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Premarital Sex, Premarital Cohabitation, and the Risk of Subsequent Marital Dissolution Among Women

Using nationally representative data from the 1995 National Survey of Family Growth, I estimate the association between intimate premarital relationships (premarital sex and premarital cohabitation) and subsequent marital dissolution. I extend previous research by considering relationship histories pertaining to both premarital sex and premarital cohabitation. I find that premarital sex or premarital cohabitation that is limited to a woman's husband is not associated with an elevated risk of marital disruption. However, women who have more than one intimate premarital relationship have an increased risk of marital dissolution. These results suggest that neither premarital sex nor premarital cohabitation by itself indicate either preexisting characteristics or subsequent relationship environments that weaken marriages. Indeed, the findings are consistent with the notion that premarital sex and cohabitation limited to one's future spouse has become part of the normal courtship process for marriage.

Unmarried heterosexual cohabitation has become very common in the United States. Among recent birth cohorts of young men and women, the majority will cohabit at some point in their lives (Smock, 2000). Bumpass and Lu (2000) estimate that nearly 60% of unions formed in the early 1990s began with cohabitation. At the same time that cohabitation has increased, so has the incidence of premarital intercourse. Among women born between 1950 and 1954, nearly one quarter experienced their first instance of sexual intercourse within marriage (Abma, Chandra, Mosher, Peterson, & Piccinino, 1997). For women born between 1965 and 1969, only about 10% had first sex within marriage. These trends clearly signify a continuing separation of marriage from the initiation of sexual intimacy and coresidential living.

Social scientists have asked what these trends mean for the nature and functioning of marriage. One of the most clearly defined correlates of cohabitation is an increased risk of marital dissolution (Bumpass, Martin, & Sweet, 1991; DeMaris & McDonald, 1993; DeMaris & Rao, 1992; Smock, 2000; Teachman & Polonko, 1990). Marriages preceded by a spell of cohabitation are as much as 50% more likely to end in divorce at any marital duration than marriages not preceded by cohabitation. Although less well researched, there is also evidence to suggest that premarital intercourse is associated with an increased risk of marital disruption (Kahn & London, 1991; Whyte, 1990). Using a nationally representative sample of women, I seek to extend research on the effects of intimate premarital relationships on marital stability in two ways. First, I consider the joint relationship between both premarital cohabitation and premarital intercourse and the risk of marital dissolution. Clearly, premarital sex and premarital cohabitation overlap, yet no prior research has considered their effects simultaneously. Second, I consider the effects of variations in histories of

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intimate, premarital relationships. In particular, I distinguish between premarital cohabitation and premarital intercourse that is limited to a woman's eventual husband from intimate relationships that occur with other men. I find that neither premarital intercourse nor premarital cohabitation, if limited to a woman's husband, is linked to the subsequent risk of marital disruption. However, intimate premarital relationships with other men are associated with a substantial increase in the likelihood of divorce.

Prior Research on Premarital Relationships and the Risk of Divorce

Premarital Cohabitation

One of the most robust predictors of marital dissolution that has appeared in the literature is premarital cohabitation. Beginning with reports by Booth and Johnson (1988) and Bennett, Blanc, and Bloom (1988), virtually all studies of the relationship between premarital cohabitation and divorce have found a positive link. Early investigators expressed surprise at this result because it had sometimes been theorized that premarital cohabitation would act as a screening device, allowing couples to choose a mate with whom they could form a successful marriage. Two alternative explanations have been put forward to explain the consistently positive link between cohabitation and marital disruption.

The first thesis used to explain the higher risk of divorce experienced by marriages preceded by a spell of cohabitation is selectivity. A number of authors have argued that people who cohabit before marriage possess different characteristics compared with those who do not cohabit, and these characteristics are tied positively to the risk of divorce. The characteristics thought to be important in distinguishing cohabitors from noncohabitors include less commitment to marriage as a permanent institution, acceptance of divorce as an appropriate means to end a poor relationship, an emphasis on individualism, poor relationship skills, and so on. A number of studies have found evidence of selectivity, either through direct measurement of differences on important characteristics (Axinn & Thornton, 1992; DeMaris & MacDonald, 1993; Thomson & Colella, 1992; Thornton, Axinn, & Hill, 1992) or the use of statistical procedures that adjust for unmeasured heterogeneity distinguishing cohabitors from noncohabitors (Lillard, Brien, & Waite, 1995).

The second thesis linking premarital cohabitation to the risk of divorce focuses on the experience of cohabitation itself. That is, it is argued that there is a causal effect of having lived with someone outside of marriage that cannot otherwise be attributed to differences on other, preexisting characteristics that may be associated with the risk of marital disruption. The underlying notion in this thesis is that cohabitation allows individuals to learn about intimate living outside of marriage, provides information about alternatives to marriage, and acts to erode their belief in the permanence of marriage. Although less well researched than the selectivity argument, the thesis of a causal effect of cohabitation has also received empirical support (Axinn & Barber, 1997; Axinn & Thornton, 1992).

Premarital Intercourse

The literature on the relationship between premarital intercourse and divorce is limited. Kahn and London (1991) found a relatively strong positive relationship between the two. They suggested, as is the case for premarital cohabitation, that the relationship may be due to either selectivity on preexisting characteristics or altered perceptions of marriage and alternatives to marriage that occur as the result of engaging in premarital sex. Their statistical modeling strategy suggests that selectivity may be the more important mechanism to consider. Unfortunately, no study has attempted to directly measure differences in characteristics affecting the risk of divorce that might exist between women who do and women who do not engage in premarital intercourse, nor has their been any research indicating that experience with premarital sex alters attitudes toward and expectations about marriage.

Extending Prior Research

Joint Effects of Premarital Intercourse and Premarital Cohabitation

Although the research findings are consistent, prior research can be extended in at least two ways. First, no study has simultaneously considered the relationship between both premarital cohabitation and premarital intercourse and marital dissolution. Clearly, the two are linked, and failure to consider both variables simultaneously may yield biased estimates of their effects on divorce. For example, it is reasonable to assume that women who co-

habit prior to marriage are more likely to have engaged in premarital sex than women who do not cohabit before marriage. If premarital sex is the primary force driving an increased risk of marital dissolution and it is not measured, the effect of premarital cohabitation will be overstated. I take this possibility into account by including measures of both premarital intercourse and premarital cohabitation in my analysis. In this fashion, I can ascertain whether the effects of premarital sex and cohabitation are independent and additive. I can also ascertain whether there is an interaction between these two variables. In particular, I can determine whether the effect of premarital sex depends on the occurrence of premarital cohabitation.

The Variable Meaning of Premarital Intercourse and Premarital Cohabitation

Another limitation of prior research is that, with few exceptions, diversity in histories of premarital relationships has not been considered. Most studies of the relationship between premarital cohabitation and divorce have used a simple variable indicating whether the respondent (usually the wife) cohabited before marriage. This measurement strategy ignores with whom the cohabitation occurred (the person the respondent married or someone else); if the question about cohabitation refers specifically to the person married, it ignores previous cohabitations. The study by Kahn and London (1991) on the relationship between premarital intercourse and divorce also ignored diversity in patterns of premarital intercourse and used a simple dummy variable to indicate whether premarital sex occurred, ignoring with whom it occurred. The importance of making such distinctions is illustrated by research conducted by DeMaris and MacDonald (1993) and Teachman and Polonko (1990), who found that premarital cohabitation limited to one's spouse does not increase the risk of marital instability (either marital dissolution or perceived risk of marital dissolution). Only respondents who had cohabited with someone in addition to their spouse were at a higher risk of marital instability.

The use of a simple measurement strategy may lead to biased estimates; for example, such a strategy may not measure the extent to which diversity in histories of premarital relationships is linked to either selectivity on variables affecting the risk of divorce or learned behaviors and attitudes related to the stability of marriage. For example, there is a growing literature suggesting that there may be two broadly different groups of cohabiting couples. One group consists of cohabiting couples who plan to marry and are using cohabitation as a newly evolved stage in the courtship process. The second group consists of very different couples who have no plans to marry and are using cohabitation as an alternative to marriage. The first group tends to resemble married couples on various dimensions of relationship quality, and the latter group appears to have lower quality relationships (Brown & Booth, 1996; Skinner, Bahr, Crane, & Call, 2002).

Even though fewer data are available, the same may be said for premarital intercourse. A significant majority of couples in today's marriage market engage in premarital intercourse, and for some couples it may simply be another stage in the courtship process. Indeed, data on premarital pregnancies indicate premarital sex with one's future spouse was not uncommon in the past (Teachman, 1985). Recent data from the 1995 National Survey of Family Growth indicate that premarital sex and marriage are linked for a nontrivial proportion of women (Abma et al., 1997). Among ever-married women who have had premarital sex, nearly 15% experienced first intercourse within 12 months of marriage and more than 25% had first sex with their husband. In addition, about 25% of all women who have had sex have had only one partner in their lifetime, most often their husband.

If premarital sex and, increasingly, premarital cohabitation have become a normal and accepted part of the courtship process in the contemporary United States, for at least some couples, one might expect little association between the risk of subsequent marital dissolution if it is limited to one's eventual marital partner. However, an intimate premarital relationship with someone other than one's marital partner may indicate increased risk to subsequent marital disruption. Multiple premarital sexual partners may indicate less commitment to the idea of a permanent relationship with one individual. Multiple sexual partners may also weaken the marital bond by heightening awareness of alternatives to one's marital partner as sources of sexual intimacy and fulfillment. Similar to the case for premarital sex, multiple coresidential unions prior to marriage may indicate a range of personal attitudes and beliefs that might undermine the stability of unions. In addition, a coresidential relationship that does not lead to marriage may provide firsthand experience with the process

of ending a union, reducing transaction costs of future disruptions.

This line of reasoning leads me to expect that premarital cohabitation or sex that is limited to one's spouse will not be linked to the risk of subsequent marital dissolution. As part of the normal and expected courtship pattern, such behavior does not indicate reduced commitment to marriage and likely does not provide socializing experiences that might weaken the marital union. However, either premarital cohabitation or sex that occurs with someone other than one's spouse is expected to be related to an increased risk of marital dissolution. These individuals are either selected on characteristics that increase the risk of divorce or their experiences with disrupted unions lead to destabilizing influences on marriage.

Change across time in the effect of premarital cohabitation. At least one author has suggested that the meaning of cohabitation has changed over time. Schoen (1992) argues that early cohabitors were selective of people more willing to break social norms and less committed to marriage. However, as cohabitation has become more common, it has become less selective of people possessing characteristics related to marital stability. Given more accepting attitudes toward cohabitation in recent years, premarital cohabitation is also less likely to provide experiences that weaken subsequent marriages. The same argument can be applied to premarital sex. As an increasing proportion of people have experienced premarital sex, it is less likely to be a marker of characteristics or experiences that raise the risk of marital disruption.

This perspective suggests changes over time in the relationship between intimate premarital relationships and subsequent marital stability, although at least one study has failed to find a change in the association between premarital cohabitation and divorce over a wide range of marriage cohorts (Teachman, 2002). However, offsetting changes could have occurred according to type of cohabiting union. For example, it could be the case that premarital cohabitation with one's spouse has become more acceptable (leading to a decreased risk of marital dissolution over time), whereas premarital cohabitation with multiple partners has become increasingly selective of people less committed to marriage (leading to an increased risk of marital dissolution over time). Even though available evidence is not sufficient to posit a firm expectation, there is enough justification to investigate whether the association between marital stability and premarital cohabitation and sex has varied across time.

In the following analysis, I estimate the effects of different histories of premarital cohabitation and sex on the risk of marital disruption, using a nationally representative sample of women. I control for a wide range of potentially confounding variables that have been identified in the literature. These confounding variables reflect variation in attitudes and values that are related to marital stability, as well as differences in ability to engage in the exchange of expressive and instrumental goods and services between husbands and wives that act to increase their interdependence (Becker, 1991; Teachman, 2002). The characteristics included are measures of race, religion, education, parental education, parental marital history, premarital births and conception, and spouse homogeneity with respect to race, religion, and age. For reviews of the literature that document the relationship between these variables and marital stability, see DaVanzo and Rahman (1993), Faust and McKibben (1999), and White (1990). Bumpass and Sweet (1989), Smock (2000), and Tanfer (1987) provide examples of the linkages between these confounding variables and premarital cohabitation.

Method

Data

The data are taken from the 1995 round of the National Survey of Family Growth (NSFG). The NSFG is a national area probability survey, a cross-sectional sample of 10,847 civilian noninstitutionalized women aged 15–45 residing in the United States (National Center for Health Statistics, 1998). The NSFG collected extensive life history data from women that detail their premarital relationships, as well as the dates at which each of their marriages began and ended. Although some caution should be exercised in examining data based on retrospective life histories, in an extensive examination of the quality of the NSFG data, Teachman and Tedrow (1998) reported that the information pertaining to relationship histories is internally consistent and of generally high quality.

For analysis, I select a subset of ever-married women whose first marriages were contracted between 1970 and 1995. I exclude first marriages begun before 1970 because they are selective of

women who married early (given the age limitations of the sampling frame, women aged 15–45, these women would had to have married as teenagers) and therefore may not represent the life course experiences of women who married at that point in history. The resulting sample size is 6,577 women.

Measures

Dependent variable. The dependent variable of interest is the rate at which first marriages are disrupted and is estimated using information on the duration of first marriages (measured in months). Marriages are considered to be disrupted at either the date of divorce, or the date of separation, whichever came first. Following common practice, I censor stable marriages at the date of the survey (Bumpass et al., 1991).

Independent variables. The NSFG contains information about the beginning and ending dates for each nonmarital, cohabiting union experienced by women in the sample and whether these unions ended in disruption or marriage. From this information, I created two variables. The first variable is a simple dichotomy indicating whether the woman ever cohabited prior to her first marriage. The second variable contains four categories (essentially dividing women who had ever cohabited prior to marriage into categories according to their histories of cohabitation): women who did not cohabit before first marriage, women who cohabited before their first marriage but only with their husband, women who cohabited before their first marriage with someone other than their husband, and women who cohabited two or more times before their first marriage, including with their husband and at least one other man.

The NSFG also contains information about the dates at which women initiated sex with each of their sexual partners, as well as information about their relationship to each of these partners (i.e., whether the sexual partner was a husband or cohabiting partner that she married, someone with whom she was cohabiting but did not marry, or someone else). From this information, I again created two variables. The first variable is a simple dichotomy indicating whether the woman ever had sex prior to her first marriage. The second variable has three categories: women who did not have sex before first marriage, women who had premarital sex but only with their husbands, and women who had premarital sex with their husbands and at least one other man.

Control variables. A number of commonly used family background, life course, and socioeconomic variables pertaining to women are available in the NSFG, and I use them to limit the likelihood that any effects of premarital cohabitation and premarital sex are spurious. Each of these control variables has been identified in prior research as being linked to the risk of marital dissolution (Bumpass et al., 1991; Teachman, 1983, 2002). The control variables that I use are as follows: father's education in years; mother's education in years; number of siblings; whether the respondent is White, Black, or Hispanic (being White serves as the baseline); whether the respondent is Protestant, Catholic, Jewish, or some other religion (Protestant serves as the baseline); whether the woman grew up in an intact family or experienced parental death, parental divorce, or any other nonintact family form during childhood (having grown up in an intact family serves as the baseline); the number of different childhood living situations experienced by the woman; the woman's age at marriage; her education in years at the time of marriage; whether she had a birth prior to marriage; whether she was pregnant at the time of marriage; and a series of dummy variables indicating 5-year marriage cohorts. In models estimating the effect of premarital sex, I also include a control for the woman's age at first sex on the assumption that sex at a younger age is likely to indicate either less commitment to the permanency of unions or provide greater opportunity for learning poor relationship skills. Women who begin their sexual careers earlier in life are also less likely to marry their first partner, are more likely to have a larger number of sexual partners, and may evidence less discrimination in their choice of eventual marital partner.

The NSFG also contains data on husbands that can be used to create variables that have been linked to the risk of marital disruption (see Bumpass et al., 1991; Teachman, 1983, 2002). The variables that I include are as follows: husband's age at marriage; husband's education in years; whether the husband was married before; whether the husband is of a different race; whether the husband is 2 or more years younger than the respondent; whether the husband is 5 or more years older than the respondent; whether the husband if of a different religion; and whether, according to the re-

spondent's report, religion is important or very important to the husband.

Descriptive statistics for the data used in this analysis are shown in Table 1 (results based on unweighted data are presented; see the discussion below). Nearly 35% of the women in the sample reported that their first marriages had ended, with 34% ending within the first 10 years. Nearly 40% of women had cohabited prior to marriage, most (31%) with their eventual husband. As expected, a much larger percent of women had experienced premarital sex (about 82%). Contrary to the situation for premarital cohabitation, a majority of women had first sex with someone other than their husband (55%).

About 18% of women in the sample did not have premarital sex and did not cohabit prior to marriage. Nearly 19% of women had premarital sex with their husband only and did not cohabit, and another 8% of women had premarital sex with their husband only and cohabited with him. More women (25%) had premarital sex with their husband and another man but did not cohabit. Nearly as many women (about 23%) had premarital sex with their husband and another man and cohabited with their husband only. Fewer women (6%) had sex and cohabited with their husband and another man, and still fewer women had sex with their husband and another man and cohabited only with the other man.

Limitations. Although they are generally well suited to the purposes of my analysis, the NSFG data are not without limitations. First, the data contain no information about relationship skills or attitudes, values, or beliefs that can be used to distinguish between groups of women defined according to their histories of premarital relationships. Although the NSFG contains information tapping attitudes toward marriage and family roles, this information is limited to 1995 and therefore may be as much a consequence of premarital sex, premarital cohabitation, marriage, and divorce as a determinant of these events. Second, there is no information pertaining to the premarital relationship histories of husbands (other than information ascertaining whether a husband was married before). Thus, the reported associations between marital disruption and premarital relationships are specific to the experiences of women.

Because the upper age limit in the NSFG is 45, resulting in the truncation of marriages begun prior to 1970, marriages of long duration are not observed. The longest marital duration considered in

Table 1. Unweighted Descriptive Statistics for Variables Used in the Analysis of the Effects of Premarital Cohabitation and Premarital Sex on the Risk of Divorce (N = 6,577)

Variable	M (SD) or %
Ever divorced	34.9
Divorced within 1 year	3.3
Divorced within 5 years	20.6
Divorced within 10 years	34.0
Wives' characteristics	
Age at marriage (in years)	22.4 (4.3)
Education (in years)	13.0 (2.8)
Black	16.4
Other race	14.8
Premarital birth	15.9
Premarital conception	29.1
Catholic	36.2
Jewish	1.2
Other religion	8.7
Number of siblings	3.5 (1.8)
Father's education	11.1 (4.1)
Mother's education	11.0 (3.7)
At least one parent died	9.6
Parents divorced	21.5
Other nonintact family	10.8
Number of childhood living situations	1.6 (1.2)
Husbands' characteristics	
Age at marriage	25.1 (5.7)
Education	12.7 (2.6)
Married before	15.4
Different race than wife	3.0
More than 5 years older than wife	20.8
More than 2 years younger than wife	1.3
Religion important to very important	1.4
Different religion than wife	32.0
Cohabited before marriage	38.1
Cohabited with first husband only	30.6
Cohabited with husband and other	5.8
Cohabited with other only	1.7
Premarital sex	81.8
First premarital sex with husband	26.6
First premarital sex with other partner	55.1
Age at first sex	18.2
No premarital sex, no cohabitation	17.8
Premarital sex with husband only, no premarital cohabitation	18.8
Premarital sex with husband only, cohabited with him	8.1
Premarital sex with husband and other, no cohabitation	25.4
Premarital sex with husband and other, cohabited with husband only	22.5
Premarital sex with husband and other, cohabited with husband and other	5.7
Premarital sex with husband and other, cohabited with other only	1.7

this analysis is 25 years. It is possible that results for longer marriages (which would be restricted to marriages formed prior to 1970) would be different from those reported here.

Model

I use a simple Cox proportional hazards model for examining the effects of the covariates on the risk of marital disruption (Blossfeld, Hamerle, & Meyer, 1989). The model takes the following form:

$$\gamma\ (t;\mathrm{X}) = \gamma_0(t)e^{(\beta_1 \mathrm{X}_1 + \ \ldots\ + \beta_k \mathrm{X}_k)},$$

where $\gamma\ (t;\mathrm{X})$ is the rate of marital disruption at time t for an individual with a set of characteristics X, and each $e^{\beta}{}_k$ is an exponentiated regression coefficient (β_k) indicating the net multiplicative effect of an independent variable in shifting upward or downward an unobserved, and perfectly arbitrary, baseline rate of marital disruption, $\gamma_0(t)$, that can vary across time (here, marital duration). By subtracting 1.0 from the exponentiated coefficients and multiplying by 100, the percent increment in the risk of marital disruption at time t can be ascertained (note that this is not the same as the percent increment in the eventual likelihood of marital disruption). As written, the model implies that the effects of the covariates are proportional across marital duration. Tests for nonproportionality were conducted by including multiplicative terms involving each of the covariates and the logarithm of marital duration. In no case did any of these interaction terms reach statistical significance.

Because there was a nontrivial amount of missing data for father's (about 10%) and mother's (about 3%) education, I used a multiple imputation scheme for the estimation of model parameters. As described by Allison (2002), I first used PROC MI in the SAS software program (SAS Institute, Cary, NC) to generate a number (five) of data sets with missing data imputed using a data augmentation procedure. In essence the augmentation procedure provides estimates of the missing data by regressing each variable with missing data on all observed variables. To achieve convergence (i.e., consistent estimates of predicted values for missing data), several iterations of this procedure are performed prior to imputing a data set. I then estimated a Cox proportional hazards model for each of the imputed data sets (using PROC PHREG in SAS). Finally, I estimated average parameter estimates over the five data sets, and accompanying standard errors, using PROC MIANALYZE in SAS.

All models were estimated using both weighted and unweighted data. The resulting parameter estimates are very similar, so I present results based on unweighted data in order to preserve the asymptotic theory on which the calculation of standard errors is based (Winship & Radbill, 1994). Conclusions would not vary if results based on weighted data were presented.

Multivariate Results

I begin the multivariate analysis by replicating results found in previous research. Shown in Table 2 are a baseline model (Model 1) and two simple extensions of the baseline model, adding premarital cohabitation (Model 2) and premarital sex (Model 3), respectively, as additional covariates. The models are estimated with all races pooled together. Previous research has documented similar processes of marital disruption operating for Whites and Blacks (Teachman, 2002). In addition, in this analysis, models including interactions between race and the remaining predictor variables failed to yield a better fit to the data (results not shown).

Results for Model 1 indicate effects that are similar to those found in previous research (Bumpass et al., 1991; Teachman, 1983, 2002). In particular, the risk of divorce is greater for women who marry earlier, are Black, have a premarital birth or conception, have fewer siblings, have less educated mothers, and have experience with other than a two-parent family. In addition, women who marry men with less education, men who were married before, men of a different race or religion, men who are at least 2 years younger, or men who believe that religion is important to very important are at a higher risk of marital disruption.

Model 2 includes a dichotomous variable measuring whether the woman cohabited prior to marriage and indicates that premarital cohabitation is associated with a 33% increase in the likelihood of marital disruption at each point in marriage. Model 3 includes a dichotomous variable measuring premarital sex and indicates that women who had their first sexual encounter prior to first marriage are about 34% more likely to experience marital dissolution at each point in their marriages (and for each year that they delay sex, the risk of marital disruption is reduced by about 8%). These results closely replicate prior research by indicating that intimate premarital relationships, either

TABLE 2. PROPORTIONAL HAZARDS REGRESSION MODELS (EXPONENTIATED COEFFICIENTS AND *t* STATISTICS IN PARENTHESES) REPLICATING PREVIOUS RESEARCH ON THE RELATIONSHIP BETWEEN PREMARITAL COHABITATION AND PREMARITAL SEX ON THE RISK OF MARITAL DISSOLUTION ($N = 6,577$)

Variable	Model 1 Baseline	Model 2 Premarital Cohabitation	Model 3 Premarital Sex
Wives' characteristics			
Age at marriage	0.924*	0.917*	0.951*
	(7.12)	(7.70)	(4.31)
Education	1.012	1.015	1.023*
	(1.07)	(1.37)	(2.10)
Black	1.593*	1.628*	1.539*
	(7.53)	(7.87)	(6.97)
Other race	1.143	1.161	1.275*
	(1.73)	(1.93)	(3.13)
Premarital birth	1.262*	1.204*	1.151
	(3.09)	(2.46)	(1.84)
Premarital conception	1.206*	1.181*	1.070
	(3.18)	(2.82)	(1.12)
Catholic	0.869*	0.874*	0.889*
	(2.62)	(2.52)	(2.20)
Jewish	1.049	0.990	0.945
	(0.21)	(0.24)	(0.25)
Other religion	1.118	1.087	1.086
	(1.41)	(1.06)	(1.05)
Number of siblings	0.978*	0.977*	0.983*
	(2.66)	(2.82)	(2.09)
Father's education	1.009	1.008	1.010
	(1.26)	(1.16)	(1.37)
Mother's education	1.025*	1.023*	1.017*
	(2.96)	(2.82)	(2.04)
At least one parent died	1.059	1.041	1.033
	(0.76)	(0.53)	(0.43)
Parents divorced	1.417*	1.374*	1.325*
	(5.70)	(5.19)	(4.58)
Other nonintact family	1.339*	1.322*	1.296*
	(4.07)	(3.90)	(3.62)
Number of childhood living situations	0.984	0.979	0.979
	(0.78)	(0.99)	(0.99)
Age at first sex			0.919*
			(8.95)
Husbands' characteristics			
Age at marriage	0.984	0.984	0.981*
	(1.80)	(1.84)	(2.17)
Education	0.937*	0.940*	0.944*
	(6.01)	(5.76)	(5.27)
Married before	1.474*	1.423*	1.430*
	(5.76)	(5.22)	(5.29)
Different race than wife	1.359*	1.315*	1.323*
	(2.74)	(2.44)	(2.49)
More than 5 years older than wife	1.021	1.019	1.041
	(0.26)	(0.23)	(0.50)
More than 2 years younger than wife	1.760*	1.781*	1.678*
	(2.48)	(2.53)	(2.26)
Religion important to very important	4.507*	4.555*	4.572*
	(13.80)	(13.88)	(13.91)
Different religion than wife	1.496*	1.451*	1.436*
	(8.71)	(7.99)	(7.80)
Wife cohabited before marriage		1.327*	
		(5.75)	
Premarital sex			1.340*
			(4.15)
Model χ^2/df	748/28	776/29	878/30

Note: All models include controls for marriage cohort. Values of the *t* statistic are presented in parentheses.
*$p < .05$.

Table 3. Proportional Hazards Regression Models (Exponentiated Coefficients and *t* statistics in Parentheses) Examining the Effect of Histories of Premarital Cohabitation and Premarital Sex on the Risk of Marital Dissolution ($N = 6,577$)

Variable	Model 1 Premarital Cohabitation	Model 2 Premarital Sex	Model 3 Premarital Cohabitation and Premarital Sex
Wife cohabited with husband only	1.291*		1.057
	(5.06)		(1.07)
Wife cohabited with husband and other	1.857*		1.282*
	(5.87)		(2.30)
Wife cohabited with other only	1.103		0.814
	(0.47)		(0.99)
First premarital sex with husband		0.920	0.917
		(1.06)	(1.10)
First premarital sex with other		2.114*	2.094*
		(9.76)	(9.52)
Model χ^2/df	784/31	1093/31	1098/34

Note: All models include the controls indicated in Table 2. Values of the *t* statistic are presented in parentheses.
*$p < .05$.

premarital cohabitation or premarital sex, are linked to an increased risk of marital dissolution.

In Table 3, I present the results of including a set of dummy variables that separate premarital cohabitation into cases that only occurred with the woman's husband, occurred with her husband after having cohabited with someone else, or only occurred with someone else (Model 1). I also present results from including a set of dummy variables that separate premarital sex into cases that occurred only with the woman's husband or with her husband after having occurred first with someone else (Model 2). Finally, I show the results from a model that includes measures of both premarital cohabitation and premarital sex (Model 3). For the sake of parsimony, I only present the multiplicative effects associated with premarital cohabitation and premarital sex (the effects of the control variables are largely unchanged from those reported in Table 2).

The exponentiated coefficients associated with premarital cohabitation in Model 1 are positive and statistically significant for two of the three situations compared with not having premaritally cohabited (the effect for having cohabited only with someone other than the woman's husband is not statistically significant but is based on a relatively small number of women). The effect for having cohabited twice (1.86) is about 44% larger (a statistically significant difference) than the effect for having cohabited only with her husband (1.29). The effects for premarital sex in Model 2 indicate that it is only women whose first sex was with someone other than her husband who experience an increased risk of marital disruption (114%).

The results in Model 3, which includes the effects of both premarital cohabitation and premarital sex (compared with women who did not cohabit before marriage and did not engage in premarital sex), show that the risk of marital dissolution is higher when the woman cohabited twice (by about 28%) and when her first sex was with someone other than her husband (by about 109%). Combining premarital cohabitation and premarital sex in the same model reduces the effect of having cohabited solely with one's husband to nonsignificance. This pattern results because women who cohabited with their husband only are more likely than women who did not cohabit before marriage to have had first sex with someone other than their husband (73% vs. 41%; data not shown). That is, for these women, it is not the fact that they cohabited before marriage that is important for marital dissolution; it is the fact that they had at least one other sexually intimate relationship prior to marrying.

To better understand the pattern of results, I estimated an additional model using a cross-tabulation of the two variables used in Table 3 to measure premarital intimate relationships (in essence, examining any interaction that occurs between the two variables), excluding categories such as premarital cohabitation without premarital sex in which there were no observations. The following categories resulted (women with no premarital sex or premarital cohabitation serve as the baseline): women who had premarital sex with

their husband only but did not cohabit with him; women who had premarital sex with their husband only and cohabited with him, women whose first premarital sex was with another man but who never cohabited, women whose first premarital sex was with another man and who cohabited with her husband, women whose first premarital sex was with another man and cohabited with him as well as her husband, and a small number of women whose first premarital sex was with another man and who cohabited with him but not her husband.

The results from estimating a model with these variables are shown in Table 4. Again, for the sake of parsimony, the effects of the control variables are not shown (they are virtually unchanged from the effects shown in Table 2). It is clear that an intimate premarital relationship limited to a woman's husband does not affect the risk of marital disruption. However, having at least one other intimate relationship prior to marriage is linked to an increased risk of divorce (from 53% to 166%). There is a substantially higher risk of marital dissolution if the woman both had sex with another man and cohabited with him (166% vs. 53%–119% for other patterns of premarital relationships involving someone other than one's husband, a difference that is statistically significant). That is, there is an interaction between having multiple premarital sexual partners and cohabiting multiple times.

I concluded the investigation by considering whether the effects of premarital relationships vary by marriage cohort. I conducted the analysis by creating interaction terms for each of the variables measuring premarital relationships shown in Table 4 and the dummy variables indicating marriage cohort. I found no evidence to suggest that the effect of any of the different premarital relationship histories had changed across time (results not shown). None of the effects for the interaction terms reached statistical significance, and the overall model fit was not significantly better than that reported in Table 4.

Table 4. Proportional Hazards Regression Model (Exponentiated Coefficients and *t* Statistics in Parentheses) Examining the Effect of the Interaction Between Premarital Cohabitation and Premarital Sex on the Risk of Marital Dissolution ($N = 6{,}577$)

Variable	Premarital Cohabitation and Premarital Sex
Premarital sex with husband only, no cohabitation	0.933 (0.84)
Premarital sex with husband only, cohabited with him	0.920 (0.73)
Premarital sex with husband and other, no cohabitation	2.087* (9.38)
Premarital sex with husband and other, cohabited with husband only	2.187* (8.93)
Premarital sex with husband and other, cohabited with husband and other	2.656* (7.40)
Premarital sex with husband and other, cohabited with other only	1.530* (1.97)
Model χ^2/df	1095/35

Note: The model includes the controls indicated in Table 2. Values of the *t* statistic are presented in parentheses.
*$p < .05$.

Discussion

The results presented in this article replicate findings from previous research: Women who cohabit prior to marriage or who have premarital sex have an increased likelihood of marital disruption. Considering the joint effects of premarital cohabitation and premarital sex, as well as histories of premarital relationships, extends previous research. The most salient finding from this analysis is that women whose intimate premarital relationships are limited to their husbands—either premarital sex alone or premarital cohabitation—do not experience an increased risk of divorce. It is only women who have more than one intimate premarital relationship who have an elevated risk of marital disruption. This effect is strongest for women who have multiple premarital coresidental unions. These findings are consistent with the notion that premarital sex and cohabitation have become part of the normal courtship pattern in the United States. They do not indicate selectivity on characteristics linked to the risk of divorce and do not provide couples with experiences that lessen the stability of marriage.

To be sure, this research is limited by the lack of information pertaining to the relationship histories of men. Only information pertaining to the premarital relationships of women is available in the NSFG (note, however, that Round 6 of the NSFG, conducted in 2002, will contain information about men). Thus, the results cannot be extrapolated to the premarital relationships of men, and there is no immediate basis for expecting the effects of such relationships to be either similar to or different from those of women. The current results also cannot be used to ascertain the joint effects of the premarital relationships of both men

and women (e.g., the likelihood of marital disruption if both partners had cohabited with someone else prior to marriage). Again, this remains an issue for subsequent research to address in full. These results are also limited to marriages formed prior to 1995 and marriages of relatively short duration. As changes in premarital sex and cohabitation continue to occur, it would prove useful to consider the effects of these variables on marital stability.

It remains the case, however, that women with more than one intimate relationship prior to marriage have an elevated risk of marital disruption. The risk of divorce is particularly great for women who cohabited with both their husbands and another man. Unfortunately, this study does not provide any information that allows us to better determine whether the effect of having multiple premarital relationships is based on differences on preexisting characteristics that are tied to the risk of divorce or whether having multiple relationships generates environments where relationship skills or attitudes and values about the permanency of marriage are somehow altered. It remains the task of subsequent research to consider these alternatives more fully. This limitation notwithstanding, the results presented here should shift attention away from research that focuses on the selection of individuals into cohabitation and premarital sex to a focus on the selection of individuals who do not marry the individuals with whom they first cohabit or initiate first sex. It may well be the case that, irrespective of the legal status of the relationship, the relevant distinction to make is between people who form multiple relationships and people who form a single, longer lasting relationship.

References

Abma, C., Mosher, W., Peterson, L., & Piccinino, L. (1997). Fertility, family planning, and women's health: New data from the 1995 National Survey of Family Growth. *Vital and Health Statistics, 23(19).* Washington DC: National Center for Health Statistics.

Allison, P. (2002). *Missing data.* Thousand Oaks, CA: Sage.

Axinn, W., & Barber, J. (1997). Living arrangements and family formation attitudes in early adulthood. *Journal of Marriage and the Family, 59,* 595–611.

Axinn, W., & Thornton, A. (1992). The relationship between cohabitation and divorce: Selectivity or causal influence? *Demography, 29,* 357–374.

Becker, G. (1991). *A treatise on the family.* Cambridge, MA: Harvard University Press.

Bennett, N., Blanc, A., & Bloom, D. (1988). Commitment and the modern union: Assessing the link between premarital cohabitation and subsequent marital instability. *American Sociological Review, 53,* 127–138.

Blossfeld, H., Hamerle, A., & Mayer, K. (1989). *Event history analysis: Statistical application in the social sciences.* Hillsdale, NJ: Erlbaum.

Booth, A., & Johnson, D. (1988). Premarital cohabitation and marital success. *Journal of Family Issues, 9,* 255–272.

Brown, S., & Booth, A. (1996). Cohabitation versus marriage: A comparison of relationship quality. *Journal of Marriage and the Family, 58,* 668–678.

Bumpass, L., & Lu, H. (2000). Trends in cohabitation and implications for children's family contexts in the United States. *Population Studies, 54,* 29–41.

Bumpass, L., Martin, T., & Sweet, J. (1991). The impact of family background and early marital factors on marital disruption. *Journal of Family Issues, 12,* 22–42.

Bumpass, L., & Sweet, J. (1989). National estimates of cohabitation. *Demography, 26,* 615–625.

DaVanzo, J., & Rahman, M. (1993). American families: Trends and correlates. *Population Index, 59,* 350–386.

DeMaris, A., & MacDonald, W. (1993). Premarital cohabitation and marital instability: A test of the unconventionality hypothesis. *Journal of Marriage and the Family, 55,* 399–407.

DeMaris, A., & Rao, K. (1992). Premarital cohabitation and subsequent marital stability in the United States: A reassessment. *Journal of Marriage and the Family, 54,* 178–190.

Faust, K., & McKibben, J. (1999). Marital dissolution: Divorce separation, annulment, and widowhood. In M. Sussman, S. Steinmetz, & G. Peterson (Eds.), *Handbook of marriage and the family,* (2nd ed., pp. 475–499). New York: Plenum Press.

Kahn, J., & London, K. (1991). Premarital sex and the risk of divorce. *Journal of Marriage and the Family, 53,* 845–855.

Lillard, L., Brien, M., & Waite, L. (1995). Premarital cohabitation and subsequent marital dissolution: A matter of self-selection? *Demography, 32,* 437–457.

National Center for Health Statistics. (1998). *Sample design, sampling weights, imputation, and variance estimates in the 1995 National Survey of Family Growth.* Washington DC: U.S. Government Printing Office.

Schoen, R. (1992). First unions and the stability of first marriages. *Journal of Marriage and the Family, 54,* 281–284.

Skinner, K., Bahr, S., Crane, D., & Call, V. (2002). Cohabitation, marriage, and remarriage. *Journal of Family Issues, 23,* 74–90.

Smock, P. (2000). Cohabitation in the United States: An appraisal of research themes, findings, and implications. *Annual Review of Sociology, 26,* 1–20.

Tanfer, K. (1987). Patterns of premarital cohabitation among never-married women in the United States. *Journal of Marriage and the Family, 49,* 483–497.

Teachman, J. (1983). Early marriage, premarital fertility, and marital dissolution. *Journal of Family Issues, 4,* 105–126.

Teachman, J. (1985). Historical and subgroup variations in the association between marriage and first childbirth. *Journal of Family History, 10,* 379–401.
Teachman, J. (2002). Stability across cohorts in divorce risk factors. *Demography, 39,* 331–351.
Teachman, J., & Polonko, K. (1990). Cohabitation and marital stability in the United States. *Social Forces, 69,* 207–220.
Teachman, J., & Tedrow, L. (1998, March). *Evaluation of the 1995 National Survey of Family Growth.* Report prepared for the National Center for Health Statistics, Washington, DC.
Thomson, E., & Colella, U. (1992). Cohabitation and marital stability: Quality or commitment? *Journal of Marriage and the Family, 54,* 259–267.
Thornton, A., Axinn, W., & Hill, D. (1992). Reciprocal effects of religiosity, cohabitation, and marriage. *American Journal of Sociology, 98,* 628–651.
White, L. (1990). Determinants of divorce: A review of research in the eighties. *Journal of Marriage and the Family, 52,* 904–912.
Whyte, M. (1990). *Dating, mating, and marriage.* New York: Random House.
Winship, C., & Radbill, L. (1994). Sampling weights and regression analysis. *Sociological Methods and Research, 23,* 230–257.