Age at Coresidence, Premarital Cohabitation, and Marriage Dissolution: 1985–2009

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This is the accepted version of the following article:

Abstract:

Does the age at which premarital cohabitors moved in together explain why they have been found to have an increased risk of marital dissolution? Explanations for the increased risk of marriage dissolution among those who marry young center on marital role preparation; for premarital cohabitors, many, if not most, of these roles began at the onset of cohabitation, not marriage. Analyses of the 1995, 2002, and 2006–2010 waves of the National Survey of Family Growth ($N = 7,037$) revealed that age at coresidence explained a substantial portion of the higher marital dissolution risk of premarital cohabitors. In comparisons standardized by age at coresidence, the difference in risk of marital dissolution between premarital cohabitors and those who married without prior cohabitation ("direct marriers") was much smaller than in comparisons standardized by age at marriage, and in some models this difference was not significant. Selection into direct marriage and premarital cohabitation was also examined.

Keywords: cohabitation | coresidence | dissolution | divorce | event history analysis | marriage

Article:

Rates of cohabitation have risen dramatically in the United States over the past several decades. A large body of research covering the 1970s–1990s found that marriages that followed cohabitation during those decades had a higher rate of divorce than marriages that began without prior cohabitation (Bumpass & Sweet, 1989; Lillard, Brien, & Waite, 1995; Phillips & Sweeney, 2005; Teachman, 2003; Woods & Emery, 2002). More recent research has found that for individuals marrying in the 2000s, premarital cohabitation, which had become common, had a smaller or neutral relationship with divorce risk (Manning & Cohen, 2012; Reinhold, 2010).

The relationship found between divorce and cohabitation in earlier decades may have been a causal relationship, resulting from cohabiting couples' ability to leave the relationship at any time without undertaking the legal procedures involved in a divorce. Partners may have become

accustomed to this ability to easily leave the coresidential relationship and carried this "individualistic ethic" into their marriage, thereby increasing their divorce risk (Cherlin, 1992, p. 16). Cohabitation has also been found to decrease levels of religiosity (Thornton, Axinn, & Hill, 1992), which could lead to an increase in later likelihood of divorce.

Selection into cohabitation is perhaps a more plausible explanation of the previously found association between cohabitation and increased divorce risk. Couples who did not cohabit with their spouse before marriage (referred to in this article as *direct marriers*) may represent a more select group that is less divorce prone than couples who did cohabit before marriage (Lillard et al., 1995). Factors that affect selection into cohabitation may have changed over time as it became more common, resulting in the changing relationship between premarital cohabitation and divorce.

One factor that may have influenced the higher divorce rates of premarital cohabitors is the age at which they began their coresidential relationship. Although not an alternative to marriage altogether, cohabitation has to some degree become a relationship that serves as an alternative to early marriage (Bumpass & Lu, 2000; Bumpass & Sweet, 1989; Bumpass, Sweet, & Cherlin, 1991; Raley, 2000, p. 20). Extensive previous research has found that younger ages at marriage were associated with higher rates of divorce (Booth & Edwards,1985; Heaton, 1991; Raley & Bumpass, 2003; South, 1995; Teachman, 2002).

Cohabitation precedes marriage, and therefore age at coresidence is necessarily lower than age at marriage for couples who cohabited prior to marriage. This younger age at union formation for premarital cohabitors may then explain some of their increased divorce risk when compared with direct marriers. Couples in cohabiting relationships take on many, if not most, of the roles associated with marriage, including living together and running a household together; entrance into marriage among premarital cohabitors is more of a symbolic transition than a functional transition (Cherlin, 2004). This symbolic change may result in some behavioral changes due to couples' shifting expectations of their own roles, the way other people treat that couple due to this symbolic shift, and the added trust that the relationship will endure due to the public nature of a marital commitment, along with barriers external to the relationship that decrease the likelihood of separation (Cherlin, 2000; Kuperberg, 2012; Waite & Gallagher, 2000). Nevertheless, marriage does not seem to result in drastic shifts in behavior; cohabiting individuals who intended to marry their partner had the same levels of relationship quality as already-married individuals (Brown & Booth, 1996) and behaved similarly to recently married individuals who cohabited before marriage in myriad other ways, including work and housework habits, level of savings and debt, and rates of unhealthy behaviors (Kuperberg, 2010, 2012).

Insofar as age at marriage is related to later outcomes, premarital cohabitors who eventually marry inhabit a gray area when it comes to what age should be used as the salient start of their relationship in models analyzing divorce risk. Should age be measured when they legally married or earlier, when they began to take on most marital roles? In this article, I explore the extent to

which the age at which premarital cohabiting women began their coresidence can explain the association between premarital cohabitation and marital dissolution.

Age at Coresidence or Age at Marriage?

Researchers of divorce and premarital cohabitation typically standardize age of entry into the marital relationship using age at marriage in statistical models. A review of the literature on cohabitation and divorce revealed that most researchers accounted for age at marriage in their regression analyses (Bennett, Blanc, & Bloom, 1988; DeMaris & Rao, 1992; Manning & Cohen, 2012; Phillips & Sweeney, 2005; Reinhold, 2010; Teachman, 2003; Teachman & Polonko, 1990), one accounted for age at the time of data collection (Lillard et al., 1995), and some did not account for age at all (Lichter & Qian, 2008; Woods & Emery, 2002), but none accounted for the age at which the couple began their coresidential union.

Although many researchers have attempted to find out why premarital cohabitation is linked to higher rates of divorce after marriage, and other research has found that premarital cohabitation is to some extent substituting for early marriage, no researchers to date have connected this literature to the rich (albeit somewhat older) literature on the association of early age at marriage and divorce. This literature established that couples who married at a later age tended to divorce at a lower rate, at least until age at marriage reached the late 20s, at which point this association plateaued (Booth & Edwards, 1985; Heaton, 1991; Raley & Bumpass, 2003; South, 1995; Teachman, 2002). Selection effects did not completely explain the link between age at marriage and divorce, and several researchers have found that this link persisted even after controlling for a wide variety of potential mitigating factors (Booth & Edwards, 1985; Heaton, 1991; South, 1995; Teachman, 2002).

Insofar as this age effect may be associated with taking on the roles of marriage and selecting a partner rather than entry into legal marriage, this earlier age at coresidence may explain some of the increased divorce risk for individuals who cohabit with their spouse before marriage. One explanation for the correlation between earlier age at marriage and divorce is that couples who married at younger ages were less prepared in emotional, psychological, and instrumental ways for the process of selecting a partner and/or for a satisfactory performance of marital roles (Lee, 1977). They may have had less adequate role models themselves (a selection process) and may also, by the act of marriage, have ended a "marriage apprenticeship" in which they observed their family of origin and learned how to properly fulfill the role of a spouse (Booth & Edwards, 1985). Furthermore, couples who married at younger ages may have had less certainty in their long-term personal aspirations and goals when they married and may have found, as they grew older, that they had misjudged the potential and trajectory of their partners (Lehrer, 2008) or that their changing values and goals led to incompatibility with their partner. Those who married later might also have revised their expectations downward and settled for a less-than-ideal match because of the "ticking biological clock" (Lehrer & Chen, 2011), whereas those who

married at younger ages may have had less realistic expectations of what marriage would entail because they had not revised those expectations.

Empirical research supports the theory that couples who married at younger ages were both less likely to select an ideal marriage partner, as measured by companionship and marital tensions following marriage, and less likely to be prepared for roles associated with marriage. Lee (1977) found a positive correlation between age at marriage and both marital satisfaction and marital companionship and a negative correlation between age at marriage and marital tensions. Similarly, Booth and Edwards (1985) found that marital role performance was positively correlated with age and negatively correlated with marital instability. Age at marriage was also positively associated with education, income, asset accumulation, and other instrumental aspects of role preparation (Lee, 1977; South, 1995; Uecker & Stokes,2008), along with satisfaction with standards of living (Lee, 1977).

Two other mechanisms explaining why couples who married at younger ages divorced at higher rates have been proposed but were not supported by empirical tests (Booth & Edwards, 1985; South, 1995). The first is that when individuals married at an earlier age, they were aware that if they divorced quickly they would have a relatively high chance of remarriage and, as a result, may have had lower levels of tolerance for marital dissatisfaction (Lee, 1977). The second is that younger couples were less likely to face external barriers to separation that older couples faced, such as moral pressure from families to stay with their spouse, as many teenage marriages may have occurred without high levels of parental approval (Booth & Edwards, 1985).

These proposed mechanisms through which age at marriage affects divorce indicate that age at coresidence may be more salient to future divorce risks than age at marriage. Couples who formed coresidential unions at early ages ended a "marriage apprenticeship" at the time of coresidence (or earlier) rather than at marriage and should theoretically have been subject to other underlying causes of poor role preparation. Premarital cohabitors who selected their partners at younger ages may have been emotionally, psychologically, and instrumentally unprepared for the selection of their partner (Lee, 1977) and therefore selected partners who were not ideal in the long term. Inadequate preparation for partner selection is related to the age at which a person forms a union with his or her future spouse; in the case of couples who cohabited before marriage, age at coresidence is a more accurate approximation of the age at which they formed a union with their future spouse than age at marriage. Furthermore, whereas married couples may change their behavior following marriage to some degree, many of the roles previously associated with marriage for which young couples may not be well prepared are taken on at the start of coresidence, not at the start of marriage. Therefore, if role preparation is the reason that age at marriage is negatively associated with divorce, then for premarital cohabitors it would make more sense to compare couples by the age at which they began those roles—which is the age at which they began to live together.

Although cohabitation experiences may have exposed these role failures, and a certain proportion of cohabiting couples may have separated as a result, some proportion of cohabiting couples may have moved to marriage as a result of relationship inertia associated with cohabitation that propels some couples into marriage after cohabitation because of the increased difficulty of separation after beginning a coresidential relationship (Stanley, Rhoades, & Markman, 2006). Cohabitors may also have faced increased normative pressure to marry after coresiding for a certain period of time, which could have propelled some cohabiting couples into marriage; Sassler (2004) found that, among cohabitors she interviewed, few discussed marriage before moving in together, but within the first year of cohabitation the topic of marriage was frequently raised. In addition, role failures may not have manifested until later in the relationship, perhaps when it was "too late" and the couple had already married. Finally, cohabitors might have married their partner with the hope that it would change their relationship for the better; Huston, Niehuis, and Smith (2001) found that some couples experienced disillusionment with their spouse fairly early on in their marriage, and they speculated that these couples may have entered marriage with the hope that marriage would improve their relationship but then divorced when this did not occur.

When examining these relationships in statistical models, it is important to take into account factors that may influence selection into cohabitation and that may explain the link between these factors and divorce rates not due to the act of cohabitation per se but rather due to selection into premarital cohabitation among groups perhaps more likely to divorce. Prior research has found selection into premarital cohabitation on the basis of race, education, mother's education, and religiosity (see Kuperberg, 2010), factors that were also accounted for in this study. Religion may be influenced by marital status later in life (Stolzenberg, Blair-Loy, & Waite 1995), and therefore I controlled for whether the women I examine had grown up with no religion rather than their reported religiosity at time of survey. "Serial cohabitation," or cohabiting with more than one partner before marriage, was found to be associated with premarital cohabitation and an increased risk of later divorce (Lichter & Qian, 2008), and so I included a measure of whether these women had cohabited with other partners prior to their first husband. I also included measures of pre-coresidential childbearing and "shotgun" coresidential relationships, in which the respondent was pregnant at time of coresidence (for premarital cohabitors) or marriage (for direct marriers) formation, reflecting recent research indicating that in recent years shotgun cohabitations have exceeded shotgun marriages (Lichter, 2012). Given the high overall levels of homogamy in many demographic characteristics of cohabiting and married couples (Blackwell & Lichter, 2004), including both husbands' and wives' demographic characteristics in the same model might result in inaccurate coefficients for the relationship between these characteristics and divorce due to multicollinearity. Therefore, I included measures of husbands' characteristics not as absolute measures but insofar as they were similar to their wives, the focus of these analyses. Specific measures in the models included whether a husband was 2 or more years younger or 5 or more years older than his wife, the respondent (a measure used by Phillips & Sweeney, 2005, and Teachman, 2003) and whether the husband was the same race as his wife.

Research has found that respondents' reports of unions formed in distant periods relative to survey collection were less likely to be accurate (Hayford & Morgan, 2008), and therefore the sample was limited to women who married within 10 years of survey collection, and survey wave was controlled for. Results were also examined separately by whether respondents married before or after 2000, and in full models examining both periods I controlled for period of marriage, because recent research has found that the association of cohabitation and divorce has become neutral among couples who married in the 2000s (Manning & Cohen, 2012; Reinhold, 2010).

Method

The data used in this article are from the 1995, 2002, and 2006–2010 waves of the National Survey of Family Growth (NSFG; http://www.cdc.gov/nchs/nsfg.htm), a cross-sectional nationally representative survey of women in the United States ages 15–44. The 2002 and 2006–2010 waves also surveyed men, but in the research reported in this article I examined female respondents only. The wave collected in 1995 had 10,847 respondents, the 2002 wave had 7,643 female respondents, and the last wave was collected between 2006 and 2010 and had 12,279 female respondents. Prior to the 1995 wave, detailed information about cohabitation experiences was not collected.

Using the NSFG, marital histories of respondents were reconstructed. In the 2002 wave, 183 women in the sample were missing information on the end date of their first marriage, and these dates were imputed by NSFG staff using a sequential multiple regression imputation procedure; in this article the imputed end dates of marriage provided by NSFG staff were used for these women as well as four women in the 1995 wave and four in the 2006–2010 wave. In addition, three women in 1995, five women in 2002, and two women in the 2006–2010 wave were missing dates on the beginning of marriage that have been imputed by NSFG staff, and these imputed dates were used. Research on the 2002 wave, which had an unusually high number of missing end dates, has shown that imputed end dates "appear to be . . . reasonable and comparable to other data sources" (Teachman, 2008, p. 297).

Marriages examined in this article were first marriages only. To be included in the sample, women had to have been married at least once within 10 years before taking the survey and had to have entered marriage between 1985 and 2009. Marriages were limited to those occurring before the age of 35 to account for age truncation in the data. Women who did not have complete or imputed information for date of marriage formation, date of cohabitation formation (if cohabited), and date or age at which first marriage ended (if ended) were excluded from the sample, as were women missing information on the control variables. A total of 7,267 women across all three waves of data collection married before age 35 in the 10 years before data collection and provided information on whether they had cohabited with their first husband. Of those, two were missing information on the duration of their marriage, two married in 2010, and 20 premarital cohabitors did not have information on age at cohabitation. An additional 206

people were missing information on one or more control variables. The final sample size was 7,037 women, with a total of 230 women, or 3.2% of the sample, excluded because of missing values on these variables.

To examine the extent to which the younger age at coresidence explained the higher marriage dissolution rate of cohabitors, taking into account other factors that may affect entrance into cohabitation and marriage dissolution, I estimated a series of Cox proportional hazards models predicting divorce. Cox proportional hazard models are a type of survival analysis model that take into account duration of the relationship and have the advantage of accounting for censoring at time of survey, after which some couples may dissolve their marriage (Blossfeld, Golsch, & Rohwer, 2007). Models accounted for the duration of time spent in marriage only. Kaplan–Meier graphs indicated that the proportional hazards assumption was not violated by these models. I compared hazard ratios for the relationship of premarital cohabitation and marriage dissolution in models that did not control for age and in models that controlled for age at marriage to hazard ratios for this relationship in models that controlled for for age at coresidence to determine the effect (if any) that the measurement of age had on the correlation between premarital cohabitation and divorce. I estimated the first set of models controlling only for cohabitation; period and survey wave controls; and, where indicated, age controls. I estimated the second set of models while also controlling for a select number of demographic characteristics that may have affected selection into cohabitation. Results are presented as hazard ratios, which are interpreted similarly to odds ratios; numbers higher than 1 indicate a positive relationship of that variable and marriage dissolution, and those between 0 and 1 indicate a negative relationship.

All results in this study were weighted to account for the complex survey design of these data. Results are nationally representative of women ages 15–44 in 1995, 2002, and 2006–2010 who married within 10 years of the survey. This method of weighting precluded goodness-of-fit statistics when estimating Cox regressions. To estimate goodness-of-fit statistics I therefore reproduced models using maximum likelihood methods of survival analysis, in which data were split by person-month. When it occurred, marriage dissolution was coded as 1 in the person-month of dissolution and 0 in other person-months for that respondent. Logistic regressions methods were then used to estimate the risk of divorce while controlling for person-month. Using methods developed by Archer and Lemeshow (2006), I then performed an F-adjusted mean residual test on these maximum likelihood models using the Stata command *estat gof*. Goodness-of-fit statistics presented are the p value results of these tests, which indicate the probability that the model does not fit the data, with higher values representing more strongly fitting models and values below .05 indicating a poorly fitting model. Results are not presented for models that do not control for age, because results of these tests are comparable only in models with the same number of independent variables.

Key Variables

Marriage dissolution

The outcome variable was marriage dissolution, which was coded as 1 if the respondent divorced or was separated from her first husband at the time the survey was collected and 0 if a respondent did not divorce or separate by the time of survey and were therefore censored. Respondents whose first husband died before the time the survey was collected were treated as censored at the time of their first husband's death and were not included among the divorced.

Marriage duration

For respondents who were married at the time of data collection, marriage duration was calculated by subtracting the date on which the marriage started from the date on which the interview occurred. For respondents whose marriages dissolved or whose first marriage ended with the death of the respondent's husband, marriage duration was calculated by subtracting the date on which the respondents reported they had separated from their husband or the date of husband's death from the date of marriage. Marriage durations ranged from 1 month to 10 years, with a median length of 5.25 years and a mean of 4.4 years.

Cohabitation

Premarital cohabitors were identified by the question "Some couples live together without being married. By living together, we mean having a sexual relationship while sharing the same usual address. Did you and [first HUSBAND] live together before you got married?" A separate dichotomous variable was used to indicate cohabitation with other partners prior to first marriage.

Age at coresidence and age at marriage

Age at coresidence was defined as the age at which women began their coresidential union with their spouse or eventual spouse. For premarital cohabitors, this was the age at which they began cohabiting with their eventual husband. For direct marriers, this age was the same at which they married. For premarital cohabitors, age at coresidence was calculated by subtracting the respondent's date of birth from the reported date at which the respondent began living with her first husband prior to marriage. For direct marriers, age at coresidence was calculated by subtracting the respondent's date of birth from the date at which the respondent married. Because these variables were coded in months, the resulting numbers were divided by 12, with fractions dropped, so that the unit of age measurement was in years rather than months. Age at marriage was calculated similarly, using date of marriage for both groups. To account for the previously found nonlinear relationship between age at marriage and divorce discussed above, additional controls were added for age at marriage squared in the models utilizing the age-at-marriage measure and age at coresidence squared in models utilizing the age-at-coresidence measure.

Control Variables

Period and survey controls

All regression models included control variables for period of marriage formation and survey wave. Period controls controlled for whether the marriage occurred between 1985 and 1999 or between 2000 and 2009, with the latter being the reference category. Dichotomous variables for survey wave were also included in regression models, with respondents in the 2006–2010 data set being the reference. The results of period and survey wave controls are not presented in tables of regression results and are available on request.

Additional controls

In addition to the period and survey wave controls, I calculated a series of models using additional control variables that may account for some selection into premarital cohabitation versus direct marriage. These controls included whether the wife was a serial cohabitor, that is, if she previously cohabited with other men prior to cohabiting or marrying her eventual husband, wife's race, wife's level of education at the time of marriage, wife's mother's level of education, whether the wife lived with both biological or adoptive parents at age 14, and whether she had been raised with no religion. Education at time of marriage was estimated on the basis of dates in which the respondent obtained her high school diploma and other degrees, if applicable. In the 2002 and first half of the 2006–2010 wave (2006–2008), data on date of bachelor degree completion were not collected. For these years, estimates were calculated by assuming that any education beyond high school reported at the survey collection date was obtained continuously without interruption, following methods used by Lehrer (2008). For respondents missing information on dates of both high school degree and bachelor's degree completion, where applicable, education at marriage was imputed as education at time of survey. To account for pregnancies that preceded coresidence, two measures of childbearing were included: One measured whether the wife gave birth to any children before beginning coresidence with her first husband, and a second measure accounted for shotgun coresidence and was a measure of whether the wife was pregnant before marriage (among direct marriers) or cohabitation (among premarital cohabitors) and moved in with the husband while pregnant, regardless of whether the pregnancy ended in a live birth, a stillbirth, or a miscarriage or if the respondent was still pregnant at interview. The NSFG included the date of both conception and the end of a pregnancy regardless of how the pregnancy ended, and this measure therefore included any woman for whom a conception of any pregnancy occurred prior to coresidence and the pregnancy ended during the month of coresidence or later. Respondents whose pregnancies ended in induced abortion were not included in this measure. Models also accounted for some husband's characteristics, as reported by their wives or former wives in this survey. These included whether a husband was 2 or more years younger or 5 or more years older than his wife and whether the husband was the same race as his wife.

Results

Descriptive statistics on variables included in these analyses are presented in Table 1 and demonstrated significant differences between premarital cohabitors and direct marriers. In this

sample, 56% of respondents cohabited with their first husband before marriage for an average of 2.2 years before entering marriage. The difference between age at coresidence and age at marriage for premarital cohabitors was also 2.2 years, meaning that premarital cohabiting couples began their coresidence on average around 2 years earlier than the direct-marrying couples to whom they were being compared in research that standardized comparisons of couples by age at marriage. Premarital cohabitors were significantly younger than direct marriers when they began their coresidence, with average ages at coresidence of 22.4 and 23.1, respectively. On the other hand, cohabitors were significantly older than direct marriers when they married; the mean age at marriage was 24.6 for cohabitors and 23.1 for direct marriers. On average, cohabitors had shorter marriage durations than direct marriers: 4.1 and 4.6 years, respectively.

Table 1. Descriptive Statistics for Women Ages 15–44 in 1995, 2002, and 2006–2010 and Their First Husbands

Characteristic	Total	Cohabitors	Direct marriers[a] (*P*)
Percentage cohabited before marriage	55.9		
Wife's age at coresidence (years)	22.7	22.4	23.1[d]
Wife's age at marriage (years)	24.0	24.6	23.1[d]
Marriage duration (years)	4.3	4.1	4.6[d]
Cohabitation duration (years)		2.2	
Previously cohabited with partner other than husband	15.5	22.1	7.2[d]
Race/ethnicity			
White non-Hispanic	69.3	71.3	66.8[c]
Black non-Hispanic	9.9	11.3	8.1[c]
Hispanic	14.7	13.0	16.9[d]
Asian American/Native American/other race, non-Hispanic	6.1	4.4	8.3[d]
Respondent's education			
Less than high school	10.1	10.8	9.0[b]
High school	29.0	31.3	26.2[c]
Some college	28.6	27.6	29.9 (*ns*)

College degree+	32.3	30.2	35.0[c]
Mother's education			
Mother less than high school	22.3	21.6	23.2 (*ns*)
Mother high school	37.4	39.1	35.3[b]
Some college	22.0	23.6	20.0[c]
College degree+	18.3	15.7	21.5[d]
Lived with both biological parents at 14	69.8	63.6	77.6[d]
Respondent grew up with no religion	7.3	9.4	4.7[d]
Moved in together while pregnant	9.8	8.7	11.1[c]
Pre-coresidence birth	27.0	32.9	19.5[d]
Husband is 5 or more years older	21.1	22.8	19.1[c]
Husband is < 5 older or < 2 years younger	71.5	68.8	75.0[d]
Husband is 2 or more years younger	7.3	8.5	5.8[c]
Husband is same race	87.3	86.0	88.9[c]
N	7,037	3,957	3,080

Note: The sample was restricted to women who married before age 35 and married within 10 years of the survey. Sample sizes were as follows: 1995 survey, n = 2,537; 2002 survey, n = 1,869; 2006–2010 survey, n = 2,631. [a] Prefers to t tests of difference between premarital cohabitors and direct marriers. [b] p < .05. [c] p < .01. [d] p < .001.

Descriptive statistics demonstrated that premarital cohabitors were significantly different from direct marriers on almost every variable measured, which likely is due to differential selection into premarital cohabitation. On average, women who cohabited with their first husband before their marriage were more than three times as likely as direct marriers to have previously cohabited with a partner other than their husband. Women who cohabited before marriage were also more likely than direct marriers to be White or Black, less likely to be Hispanic or of an other race, more likely to have stopped their education before entering college, less likely to have a college degree and less likely to have a mother who had completed a college degree, less likely to have lived with both biological or adoptive parents at age 14, and more likely to have grown up with no religion. Cohabitors were more likely than direct marriers to have had a pre-coresidential birth but significantly less likely to have moved in together when pregnant. Marriages that began with cohabitation were also less homogamous than those that did not;

women who cohabited before marriage were more likely to differ from their husbands in age and were less likely to be the same race as their husbands.

An examination of how premarital cohabitation and selection into premarital cohabitation changed across two cohorts is presented in Table 2. These two cohorts were differentiated on the basis of recent research that found that the effect of cohabitation on divorce has become neutral in cohorts marrying since 2000; the first cohort comprises individuals married before 2000, in 1985–1999, and the second comprises cohabitors who married between 2000 and 2009. Over these two cohorts cohabitation became an increasingly common and lengthy precursor to first marriages. Rates of premarital cohabitation increased from around 52% among women who married between 1985 and 1999 to around 62% among women who married between 2000 and 2009. Irrespective of whether cohabitation rates will continue to increase, almost two thirds of marriages in the latter cohort began in premarital cohabitation, and thus issues of premarital cohabitation and its relationship to divorce are relevant to the majority of recently formed marriages in the United States. The length of premarital cohabitation also grew significantly between these two cohorts, from 2 years in the first cohort to 2.6 years in the second. Although the difference between the two in ages at marriage and coresidence did not change between the two cohorts, both premarital cohabitors and direct marriers married and coresided at later ages in more recent years. Marital durations were shorter in the second cohort because of the timing of surveys administered after 2000.

Table 2. Descriptive Statistics for Women Ages 15–44 in 1995, 2002, and 2006–2010 and Their First Husbands, by Marriage Cohort

	Married 1985–1999		Married 2000–2009	
Characteristic	**Cohabitors**	**Direct marriers**	**Cohabitors**	**Direct marriers**
Percentage cohabited before marriage	52.47[f]		61.95	
Wife's age at coresidence (years)	22.2[c, f]	23.1[d]	22.7[a]	23.3
Wife's age at marriage (years)	24.2[c, f]	23.1[d]	25.2[c]	23.3
Marriage duration (years)	4.9[c, f]	5.7[f]	3.0	3.2
Cohabitation duration (years)	2.0[f]		2.6	
Previously cohabited with partner other than husband	20.0[c, e]	6.7	25.1[c]	8.2
Race/ethnicity				
White non-Hispanic	74.4[c, f]	67.0	66.7	66.5

Black non-Hispanic	10.3[b, d]	7.9	12.8[a]	8.3
Hispanic	10.8[c, e]	17.4	16.2	15.7
Asian American/Native American/other race, non-Hispanic	4.5[b]	7.7	4.3[c]	9.5
Respondent's education				
Less than high school	7.9[f]	8.2	15.2[b]	10.8
High school	34.7[a, f]	30.2[f]	26.3[c]	17.5
Some college	26.1	28.5	29.9	32.9
College degree+	31.4	33.1[d]	28.6[c]	39.0
Mother's education				
Less than high school	23.3	25.7[e]	19.0	17.9
High school	40.5	39.3[f]	37.0[c]	26.7
Some college	21.9[a, d]	18.1[e]	26.1	24.0
College degree+	14.2[a, d]	17.0[f]	17.8[c]	31.4
Lived with both biological parents at 14	64.9[c]	77.5	61.8[c]	77.8
Respondent grew up with no religion	9.2[c]	5.2	9.6[c]	3.6
Moved in together while pregnant	8.8[b]	12.2[d]	8.7	8.6
Pre-coresidence birth	31.4[c, d]	18.6	35.1[c]	21.5
Husband is 5 or more years older	23.0[b]	18.5	22.4	20.4
Husband is < 5 older or < 2 years younger	68.8[c]	75.6	68.7[a]	73.9
Husband is 2 or more years younger	8.2[a]	5.9	8.9[a]	5.7
Husband is same race	86.9[a]	89.6[d]	84.6	87.1
N	2,264	2,080	1,693	1,000

Note: The sample was restricted to women who married before age 35 and married within 10 years of the survey. The t tests of difference by premarital cohabitation are denoted with asterisks; t tests of difference among premarital cohabitors or direct marriers by period are denoted by number signs. [a] $p < .05$. [b] $p < .01$. [c] $p < .001$. [d] $p < .05$. [e] $p < .01$. [f] $p < .001$.

A closer examination of the patterns of cohabitation and marital formation depicted in Figures 1 and 2 reveals that premarital cohabiting women tended to move in with their partners earlier than direct marriers married and coresided with their husbands, but they married significantly later in both cohorts. Results are presented separately by the two cohorts to account for the changing rates of cohabitation and age at marriage and coresidence that may otherwise result in differences due to these two factors. The findings provide some support for previous findings that indicate that premarital cohabitation has been to some extent substituting for early age at marriage (Bumpass et al.,1991; Bumpass & Sweet, 1989; Raley, 2000, p. 20). Age at marriage for direct marriers fell between age at coresidence and age at marriage for premarital cohabitors but was more similar to age at coresidence than age at marriage for premarital cohabitors in both cohorts. Among respondents who married in the 2000s, age at coresidence for cohabitors and age at marriage for direct marriers occurred at fairly similar ages, although direct marriers seemed to have several distinct peaks in timing of marriage, including at age 18 and 22, the modal age at graduation from high school and college, and at age 29, when women may rush to marry before they reach age 30. Cohabitors did not show such distinct peaks in timing of marriage or coresidence.
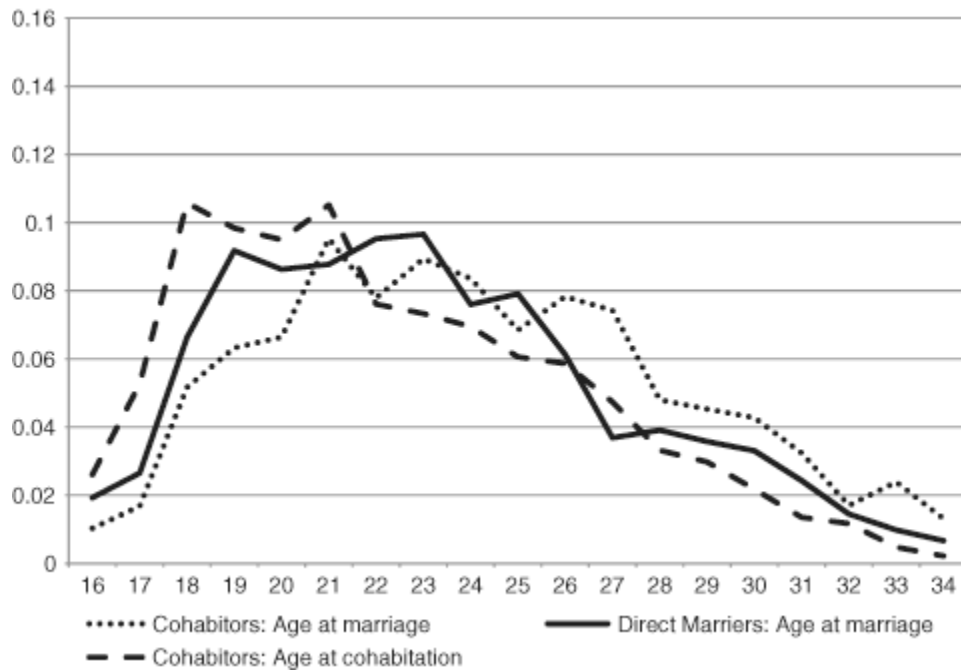

Figure 1. Wife's Age at Marriage Versus Age at Cohabitation, Marriages Formed 1985–1999.
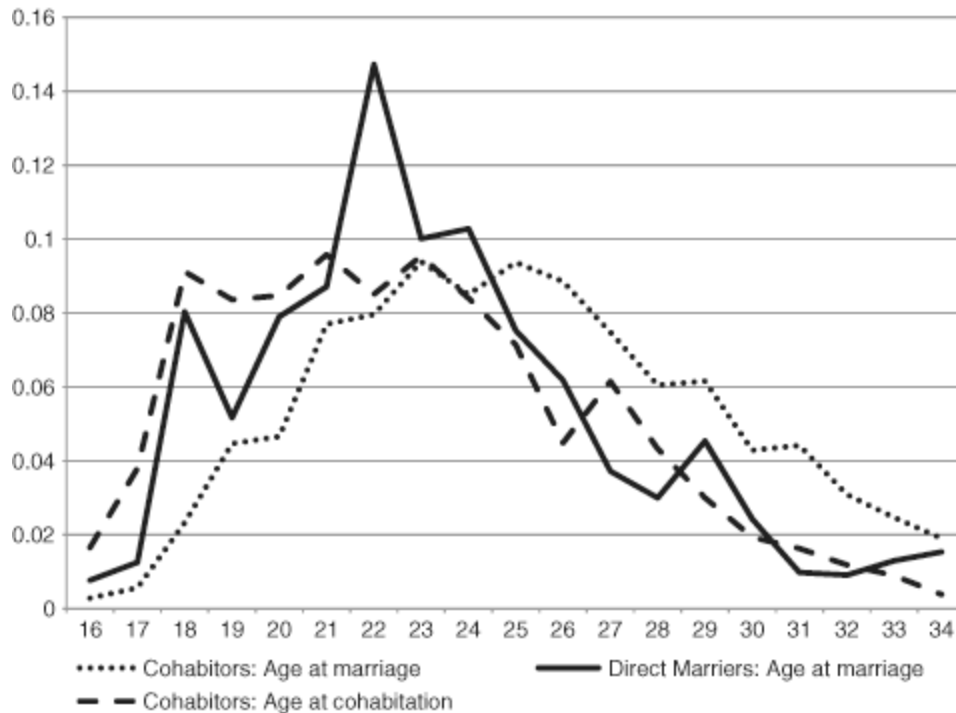
Figure 2. Wife's Age at Marriage Versus Age at Cohabitation, Marriages Formed 2000–2009.

Patterns of selection into premarital cohabitation and direct marriage over the two cohorts presented in Table 2 show that, over time, in some respects these groups became more distinct and in others they became more similar. Education differentials became more pronounced. Among those who married in 1985–1999 the only difference in terms of education at marriage was that cohabitors were more likely to be in the high-school-degree category and were slightly more likely to have a mother with some college and less likely to have a mother with a college degree. Among those who married in 2000–2009, premarital cohabitors were significantly more likely to have a high school degree or be a high school dropout, significantly less likely to have a college degree compared to direct marriers, and significantly more likely to have a mother who stopped education after high school. Direct marriers were more likely to have a mother with a college degree in both cohorts, but disparities widened in the latter cohort from a difference of less than 3 percentage points to a difference of almost 14 percentage points. In terms of race, premarital cohabitors and direct marriers became more similar; in the first cohort there were significant differences in every race, with premarital cohabitors being more likely to be White or Black and less likely to be Hispanic or another race. Among those marrying in 2000–2009, premarital cohabitors and direct marriers had the same probability of being White or Hispanic, although premarital cohabitors were still more likely to be Black and less likely to be part of another race. Finally, although cohabitors were less likely than direct marriers to have moved in together while pregnant and to be the same race as their husband in the first cohort, these differences had both disappeared by the second cohort.

Marriage Dissolution and Premarital Cohabitation

In line with previous research, marriage dissolution rates were found to significantly decline when women married at older ages until women reached their mid- to late 20s.

Figures 3 and 4 depict life table estimates of the cumulative proportion of marriages that had dissolved at 5 years after marriage (Figure 3) and 10 years after marriage (Figure 4) by age at marriage and coresidence for cohabitors and age at marriage for direct marriers. These rates were calculated using life table techniques in which three life tables were calculated for each 2-year grouping of age at marriage or age at coresidence. These life tables examined the proportion of marriages dissolving by duration of marriage among couples who first married or coresided while part of each age group.
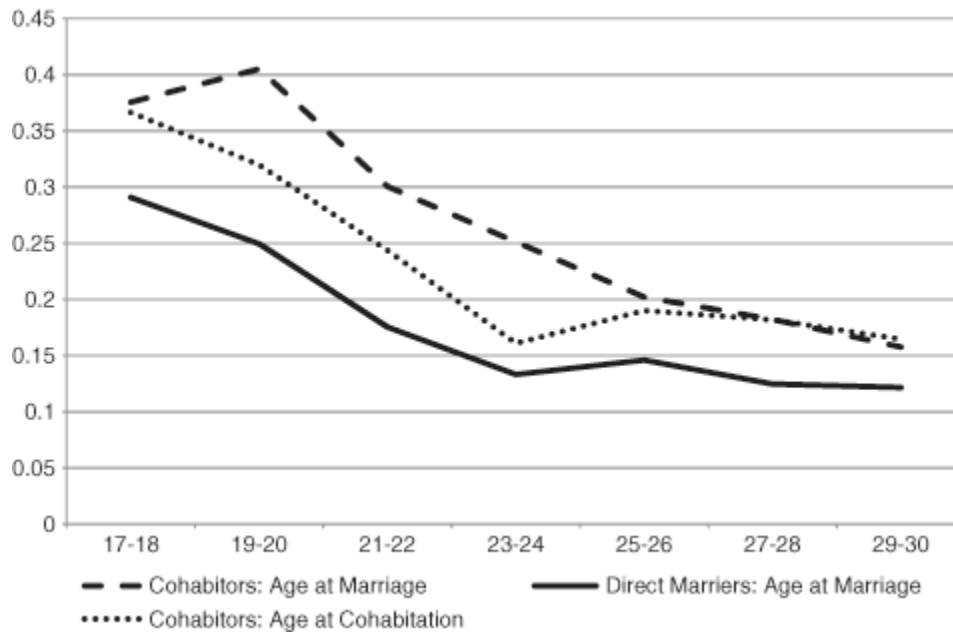

Figure 3. life-table estimates of marital dissolution by fifth anniversary of marriage, by age at marriage or coresidence and premarital cohabitation.

Note: Life table estimates were calculated separately for each 2-year age grouping.
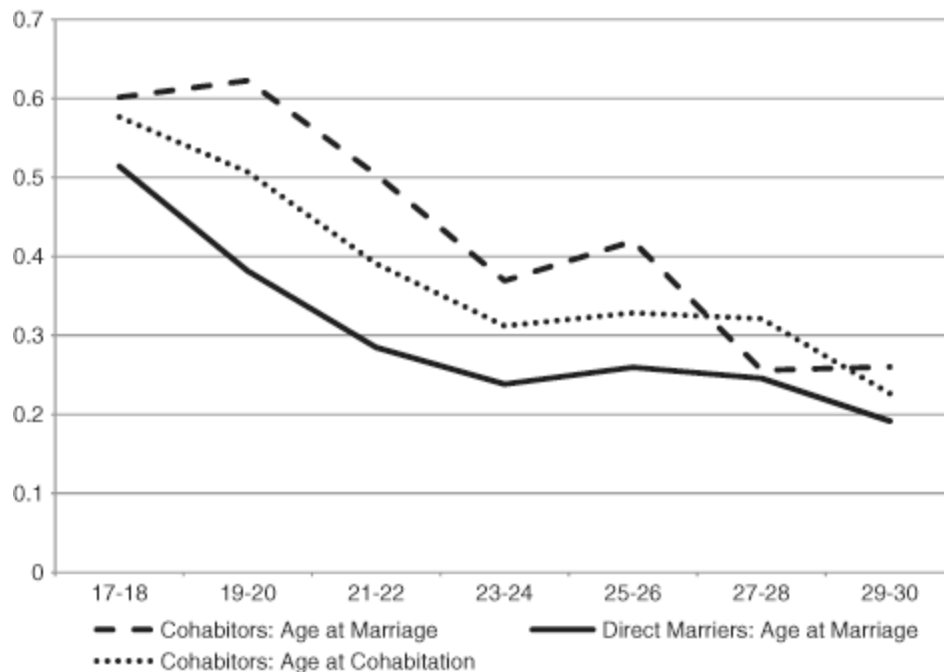
Figure 4. life-table estimates of marital dissolution by 10th anniversary of marriage, by age at marriage or coresidence, and premarital cohabitation.

Note: Life tables estimates were calculated separately for each 2-year age grouping.

As expected and in line with prior research, older ages at both marriage and coresidence were associated with lower rates of marriage dissolution until women reached their mid-20s. Strikingly, although cohabitors had overall higher marriage dissolution rates by age at coresidence compared to the age at marriage for direct marriers, which likely is due to selection into cohabitation by couples more at risk for divorce, the shape of the dissolution line by cohabitors' age at coresidence was remarkably similar to the shape of the dissolution line for direct marriers' age at marriage. This similarity is especially pronounced in Figure 4, in which divorce rates at 10 years after marriage are presented, although it also is present in Figure 3. For both groups, the proportion of marriages ending in dissolution was smaller for each subsequent age at marriage or coresidence until women reached their mid-20s, at which point the association plateaued. The association between age at marriage for cohabitors and dissolution rates followed a distinctly different pattern, in which the proportion of marriages dissolving continued to fall until women reached their late 20s at age at marriage. These findings suggest that whatever mechanism connected age at marriage to later dissolution probability for direct marriers (whether role preparation, poor matching, or some other mechanism) operated in a similar fashion on age at coresidence for couples who cohabited prior to marriage.

Findings from life tables indicated that when dissolution risk was measured by age at coresidence rather than age at marriage for premarital cohabitors, the risk was reduced to the rate of dissolution among premarital cohabitors who married approximately 2 years later, around the

average duration of premarital cohabitation in these data. As demonstrated in Figures 3 and 4, a 2-year difference in age measurement, although seemingly small, can result in dramatically different results when examining marriage dissolution. For instance, a direct marrier who married at age 23–24, the average age in this sample, could be compared to a premarital cohabitor who married at age 23–24 or to one who began coresiding at age 23–24. If premarital cohabitors and direct marriers who married at age 23–24 are compared, the cohabitor would have a dissolution risk at 10 years after marriage of approximately 37% versus 23% among direct marriers, which is approximately 60% the size of the dissolution risk among premarital cohabitors. Alternatively, if women who directly married at age 23–24 are compared to women who began premarital cohabitation at age 23–24, the risk of marriage dissolution is 31% among cohabitors versus 23% among direct marriers, a smaller difference in which direct marriers are 74% as likely as premarital cohabitors to dissolve their marriage.

Having established that age at coresidence for married couples who cohabited prior to marriage operated similarly on marriage dissolution to age at marriage for couples who did not cohabit, I next examined the extent to which researchers of cohabitation and divorce may have overestimated the relationship between the two when controlling for age at marriage rather than age at coresidence. Table 3 presents the results of Cox proportional hazard models predicting marriage dissolution with control variables for marriage cohort and data set along with a set of models that added controls for demographic characteristics that may have affected selection into cohabitation before marriage. The first model without demographic controls in Table 3 did not include age controls in order to establish a baseline relationship of cohabitation on marriage dissolution. Without controlling for the age at which couples married or cohabited, premarital cohabitation was associated with a 40% higher risk of dissolution compared to direct marriers. The next model in Table 3 added controls for age at coresidence, and the association between cohabitation and dissolution was reduced to a 29% increase in this hazard relative to direct marriers, indicating that the age at which cohabiting couples began coresiding accounted for more than one fourth of the gross relationship between cohabitation and divorce. Controlling for age at marriage, however, as shown in the next model, resulted in an increase in the hazard ratio of dissolution compared with the baseline model; the hazard ratio rose to 1.63, indicating that, when controlling for age at marriage, cohabitors seemed to be 63% more likely than direct marriers to dissolve their marriage, an increase of 58% from the baseline model and 117% from the model that controlled for age at coresidence. Controlling for age at coresidence in these models thus resulted in a hazard ratio for the relationship between premarital cohabitation and dissolution that was 54% smaller, or around 46% of the size of the hazard ratio found when data were standardized by age at marriage, the latter being the standard method used by researchers of premarital cohabitation and divorce.

Table 3. Cox Proportional Hazards Models Predicting Marriage Dissolution by Cohabitation and Age: Hazard Ratios (N = 7,037)

Predictor	Model 1: No age controls	Model 2: Age at coresidence	Model 3: Age at marriage
Models with no demographic controls			
Cohabited before marriage with husband	1.40[c]	1.29[c]	1.63[c]
Wife's age at coresidence		0.74[c]	
Wife's age at coresidence squared		1.00[b]	
Wife's age at marriage			0.74[c]
Wife's age at marriage squared			1.00[a]
F-adjusted mean residual test (P)		0.97	0.77
Models with demographic controls			
Cohabited before marriage with husband	1.21[b]	1.09	1.37[c]
Wife's age at coresidence		0.73[c]	
Wife's age at coresidence squared		1.00[b]	
Wife's age at marriage			0.74[c]
Wife's age at marriage squared			1.00[a]
Previously cohabited with partner other than husband	0.94	1.19	1.18
Race/ethnicity (ref.: White)			
Black	1.43[c]	1.58[c]	1.64[c]
Hispanic	0.71[b]	0.70[b]	0.70[b]
Asian American/Native American/other race	0.75	0.77	0.78
Respondent's education (ref.: some college)			
Less than high school	1.64[c]	1.13	1.11
High school	1.20[a]	1.09	1.08

Bachelor's degree+	0.49^c	0.59^c	0.59^c
Mother's education (ref.: some college)			
Less than high school	0.89	0.89	0.91
High school	0.88	0.87	0.89
Bachelor's degree+	0.95	0.97	0.97
Lived with both biological parents at 14	0.72^c	0.79^b	0.78^c
Respondent grew up with no religion	1.14	1.03	1.01
Moved in together while pregnant	1.32^b	1.18	1.13
Pre-coresidence birth	1.39^c	1.57^c	1.56^c
Husband age (ref.: < 5 years older or < 2 years younger			
Five or more years older	0.97	0.99	0.99
Two or more years younger	0.92	1.34^a	1.32^a
Husband is same race	0.70^b	0.71^b	0.71^b
F-adjusted mean residual test (P)		0.14	0.13

Note: Models include controls for period of marriage formation (reference [ref.]: marriages formed after 2000) and survey wave (ref.: 2006–2010 wave). ^{a} $p < .05$. ^{b} $p < .01$. ^{c} $p < .001$.

Adding in controls for demographic characteristics in Table 3 explained a little under half of the gross relationship between cohabitation and divorce. The hazard ratio for cohabitation was reduced from 1.40 in the baseline model with no demographic controls to 1.21 in the baseline model that did not control for age but that added controls for wife's previous cohabitation with a partner other than her spouse, wife's race, education at time of marriage, wife's mother's education, whether the wife lived with both biological or adoptive parents at age 14, whether the wife had grown up with no religion, whether she had a pre-coresidential birth or moved in together pregnant, and husband's relative age and race. Adding in controls for age at coresidence while controlling for demographic differences further reduced the relationship between cohabitation and dissolution to a hazard ratio of 1.09, which was not statistically significant. When instead controlling for age at marriage, as shown in the final model, the hazard ratio for cohabitation was again increased relative to the model that did not control for age, to a hazard of 1.37, significant at the $p < .001$ level. Measuring age using age at coresidence in this model

reduced the net relationship between cohabitation and dissolution by 76% and yielded a hazard ratio that was 24% as large when compared with models controlling for age at marriage. Models using age at coresidence also explained around 57% of the relationship of cohabitation and dissolution without age controls but including demographic controls. Furthermore, using this alternative measurement of age reduced the relationship between premarital cohabitation and dissolution from statistical significance at the $p < .001$ level to nonsignificance. A comparison of the two hazard ratios found that the hazard ratios for the effect of cohabitation on marriage dissolution were significantly higher for models controlling for age at marriage compared to those controlling for age at coresidence at the $p < .05$ level in a one-tailed test.

Examination of model fit suggested that age at coresidence may be a better predictor of marriage dissolution compared to age at marriage. The reported statistic, the F-adjusted mean residual test (P), estimated the probability that the model fit, with higher values indicating a stronger probability of fit and values below .05 indicating a poorly fitting model. Results presented in Table 3 demonstrated that models that controlled for age of coresidence instead of age at marriage had a stronger fit, although in models that also controlled for demographic characteristics the difference between fit in these two models was small. I conducted additional F-adjusted mean residual tests on models that predicted marriage dissolution among premarital cohabitors only (results not shown, available on request) using the two alternative age measurements and similarly found that models controlling for age at coresidence had a stronger fit than models controlling for age at marriage. When controlling for age at coresidence in models with and without additional demographic controls used in this study, the p values from these tests were .64 and .39, respectively. In models controlling for age at marriage with and without demographic controls, the p values were .20 and .02, respectively.

Is the effect of age measurement on the relationship between cohabitation and marriage dissolution stable across marriage cohorts? Table 4 presents the hazard ratios for the relationship between premarital cohabitation and marital dissolution for respondents who married in 1985–1999 and those who married in 2000–2009. For both cohorts, controlling for age at coresidence resulted in a smaller observed relationship between cohabitation and dissolution compared with models that controlled for age at marriage. Among respondents who married in 1985–1999, patterns were similar to the overall models presented in Table 3; in models controlling for demographic characteristics the hazard ratio for the effect of cohabitation on dissolution was reduced to nonsignificance when age was compared by age at coresidence instead of age at marriage. Among those respondents who married in 2000–2009, models with no demographic controls had a neutral association between cohabitation and dissolution when controlling for age at coresidence or adding no age controls, but in the model controlling for age at marriage the cohabitation coefficient was significant. For models in this cohort that controlled for demographic characteristics, all three models had no significant association between cohabitation and dissolution.

Table 4. Hazard Ratios of Association Between Cohabitation and Marriage Dissolution by Year of Marriage

Model/controls	Models with no demographic controls		Models with demographic controls	
	1985–1999	**2000–2009**	**1985–1999**	**2000–2009**
No age controls	1.49[b]	1.16	1.30[a]	0.95
Controlling for age at marriage and age at marriage squared	1.69[b]	1.51[a]	1.42[b]	1.16
Controlling for age at coresidence and age at coresidence squared	1.38[b]	1.05	1.15	0.90
N	4,344	2,693	4,344	2,693

Note: Models included controls for survey wave. Models with demographic controls also control for prior cohabitation experience, race, education at time of marriage, mother's education, living with both biological parents at age 14, growing up with no religion, pre-coresidential birth, moving in together while pregnant, husband is 2+ years younger or 5+ years older, and husband is same race. [a] $p < .01$. [b] $p < .001$.

Sensitivity Tests

I conducted three sets of sensitivity tests to examine the sensitivity of these findings to different model specifications (see Table 5). In the first, models were extended to examine those marrying within 15 years of the survey and limited to respondents who married under age 30 to account for age truncation. The second set of models treated women who separated within 12 months of the survey as censored at 12 months before the survey began to account for separations that may later result in reconciliation. In the third set, models deleted women from the sample who separated within less than 1 year before the survey. Although the overall effect of cohabitation on marriage dissolution was higher in the first set of models and lower in the second two sets of models compared to models presented in Table 3, in all three sets of models the same set of findings were reproduced. Comparing couples by age at coresidence led to a reduction in the hazard ratio for the association between cohabitation and marriage dissolution compared to the model with no age controls, but comparing couples by age at marriage led to an increase in this hazard ratio compared to the model with no age controls.

Table 5. Hazard Ratios for Effect of Cohabitation on Marriage Dissolution in Sensitivity Tests

Model/controls	Model 1: No age controls	Model 2: Age at coresidence	Model 3: Age at marriage	*N*

Models examining women married within 15 years of the survey, age 29 and younger at time of marriage, married 1980–2009				
No demographic controls	1.46[d]	1.32[d]	1.69[d]	9,484
With demographic controls	1.28[d]	1.14[b]	1.43[d]	9,484
Models treating women who separated within less than one year of survey as censored at 12 months before survey				
No demographic controls	1.32[d]	1.22[b]	1.54[d]	7,037
With demographic controls	1.16[a]	1.03	1.30[c]	7,037
Models deleting women who separated within less than one year of survey				
No demographic controls	1.34[d]	1.23[b]	1.56[d]	6,784
With demographic controls	1.16[a]	1.03	1.30[c]	6,784

Note: Models included controls for survey wave (reference: 2006–2010) and period of marriage formation (reference: 2000 or later). Models including demographic controls also control for prior cohabitation experience, race, education at time of marriage, mother's education, living with both biological parents at age 14, growing up with no religion, pre-coresidential birth, moving in together while pregnant, husband is 2+ years younger or 5+ years older, and husband is same race. [a]$p < .10$. [b]$p < .05$. [c]$p < .01$. [d]$p < .001$.

Discussion

The findings discussed in this article indicate that the previously found association between premarital cohabitation and divorce in earlier decades can in part be attributed to the age at which premarital cohabitors began coresiding. These findings also suggest that the measurement of age has a considerable effect on the observed relationship between cohabitation and divorce. Standardizing by age at marriage in statistical comparisons of marriage dissolution among premarital cohabitors and direct marriers resulted in an artificially inflated "gap" in divorce rates relative to both models that standardized age using age at coresidence and models that did not take into account age at all. Hazard ratios for the effect of cohabitation on marriage dissolution when controlling for coresidence were 54% to 76% smaller than those found when controlling for age at marriage. The association between cohabitation and marriage dissolution was nonsignificant in models that controlled for age at coresidence and demographic characteristics, even in the cohort who married prior to 2000, for whom all prior research has found a significant positive association of cohabitation and divorce. These findings indicate that previous research

on cohabitation and divorce that typically standardized age using age at marriage may have overstated the association between cohabitation and divorce if controlling for age at coresidence is the correct model specification.

Theoretical explanations of the relationship between early age at marriage and divorce along with empirical findings provided some evidence that the correct model is one that accounts for age at coresidence rather than age at marriage. Theoretical explanations of associations between age at marriage and divorce can also apply to an examination of early age at coresidence and divorce. Older studies of age at marriage and divorce (Booth & Edwards, 1985; Lee, 1977; South, 1995) have found that the only empirically supported explanation for the negative correlation between age at marriage and divorce was one centered on role performance: Couples who married at younger ages were less prepared for marital roles and perhaps less prepared to select an ideal partner for themselves. This created a shaky foundation on which young adults began their marriage, which in the long term resulted in an increased divorce risk.

For couples who cohabited prior to marriage, age at coresidence is a more accurate measure of the age at which they select their partners and, one could argue, of when they begin marital roles, because many roles associated with marriage among direct marriers are in fact related to coresidence and running a shared household. Furthermore, in line with negative correlations between education and premarital cohabitation presented in Tables 1 and 2, some proportion of couples who would otherwise directly marry may instead select into cohabitation as a result of that lower role preparation. Couples who subsequently marry may then ultimately divorce because they were too young and unprepared to select and settle down with a partner at the age they began their coresidence, regardless of the age at which they later legally married that partner. Regardless of the underlying mechanisms connecting age at union formation, cohabitation, and divorce, as shown in Figures 3 and 4, the shape of the relationship between age at coresidence and later marriage dissolution among premarital cohabitors was remarkably similar to the shape of the association between age at marriage and dissolution for direct marriers. The shape of the association between age at marriage and marriage dissolution among cohabitors had a distinct and later pattern. Furthermore, examination of model fit revealed that models that used age at coresidence had a stronger fit than models using age at marriage to predict divorce both in the combined sample of cohabitors and direct marriers examined in this study and in examinations of divorce among cohabitors only.

As increasing numbers of couples cohabit before marriage, correctly measuring age at union formation and therefore not artificially inflating the association between cohabitation and divorce is of increasing importance both methodologically and from a public interest standpoint. The findings presented here indicate that future research on cohabitation and divorce should standardize for age at coresidence rather than age at marriage. This research also suggests that young couples wishing to avoid divorce would be better served by delaying settling down and forming coresidential unions until their mid-20s when they are older and more established in

their lives, goals, and careers, whether married or not at the time of coresidence, rather than avoiding premarital cohabitation altogether.

Note

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