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Age at Marriage and Marital Instability: Revisiting the Becker-Landes-Michael Hypothesis

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ABSTRACT

Age at Marriage and Marital Instability: Revisiting the Becker-Landes-Michael Hypothesis*

An early age at first marriage is known to be associated with a high risk of divorce. Yet it has been suggested that beyond a certain point, the relationship between age at marriage and marital instability may become positive, because as unmarried women begin to hear their biological clock tick, they may settle for matches far from the optimal. Analyses based on cycles 5 and 6 of the National Surveys of Family Growth show that the relationship between age at marriage and marital instability is strongly negative up to the late twenties, with a flattening of the curve thereafter.

JEL Classification: J12, J11, J10

Keywords: divorce, marital dissolution, marriage

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Age at Marriage and Marital Instability:

Revisiting the Becker-Landes-Michael Hypothesis

INTRODUCTION

During the first part of the twentieth century, the United States witnessed a decline in age at entry into marriage. While in 1900 the median age at marriage was 26 for men and 22 for women, by 1950-1960 it had fallen to 23 for men and 20 for women. A pronounced trend toward delayed marriage has emerged since the 1960s, and by 2003, the median age at marriage had reached 27 for men and 25 for women (U.S. Census Bureau 2004). A complex set of factors has led to the current pattern of delayed entry into marriage. These include changing male and female employment opportunities (see Fitch and Ruggles (2000) for a review), the growth of cohabitation, and the emerging view of formal marriage as a transition to be postponed until financial security has been attained (Cherlin 2004).

An important question is whether this present pattern of increasingly older ages at entry into marriage has implications for the stability of marital unions. Numerous studies show that individuals who marry at a young age tend to be at a high risk of marital dissolution (Castro-Martin and Bumpass 1989; Bumpass et al. 1991; Lehrer 1996; Teachman 2002). Yet as suggested in the pioneering work of Becker, Landes and Michael (1977), the age at marriage - divorce relationship may be non-linear. Marriages that take place at a very late age may actually be more unstable than those contracted in the early or mid twenties, because individuals may settle for poorer matches as time passes. Using data from the 1960s, the authors found support for this non-linearity. In

spite of the pronounced trend towards later marriage that the U.S. has witnessed since that period, subsequent research has generally entered age at marriage as a linear variable and the possibility of a U-shaped relationship has not been revisited with more recent data. The objective of the present paper is to fill this void in the literature, focusing on the effects of *women's* age at first marriage on the stability of their unions. The empirical analysis is based on data from the two most recent cycles of the National Survey of Family Growth (NSFG), cycles 5 and 6, conducted in 1995 and 2002-2003, respectively.

The paper is organized as follows. The first section presents a theoretical framework that helps understand the determinants of divorce in general and the role of age at marriage in particular. The next sections describe the data set and methods used in the analysis, and the empirical findings. The paper closes with a summary.

ANALYTICAL FRAMEWORK

From an economic perspective, marriage may be viewed as a partnership that helps coordinate and facilitate production and consumption activities, including raising children. The gains from marriage include (a) division of labor and specialization within the family, which increases the couple's productivity; (b) the pooling of risks (e.g., one spouse may increase the level of work in the labor market if the other becomes unemployed); (c) economies of scale (e.g., cooking a meal for two people costs less than cooking two separate meals); and (d) public goods (e.g., both partners enjoy the same home) (Becker 1991; Weiss 1997). More recently, marriage has also been linked to significant benefits in the areas of physical and mental health (Waite 1995; Waite and Lehrer 2003). These benefits stem from the economic advantages associated with the

married status; from a social capital effect (the spouse provides support and helps integrate the individual into wider social networks); and from a regulative effect (marriage encourages healthy conduct partly because self-destructive behaviors impose negative externalities on the spouse). The amount of the gain associated with marriage varies across couples, depending on the characteristics of each partner and the quality of their match.

While a union between two individuals may seem optimal from the perspective of both partners at a certain point in time, this assessment may subsequently change if one or both spouses discover that their expectations about their own characteristics or those of their partner were incorrect, or if major changes that were not anticipated at the time of the marriage take place. Small shocks will not destabilize a union if the gains from marriage are large. Another key factor is the magnitude of the costs of terminating the union, which also varies across couples.

Overall, divorce is more likely if the characteristics of the partners or their match, or the behavior of the spouses imply *(a)* relatively low gains from marriage; *(b)* relatively low costs of divorce; and/or (c) a high probability of mistaken expectations at the time of marriage and subsequent surprises. Variables that are related to these factors are considered below. These include family background characteristics, the behaviors of the partners prior to the marriage, and their characteristics at the time of marriage, including the variable of central interest here, age at marriage.[1]

Family Background Characteristics

Individuals raised in broken homes grow up with fewer opportunities to learn the interpersonal skills that are needed for a successful marriage; they also tend to begin their unions at an economic disadvantage. In addition, their perceived costs of marital breakup may be lower as they have seen that divorce is a viable solution to an unhappy marital situation. Numerous studies document an intergenerational transmission of marital instability (McLanahan and Bumpass 1988; Bumpass et al. 1991; Amato 1996).

Religion is another relevant background factor. A growing body of research documents a wide range of benefits associated with some religious involvement during childhood and adolescence, including better mental health (Waite and Lehrer 2003). Young people who grow up in homes where there is some religious participation are also less likely to enter cohabiting unions (Thornton et al. 1992; Lehrer 2004), which in turn are predictive of subsequent marital instability. Furthermore, since religions are generally family-oriented, affiliation with a religious group raises the perceived costs of divorce; the divorce probability has been found to be high when one or both spouses are unaffiliated (Lehrer and Chiswick 1993).

Behaviors Prior to Marriage and Spouses' Characteristics at the Time of Marriage

Men with a high earning potential tend to have stable unions, reflecting a positive income effect: more resources in the household imply a higher standard of living and alleviate marital tension associated with economic difficulties (Lehrer 1988; Weiss and Willis 1997). While an increase in the wife's earning capacity generates an income effect similar to that associated with the husband's earnings, an "independence effect" exerts a

countervailing influence: a higher wage rate increases a woman's ability to support herself and her children outside of marriage. Thus among unhappily married women, those with a higher earning potential can more easily terminate their unions. The empirical findings in the literature are mixed, partly because of differences across studies in how and when female earnings capacity is measured and the extent to which related variables are controlled for (Lehrer 1988, 2003). Analyses that include only educational attainment at the time of marriage as the measure of earning capacity report a favorable influence on marital stability (Lehrer and Chiswick 1993; Weiss and Willis 1997); this effect appears to have become more pronounced in recent years (Raley and Bumpass 2003; McLanahan 2004).

Certain behaviors of the spouses before the marriage are also known to be associated with subsequent marital instability. These include prior cohabitation with the spouse or other partners, a prior formal marriage, and having had a child from a previous union.

By providing a great deal of information about the characteristics of the partner, cohabitation should improve subsequent marital stability since presumably only those matches that are "proven" to work out are formalized into a marriage. However, the empirical evidence overwhelmingly shows that cohabitation before marriage is linked with a higher risk of an eventual divorce (Popenoe and Whitehead 1999). The most pronounced adverse effects are associated with a pattern of serial cohabitation (Teachman and Polonko 1993). At the other extreme, a brief period of pre-nuptial cohabitation has been found to have no adverse influence (Brown 1998). Prior cohabitation with other partners provides none of the information benefits associated with prenuptial cohabitation

with the spouse and not surprisingly it has also been linked with a higher risk of divorce (Lehrer and Chiswick 1993).

It has been suggested that the process of cohabitation *per se* may lead to changes in behaviors that undermine union stability (Axinn and Thornton 1992). In addition, individuals who choose cohabiting arrangements may include a disproportionate number of people who have less commitment to the institution of marriage, who are poor "marriage material," or who thought their unions were at a high risk of dissolution in the first place (Bennett, Blanc and Bloom 1988; Schoen 1992). Lillard et al. (1995) find that the negative effect of cohabitation on subsequent marital stability is attributable to such selectivity factors. It seems likely, however, that with the dramatic increase in the prevalence of cohabitation in recent years (Cherlin 2004), the unobserved characteristics of cohabitors have become less distinct.

The nature of the association between having been previously married and marital instability is unclear on theoretical grounds. Marriage dissolution may be more likely for people in second or third marriages because individuals who have been divorced disproportionately have traits that make them more susceptible to marital instability. At the same time, a failed marriage may provide a learning experience that increases the chances of success in a future union. Most studies show that the risk of divorce is higher when one of the partners has been previously married (Castro-Martin and Bumpass 1989; Lehrer and Chiswick 1993). However, there is high variance in the stability of higher order unions depending on the duration of the previous marriage(s) and whether any children were born (Lehrer 1996).

Children from a previous union have an adverse impact on marital stability (White and Booth 1985, Waite and Lillard 1991). It has been suggested that the reason for this effect is that such children make their custodial parent, typically the mother, a less attractive partner. The presence of such children indicates that, *ceteris paribus*, she embodies less human capital that would be relevant to a new union; it also signals that many of her future investments of time, energy, and other resources will be diverted away from her new partnership (Chiswick and Lehrer 1990).

Characteristics of the Match: Differences between Spouses in Complementary Traits

Religion, race/ethnicity, age, and education are complementary traits within the context of marriage, i.e., they are relevant to activities that the husband and wife perform together, as a couple. Gains from marriage are lower, and the divorce probability higher, when the spouses differ significantly along any of these dimensions (Becker 1973, 1991).

The partners' religious affiliations affect not only their participation in religious observances at home and at church, but also many other dimensions of family life, including the education and upbringing of the children and the allocation of time and money. When the partners differ in religion the likelihood of dissolution is thus expected to be higher, a result confirmed by many empirical studies (see review in Lehrer 2004). For similar reasons, heterogamy in race/ ethnicity, which implies differences in family traditions, culture, and history, is also expected to be destabilizing, although less attention has been paid in the literature to this relationship (Kalmijn et al. 2005).

With regard to age, a gap of about two years between husband and wife is typical in the U.S., with the husband usually the older partner. Larger differences in age,

especially when the wife is older than the husband, have been found to have an adverse impact on stability (Lehrer 1996). Given that educational attainment is a major determinant of various dimensions of non-market productivity and influences all aspects of the interactions between spouses, a difference in this realm should also be destabilizing. Evidence presented by Tzeng (1992) confirms this expectation. If the spouses' wage rates are not known and hence not controlled for (as is the case in the present study), the adverse impact of educational heterogamy on marital stability should be even stronger (Lam 1988).[2]

Age at Marriage

Marriages contracted during the teens are known to be highly unstable, a result that has been interpreted as a "maturity effect:" there is a greater likelihood of mistaken expectations in the case of such marriages (Oppenheimer 1988). At very young ages, people often have inadequate self-knowledge and are uncertain about their own future prospects and potential; they are also prone to misjudge the characteristics and likely trajectories of their partners. As Oppenheimer observes (p. 572), "an early marriage may preclude a premarital matching on adult attributes that have not yet emerged." Thus the "maturity effect" is much broader than just emotional maturity. It seems likely that the maturity effect also includes a learning effect: an individual who enters marriage at a late age, after having spent most of the young adult years in the single state, probably has a deeper understanding of the foregone gains from marriage and is less likely to terminate the union even if it turns out to be quite far from perfect.[3]

The maturity effect, which is the way age at first marriage is postulated to *directly* affect the probability of divorce, predicts a pattern of steadily declining marital instability as age at marriage rises. Age at marriage also influences the risk of dissolution *indirectly*, in two ways. First, the age at which a woman enters her first marriage is systematically associated with other characteristics she has at that time that are relevant to marital stability, as discussed above. Women who marry late tend to do so when they have completed more schooling, which is a stabilizing factor. At the same time, at the later ages at marriage there is greater exposure to the risk of having had a previous cohabitation and/ or a child from a previous partnership, which are destabilizing influences. If these variables are not controlled, age at marriage would capture their effects.

Second, Becker et al. (1977) identify a force that, if strong enough, would tend to produce a U-shaped association between age at marriage and the risk of divorce: As time passes and a woman reaches her late twenties/ thirties in the single state, with the biological clock ticking, she may revise her expectations downward and settle for a match that is far from the optimal (e.g., a partner who differs substantially in religion, race/ethnicity, age, and/or education). If so, the result would be a union with low gains from marriage and correspondingly high likelihood of eventual dissolution. Becker et al. (1977) suggest that although this influence, which might be termed "the poor match effect," applies to men and women, it is especially relevant for the latter since the decline in the capacity to bear children sets in at a much younger age in their case. If the poor match effect that emerges at the later ages at marriage is large enough to offset the maturity effect, the observed *total effect* of age at marriage on marital instability (i.e.,

with the couple's characteristics at marriage not controlled) would become positive beyond a certain age.

DATA AND METHODS

The empirical analysis uses data from cycles 5 and 6 of the National Survey of Family Growth. Cycle 5 was conducted in 1995 by the Research Triangle Institute, under contract from the National Center for Health Statistics (NCHS) (see Kelly et al. 1997 for a description of the methodology). Cycle 6 was conducted in 2002-2003 by the University of Michigan's Institute for Social Research under contract from NCHS. (Groves et al. 2005 describe the methodology.) The questionnaires were addressed to nationally representative samples of individuals 15-44 years of age of all marital statuses living in the United States. Only women were surveyed in cycle 5 (n = 10,847). Cycle 6 was addressed to both men and women; the female surveys were used here (n = 7,643 women). The interviews included questions on socioeconomic and family background variables, as well as information on marriage and informal union histories.

The samples used in the present paper were restricted in two main ways. First, the samples were limited to women who had been married at least once at the time of the survey. This restriction brought the sample to n= 6,844 for cycle 5 (63% of the cases) and n= 4,126 (54% of the cases) for cycle 6. The difference in these percentages is a first indication of a pronounced tendency towards later entry into first marriage in recent years. Second, only non-Hispanic white respondents were included in the analysis, as the number of African-American and Hispanic respondents was too small to permit estimation of the relationships of central interest in this paper. Adding this restriction led

to a sample of n= 4,424 for cycle 5 and n =2,439 for cycle 6, representing a loss of 22% of the cases in both cycles on account of race/ ethnicity. A few additional observations were dropped due to invalid codes for key variables, leaving final sample sizes of 4,413 and 2,437 for cycles 5 and 6, respectively.[4]

All analyses pertain to the respondent's first marriage experience, as the central question in this study is the nature of the relationship between women's age at first marriage and marital stability. The year of marriage ranges from1965 to 1995 in cycle 5 (median: 1982) and from 1972 to 2002 in cycle 5 (median: 1992). Table 1 presents descriptive statistics for the explanatory variables. The key variable, age at marriage, is defined as a set of dummies, a flexible specification that allows for easy identification of possible non-linearities. In cycle 5, 15% percent of the respondents' first marriages took place at age 27 or later, with only 2% occurring in the oldest age group, 33 or older. The corresponding figures for cycle 6 are 23% and 5%, a second indication of major change in the distribution of women's age at first marriage over this relatively short period of time.

[Insert Table 1 here]

Cycle 5 contains detailed information on the respondents' backgrounds and the characteristics of the first marital partner. The information contained in cycle 6 is less complete; the differences that are relevant to this study are described in Table 1. These deficiencies of the cycle 6 data have little impact on the estimates of the total effect of age at marriage and hence on the answer to the central question of this study-- whether the relationship between age at marriage and marital stability is non-linear. However, they do bias the estimate of the maturity effect, as such estimate depends critically on

being able to hold constant all relevant factors. These issues are discussed in more detail later in the paper.

Another shortcoming of cycle 6 is that due to an error in the administration of the survey, a significant number of respondents whose first marriages had ended by the time of the interview were not asked questions on how and when this happened. For these cases, the public use file includes information on the date and type of marriage dissolution that was imputed using regression procedures. This affects 9.1% of the cases in the present sample. While errors in measurement of the dependent variable increase the error variance, they do not lead to biases in the estimates.

The Statistical Model

The role of age at marriage and other factors on marital instability is assessed using Cox proportional hazards models. Survival time is the interval from the respondent's first formal marriage until union dissolution.[5] The hazard function is expressed as follows:

$$h(t,z) = h_o(t) \exp(\beta' z) \qquad (1)$$

where $h_o(t)$ is an unspecified time-dependent function, z is a vector of covariates, and β is a vector of unknown coefficients.

The tables that follow report the estimated values of β and $\exp(\beta)$. For dummy variables, $\exp(\beta)$ can be interpreted as the ratio of the estimated hazard for those with a value of 1 to the estimated hazard for those with a value of 0 (controlling for other factors).

The survival function in the Cox model is:

$$F(t,\mathbf{z}) = (F_o(t))^{\exp(\boldsymbol{\beta}'\mathbf{z})}, \text{ where} \quad (2)$$

$$Fo(t) = \exp\{ - \int_0^t h_o(u)du \} \quad (3)$$

Evaluating the survival function at specified durations and values of the covariates provides estimates of the absolute magnitudes of the various effects.

EMPIRICAL FINDINGS

Cycle 5 Results

The effects of age at marriage on marital stability can be assessed from Table 2. Panel A controls only for the wife's background characteristics and thus provides an estimate of the total effect of age at first marriage; Panel B adds controls for the wife's traits at the time of marriage; and Panel C includes also the characteristics of the husband and the match. This last panel, which controls for all the relevant, observed factors, provides an estimate of the maturity effect, i.e., the direct influence of growing older and more mature on marital instability.

[Insert Table 2 here]

The fifth-year dissolution probabilities reported in the table are calculated as the complement of the survival function evaluated at five years from the date of marriage. Results in each case are reported for the "reference woman," a respondent who entered her first marriage at age 20-26 and whose other characteristics are also typical (all explanatory variables set at the modal category). Additional estimates are shown for women who differ from the reference woman in only one trait, as noted in the stub.

Panel A shows that as age at marriage increases, the fifth-year dissolution probability falls from 0.27 for marriages contracted in the teens to 0.09 for marriages at

age 33 or older. This first set of results shows that there is no U-shaped pattern and the total effect of age on marital instability is negative: controlling only for the wife's background characteristics, as age at marriage rises, the probability of divorce declines. Re-estimation of the model with the 27-29 age category as benchmark shows that the dummies for 30-32 and 33 or older are not statistically significant, revealing a flattening in the age at marriage- marital instability relationship beyond age 29: further increases in age do not significantly reduce the probability of marriage dissolution.

As expected, the coefficients on the control variables reveal that individuals raised in families where the parents never married or dissolved their unions have a higher likelihood of divorce; the coefficient on the variable indicating parental death is not significant. Also consistent with expectations, individuals raised with no religion are seen to be at a higher risk of marital instability, although significance is marginal ($t = 1.6$). The estimates for the control variables provide a way of assessing the relative importance of the age effect. For example, the destabilizing effect of getting married in the teens relative to age 20-26 (an increase in the fifth-year dissolution probability from 0.16 to 0.27) is of the same order of magnitude as the destabilizing influence of having parents who never married (an increase in the probability from 0.16 to 0.29).

In Panel B, which adds controls for the wife's characteristics at the time of marriage, the non-intact family background variables other than parental death continue to be positively associated with marital instability. The effect of having grown up without a religious affiliation becomes weaker in size and significance, suggesting that this variable largely operates by influencing the odds of entering informal living arrangements. Cohabitation with individuals other than the first spouse is associated with

an increase in the probability of dissolution; the effect is especially pronounced when two or more partners are involved. An out-of-wedlock child also has a destabilizing effect. The influence on marital instability of years of schooling completed is negative and sizeable. Regarding age at marriage, the effects in this specification also reveal a negative effect: as age increases from under 20 to 33 or older, the fifth-year dissolution probability falls from 0.24 to 0.08.

Panel C adds controls for the husband's traits and the characteristics of the couple. All the control variables that were significant in Panel B remain significant here, but with smaller coefficients (an exception is prior cohabitation with one partner other than the spouse, which is now insignificant). Marital instability is higher if the husband has less than a college education and if he had been married before. Couples who lived together prior to formalizing their union have a higher likelihood of subsequent marital instability, as do unaffiliated couples and those that are heterogamous in religion, race/ethnicity, or education. Differences in age are destabilizing if the wife is the older partner. However, there is no adverse influence if the husband is older than the wife; this was true also when the dummy variable was redefined to capture a difference of eight and even ten years.

All the observed variables that are systematically associated with age are controlled in this specification and the coefficients on the age at marriage dummies provide an estimate of the pure maturity effect. This effect predicts that, other factors held constant, we should observe a pattern of declining instability as age at marriage rises. Consistent with this, the results sow that for women who marry in the teens, the fifth-year dissolution probability is 0.19; the probability declines to 0.13 for those who marry at age 20-26[6]; and to 0.05-0.09 for those who enter marriage later.

The estimated fifth-year probabilities of dissolution provide a good way to assess the absolute magnitudes of the effects and also to compare the influence of age at marriage with that of other variables included in the model. For comparisons across models, however, the hazard ratio is a more useful measure, and the discussion below focuses on this statistic. The ancillary analyses reported in Table 3 help interpret the results.

Table 2, Panel C shows that the risk of instability for marriages contracted in the teens is higher than for those contracted at ages 20-26 by 50%. The total effect, shown in Panel A, is substantially larger: 73%. Panel A in Table 3 reveals the reason: women who marry during their teens are at a high risk of divorce not only because of the maturity effect, but also because of their unusually low level of schooling. Among teen wives, 51.0% have less than 12 years of schooling and of course none have a college degree; in contrast, the corresponding figures are 6.0% and 17.2% for women who are 20-26 years of age at the time of marriage.

A different picture emerges for the comparison between the reference group, ages 20-26, and women who marry later. Using the 27-29 age category as illustration (a similar pattern holds for the older ages), Panel C of Table 2 shows that the maturity effect is large: other factors held constant, the risk of instability for women who marry at ages 27-29 is 64% of the risk for their counterparts who wed at ages 20-26. The total effect (Panel A) is smaller: when other factors are not held constant, the risk of instability for women who enter marriage at age 27-29 is 70% of that of their counterparts who wed at ages 20-26.

[Insert Table 3 here]

Panels B and C of Table 3 shed light on these results. Compared to their counterparts who enter marriage at ages 20-26, women who marry later do so with men who are better educated (and have better financial prospects), which tends to make their unions more stable. But on virtually every other observable trait, women who marry later have a match that is less favorable for marital stability: the husband is more likely to have been married previously, to be at least three years younger than her, and to differ in religion and education; premarital cohabitation is also more likely. These results are consistent with Becker et al.'s (1977) hypothesis that women who are still single in their late twenties lower their reservation offers, i.e., they confirm the notion of a "poor match effect" emerging at the later ages. However, contrary to Becker et al.'s findings based on data from the 1960s, Table 2, Panel A shows that the maturity effect, which operates in the opposite direction, initially dominates and then cancels out the poor match effect: increases in age at marriage up to the late twenties are associated with a marked decline in the likelihood of dissolution, with the age at marriage- marital instability relationship flattening in the thirties.

Cycle 6 Results

The findings for cycle 6 are presented in Table 4. Focusing first on the control variables, the results are remarkably consistent with those discussed above for cycle 5. A broken-home family background adversely affects marital stability in the three specifications. Growing up with no religious affiliation has an adverse influence in Panel A, but consistent with the pattern for cycle 5, the effect loses significance after controls are added in Panel B.

[Insert Table 4 here]

The descriptive statistics reported in Table 1 confirm the well known increase over time in cohabitation (with both the spouse and previous partners). Consistent with the hypothesis that the unobserved characteristics of cohabitors have correspondingly become less distinct, Table 4 shows that cohabitation with other partners no longer has a discernible effect on marital stability. Surprisingly, however, comparison of the cycle 5 and cycle 6 results reveals no evidence of a decline over time in the adverse impact associated with prenuptial cohabitation with the husband.

The adverse effects on marital stability of a child from a previous union, a prior marriage of the husband, and race/ ethnicity heterogamy that were found in cycle 5 are present here also, and the same is true of the favorable effect associated with higher levels of wife's education. Information on the husband's education is unavailable in cycle 6, and this may account for the unexpected result that marital stability is higher when the husband is substantially older than the wife. To the extent that high levels of husband's permanent income are traded for wife's youth in the marriage market, husband's education is likely to be relatively high in these cases. The coefficient on the dummy for husband being younger than the wife, which is insignificant, may be similarly affected by omitted variables biases.

The lack of information in cycle 6 on the husband's education and religion-- both of which were shown to have important influences in cycle 5—also biases the estimate of the maturity effect, as measuring such influence depends critically on being able to hold constant the relevant factors. The theoretical expectation is that Panel C, which provides an estimate of this effect, should show that the probability of union dissolution declines

steadily as age at marriage rises. In light of the limited set of available controls, the non-linear pattern shown by the point estimates is not surprising: as age at marriage rises from less than 20 to 20-26, 27-29, and 30 and over, the fifth-year dissolution probability falls from 0.31 to 0.21 and 0.14, and then rises to 0.16. The dummies for 30-32 and 33 or older are not significantly different from the 27-29 category, however, and the upturn in the curve is not significant.

The limitations of the cycle 6 data do not pose difficulties for estimation of the key relationship, namely, the total effect, shown in Panel A. The point estimates are consistent with the U-shaped relationship posited by Becker, Landes and Michael. As age at first marriage increases from less than 20 to 20-26, to 27-29, and to 30 and over, the fifth-year dissolution probability declines from 0.34 to 0.22, and 0.13, and then rises to 0.16-0.18. However, the dummies for 30-32 and 33 or older are not significantly different from the 27-29 category (t-values are 0.9 and 1.4, respectively). Overall, the relationship between age at marriage and marital instability is strongly negative initially and flattens out beyond age 29, suggesting that as was true in cycle 5, there is a poor match effect that emerges at the late ages which offsets the maturity effect.

Table 5 indeed provides evidence of a poor match effect very similar to that uncovered for cycle 5. Women who wed in their late twenties or thirties have an advantage with regard to marital stability in terms of higher levels of schooling, but disadvantages in other areas. They are more likely to display prenuptial cohabitation; their husbands are more likely to have been previously married and to be substantially younger than them. They are also more likely to have a child from a previous union, although this difference is only marginally significant.

[Insert Table 5 here]

Additional Analyses of Cycles 5 and 6

Summarizing the main results regarding the total effect (Panel A, Tables 2 and 4), the point estimates for cycle 5 show a steadily declining probability of marriage dissolution as age at marriage increases; the point estimates for cycle 6 suggest an upturn in the relationship in the thirties. In both cases, changes beyond age 30 are not statistically significant, indicating that at these late ages at marriage, the opposing maturity and poor match effects cancel each other out. These results raise the following question: Is the U-shaped pattern indicated by the cycle 6 point estimates suggestive of a change over time in the relationship between age at first marriage and marital stability, which might be discerned more clearly if a larger sample size were available?

The fact that both cycles include marriages contracted in the 1972-1995 period provides an opportunity to explore this question. The results in Table 6 show that when the cycle 5 and 6 samples are restricted to such marriages, the patterns evident in Panel A of Tables 2 and 4 persist. Thus, although comparative analyses of the two cycles reveal a clear tendency towards later entry into first marriage over time, there is no evidence that such delays are exposing women to an elevated risk of future marital instability.

[Insert Table 6 here]

CONCLUDING REMARKS AND DIRECTIONS FOR FUTURE RESEARCH

One of the salient features of the second demographic transition currently underway in the United States and other industrialized nations is a pattern of delayed

entry into formal marriage. Using data from the 1995 and 2002-2003 cycles of the National Survey of Family Growth, this paper has explored the implications of this phenomenon for marital stability. Analyses of both cycles show that, compared to women who wed in the early and mid-twenties, women who marry later tend to display matches of lower quality. Cycle 5, which includes information on husband's education, shows that this dimension of the match is an important exception. For both cycles, the stabilizing effect associated with the greater maturity that comes with age counteracts the poor match effect that emerges at the later ages, and overall, beyond the late twenties, further increases in age at marriage have no significant impact on marital instability.

While the age at marriage-marital instability curve flattens in the early thirties, the strongly favorable effect of postponing marriage is the most salient pattern in both cycles: the unions of women who delay entry into marriage are more stable than those of their counterparts who wed in their teens by a wide margin. This age at marriage – divorce connection, coupled with the trend towards delayed marriage, is undoubtedly a major force in the overall decline in the rate of marriage dissolution in the United States since the early 1980s (Goldstein 1999; Popenoe and Whitehead 2004).

Due to limitations of sample size, this study was not able to explore the linkage between age at marriage and marital instability for African-Americans, Latinas, and other minorities. For disadvantaged groups, the second demographic transition has involved a pattern of increased out-of-wedlock childbearing and a retreat from formal marriage (McLanahan 2004). Recent research has also begun to show significant differences by race and ethnicity in how various factors influence the stability of marital unions (Phillips and Sweeney 2005). Exploring whether the relationships found here are unique to non-

Hispanic white women or whether they extend also to other groups of the population would be an important avenue for further research.

ENDNOTES

[1] For a review of other determinants of marital instability, including own children and other human capital investments, see Weiss 1997, and Lehrer 2003.

[2] Contrary to the prediction of Becker's (1973) model, there is positive assortative mating by wages when other factors are held constant. Lam (1988) provides an explanation for this empirical regularity. He develops the idea that joint consumption of public goods, an important source of gains from marriage, generates a tendency for positive assortative mating by wages due to the returns from the spouses having similar demands for public goods.

[3] Another interpretation that has been suggested for the effect of age is as a proxy for the length of search and the quality of the match (Willis and Weiss 1997). However, as the pattern of delayed marriage has unfolded over the past decades, the connection between age at marriage and the length of the dating process has weakened. Substantial anecdotal evidence suggests that couples entering marriage in the late twenties and thirties often first met as mature adults.

[4] To minimize loss of information, imputations were used for missing data. Most imputations, including the dates of various events, were available in the public use data files, based on sophisticated imputation procedures. The few cases that had missing information on education were assigned the lowest education category; the modal category was used for other control variables. Dummy variables indicating imputations for the controls were included in preliminary runs; they were insignificant in all cases and dropped in the final models.

[5] In the empirical analysis, union dissolution was defined as of the date of divorce for respondents whose first marriage had ended in divorce, and as of the date the spouses stopped living together for those who had been married only once and were separated at the time of the interview. Unions that were dissolved through widowhood were treated as censored at the time of the husband's death.

[6] The estimated fifth-year dissolution probability for the reference woman is lower in this specification, because the regression now includes the husband's and couple's characteristics, and the modal traits are generally associated with stabilizing forces (husband not married before, homogamy in all dimensions).

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Table 1. Definitions and Means of Variables[a]

Variable	Definition	Cycle 5	Cycle 6
Wife's Age at Marriage	=1 if respondent's (R) age at marriage was in category indicated		
less than 20		0.29	0.19
(20-26)		*(0.56)*	*(0.58)*
27-29		0.09	0.12
30-32		0.04	0.06
33 or older		0.02	0.05
Wife's Background Characteristics			
Family of origin not intact	=1 if R's family of origin was not intact[b]		
due to death		0.06	
due to divorce or separation		0.20	
due to parents never having married		0.04	
due to any reason			0.30
(intact)		*(0.70)*	
Unaffiliated	=1 if R was raised with no religious affiliation	0.06	0.08
Wife's Characteristics at Marriage			
Education	=1 if at date of first marriage, R's education was in category indicated[c]		
less than 12 years		0.19	0.12
(12 – 15 years)		*(0.65)*	*(0.60)*
16 years or more		0.16	0.28

Table 1 (continued)

Variable	Definition	Cycle 5	Cycle 6
Cohabitation with others	=1 if before the date of first marriage, R had cohabited with one, or two or more other partners, as indicated		
one partner		0.06	0.10
two or more partners		0.01	0.03
(none)		*(0.93)*	*(0.87)*
Child from previous union	=1 if R had had a live birth prior to the date of first marriage	0.09	0.14
Husband's Characteristics at Marriage			
Education	=1 if education of R's husband as of date of marriage was in category indicated[d]		
less than 12 years		0.15	
(*12-15 years)*		*(0.65)*	
16 years or more		0.20	
Married before	=1 if R's husband had been married before	0.16	0.15
Characteristics of Couple			
Premarital cohabitation	=1 if R cohabited with husband prior to marriage	0.36	0.50
Religious composition	=1 if religious composition of marriage is as indicated[e]		
Different religion		0.26	
One partner unaffiliated		0.17	
Both partners unaffiliated		0.02	
Both partners have same religion		*(0.55)*	

Table 1 (continued)

Variable	Definition	Cycle 5	Cycle 6
Different race/ ethnicity	=1 if husband is non-white and/or Hispanic	0.07	0.08
Different education	=1 if spouses' education levels at marriage were in different categories (less than 12 years; 12-15; 16 or more)	0.34	
Age composition	=1 if difference between husband's and wife's age is as indicated		
6 years or more		0.14	0.16
– 3 years or less		0.02	0.04
(more than –3; less than 6)		*(0.84)*	*(0.80)*
n		4,413	2,437

[a] For variables with more than two categories, the reference category is noted in parentheses.

[b] In cycle 5, non-intact family is measured as of age 16 and the reason for a broken-home background is available. In cycle 6, the measurement is as of age 18 and the reason is not documented.

[c] In cycle 5, the wife's education at the time of the marriage is estimated based on information on the date of marriage and the dates when she obtained her high school diploma and any other degrees, if applicable. In cycle 6, the wife's education at marriage is estimated by using information on the date of marriage, the date of high school completion, if applicable, and the years of schooling completed as of the survey date, coupled with the assumption that any education beyond high school was obtained continuously, without interruptions, after finishing secondary schooling.

[d] Cycle 5 contains a specific question regarding the husband's level of education at the date of marriage; cycle 6 contains no information on this variable.

[e] Cycle 5 includes includes broad categories for the husband's affiliation (Protestant, Catholic, Jewish, other, no religion); the religious heterogamy dummy is defined to equal 1 if the spouses belong to different groups. Cycle 6 contains no information on the husband's religion.

Table 2. Cox Proportional Hazards Models of Divorce : Cycle 5
(standard errors in parentheses)

	Panel A: Controlling only for wife's background characteristics			Panel B: Adding wife's characteristics at marriage			Panel C: Adding husband's characteristics at marriage and characteristics of the couple		
	Total Effect						**Maturity Effect**		
	Coefficient	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*
Wife's Age at Marriage									
Less than 20	0.548 (0.05)**	1.73	0.27	0.407 (0.06)**	1.50	0.24	0.404 (0.07)**	1.50	0.19
20-26 (reference)			***0.16***			***0.18***			***0.13***
27-29	-0.362 (0.13)**	0.70	0.12	-0.371 (0.14)**	0.69	0.12	-0.453 (0.14)**	0.64	0.09
30-32	-0.467 (0.22)**	0.63	0.11	-0.473 (0.22)**	0.62	0.11	-0.682 (0.23)**	0.51	0.07
33 or older	-0.682 (0.38)*	0.51	0.09	-0.720 (0.38)**	0.49	0.08	-0.984 (0.39)**	0.37	0.05
Wife's Background Characteristics									
Family of origin not intact									
death	0.114 (0.10)	(1.12)[a]	(0.18)	0.079 (0.10)	(1.08)	(0.18)	0.055 (0.10)	(1.06)	(0.14)
divorce or separation	0.448 (0.06)**	1.56	0.25	0.351 (0.06)**	1.42	0.23	0.263 (0.06)**	1.30	0.17
parents never married	0.633 (0.11)**	1.88	0.29	0.519 (0.11)**	1.68	0.26	0.408 (0.11)**	1.50	0.19
Unaffiliated	0.164 (0.10)	(1.18)	(0.19)	0.131 (0.10)	(1.14)	(0.19)			

Table 2: Continued

	Panel A			Panel B			Panel C		
	Coefficient	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*
Wife's Characteristics at Marriage									
Education									
less than 12 years				0.275 (0.07)**	1.32	0.21	0.175 (0.07)**	1.19	0.16
16 years or more				-0.423 (0.11)**	0.66	0.11	-0.264 (0.11)**	0.77	0.10
Cohabitation with others									
one partner				0.285 (0.13)**	1.33	0.21	0.107 (0.13)	(1.11)	(0.15)
two or more partners				0.634 (0.21) **	1.89	0.29	0.426 (0.21)**	1.53	0.20
Child from previous union				0.359 (0.09)**	1.43	0.23	0.211 (0.09)**	1.24	0.16
Husband's Characteristics at Marriage									
Education									
less than 12 years							0.06 (0.07)	(1.07)	(0.14)
16 years or more							-0.419 (0.10)**	0.66	0.09
Married before							0.310 (0.08)**	1.36	0.18

Table 2: Continued

	Panel A			Panel B			Panel C		
	Coefficient	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*
Characteristics of Couple									
Premarital cohabitation							0.195 (0.06)**	1.21	0.16
Religious composition									
Different religion							0.198 (0.06)**	1.22	0.16
One partner unaffiliated							0.571 (0.07)**	1.77	0.22
Both partners unaffiliated							0.288 (0.17)*	1.33	0.17
Different race/ethnicity							0.349 (0.09)**	1.42	0.18
Different education							0.141 (0.06)**	1.15	0.15
Age difference									
6 years or more							-0.041 (0.08)	(0.96)	(0.13)
-3 years or less							0.514 (0.20)**	1.67	0.21

n = 4,413

[a] Hazard ratios and probabilities are shown in parentheses when the corresponding coefficient is not significant at the 0.10 level.

** $p < 0.05$; * $p < 0.10$

Table 3. Selected Characteristics by Age at Marriage : Cycle 5[a]

	Age at Marriage				
	<20	*20-26*	*27-29*	*30 or older*	χ^2 test (p-value)
PANEL A: *Wife's Characteristics at Marriage*					
Education					
less than 12 years	51.0	6.0	3.9	5.6	<0.01
16 years or more	0.0	17.2	39.2	42.7	<0.01
Cohabitation with two or more partners	0.1	1.2	4.1	7.1	<0.01
Child from previous union	6.4	9.2	11.1	16.5	<0.01
PANEL B: *Husband's Characteristics at Marriage*					
Education: 16 years or more	2.5	23.0	39.7	41.2	<0.01
Married before	7.8	15.6	27.1	42.7	<0.01
PANEL C: *Characteristics of Couple*					
Premarital cohabitation	22.2	37.9	59.3	57.3	<0.01
Age difference: - 3 years or less	0.2	1.3	9.0	15.7	<0.01
Race/ethnicity difference	7.2	6.0	7.7	8.2	0.25
Different education	39.8	29.1	37.4	40.1	<0.01
Different religion	22.8	25.9	33.8	26.6	<0.01

n = 4,413

[a] Figures reported are percentage of cases with dummy variable equal to 1.

Table 4. Cox Proportional Hazards Models of Divorce: Cycle 6
(standard errors in parentheses)

	Panel A: Controlling only for wife's background characteristics			Panel B: Adding wife's characteristics at marriage			Panel C: Adding husband's characteristics at marriage and characteristics of couple		
	Total Effect						**Maturity Effect**		
	Coefficient	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*
Wife's Age at Marriage									
Less than 20	0.504 (0.08)**	1.66	0.34	0.363 (0.08)**	1.4	0.32	0.441 (0.08)**	1.56	0.31
20-26 (reference)			***0.22***			***0.23***			***0.21***
27-29	-0.558 (0.14)**	0.57	0.13	-0.420 (0.14)**	0.66	0.16	-0.478 (0.14)**	0.62	0.14
30-32	-0.360 (0.19)*	0.70	0.16	-0.230 (0.19)	(0.80)	(0.19)	-0.305 (0.20)	(0.74)	(0.16)
33 or older	-0.207 (0.22)	(0.81)[a]	(0.18)	-0.149 (0.23)	(0.86)	(0.20)	-0.272 (0.23)	(0.76)	(0.16)
Wife's Background Characteristics									
Family of origin not intact	0.359 (0.07)**	1.43	0.30	0.273 (0.07)**	1.31	0.29	0.242 (0.07)**	1.27	0.26
Unaffiliated	0.225 (0.12)*	1.25	0.27	0.174 (0.12)	(1.19)	(0.27)	0.135 (0.12)	(1.14)	(0.24)
Wife's Characteristics at Marriage									
Education									
less than 12 years				0.151 (0.09)	(1.16)	0.27	0.092 (0.10)	(1.10)	(0.23)
16 years or more				-0.551 (0.11)**	0.58	0.14	-0.541 (0.11)**	0.58	0.13

Table 4: Continued

	Panel A			Panel B			Panel C		
	Coefficient	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*	*Coefficient*	*Hazard Ratio*	*5th year dissolution probability*
Cohabitation with others									
one partner				0.016 (0.13)	(1.02)	(0.24)	-0.004 (0.13)	(0.98)	(0.21)
two or more partners				0.247 (0.23)	(1.28)	(0.29)	0.193 (0.24)	(1.21)	(0.25)
Child from previous union				0.505 (0.09)**	1.66	0.36	0.429 (0.10)**	1.54	0.30
Husband's Characteristics at Marriage									
Married before							0.313 (0.10)**	1.37	0.28
Characteristics of Couple									
Premarital cohabitation							0.232 (0.07)**	1.26	0.26
Different race/ethnicity							0.425 (0.11)**	1.53	0.30
Age difference									
6 years or more							-0.412 (0.11)**	0.66	0.14
-3 years or less							-0.029 (0.21)	(0.97)	(0.20)

n = 2,437

[a] Hazard ratios and probabilities are shown in parentheses when the corresponding coefficient is not significant at the 0.10 level.

** $p < 0.05$; * $p < 0.10$

Table 5. Selected Characteristics by Age at Marriage : Cycle 6[a]

	Age at Marriage				
	<20	*20-26*	*27-29*	*30 or older*	χ^2 test (p-value)
PANEL A: *Wife's Characteristics at Marriage*					
Education					
less than 12 years	34.5	7.7	3.3	5.0	<0.01
16 years or more	0.0	26.7	55.5	51.7	<0.01
Child from previous union	11.9	13.3	13.7	18.2	0.12
PANEL B: *Husband's Characteristics at Marriage*					
Married before	8.9	13.4	17.7	32.4	<0.01
PANEL C: *Characteristics of Couple*					
Premarital cohabitation	35.0	48.5	66.6	64.9	<0.01
Age difference: - 3 years or less	0.9	1.4	10.7	17.8	<0.01
Race/ethnicity difference	9.1	8.2	8.7	8.1	0.93

n= 2,437

[a] Figures reported are percentage of cases with dummy variable equal to 1.

Table 6. Cox Proportional Hazards Models of Divorce for Cycles 5 and 6: Samples Restricted to Marriages Contracted in 1972-1995[a]
(standard errors in parentheses)

	Cycle 5 n = 3,999				Cycle 6 n = 1,606			
	Mean of variable	Coefficient	Hazard Ratio	5th year dissolution probability	Mean of variable	Coefficient	Hazard Ratio	5th year dissolution probability
Less than 20	0.24	0.591 (0.06)**	1.81	0.28	0.24	0.480 (0.08)**	1.62	0.33
20-26 (reference)	0.60	- -	- -	**0.17**	0.59	- -	- -	**0.22**
27-29	0.10	-0.370 (0.13)**	0.69	0.12	0.11	-0.659 (0.16)**	0.52	0.12
30-32	0.04	-0.476 (0.22)**	0.62	0.11	0.04	-0.421 (0.23)*	0.66	0.15
33 or older	0.02	-0.698 (0.38)*	0.50	0.09	0.02	-0.064 (0.31)	(0.94)	(0.21)

[a] The regressions include controls for unaffiliated and nonintact family (one dummy for cycle 6, separate dummies by cause of broken-home background in cycle 5).