associated with lower hazard of divorce (Bramlett and Mosher 2002). College degrees are associated with higher pay, better working conditions, and jobs with higher status, all of which could be beneficial for marital stability. Second, the college degree selects for people who come from more privileged backgrounds, and the privileged background itself could be advantageous to a married couple (for instance shielding them from financial downturns, or helping them to make a down payment on a home). Third, the achievement of a college degree selects for individual qualities such as persistence, which might be associated with greater marital stability.

Adults whose parents divorced have been shown to be more likely to divorce themselves (Amato and Cheadle 2005). Divorce of the parents imposes some potentially long term emotional, psychological, and financial costs on children. Young adults who have seen their parents fight, breakup, and then divorce tend to be less sure of themselves in romantic relationships (Wallerstein and Blakeslee 1989). After divorce, the parent who retains custody (usually the mother) generally sees her socioeconomic status decline, as women earn less than men, and as a substantial fraction of court-ordered child support from fathers is never paid.

The Family Inequality Hypothesis presumes that the family system is not only a result of societal inequality, but that the family system is also an engine of inequality (Cherlin 2014; Johnson et al. 1986). McLanahan and Percheski (2008) note that poor women are more likely to have children out of wedlock, and children raised by single mothers are more likely to experience poverty and disadvantageous social and legal outcomes (McLanahan and Percheski 2008; McLanahan 2004; McLanahan and Sandefur 1994). Single parenthood is therefore a family system that may amplify inequalities across generations.

Another way that the family system potentially magnifies inequality is through status and economic endogamy. The well-established tendency for college educated women to marry college educated men (i.e. educational endogamy) means that the mate selection process concentrates college educated adults within families. Young married women with college degrees have between 15 times and 20 times higher odds of being married to men with college degrees, compared to married women without college degrees (Rosenfeld 2008). As men and women increasingly both work, and as the wage returns to college education in the U.S. have risen (Autor, Katz and Kearney 2006), the concentration of college educated adults within families contributes to the inequality between families. Whether educational endogamy is rising over time (Schwartz and Mare 2005) or is relatively flat or even declining over time in the U.S. (Rosenfeld 2008; Breen and Salazar 2011), the high level of income inequality in the U.S. makes any degree of educational or status endogamy a multiplier for inter-family inequality. Educational endogamy and women's increasing labor force participation and earnings are the reasons why inequality of family income is greater than inequality of individual income (Gottschalk and Danziger 2005; but see also Heathcote, Perri and Violante 2010).

If family trajectories are diverging in the U.S. along social class lines, we would expect to see the gap widen in divorce rates between historically disadvantaged groups (the less educated, interracial couples, children of divorce, racial minorities) compared to advantaged groups (the highly educated, same-race couples, individuals raised by two parents, whites). The historically important black-white marriage gap seems to be increasing in recent years (Raley, Sweeney and Wondra 2015). In an era of rising inequality, any social status distinction may be increasingly consequential. If the Family Inequality Hypothesis is correct, then we would expect to see a divergence in divorce rates between the advantaged groups and the disadvantaged groups, even after socioeconomic status is controlled for, because according to the Family Inequality Hypothesis, the family system is expected to not only reflect but also to amplify social inequalities.

Whereas the Normalization Hypothesis predicts *convergence* of divorce rates as formerly stigmatized groups become less stigmatized and more common, the Family Inequality Hypothesis predicts a *divergence* of divorce rates between advantaged and disadvantaged groups. The Normalization Hypothesis and the Family Inequality Hypothesis do not apply equally well to every social category we examine below. For instance, the Inequality Hypothesis does not make clear predictions about the convergence or divergence in divorce rates of premarital cohabiters compared to those who did not cohabit before marriage. Married women who cohabited before marriage do not differ sharply in status from married women who did not cohabit before marriage.

Previous Research on Change in Predictors of Marital Dissolution over Time in the US

Teachman's (2002) classic analysis of divorce risk across marriage cohorts using the National Survey of Family Growth (hereafter NSFG) is the starting point for our analysis. Teachman found a broad pattern of stability in the predictors of divorce over time, through the NSFG wave of 1995. By the conservative Bayesian Information Criteria (BIC, see Raftery 1995), the only divorce predictor that changed over time in Teachman's analysis was subject's race. Teachman showed that while black women had higher rates of divorce than white women, the black and white divorce rates were converging over time. As Teachman did, we rely on the parsimony-favoring and conservative BIC criteria to identify changes in marital dissolution predictors over time. The rationale for using the parsimony-favoring BIC test is that with large sample sizes, significant coefficients can arise through overfitting, and effects that are not robust can appear to be significant by coefficient significance or by coefficient significance or by the Likelihood Ratio Test (Grusky and Hauser 1983; Raftery 1995).

We build on Teachman's work in several ways. First, we endeavor to apply Teachman's choice of the conservative BIC standard to a variety of tests of change in divorce predictors over time. Second, we incorporate the four additional waves of NSFG have been fielded since Teachman's (2002) paper. The 2002, 2006-10, 2011-13, and 2013-15 waves of NSFG provide a new and important perspective on divorce, including more coverage of divorce exposure during the post 1980 divorce plateau. Third, we address the empirical findings from the research on the predictors of divorce, much of which has relied on the most recent waves of NSFG data.

a) Premarital Cohabitation:

Prior to the most recent waves of NSFG, the NSFG single wave reports had consistently found that premarital cohabitation was associated with a greater hazard of marital dissolution (Bramlett and Mosher 2002; Cherlin 1992; Goodwin, Mosher and Chandra 2010). Teachman (2002) found no significant change in the effect of premarital cohabitation on marital dissolution across marriage cohorts using NSFG waves 1988 and 1995. Rosenfeld and Roesler (2018a) found stable association between premarital cohabitation and an elevated hazard of divorce, through NSFG wave 2013-2015. Dush, Cohan, and Amato (2003) found that the association between premarital cohabitation and divorce was the same across the marriage cohorts, despite the sharp rise in premarital cohabitation across marriage cohorts.

Reinhold (2012), using the 1988, 1995, and 2002 waves of NSFG found a significant decline in the power of premarital cohabitation to predict the risk of marital dissolution. Kuperberg (Kuperberg 2014) found that the most recent NSFG cohorts did not have an association between premarital cohabitation and elevated risk of divorce, once she accounted for the earlier relationship entry of premarital cohabiters.[2] Manning and Cohen (2012) found no association between premarital cohabitation and divorce in the 2010 wave of the NSFG. Teachman (2003) using only the 1995 wave of

[2] On the question of whether the beginning of cohabitation and the beginning of marriage are comparable relationship start dates, see Kuperberg (2018) and Rosenfeld and Roesler (2018b).

NSFG found that there was no association between premarital cohabitation and divorce if the wife's premarital sex with other (non-marital) partners was accounted for.

The divergent findings in the literature about whether premarital cohabitation still leads to higher divorce risk in the US are difficult to square. The meaning of cohabitation and marriage, the prevalence of cohabitation, and the age at entry into marriage and cohabitation have been changing so rapidly in the U.S. that the institutions of cohabitation and marriage are barely consistent over time and across marriage cohorts. Rosenfeld and Roesler (2018a) found that in the first year of marriage, couples who had cohabited had a lower divorce rate than couples who had not cohabited. The elevated risk of divorce for couples who had previously cohabited did not emerge as statistically significant until after 5 years of marital duration. Because of the interaction between premarital cohabitation, marital duration, and divorce, the most recent marriage cohorts will always tend to show less of an effect of premarital cohabitation on the risk of divorce, even if the relationship between premarital cohabitation and divorce is unchanged across marriage cohorts.

b) Race

Teachman (2002) found that the higher hazard of divorce for blacks was slowly converging with the white divorce hazard. Raley and Bumpass (2003), using the 1995 wave of NSFG, found the black and white marital dissolution rates to be diverging across marriage cohorts. Sweeney and Phillips (2004) used Current Population Survey data and found black marriage dissolution rates were slightly diverging from white marriage dissolution rates.

c) Education

Teachman (2002) found no significant change across marriage cohorts in the effects of either partner's education on the hazard of divorce, up to NSFG 1995. Härkönen and Dronkers (2006) found that divorce risk was diverging between highly educated women and others in the U.S., from marriage cohorts of the 1980s and 1990s. Martin (2006) found divergence in divorce rates between women with college degrees and other women in the US, from the 1970s to the 1990s, using the Survey of Income and Program Participation. Raley and Bumpass (2003) used the 1995 wave of NSFG and found divergence over time in the divorce rates of people without college degrees compared to people with college degrees. Esping-Anderson (2016) found that divorce rate gap between lower educated people and higher educated people was widening after 1990 not only in the U.S., but also in Denmark, Germany, and Sweden.

d) Family of Origin Stability

Teachman (2002) found no significant change across marriage cohorts in the association between family of origin stability (whether subject lived with the same two parents throughout childhood) and the hazard of divorce. Wolfinger (1999; 2011) used the General Social Survey and found that the influence of family of origin instability on adult children's divorce risk was declining over time. In other words, Wolfinger found convergence over time in the divorce rates of adults from stable and unstable family backgrounds. Li and Wu (2008), using data from the 1987-88 National Survey of Families and Households argued that Wolfinger's results were spurious, because the General Social Survey lacks information about relationship duration; controlling for relationship duration allowed Li and Wu to show that family of origin instability had not had a changing effect on adult children's marital instability in the 1970s and 1980s.

e) Interraciality

Historically, interracial couples have higher divorce rates (Bramlett and Mosher 2002). The Normalization Hypothesis should lead us to expect that the divorce rate of interracial marriages would converge with the divorce rate of same-race marriages as explicit opposition to interracial marriage in the US has plummeted since the 1970s (Schuman et al. 1997). Teachman (2002) did not test interraciality's changing effect on divorce across marriage cohorts.

Data and Methods

We use 9 available cycles, 1973, 1976, 1982, 1988, 1995, 2002, 2006-10, 2011-13, and 2013-15 of the National Survey of Family Growth (National Center for Health Statistics 2016, hereafter NSFG; Copen et al. 2012) to analyze first marriages for women age 15-44.[3] NSFG was designed to study fertility,

[3] The sample frame of the first two waves of NSFG covered only ever-married women in the U.S. under age 45, whereas the sample frame for later waves of NSFG included ever-married and never-married women

hence the age restriction to subjects still in the childbearing years. All marriages recorded in NSFG were heterosexual marriages, i.e. marriages between a man and a woman. One of the key limitations of the NSFG is that, as a retrospective survey, it covers events decades prior to the interview, so recall bias is a potential problem, especially for cohabitation (Hayford and Morgan 2008). Furthermore, the age window of NSFG at the time of survey (15-44) becomes more constricted as one examines events in the years before the survey. NSFG subjects from the 1973 wave were 21 years old or younger in 1950. Subjects can be expected to answer questions accurately about their current spouse if they are married at the time of the NSFG survey. Questions about prior spouses and ex-partners are much more likely to have been left unanswered, and this pattern of missing values that is specific to divorced relationships could bias estimates of the predictors of divorce (Kennedy and Ruggles 2014).

Information on premarital cohabitation became available for the first time in the 1988 wave of NSFG. Spouse's race (and therefore a measure of interraciality) was available for the first time in the 1995 wave of NSFG. Mother's education, a control variable, was only available starting in the 1982 wave of NSFG. Spouse's education was recorded in different ways in different waves of NSFG, which makes trend analyses of educational endogamy's effect on marital dissolution using NSFG problematic, and we therefore eschew analysis of educational homogamy and educational hypergamy across waves of the NSFG.[4] The following variables are available in every wave and are used as controls in every event history model below: wife's race (white, black, or other), wife's education (time varying), wife's age at marriage, whether wife grew up in an intact family of two parents or not, marital duration of wife's first marriage (time varying), and the presence of minor children in the home (time varying).

Our descriptive statistics from NSFG are weighted by a cross-wave harmonized analytic weight (weights rescaled to have mean equal to 1 within each wave). In our analyses we use discrete time event history logistic regression with NSFG data in a couple-year format, and Cox proportional hazard regression (Yamaguchi 1991). The discrete time event history models and the Cox models are substantively equivalent as long as the discrete time models properly account for marital duration (Mills 2011). Our dependent variable is marital dissolution, which transitions from zero to 1 in the year of divorce or separation, whichever comes first. Separate analyses with divorce only as the dependent

under age 45 (Lepkowski et al. 2010). For the purposes of analyzing divorce rates, the never-married population is irrelevant, so the NSFG waves are consistent enough to be analyzed together.

[4] For instance, the 2002, 2006-10 and 2011-13 waves of NSFG only recorded spouse's education if the respondent and spouse were still married, making these waves inappropriate for analysis of educational endogamy's effect on divorce, since divorced husbands' education would all be missing. The 1973, 1976, 1988, and 1995 waves recorded first husband's education at the time of marriage, while the 1982 and 2013 waves recorded first spouse's educational attainment at the time of the survey.

variable (not shown below) yield similar substantive results. The main difference between divorce as an outcome and marital dissolution as an outcome (including divorce and separation without divorce) is that black married couples were more likely to separate without getting divorced (Raley and Bumpass 2003; Sweeney and Phillips 2004). Our event history logistic regressions are unweighted, to preserve likelihood maximization and the associated BIC tests. All event history regressions include predictors of the NSFG weights, race and dummy variables for wave (Winship and Radbill 1994). The full event history dataset (including control variables that were available in all waves) has 44,253 women in first marriages, and 408,955 couple-years, for couples without missing data, and 13,341 marital dissolutions.

Because NSFG is a dataset with substantial sample size and therefore substantial statistical power to identify modest changes, the statistical significance of coefficients (at the traditional 5% level) and the statistical significance of likelihood ratio tests can misleadingly identify non-substantive effects as significant (Raftery 1995). The Bayesian Information Criteria is defined as $BIC = -LRT + (\log(N))df$, where LRT is the Likelihood Ratio Test between two nested models, df is the number of degrees of freedom difference between the models, and N is the sample size. In the case of discrete time event history models, Raftery recommends the number of events (e.g. the number of marital dissolutions) for N.[5] Negative values of BIC are associated with better fit. The larger the N, the more dramatic a difference in LRT has to be in order to be significant by BIC. Raftery considers BIC values more negative than -10 to be indicative of statistically significant improvement in goodness of fit.

An alternate to the LRT and the BIC is the Akaike Information Criterion, or AIC (Akaike 1974). The AIC is defined as $AIC = -LRT + 2df$, with smaller values indicating better fit. Since the NSFG data have N of events in the thousands, log(N) is always substantially larger than 2, and therefore the BIC is more parsimony favoring than AIC. In the analyses that follow, we rely on BIC because BIC is the more conservative criteria for testing the significance of interaction terms predicting change in predictors of divorce over time. AIC yields the same model preferences as LRT alone in almost every case (see Appendix 2).

There were no missing values for subject's race, the time-varying presence of children, or age at first marriage after NSFG imputation of missing values. Family of origin stability and subject's education were each missing in less than 1% of first married women.

[5] An alternate choice for N, the number of first marriages, would be roughly 3 times larger than the number of marital dissolutions in NSFG, and this larger N would make the BIC even more conservative and parsimony favoring, though the difference in BIC statistics would not change any of the substantive results below.

As the time axis for historical change, we use either calendar year or year of marriage.[6] Most of the literature on changing divorce risk over time has used marriage cohort as the time axis. An interest in period effects on marital dissolution would suggest the use of calendar year rather than marriage cohort. Changes in policy or public attitudes, such as the Civil Rights Act of 1964, or the no-fault divorce revolution of the 1970s, or the steady decline in hostility toward premarital sex since 1972, would affect all married couples at the same calendar time regardless of when they were married, and would lead us to prefer calendar time to marriage cohort as the time axis. Our figures below are based on calendar time and discrete time event history models. Alternate models based on marriage cohort and Cox proportional hazards models yield the same substantive results, see Table 1.

We examine women in first marriages exclusively, for several reasons: second and third marriages occur later in life, and marriage duration is heavily truncated for second and third marriages in the age-restricted NSFG. Second, many variables relating to the spouse were collected only for the current spouse and for the first spouse, so second and third marriages in NSFG are subject to substantial data limitations.

Results

[Figure 1 here]

We begin with an examination of the extraordinary change in the social demography of women at the time of first marriage, using weighted data smoothed by a 5 year moving average. We truncate Figure 1 to 1960-2013 to minimize the potential bias of the NSFG age window, and to reflect the fact that too few new marriages were reported in NSFG for 2014 and 2015. Figure 1 shows that the proportion of married women who were raised by stable two parent families steadily declined from about 78% in 1970, to about 60% in 2005, before leveling off and even starting to rise. Eleven percent of women who married for the first time in 1970 had cohabited with the marital partner before marriage, according to NSFG. The percentage of women who cohabited with the marriage partner before first marriage rose dramatically in the subsequent years, reaching 34% in 1980, 46% in 1990, 60% in 2000, and peaking at 70% in 2011. The proportion of women holding a college degree at time of first marriage

[6] (Calendar Year) – (Years of Marital Duration) = Year of Marriage, so only two of the three predictors can be included linearly in a model. We prefer calendar year as the time axis for Figure 2. Year of marriage (i.e. marriage cohort) shows a slight tendency to interact more strongly with predictors of marital dissolution, and these interactions are described in Appendix 2.

rose from 5% in 1960 to 43% in 2011, a change that resulted from both increasing education and the delay of first marriages. The percentage of married couples who were interracial (i.e. with different races across the NSFG's reduced racial categories of black, white, and other), was 5% in 1975, rising to 12% in 2013. Not shown in Figure 1 is the change in percentage of women in NSFG whose first marriage occurred before the age of 20. In 1960, 52% percent of NSFG recorded first marriages were women in their teen years, which declined steadily to 3% by 2013.[7]

Because NSFG is a retrospective survey, it is natural to be concerned that the shifting age windows of the NSFG surveys might bias Figure 1. We have found the age bias to be strongest at the extreme ends of the calendar years covered by the combined NSFG surveys, which is why Figure 1 truncates the data at the extreme ends of calendar year coverage. Other kinds of truncations (for instance for marriages too close or too far from the survey year) do not substantively change Figure 1. Another kind of bias, the bias of marriage duration or marriage survival is not relevant to Figure 1 because Figure 1 records statistics on couples only once, at the time of marriage, not in subsequent years.

As with any data based on descriptive or bivariate statistics, one might naturally be concerned about how the interaction of other variables related to marriage and divorce might affect Figure 1. We show below, in Figure 2, that the different predictors of marital dissolution (available in NSFG data) are impressively independent (in their ability to predict marital dissolution) from each other. Controlling for age at marriage, subject's educational attainment, the presence of children, mother's educational attainment, race, and family of origin stability hardly change the raw trends in Figure 2.

[Figure 2 here]

Figure 2 shows the raw odds ratios of breakup (smoothed by 5 year moving averages) for five predictors of breakup in the NSFG: premarital cohabitation, wife's race, wife's educational attainment, unstable family of origin, and interraciality, by calendar year.[8] The Y axis of the figures in Figure 2

[7] Age at marriage is especially subject to the bias from the NSFG's moving age window. Women married in 1960 (and before) had to be young brides to have been still young enough to be interviewed by NSFG in the 1970s. In more recent years, as age at first marriage has increased over time, percentage of all marriages that are teen marriages would be even lower than the 3% reported in 2013 if the NSFG captured the first marriages that occurred later in the life course. Also worth noting, and not shown in the figures below, the association between teen marriage and marital dissolution has not changed significantly over time in the NSFG data.

[8] In Figure 2, the figures for premarital cohabitation and interraciality are trimmed on the left because early waves of NSFG did not contain the relevant information. Wife's education is trimmed on the left because the youngest

measures the odds ratio of breakup with respect to the comparison group (premarital cohabiters compared to non-cohabiters, interracial couples compared to same-race couples, black compared to white, etc). The Y axis scale is a log scale, because the natural log of the odds ratio is asymptotically Normal. Along with raw odds ratios, Figure 2 also plots the adjusted odds ratios, adjusted by discrete time event history logistic regressions controlling for marital duration, age at marriage, presence of minor children, education, race, family of origin stability, calendar decade, and NSFG wave. The adjusted odds ratios are between 1 and 2 for every marital dissolution predictor in Figure 2, and for every period except for black wives in the 1950s (odds ratio of marital dissolution of 2.11 compared to white wives).

Figure 2 shows that, for the years in which NSFG has substantial numbers of marriages and breakups, there is no apparent trend over time in the raw or adjusted odds ratios of breakup for premarital cohabitation or interraciality. For black women, the odds of marital breakup were significantly higher (compared to white women) in the 1950s and the 1960s. The higher odds of breakup for black women in the 1950s and 1960s was significant by BIC, see Figure 3 below and Appendix Table 2, and Table 1. The black-white marriage stability gap was converging from the 1950s to the 1970s, consistent with Teachman's (2002) results and consistent with the Normalization Hypothesis. After 2000 the black and white marital dissolution rates appear to diverge again in Figure 2 (but not with statistical significance by the BIC). The apparent divergence in black-white marital stability, if it were to be statistically significant, would be consistent with the findings of Raley and Bumpass (2003) and Sweeney and Phillips (2004), who found the beginnings of a modest divergence between black and white marital stability in the US beginning with marital cohorts of the early 1990s, and would also be consistent with the Family Inequality Hypothesis.

For women with less than a BA, their odds of marital dissolution rose over time (compared to the odds of marital dissolution for women with BAs), especially after 2000, and this change was also significant by BIC (see Table 1 for the Cox regression alternate version, with the same substantive results). Unstable families of origin appears to have an upward trend in the odds ratios of breakup (both raw and adjusted) compared to women from stable families. Taking all the time periods and observations into account, the time trend in the association between family of origin instability and breakup was only marginally significant (significant by the LRT, marginally significant by BIC, see Appendix Table 2). For all the figures in Figure 2, the confidence intervals for the adjusted odds ratios in

married women from the 1950s and 1960s reported in the retrospective NSFG were generally too young to have achieved a BA.

the 2010-2015 period were especially wide, because the number of marriages and breakups in this period was small in NSFG.

Given the enormous changes over time in the demography of couples who marry, Figure 2 shows a surprising stability in predictors of marital dissolution over time.

[Figure 3 here]

Figure 3 summarizes the (relatively small, or insignificant) BIC scores for various tests of change over time in each predictor of divorce, compared to the enormously significant BIC scores for each predictor of marital dissolution, from the discrete time event history models. Figure 3 shows the significance on the BIC scale (more negative BIC is more significant, and values of BIC less than -10 are considered by Raftery 1995 to be highly significant) of each of the predictors of marital dissolution, with and without interactions with time. Appendix 1 and 2 contain detailed descriptions of the models and the tests. Table 1 contains the Cox regression models with similar substantive results. The significance of each predictor of marital dissolution is based on adding each predictor to a model that already contains all the other available predictors of marital dissolution, including marital duration and wave. Each predictor of marital dissolution is strongly independent from the other measured predictors of marital dissolution. Appendix Figure 1 shows how little the odds ratio of each predictor of marital dissolution is mediated or moderated by the full set of other predictors of marital dissolution. Figure 3 shows how each individual predictor of marital dissolution is, by itself, enormously statistically significant (BIC Values of less than -100, except for interraciality). The enormous statistical significance of each individual predictor of marital dissolution further highlights the modest degree of statistically significant changes over time in predictors of marital dissolution.

Figure 3 shows that interactions with decade dummy variables are not significant by the BIC test for *any* of the predictors, which is why the red bars for interactions with decade are positive, and insignificant. Because the BIC so strongly favors parsimony, and because the models testing interaction with decade include up to 7 different decades, the test for change across all decades is more likely to be rejected by the BIC (which penalizes models for adding too many terms). We tested for interaction between each predictor and any decade or set of decades, and we tested interactions with marriage year and calendar year as linear terms, and we found four interactions that improved the goodness of fit of the models significantly by BIC (i.e. with BIC scores of less than -10), and an additional three interactions with time that were marginally significant by BIC (BIC values between 0 and -10).

The first significant interaction we found with marital dissolution predictors and historical time was a decline in the gap between the marital dissolution rates of black women and the marital dissolution rates of white women, from the 1950s and 1960s (when the black marital dissolution rates were especially high), with a highly significant BIC statistic of -18.6. Across all years, black women had an odds ratio (equivalent to a hazard ratio) of marital dissolution 1.57 times higher than white women, controlling for all other factors. In the 1950s and 1960s, controlling for all other factors, the ratio between the odds of marital dissolution of black and white women was 1.28 times higher (see Appendices 1 and 2). The narrowing of the gap between black and white marital dissolution rates after Civil Rights is consistent with the Normalization Hypothesis. The convergence of black and white marital dissolution rates from the 1950s to the 1970s is consistent with Teachman's (2002) finding that convergence of black and white marital dissolution rates was the only historical change in predictors of marital dissolution that was significant by BIC through the 1995 wave of NSFG. We note, however, that Figure 2 appears to show a re-emergence of a divergence between black and white marital dissolution rates after 2000.

Figure 3 shows robust measures of significance (i.e. BIC values more negative than -10) for the divergence in marital dissolution risk between women with college degrees (e.g., the BA degree), and women without college degrees. Women's BA interacted with dichotomous variable indicating the period of year 2000 and after had BIC of -20.2, and the long term linear divergence of marital dissolution rates of college degree women from other women by calendar year (BIC of -14.4), and by marriage year (BIC of -36.2) were also highly significant.

Historically in NSFG, women whose time-varying education was at least a college degree have had odds of marital dissolution 0.71 times as high as women whose educational attainment was less than a college degree. After 2000, college degree women's marital dissolution rates fell by another factor of 0.72, nearly squaring (in odds ratio terms) the powerful marital preserving effect of a bachelor's degree. The divergence of marital dissolution rates by wife's educational attainment supports the Family Inequality Hypothesis.

Figure 2 showed women from unstable family backgrounds increasing their marital dissolution rates compared to women whose family backgrounds were stable. Figure 3 shows the BIC statistic for this linear change over time is -5.5 (or -7.0 when interacted with marriage year instead of with calendar year), which is in an intermediate level of significance by the BIC standard. The interactions between predictors and linear marriage year are only shown in Figure 3 when they are at least marginally significant by BIC, i.e. less than zero. To the extent that women from stable families of origin have diverging rates of marital stability from women from unstable families of origin, this result is consistent with the Family Inequality Hypothesis.

None of the other interactions between predictors of marital dissolution and historical time were significant by BIC. We find premarital cohabitation's association with marital dissolution to be unchanged over time, with change not significant even by the easier to satisfy by LRT. Our Appendix 2 describes several interactions between predictors of divorce and historical time that were not significant by the more conservative BIC test, but were significant by LRT and AIC.

Conclusion and Discussion

We find surprisingly little support for the Normalization Hypothesis. The Normalization Hypothesis argues that as once-stigmatized attributes (premarital cohabitation, interraciality, having parents who divorced) became dramatically more common, or as discrimination against racial minorities declined, the penalty in higher marital dissolution rates for these groups should have diminished. The Normalization Hypothesis predicts a convergence over time in marital dissolution rates between groups, and we find no such convergence, except for the decline in marital dissolution rates by black couples from the 1950s to the 1970s, from before to immediately after the Civil Rights revolution of the 1960s. Even in the case of racial differences in marital dissolution, part of the convergence from 1950-1980 appeared to begin to reverse after 2000, when the marital dissolution gap between blacks and whites began to widen again.

The recent trends in marital dissolution that we found to be statistically significant by BIC were trends that were more consistent with the Inequality Hypothesis. Women with college degrees have marital dissolution rates that have dropped sharply over time, so that the marital stability gap between women with college degrees and women without college degrees has grown over time. Our findings of divergence in marital dissolution rates between women with college degrees and other women is consistent with the most recent prior literature (Härkönen and Dronkers 2006; Martin 2006; Raley and Bumpass 2003), though our data cover a longer time frame. Teachman (2002) found no significant association between divorce risk and women's education over time, but our results show that the divergence in marital dissolution risk by education has been strongest in the NSFG waves that postdate Teachman's classic paper. We find that the advantage in marital stability for women who come from stable families of origin has grown over time (though the significance by BIC is only marginal) compared to women who experienced parental divorce in their families of origin. Lastly, we find that premarital cohabitation has had a consistently significant and stable positive association with marital dissolution rates from the 1970s to 2015.

When examining evidence of change over time in the predictors of marital dissolution, it is important to put any apparent changes into perspective. The profile of women at first marriage in the U.S. has changed dramatically in the last 7 decades. The predictors of marital dissolution are each independent and powerful. The predictors of marital dissolution have been either constant in strength over time, or have changed slowly. To a first approximation, the predictors of marital dissolution have been constant over time. Empirical social science tends to emphasize evidence of change over stasis, in part because any significant change is easier to publish than null results (Iyengar and Greenhouse 1988). A conservative test such as the BIC is helpful, but by no means a guarantee, that apparently statistically significant results are indeed robust.

Many things that would be relevant for understanding marital stability are missing from the NSFG data: marital quality; sexual frequency; measures of love, affection and commitment; communication quality; and ties to family and friends. Because of the retrospective nature of the NSFG, NSFG data lack history of individuals' income, assets, and employment that would be useful to understanding how disadvantaged economic positions affect marital instability. Other kinds of data beside the NSFG are necessary to explore the causal mechanisms of how inequalities lead to marital dissolution.

Where changes in predictors of marital dissolution have occurred in recent decades in the U.S., all of the changes (subtle though most of them may be) are in the direction of amplifying existing already severe social and economic inequalities. Being married appears to be becoming more of a privileged status in the U.S. The economic polarization of family life in the U.S. observed here is consistent with recent research in Europe as well (Esping-Anderson 2016). Divorce in the U.S. is increasingly an experience for women with less education, and for women from less stable families of origin. Since divorce and single parenthood are important contributors to childhood poverty and disadvantage, greater inequality in who remains married and in who divorces may further polarize an already polarized U.S. society.

References:

Loving v. Virginia, 388 U.S. 1 (1967). U.S. Supreme Court.

Akaike, Hirotugu. 1974. "A New Look at the Statistical Model Indentification." *IEEE Transactions on Automatic Control* 19 (6):716-723.

Amato, Paul R., and Jacob Cheadle. 2005. "The Long Reach of Divorce: Divorce and Child Well-Being Across Three Generations." *Journal of Marriage and Family* 67:191-206.

Autor, David H., Lawrence F. Katz, and Melissa S. Kearney. 2006. "The Polarization of the U.S. Labor Market." *American Economic Review* 96 (2):189-194.

Bobo, Lawrence D., Camille Z. Charles, Maria Krysan, and Alicia D. Simmons. 2012. "The *Real* Record on Racial Attitudes." Pp. 38-83 in *Social Trends in American Life: Findings from the General Social Survey since 1972*, edited by Peter V. Marsden. Princeton, NJ: Princeton University Press.

Bramlett, Matthew D., and William D. Mosher. 2002. "Cohabitation, Marriage, Divorce, and Remarriage in the United States." http://www.cdc.gov/nchs/data/series/sr_23/sr23_022.pdf. Accessed 12/19/2013.

Brandolini, Andrea, and Timothy M. Smeedling. 2006. "Patterns of Economic Inequality in Western Democracies: Some Facts on Levels and Trends." *PS: Political Science and Politics* 39 (1):21-26.

Breen, Richard, and Leire Salazar. 2011. "Educational Assortative Mating and Earnings Inequality in the United States." *American Journal of Sociology* 117 (3):808-843.

Cherlin, Andrew J. 1978. "Remarriage as an Incomplete Institution." *American Journal of Sociology* 84 (3):634-650.

—. 1992. *Marriage, Divorce, Remarriage*. Second Edition. Cambridge, Mass.: Harvard University Press.

—. 2004. "The Deinstitutionalization of American Marriage." *Journal of Marriage and Family* 66:848-861.

—. 2014. *Labor's Love Lost: The Rise and Fall of the Working-Class Family in America*. New York: Russell Sage Foundation.

Copen, Casey E., Kimberly Daniels, Jonathan Vespa, and William D. Mosher. 2012. "First Marriages in the United States: Data from the 2006-2010 National Survey of Family Growth." http://www.cdc.gov/nchs/data/nhsr/nhsr049.pdf.

Dush, Claire M. Kamp, Catherine L. Cohan, and Paul R. Amato. 2003. "The Relationship between Cohabitation and Marital Quality and Stability: Change across Cohorts?" *Journal of Marriage and Family* 65 (3):539-549.

Esping-Anderson, Gøsta. 2016. *Families in the 21st Century*. Stockholm, Sweden: SNS Förlag.

Goodwin, Paula Y., William D. Mosher, and Anjani Chandra. 2010. "Marriage and Cohabitation in the United States: A Statistical Portrait Based on Cycle 6 (2002) of the National Survey for Family Growth." National Center for Health Statistics.

Gottschalk, Peter, and Sheldon Danziger. 2005. "Inequality of Wage Rates, Earnings, and Family Income in the United States, 1975-2002." *Review of Income and Wealth* 51 (2):231-254.

Grusky, David B., and Robert M. Hauser. 1983. "Comparative Social Mobility Revisited: Models of Convergence and Divergence in Sixteen Countries." *American Sociological Review* 49 (1):19-38.

Härkönen, Juho, and Jaap Dronkers. 2006. "Stability and Change in the Educational Gradient of Divorce: A Comparison of Seventeen Countries." *European Sociological Review* 22 (5):501-517.

Hatzenbuehler, Mark L., Jo C. Phelan, and Bruce G. Link. 2013. "Stigma as a Fundamental Cause of Population Health Inequalities." *American Journal of Public Health* 103 (5):813-821.

Hayford, Sarah R., and S. Philip Morgan. 2008. "The Quality of Retrospective Data on Cohabitation." *Demography* 45 (1):129-141.

Heathcote, Jonathan, Fabrizio Perri, and Giovanni L. Violante. 2010. "Unequal we Stand: An Empirical Analysis of Economic Inequality in the United States, 1967-2006." *Review of Economic Dynamics* 13:15-51.

Hochschild, Arlie. 2016. *Strangers in Their Own Land: Anger and Mourning on the American Right*. New York: The New Press.

Hyman, Herbert H, and Paul B. Sheatsley. 1964. "Attitudes Towards Desegregation." *Scientific American* 211 (1):16-23.

Iyengar, Satish, and Joel B. Greenhouse. 1988. "Selection Models and the File Drawer Problem." *Statistical Science* 3 (1):109-117.

Johnson, D. Gale, Ronald D. Lee, Nancy Birdsall, Rodolfo A. Bulatao, Eva Mueller, Samuel H. Preston, T. Paul Schultz, T.N. Srinivasan, Anned D. Williams, Kenneth M. Chomitz, and Geoffrey Greene. 1986. *Population Growth and Economic Development: Policy Questions*. Washington, D.C.: National Academies Press.

Kalleberg, Arne L. 2009. "Precarious Work, Insecure Workers: Employment Relations in Transition." *American Sociological Review* 74 (1):1-22.

Kennedy, Sheela, and Steven Ruggles. 2014. "Breakup Up is Hard to Count: The Rise of Divorce in the United States, 1980-2010." *Demography* 51:587-598.

Kuperberg, Arielle. 2014. "Age at Coresidence, Premarital Cohabitation, and Marriage Dissolution: 1985-2009." *Journal of Marriage and Family* 76:352-369.

—. 2018. "Cohabitation and Divorce: The Importance of Accounting for Age at Coresidence." The Society Pages: Council on Contemporary Families. https://thesocietypages.org/ccf/2018/10/16/cohabitation-and-divorce-the-importance-of-accounting-for-age-at-coresidence/. Accessed November 24, 2018.

Lepkowski, JM, WD Mosher, KE Davis, RM Groves, and J Van Hoewky. 2010. "The 2006-10 National Survey of Family Growth: Sample Design and Analysis of a Continuous Survey." National Center for Health Statistics. https://www.cdc.gov/nchs/data/series/sr_02/sr02_150.pdf.

Li, Jui-Chung Allen, and Lawrence L. Wu. 2008. "No Trend in the Intergenerational Transmission of Divorce." *Demography* 45 (4):875-883.

Liefbroer, Aart C., and Edith Dourleijn. 2006. "Unmarried Cohabitation and Union Stability: Testing the Role of Diffusion Using Data from 16 European Countries." *Demography* 43 (2):203-221.

Manning, Wendy D., and Jessica A. Cohen. 2012. "Premarital Cohabitation and Marital Dissolution: An Examination of Recent Marriages." *Journal of Marriage and Family* 74:377-387.

Martin, Steven P. 2006. "Trends in Marital Dissolution by Women's Education in the United States." *Demographic Research* 15 (20):537-560.

Massey, Douglas S., and Nancy A. Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, Mass.: Harvard University Press.

McLanahan, Sara. 2004. "Diverging Destinies: How Children are Faring Under the Second Demographic Transition." *Demography* 41 (4):607-627.

McLanahan, Sara, and Christine Percheski. 2008. "Family Structure and the Reproduction of Inequalities." *Annual Review of Sociology* 34:257-76.

McLanahan, Sara, and Gary Sandefur. 1994. *Growing Up with a Single Parent: What Hurts, What Helps*. Cambridge, Mass.: Harvard University Press.

Mills, Melinda. 2011. *Introducing Survival and Event History Analysis*. Los Angeles: Sage Publications.

Moynihan, Daniel Patrick. 1965. "The Negro Family: The Case for National action." Washington, DC.

National Center for Health Statistics. 2016. "National Survey of Family Growth Public Use Data and Documentation, waves 1973 through 2013-15." Hyattsville, MD: https://www.cdc.gov/nchs/nsfg/nsfg_2013_2015_puf.htm.

Piketty, Thomas. 2014. *Capital in the Twenty-First Century*. Cambridge, Mass: Belknap Press of Harvard University Press.
Raftery, Adrian E. 1995. "Bayesian Model Selection in Social Research." *Sociological Methodology* 25:111-163.
Raley, R. Kelly, and Larry Bumpass. 2003. "The Topography of the Divorce Plateau: Levels and Trends in Union Stability in the United States after 1980." *Demographic Research* 8 (8):245-160.
Raley, R. Kelly, Megan M. Sweeney, and Danielle Wondra. 2015. "The Growing Racial and Ethnic Divide in U.S. Marriage Patterns." *The Future of Children* 25 (2):89-109.
Reardon, Sean F. 2011. "The Widening Academic Achievement Gap between the Rich and the Poor: New Evidence and Possible Explanations." Pp. 91-116 in *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chance*, edited by Richard J. Murnane and Greg J. Duncan. New York: Russell Sage Foundation.
Reinhold, Steffen. 2012. "Reassessing the Link between Premarital Cohabitation and Marital Instability." *Demography* 47 (3):719-733.
Riggle, Ellen D.B., and Sharon S. Rostosky. 2007. "The Consequences of Marriage Policy for Same-Sex Couples' Well-Being." Pp. 65-84 in *The Politics of Same-Sex Marriage*, edited by Craig A. Rimmerman and Clyde Wilcox. Chicago: University of Chicago Press.
Rosenfeld, Michael J. 2007. *The Age of Independence: Interracial Unions, Same-Sex Unions, and the Changing American Family*. Cambridge, Mass.: Harvard University Press.
—. 2008. "Racial, Educational, and Religious Endogamy in Comparative Historical Perspective." *Social Forces* 87 (1):1-32.
—. 2017. "Moving a Mountain: The Extraordinary Trajectory of Same-sex Marriage Approval in the U.S." *Socius* 3:1-22.
Rosenfeld, Michael J., and Katharina Roesler. 2018a. "Cohabitation Experience and Cohabitation's Association with Marital Dissolution." *Journal of Marriage and Family*.
—. 2018b. "Response to Arielle Kuperberg, 'Cohabitation and Divorce: The Importance of Accounting for Age at Coresidence'." https://thesocietypages.org/ccf/2018/11/27/response-to-arielle-kuperberg-cohabitation-and-divorce-the-importance-of-accounting-for-age-at-coresidence/. Accessed July 28, 2019.
Schuman, Howard, Charlotte Steeh, Lawrence Bobo, and Maria Krysan. 1997. *Racial Attitudes in America: Trends and Interpretations*. Revised Edition. Cambridge, Mass.: Harvard University Press.
Schwartz, Christine R., and Robert D. Mare. 2005. "Trends in Educational Assortative Marriage From 1940 to 2003." *Demography* 42 (4):621-646.
Smock, Pamela J. 2000. "Cohabitation in the United States: An Appraisal of Research Themes, Findings, and Implications." *Annual Review of Sociology* 26:1-20.
Sweeney, Megan M., and Julie A. Phillips. 2004. "Understanding Racial Differences in Marital Disruption: Recent Trends and Explanations." *Journal of Marriage and Family* 66:639-650.
Teachman, Jay. 2002. "Stability across Cohorts in Divorce Risk Factors." *Demography* 39 (2):331-351.
—. 2003. "Premarital Sex, Premarital Cohabitation, and the Risk of Subsequent Marital Dissolution among Women." *Journal of Marriage and Family* 65 (2):444-455.
Treas, Judith. 2002. "How Cohorts, Education, and Ideology Shaped a New Sexual Revolution on American Attitudes Toward Nonmarital Sex, 1972-1998." *Sociological Perspectives* 45 (3):267-283.
van de Kaa, Dirk J. 2002. "The Idea of a Second Demographic Transition in Industrialized Countries," presented at the meeting of the Sixth Welfare Policy Seminar of the National Institute of Population and Social Security in Tokyo, Japan. http://websv.ipss.go.jp/webj-ad/WebJournal.files/population/2003_4/Kaa.pdf

Wallerstein, Judith S., and Sandra Blakeslee. 1989. *Second Chances: Men Women, and Children a Decade After Divorce*. New York: Ticknor and Fields.
Wilson, William Julius. 1980. *The Declining Significance of Race*. Chicago: University of Chicago Press.
Winship, Christopher, and Larry Radbill. 1994. "Sampling Weights and Regression Analysis." *Sociological Methods and Research* 23 (2):230-257.
Wolfinger, Nicholas H. 1999. "Trends in the Intergenerational Transmission of Divorce." *Demography* 36 (3):415-420.
—. 2011. "More Evidence for Trends in the Intergenerational Transmission of Divorce: A Completed Cohort Approach Using Data from the General Social Survey." *Demography* 48 (2):581-592.
Yamaguchi, Kazuo. 1991. *Event History Analysis*. Newbury Park, California: Sage Publications.

Table 1: Interactions between predictors of marital dissolution and marriage cohort, from Cox proportional hazard regressions

Predictor	Interaction with marriage cohort	df	LRT	BIC
Premarital Cohabitation	Decade of marriage	5	3.1	42.1
Race (black and other compared to white)	Decade of marriage	12	51.8***	62.2
Race (black compared to all others)	Marriage cohort, before 1970 and after 2000	2	26.3***	-7.3
Wife with BA	Linear marriage cohort	1	33.6***	-24
Wife from Stable family	Linear marriage cohort	1	2.87	6.6
Interracial	Linear marriage cohort	1	1.02	7.8

Source: NSFG all waves 1973- 2015, except Interracial include waves since 1995, and premarital cohabitation includes waves since 1988. N of marital dissolution events is 13,341 for all categories except premarital cohabitation (N=8,488) and interraciality (N=6725).

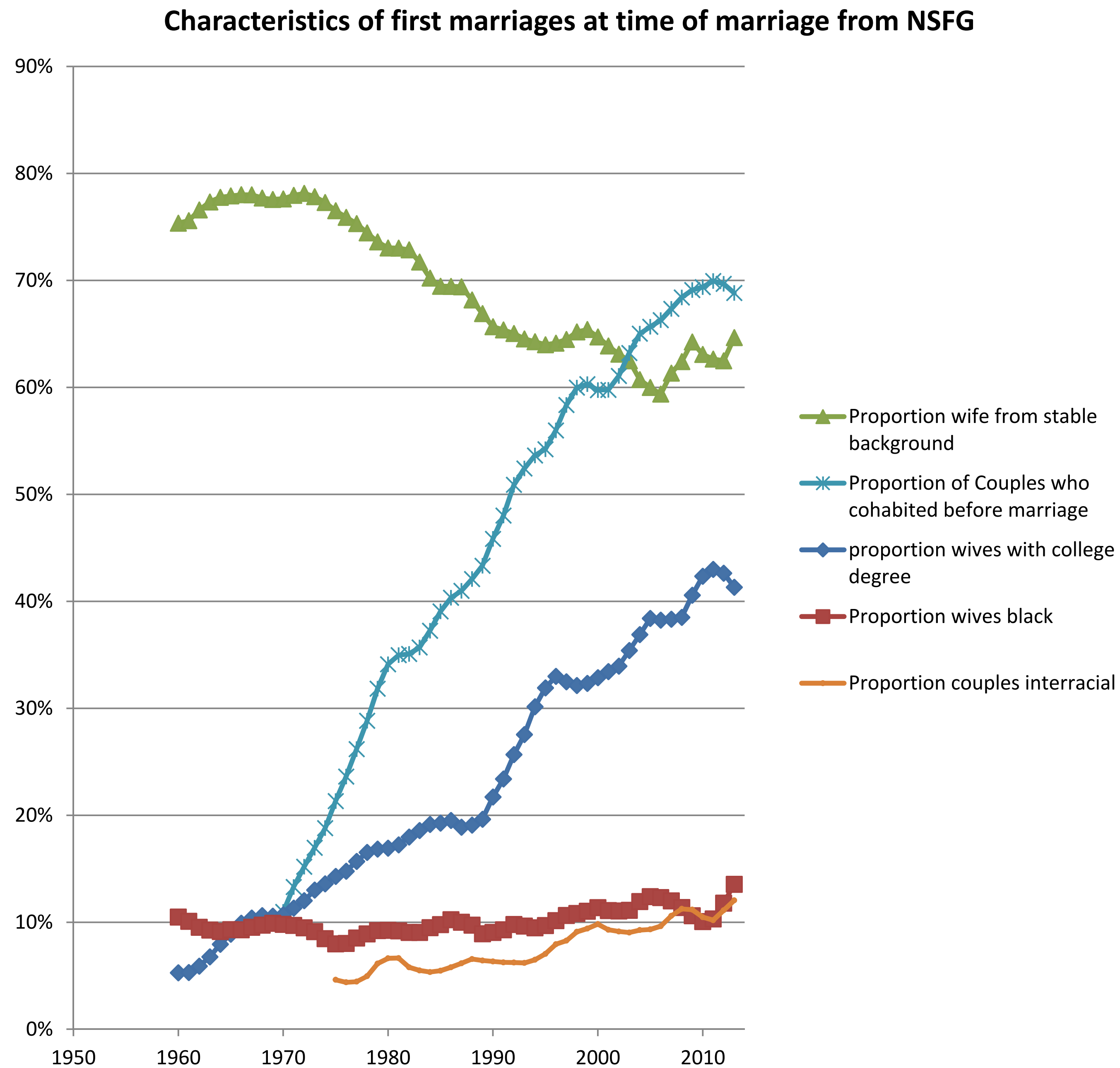


Figure 1: Weighted NSFG data on first marriages, female subjects age 15-44, smoothed with 5 year moving average. Data points for 2014 and 2015 not show because there were too few new first marriages reported in NSFG for 2014 and 2015.

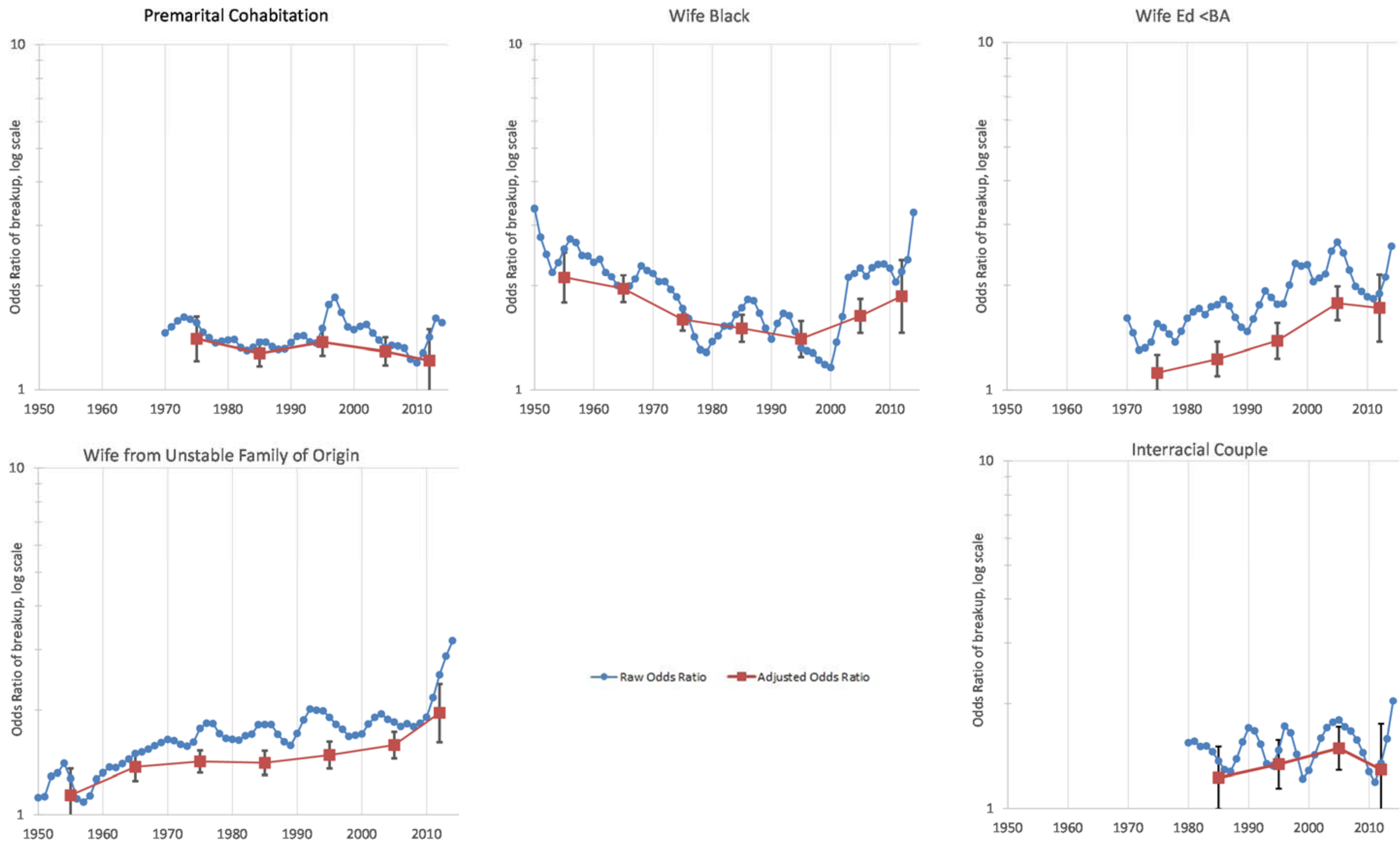


Figure 2: Raw Odds Ratios of Breakup, and Adjusted Odds Ratios of Breakup (with 95% CI) for First Marriages by Calendar Year

Source: NSFG data on first marriages, female subjects age 15-44. Unadjusted Odds Ratios are weighted, and smoothed with 5 year moving average. Adjusted Odds Ratios interacted with decade are derived from unweighted discrete time event history logistic regressions, controlling for: marital duration, age at marriage, presence of minor children, subject's education, subject's race, family of origin stability, NSFG wave. Predictors that exclude early waves add extra controls: premarital cohabitation also controls for mother's educational attainment; adjusted Odds Ratio for interracial couples also controls for premarital cohabitation, and mother's educational attainment. Comparison categories: Premarital cohabiters are compared to non-cohabiters. Divorce rate for blacks is compared to whites; wives with BA compared to wives without BA; wives from unstable family of origin are compared to wives from stable family of origin; wives married as teens compared to wives married at age ≥20; interracial couples compared to same-race couples.

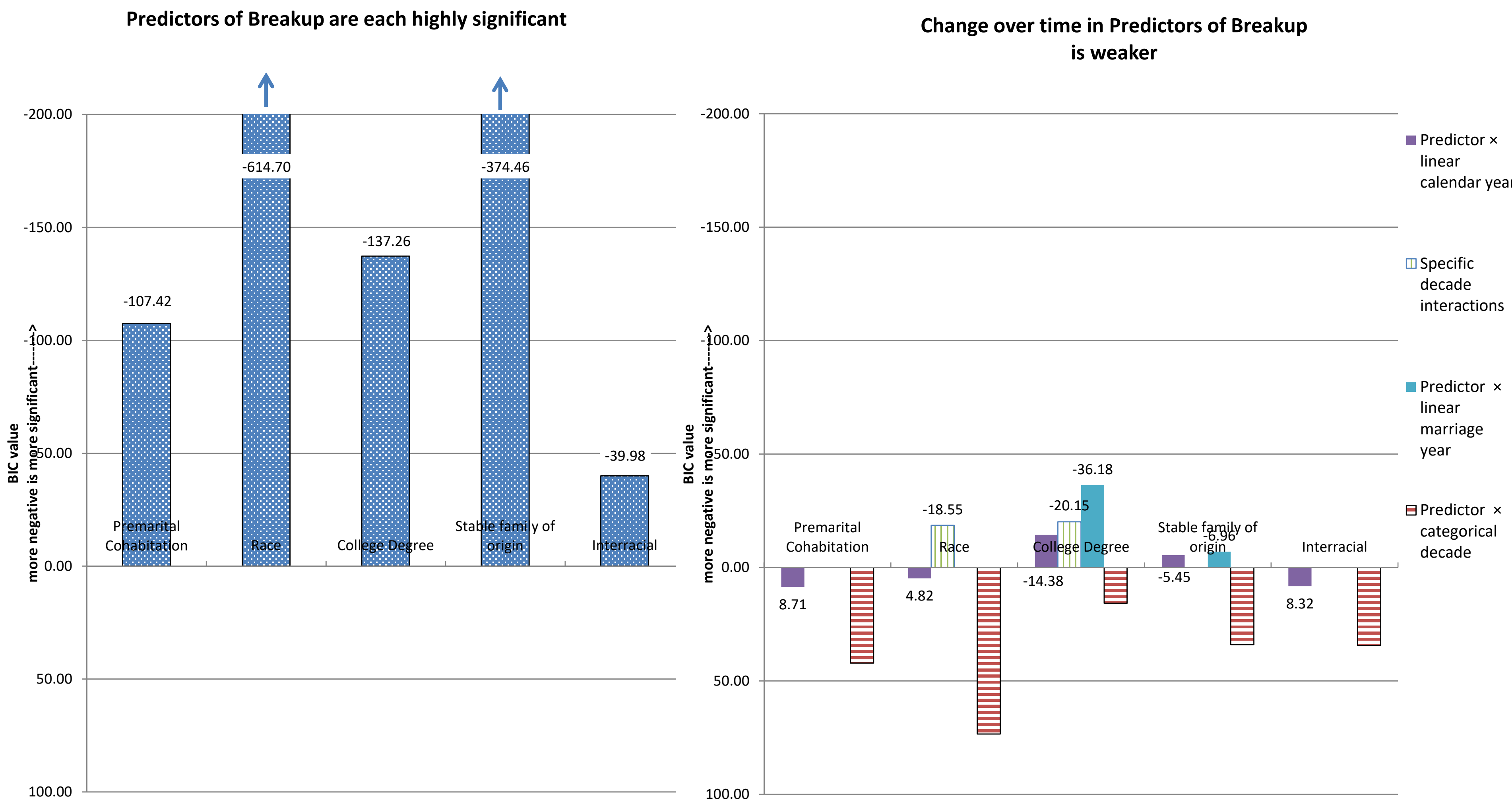
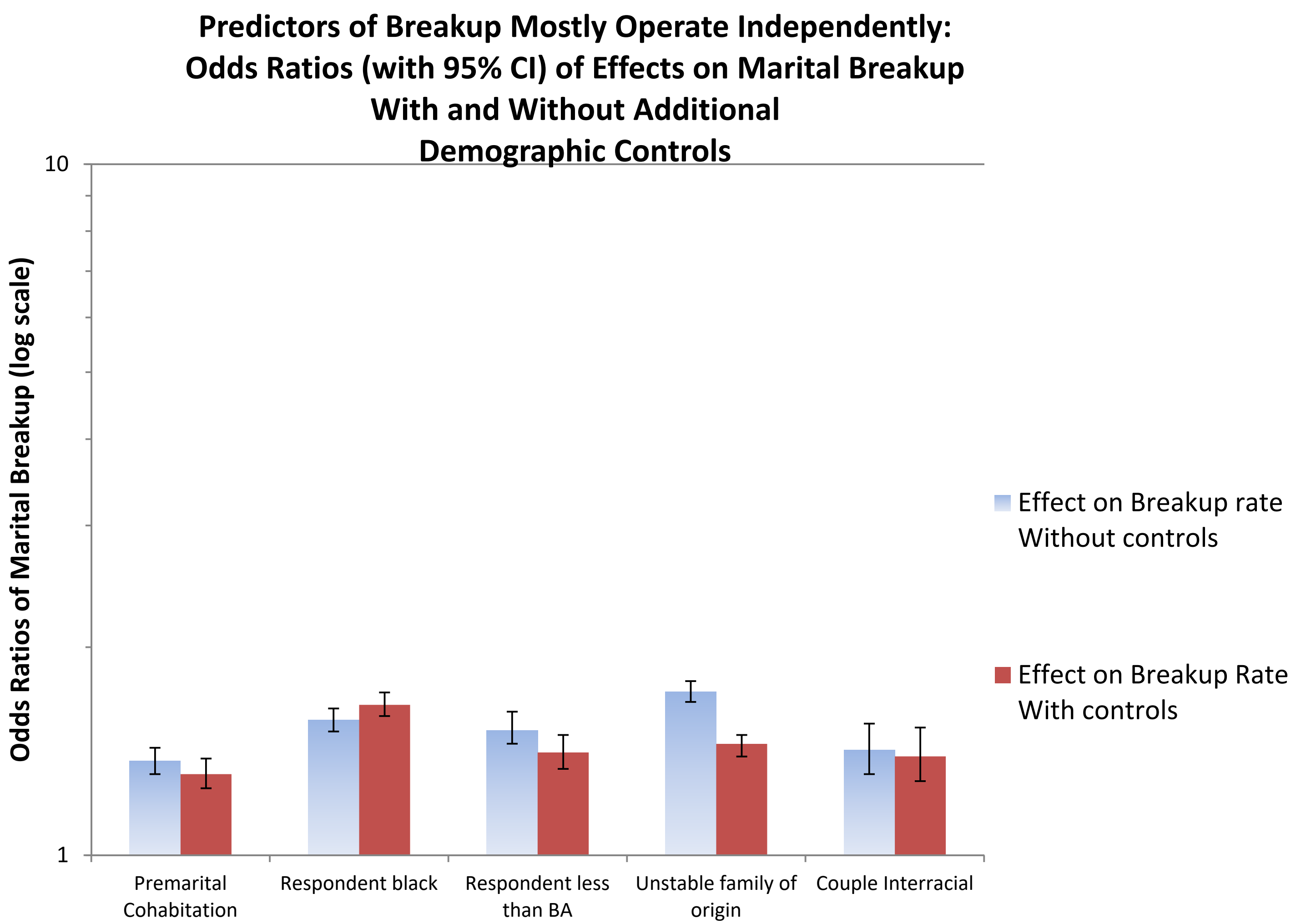


Figure 3. NSFG data on first marriages, female subjects age 15-44. Results from unweighted discrete time event history models in logistic form. For BIC, values smaller than -10 are statistically significant. Specific interactions that are significant by BIC: married black women had higher breakup rates (compared to white women) in the 1950s and 1960s; Married women without college degrees had higher breakup rates (compared to women with BAs) in the 2000s. Interactions with specific decade and with linear marriage year shown above only when significant by BIC.



Appendix Figure 1. NSFG data on first marriages, subjects age 15-44. Results from unweighted discrete time event history models in logistic form.

Appendix Table 1: Different predictors of first marriage breakup, with and without controls

Predictor of Divorce	Waves of NSFG used	Controls applied	OR and 95% CI of predictor's effect on breakup, without controls	OR and 95% CI of predictor's effect on breakup, with controls	Test for predictor significance with controls, by LRT	df	N of marital dissolutions	Test for predictor significance with controls, by BIC
Premarital Cohabitation	1988 and later	marital duration, age at marriage, minor children, education, race, stable parents, decade, wave, mother's education	1.37 (1.31, 1.43)	1.15 (1.10, 1.21)	117.54***	1	8,488	-108.49***
Respondent race (compared to whites)	all waves	marital duration, age at marriage, minor children, education, stable parents, decade, wave	1.57 (1.51, 1.63)	Black 1.65 (1.59, 1.72); Other 0.77 (0.71, 0.84)	636.09***	2	13,341	-617.09***
Respondent with BA	all waves	marital duration, age at marriage, minor children, race, stable parents, decade, wave	0.66 (0.62, 0.69)	0.71 (0.67, 0.75)	147.96***	1	13,341	-138.46***
Respondent has stable family of origin	all waves	marital duration, age at marriage, minor children, race, education, decade, wave	0.58 (0.56, 0.60)	0.69 (0.67, 0.72)	385.16***	1	13,341	-375.66***
Couple Interracial	1995, 2002, 2006	marital duration, age at marriage, minor children, premarital cohabitation, education, race, stable parents, decade, wave, mother's education	1.42 (1.31, 1.55)	1.39 (1.28, 1.53)	49.87***	1	6,725	-41.06***

Source: NSFG data on first marriages, female subjects age 15-44. Results from unweighted discrete time event history models in logistic form. All predictors significant by LRT. For BIC, the more negative the value, the greater the significance. ***P<0.001, two tailed tests

Appendix Table 2: Tests of change over time in predictors of first marriage breakup

Predictor of Divorce	Waves of NSFG used	Controls applied	Change over time test	LRT	AIC	BIC	Substance of Effect if significant by BIC
Premarital Cohabitation	1988 wave and later	marital duration, age of first marriage or cohabitation, minor children, education, race, stable parents, decade, wave, mother's education	Cohab× decade	3.1 (5 df)	7.0	42.2	
			Cohab × linear calendar year	0.3 (1df)	1.7	8.7	
			Cohab × linear marriage year	2.9 (1 df)	-0.9	6.2	
Wife race (compared to whites)	all waves	marital duration, age at first marriage, minor children, education, stable parents, decade, wave	race (2df) × decade	40.6*** (12 df)	-16.6	73.4	
			black × 1950s and 1960s	28.1*** (1 df)	-26.1	-18.6***	Higher rate of breakup for blacks in the 50s and 60s, Odds Ratio 1.28
			race (2df) × linear calendar year	14.2*** (2 df)	-10.2	4.8	
			race (2df) × linear marriage year	16.6*** (2df)	-12.6	2.4	
Wife has BA	all waves	marital duration, age at first marriage, minor children, race, stable parents, decade, wave	BA × decade	41.2*** (6 df)	-29.2	15.8	
			BA × 2000s	29.7*** (1 df)	-27.7	-20.2***	Lower rate of breakup for wives with BAs in the 2000s, Odds Ratio 0.72
			BA × linear calendar year	23.9*** (1df)	-21.9	-14.4***	Increasing divergence of breakup risk between women who have BA and women who don't
			BA × linear marriage year	45.7*** (1df)	-43.7	-36.2***	Increasing divergence of breakup risk between women who have BA and women who don't
Wife has stable family of origin	all waves	marital duration, age at first marriage, minor children, race, education, decade, wave	stable family × decade	23.0*** (6 df)	-11.0	34.0	
			stable× 2000s	11.7*** (1 df)	-9.7	-2.2*	Stable parents more protective against breakup in the 2000s, Odds Ratio 0.85
			stable × linear calendar year	15.0*** (1df)	-13.0	-5.5**	Increasing divergence of breakup risk between women from stable families of origin, and other women
			stable × linear marriage year	16.5*** (1df)	-14.5	-7.0**	Increasing divergence of breakup risk between women from stable families of origin, and other women

Couple Interracial	1995 wave and later	marital duration, age at first marriage, minor children, premarital cohabitation, education, race, stable parents, decade, wave, mother's education	interracial × decade	9.7 (5 df)	0.3	34.4
			interracial × linear calendar year	0.5 (1 df)	1.5	8.3
			interracial x linear marriage year	0.8 (1 df)	1.2	8.0

Source: NSFG data on first marriages, female subjects age 15-44. Results are from unweighted discrete time event history models in logistic form. For BIC, values smaller than -10 are statistically significant. Interactions with time that are significant by the parsimony favoring BIC are highlighted in red. AIC values less than zero are preferred to the model without the interaction with time, but no P value is associated with the AIC statistic. Number of breakup events, used as N for the BIC: Premarital cohabitation N= 8,488; Interraciality N=6,725; Educational Endogamy N=8,243; All other analyses above have N of breakup events for all waves= 13,341. AIC=-LRT+2df. BIC=-LRT+(ln(N))df.

* P<0.05; ** P<0.01; ***P<0.001