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Sexual Frequency and the Stability of Marital and Cohabiting Unions

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Abstract

Prior research on marriage shows that lower sexual frequency or lower sexual satisfaction is associated with higher rates of divorce. Scant research, however, has addressed the role of sexual activity in the dissolution of cohabiting unions. Researchers have shown that marriage and cohabitation are different institutional family forms. Thus, there are good reasons to expect that the link between sexual activity and stability will differ across marriage and cohabitation. We draw upon social exchange theory to develop our hypotheses. Our theoretical framework proposes several reasons why sexual frequency is more important in cohabitation: (1) cohabitors' lower costs of finding sexual alternatives, (2) cohabitors' lower barriers of ending the relationship in the form of union-specific economic and non-economic capital, and (3) cohabitors' higher demands for sexual activity. In other words, sexuality occupies a more prominent role in cohabitation than marriage, and low sexual frequency within cohabitation is more likely to lead to dissolution. Using the National Survey of Families and Households (NSFH) and discrete-time event history models, we examine the relationships between sexual frequency and union dissolution. Results indicate that low sexual frequency is associated with significantly higher rates of union dissolution among cohabitors than married couples.

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Introduction

Prior research finds that sexuality within marriage is an important component of marital quality and stability. Typically, studies find that higher sexual satisfaction or frequency is positively associated with marital stability (Yeh, Lorenz, Wickrama, Conger, & Elder 2006; Edwards & Booth, 1994, Oggins, Leber, & Veroff, 1993; Veroff, Douvan, & Hatchett, 1995; White and Keith, 1990). The relationship between sexual activity and union stability in cohabitations has received less research attention, but the existing research finds that sexual satisfaction in nonmarital unions also promotes stability (Sprecher, 2002).

Although it has previously been established in separate studies that sexual activity is associated with union stability for both marriage and cohabitation, no studies have compared the importance of sexual activity across marital and nonmarital unions. Because partners in these two types of unions have different expectations, histories, and responsibilities (Giddens, 1992), there is good reason to believe that sexuality within these unions may have differential stabilizing roles. The role of sexual frequency in relationship satisfaction is an important area of study as recent research finds that sexual relations ranked as the second most problematic issue (after balancing job and family) among a national sample of young married couples (Risch, Riley, & Lawler, 2003).

In this paper, we develop and present a theoretical framework that links sexual activity to union stability. We examine how the importance of sexual activity varies across marital and cohabiting unions. We use the first and second waves of the National Survey of Families and Households (NSFH) to empirically test our hypotheses.

Theoretical Issues

It has been well-established in the literature that positive, healthy sexuality within marriage is associated with several dimensions of marital well-being including marital satisfaction and happiness (Edwards & Booth, 1994; Henderson-King & Veroff, 1994; Perlman & Abrahmson, 1982; Blumstein & Schwartz, 1983). Research has also found that low sexual satisfaction can promote marital instability (Edwards & Booth, 1994; Oggins, Leber, & Veroff, 1993; Veroff, Douvan, & Hatchett, 1995; White & Keith, 1990). For example, Edwards and Booth (1994) found that declines in sexual satisfaction among married couples from 1980 to 1983 were associated with a higher likelihood of divorce 5 years later. White and Booth (1991) wrote that reports of sexual problems among married couples increased the likelihood of divorce, net of other relationship quality variables. Fewer studies have focused on the role of sexual satisfaction in cohabiting or dating relationships. One exception is Sprecher's (2002) study of the quality and stability of dating couples. She finds that couples who reported higher sexual satisfaction scores were more likely to stay together than couples with lower scores.

Social and Biological Factors Linking Sexual Frequency and Dissolution

There are several explanations linking lower sexual frequency or lower sexual satisfaction to higher rates of union dissolution. One explanation is selection. It may not be that reduced sexual activity causes union dissolution, but that as partners experience other non-sexual problems and difficulties in the relationship, their level of intimacy and sexual activity drops as well. Findings from prior studies are consistent with this reasoning. For example, alcoholism is likely to cause both low sexual frequency and higher rates of dissolution (O'Farrell, Choquette, & Birchler, 1991). Also, much research has demonstrated that poor communication is linked to low levels of sexual satisfaction. Poor communication may also account for higher rates of

relationship dissolution (Thachil & Bhugra, 2006). In sum, this literature suggests that any research studying the relationship between sexual activity and union stability must control for potential confounding causes of both sexual frequency and dissolution in order to avoid spurious associations.

A second explanation of the relationship between sexual frequency and union stability is a causal one: the sexual act promotes social attachment between participants. Research from both the biological and social sciences also is consistent with this explanation. The social sciences usually focus on behavioral models of attachment, while biological sciences have investigated neuroendocrine models (Carter, 1998). Neuroendocrine models of attachment point to neurochemical mechanisms that aid the formation of social bonds. Neurochemicals such as Oxytocin and vasopressin, for example, are released during sexual activity and may help to increase social attachment (Carter, 1998; Insel, 1997). While these processes have not been conclusively identified in humans, animal studies strongly suggest that neurochemical released during sex do cause social attachment to increase through biochemical mechanisms in the brain (Insel, 1997).

From a social science perspective, the relationship between sexual activity and union dissolution can be studied with social exchange theory. Social exchange theory has been used to analyze a broad range of social interactions (e.g., Blau, 1964; Homans, 1961; Sprecher, 1998), based on the assumption that in a given interaction, each individual gives something and gets something in return. Analyzing the costs and benefits of various interpersonal behaviors provides a useful basis for making predictions about how people will choose to act. Specifically, social exchange theory can help explain how sexual interaction occurs or does not (Lawrance & Byers,

1995), and more generally how sexual interactions may influence relationship disruption decisions (Levinger & Moles, 1979).

Capitalizing on the strengths of exchange theory, Lawrance and Byers (1995) developed the Interpersonal Exchange Model of Sexual Satisfaction (IEMSS). This model takes into account how potential partners weigh the rewards and costs of their sexual relationship. Rewards emerge when exchanges are pleasurable while costs are generated, for example, when exchanges require physical or mental effort or those that produce pain, embarrassment, or anxiety (Thibaut & Kelley, 1959). The IEMSS also accounts for an individual's comparison level (CL) -- the standard against which individuals judge the attractiveness of their rewards and costs (Kelley & Thibaut, 1978). In other words, the individual evaluates the level of rewards and costs that they expect to receive in a sexual relationship. In sum, social exchange theory holds that as the costs of a given interaction, for example having sex, begin to outweigh the rewards, an individual will not engage in the interaction.

More generally, social exchange theory can be used to study the relationship between low sexual frequency and union dissolution. Social exchange theory suggests that partners weigh the costs and benefits of a marriage in deciding whether to dissolve it or not. Part of this calculation includes the barriers to ending their current union (Levinger & Moles, 1979). When the costs of staying in a relationship consistently outweigh the rewards, and barriers are seen as surmountable, individuals may seek to end the relationship. When faced with low sexual frequency, we argue that cohabiting couples face fewer barriers to and lower costs of leaving a relationship. Using social exchange theory, we generate several hypotheses to predict why the impact of sexual frequency on union stability will differ for cohabitation and marriage.

Differences between Marital and Cohabiting Unions

To better understand differences between cohabiting and marital unions in relation to sexual frequency and dissolution, we first need to explicate the broader differences between marriage and cohabitation. Broadly, marriage and cohabitation involve different levels of institutionalization. Specifically, cohabitation has been described as an incomplete institution compared to marriage (Brown & Bulanda, 2005; Smock & Gupta, 2002). The concept of an incomplete institution was first used by Cherlin (1978) to argue that remarried families with children lack a clear set of norms and thus proscriptive solutions to problems that emerge. For example, the role of a step-parent in rearing step-children is less clear than the role of a biological parent. Nock (1995) extended this idea to argue that cohabitation also falls within the definition of an incomplete institution. The norms about marriage are clearer and more specific than those surrounding cohabitation, because cohabitation is a much newer relationship form, and thus not governed by a clear set of consensual norms. Because the rules and norms governing cohabiting relationships are less clear, it has been suggested that partners face greater negotiations over their roles in the relationship than married couples (Brown & Bulanda, 2005), although direct evidence of this is scant.

Perhaps even more important Nock (1995) noted that cohabitation is not governed by formal law as marriage is. This partially explains why marriage and cohabitation have different time horizons (Waite & Joyner, 1992). While both marriage and cohabitation are viewed as monogamous relationships, cohabiting involves less long-term commitment compared to marriage as cohabitations are much more easily dissolved. Married couples expect to and do stay together longer than cohabiting couples (Bumpass & Lu, 2000; Bumpass, Sweet, & Cherlin, 1991). Thus, cohabitation, unlike marriage, carries no explicit social or legal commitment to stay together for the long term.

Given these broad differences between marriage and cohabitation, we propose several hypotheses to explain why the impact of sexual frequency on union stability differs between marriages and cohabitations. First, cohabiting couples have lower costs of ending the union with regards to sexual alternatives. When a marriage or cohabitation ends, sexual activity with the partner also ends: one of the costs of dissolving the union is lost sexual activity. Partners may seek to replace this lost sexual activity with a new partner, but there are search costs to finding a new partner (Oppenheimer, 1988). These search costs are probably lower for cohabiting than married individuals (Kravdal, 1999). Dolcini et al. (1993) reported that while only 2% of married individuals had more than one sexual partner in the past year, 12% of cohabitors did. Other research showed that cohabitors are twice as likely to have been unfaithful in the past year (Treas & Giesen, 2000). We hypothesize that cohabitors will have more ready access to a replacement sexual partner, which lowers the costs of ending the union with regards to lost sexual activity.

Second, cohabitors have fewer barriers to ending the union because they have fewer shared investments in economic and non-economic union-specific capital. Children can be viewed as a form of non-economic, union-specific capital. Cohabiting couples are less likely to have children present in the household compared with married couples. For example, 39 percent of cohabiting couples have children compared to 45 percent of married couples who have children present (U.S. Bureau of the Census, 2003). However, in married couples with children, the children are more likely to be the biological offspring of both parents compared with children in cohabiting families. In sum, it is still the case that cohabitors are less likely to have children than married couples, and that a larger proportion of these cohabiting couples did not have these children together. Thus, compared to married couples, cohabitors have fewer barriers to dissolve the union because of a higher likelihood that no children are present or that only one of the

partners is the child's biological parent. In contrast to non-economic union-specific capital, home ownership represents economic union-specific capital. A home represents a substantial economic asset that would have to be divided if the union were to end (Rindfuss & Van den Heuvel, 1990). In general, cohabitors do not pool together financial resources to the same degree as married partners (Morrison & Ritualo, 2000). Thus, married couples are more likely to face substantial barriers such as selling a large asset or losing touch with biological children than are cohabitors. In terms of social exchange, while low sexual frequency may lower the benefits of the union for both marriage and cohabitation, married individuals will have higher barriers to leaving the relationship, and the impact of low sexual frequency is weakened.

Third, cohabitors might have higher expectations and demands for sexual activity than married partners. The literature suggests multiple dimensions on which cohabitors' values, expectations, and norms differ from married spouses. For example, cohabitors are usually more individualistic than people in marital unions (Teachman, 2003), and these individualistic tendencies can interfere with the development of commitment to the relationship and its intrinsic rewards (Scanzoni, Polonko, Teachman, & Thompson1989). An additional dimension on which cohabitors and married partners might differ is the expectation of sexual frequency. Researchers find that cohabitors report higher sexual frequency per month compared to married couples (Michael, Gagnon, Laumann, & Kolata, 1994). For example, while over 40 percent of married couples report having sex 2 - 3 times per week, well over 50 percent of cohabiting couples have sex 2 - 3 times per week (Michael, et al. 1994). Prior research on marital sexual frequency documents that sexual activity declines with age and relationship duration (James, 1974; Jasso, 1985; Klusmann, 2002; Rao & DeMaris, 1995; Udry 1993; Udry & Morris, 1978; Westoff, 1974). For example, Klusmann (2002) reports that sexual activity and sexual satisfaction decline

among women and men as the duration of partnership increases and that sexual desire declines in women as well. Overall, norms and expectations for sexual activity are lower for marriages than cohabitations. We expect that the disruptive impact of low sexual frequency in marriage will be weaker than in cohabitation, where partners expect higher levels of sexual activity.

In sum, we expect that higher sexual frequency will be associated with lower rates of union disruption in both marriage and cohabitation. We hypothesize, however, that higher sexual frequency will have a stronger effect at maintaining union stability in cohabitation than marriage. Potential reasons include cohabitors' lower costs of finding sexual alternatives, cohabitors' lower barriers of ending the relationship in the form of union-specific economic and non-economic capital, and cohabitors' higher demands for sexual activity.

Data and Methods

To test our hypotheses, we use data from the first two waves of the National Survey of Families and Households (NSFH). Wave 1 of the NSFH collected a variety of family, household, and demographic data from a nationally representative sample of individuals in 1987-1988. NSFH data were collected from a randomly selected adult in each household surveyed and from the respondent's spouse or partner. Respondent data were collected through both face-to-face interviews and self-administered questionnaires; spouses and partners were asked to complete a shorter, less detailed questionnaire (Sweet, Bumpass, & Call, 1988). Wave 2 data were collected in 1992-1994, and wave 3 data were collected in 2001-2003, but did not follow up with all respondents. Thus, our analysis is based on the wave 1 sample of married and cohabiting respondents who were reinterviewed at wave 2. This includes 5440 marital unions and 328

cohabiting unions. We take advantage of the couple data by including measures of variables for both partners.

Dependent variable: Union dissolution. We use discrete-time event history analysis to model the rate of union dissolution for marriages and cohabitation between wave 1 and wave 2. Because the couple's union dissolution is measured to the nearest month, the time unit of risk is the couple-month. As is typical in discrete-time event history, the couple contributes observations to the data for each month they are at risk. In order to preserve the proper time-ordering of independent variables measured at wave 1, couples become at risk of dissolution and contribute observations starting at NSFH wave 1. Beginning at wave 1, for every month that the union is intact the dependent variable is coded 0. In the month in which the couple either divorces (marriages) or dissolves (cohabitations), the dependent variable is coded 1, and the couple no longer contributes observations to the dataset. Couples who remain together until wave 2 are censored and do not experience dissolution. Cohabiting couples who marry are censored at the time of marriage. It is necessary to specify the functional form of the hazard in a discrete time model, and we use a quadratic function of the duration since the date of marriage or date of the beginning of cohabitation. Because couples are already married or cohabiting at wave 1 but the duration measure begins prior to wave 1, this modeling approach can be described as left truncation or delayed entry (Allison, 1995). We also estimate an alternative specification using dummies variables to represent time periods of risk, which do not force the hazard into a pre-determined shape. This alternative specification yields similar results, and thus we present the quadratic models.

Independent variable: Sexual frequency. Our primary independent variable of interest is sexual frequency. Although subject to social desirability bias (Leridon, 1996), researchers are

confident that reports of coital frequency are valid and fairly reliable (Smith, Morgan, & Gager, 1994). This confidence comes from a set of empirical observations. First, respondents have been willing to provide answers. Second, frequency distributions seem reasonable given consistency with distributions obtained using other data collection procedures such as interviews or diaries (Kinsey et al., 1948, 1953). Some expected correlates of coital frequency are confirmed across studies using a variety of data collection techniques. For example, in all surveys, mean coital frequency declines with age and marital duration (Laumann, Gagnon, Michael, & Michaels 1994, Udry, 1982; Kinsey 1948; 1953).

Recall is one potential problem with such retrospective reports of coital frequency. For example, Udry (1993) has contended that the use of a diary for data collection is superior to retrospective reports, especially when trying to map out the rhythmic aspects of coitus. He argues that respondents answer the retrospective question concerning monthly coital frequency by looking back over the past week, counting how often they had intercourse, and then multiplying that number by 4. Although retrospective recall of sexual frequency will contain measurement error, this error is most likely to introduce Type II error (failing to reject the null when the null hypothesis is false), thus making our estimates of effects more conservative.

The NSFH question on sexual frequency asked married respondents, "About how often did you and your husband/wife have sex during the past month?" A similar question was asked of cohabiting respondents. The scale for this survey question is the number of times, from 0 up to a maximum of 95. Because the NSFH interviewed partners of respondents, answers to these questions are also available from the partners. We took the average of both partners' responses because Smith, et al., (1994) find little difference between husbands' and wives reports of sexual frequency. In addition, we transform this frequency measure with a logarithmic function by

adding 1 and taking the natural log. The log transformation compresses the distribution at the higher range more than at the lower range. For example, a difference between 10 and 20 times per year is given more importance than the difference between 90 and 100 times per year. This log transformation is appropriate because there is likely a threshold effect of sexual intimacy. In other words, additional sexual activity at higher levels is not as important as increases in sexual frequency at lower levels (Blanchflower & Oswald, 2004).

Costs to ending the union. If cohabitors have lower costs to ending the union, then they have little reason to stay in a union if a partner is dissatisfied with lower sexual frequency. One way to think about costs of ending the union is a choice of alternatives with regards to sex. If partners believe their sex lives will suffer greatly if their union ends, then the union may be less likely to dissolve, even if one partner perceives low sexual frequency. It may be that married spouses have fewer potential sexual alternatives than cohabiting partners. For married individuals, low sexual frequency may not be as strongly linked to dissolution because these individuals may be less confident of their ability to find a replacement sexual partner. We measure potential sexual alternatives with a question that asked both partners, "Even though it may be very unlikely, think for a moment about how various areas of your life might be different if you separated." The survey asked how they thought their "sex life" would change: much worse, worse, same, better, or much better. This variable is coded from 1 to 5, with higher values meaning the respondent thinks his or her sex life would become better if the current union would end. We average the responses from both partners to form a single couple-level measure of perceived sexual costs to ending the union.

Barriers to ending the union: Union-specific capital. One possible reason why sexual frequency is more important for the dissolution of cohabitation compared to marriage is that

cohabitors have less union-specific capital. Thus, cohabitors may find it easier to end the union that married couples. We use two measures of union-specific capital: one is economic, the other is non-economic. The first is home ownership. Although the NSFH asks respondents about multiple assets, we focus on home ownership because a primary residence is most American's single most valuable asset (Keister & Deeb-Sossa, 2001). Home ownership is coded 1 if the couple owns a home, and 0 otherwise. Due to the way the NSFH asked questions about home ownership, we have to make several assumptions. If a couple is married, the home ownership question was asked only of the primary respondent; it is assumed that both partners share ownership because they are married. If a couple is cohabiting, the question is asked of both the respondent and partner, but it remains unknown whether they have joint ownership of the same house. We assume that if both cohabiting partners say they own a home, both partners are referring to the same house. The second measure of union-specific capital is the presence of biological children common to both partners in the home. This variable is coded 1 if there is at least one child in the household who is biologically related to both partners, and 0 otherwise.

Controls. Age of each partner is included given the consistent findings that older age is associated with less coital frequency. Lower coital frequency occurs among older couples and those in longer marital unions (James, 1974; Jasso, 1985; Rao & DeMaris, 1995; Udry, 1993; Udry & Morris, 1978; Westoff, 1974). Declines in coital frequency by age and marital duration are attributed to the aging process and include increases in illness and decreases in male physical ability and male and female hormone levels, but cannot adequately explain the pattern of the decline (Greenblat, 1983; Udry, Deven, & Coleman, 1982). For example, research suggests that much of the decline occurs early in marriage (even in the first year) and is attributed to

habituation, which is defined as the loss of interest or novelty of a sexual partner (James, 1974, 1981).

We also include control variables previously shown to be correlated with sexual frequency and divorce or the dissolution of cohabitation, including religion, race and ethnicity, couple income, education level, relationship satisfaction, self-rated health, and hours in the paid workforce (Call, Sprecher, & Schwartz, 1994; Michael et al., 1994; Teachman, 2003). Because prior work documents differences in the frequency of sex and the likelihood of divorce by religious affiliation (Call et al., 1995; Lehrer & Chiswick, 1993), we include the religion of the couple. We base our measurement of religion on the work of Lehrer and Chiswick (1993) who also used the NSFH to study marital stability. Taking advantage of couple-level data, we measure whether both partners are 1) ecumenical Protestant, 2) exclusivist Protestant, 3) Catholic, 4) an interfaith marriage involving two different religion categories, or 5) all other categories. While not ideal, it was necessary to combine many different faiths in an "all other category" because the sample of cohabitors was not large enough to distinguish between these different faiths. The race/ethnicity of the couple is coded as 1) both non-Hispanic white, 2) both non-Hispanic black, 3) both Hispanic, 4) both other race/ethnicity, or 5) interracial marriage. Income is measured as the couple's total income, including investments, as reported by the respondent. Because this measure is skewed, we use a log transformation. Education of the partners is measured in years, with a maximum of 17 for respondents who achieved more than a Bachelor's degree. Hours per week spent in paid work force is included in the models as it jointly affects sexual frequency and the likelihood of divorce. It is measured with a continuous variable.

Relationship happiness has been shown to be positively correlated with sexual frequency and divorce (Blumstein & Schwartz, 1983; Edwards & Booth, 1994; Sprecher, 2002), and we include this measure as a control. Respondents were asked, "Taking things all together, how would you describe your marriage?" Responses were on a seven point scale, from 1) very unhappy to 7) very happy. A similarly worded question was asked of respondents in cohabiting relationships.

We include two different measures of health and well-being. Research finds that poor physical health interferes with the ability to engage in sexual activity, while depression and anxiety may inhibit desire for sex (Channon & Ballinger, 1986; Heiman, 2000; Laumann, Paik, & Rosen, 1999). The overall health measure asked, "Compared with other people your age, how would you describe your health?" Respondents replied on a scale from 1) very poor to 5) excellent. Individual mental well-being was assessed with a global happiness question that asked, "First taking things all together, how would you say things are these days?" Respondents answered on a scale, from 1) very unhappy to 7) very happy. Although the NSFH contains more detailed measurement of mental well-being using a more standard assessment of mental health, this more detailed measurement is available only for the primary respondent, not spouses and partners. Thus we use a general measure of overall well-being, which was asked of both partners.

An additional methodological concern in our analysis is missing data. There are many ways to handle missing data, and Call et al. (1995) try numerous strategies for dealing with missing reports of sexual frequency. Currently, a well-accepted practice is to use multiple imputation techniques (Allison, 2002). The critical assumption for this missing data is that the data are missing at random (MAR), conditional on other non-missing attributes. Although this assumption cannot be tested, the assumption can be strengthened by including all relevant

predictors in an imputation model. In our multiple imputation approach to deal with item missing data, we created 5 complete datasets for wave 1 respondents who were also interviewed at wave 2. We then analyzed the imputed datasets with complete-data methods. The results of these complete-data analyses were combined to arrive at a single estimate that properly incorporates the uncertainty in the imputed values. We used SAS PROC MI and PROC MIANALYZE to create the datasets and combine the multiple analyses.

Results

(Table 1)

Descriptive statistics are presented separately for cohabiting and marital unions in Table 1. From NSFH wave 1 to wave 2, 53% of cohabitations dissolved, while only 12% of marriages did. Sexual activity is higher in cohabitation, at about 12 times per month compared to only 7 times per month for marriages. Cohabiting couples were much less likely to have a shared biological child in the household (21% of cohabitors, 55% of married partners). Lower proportions of cohabitors (17%) owned homes than married partners (75%). Perceptions of how each partner's sex life would change if the union ended varied by union type. If the current union ended, cohabiting partners were more optimistic about the improvements in their sex lives.

Many of the differences in the control variables between the two types of unions are expected and consistent with the prior literature. For example, compared to married partners, cohabitors are younger, had lower income, worked more hours in the labor force, and have less traditional gender ideology.

(Table 2)

In Table 2, we present the multivariate analyses of sexual frequency and union dissolution. Analyses are conducted separately for cohabitations and marriages. The results are presented as odds ratios, which are the exponentiated coefficients from the logistic regression models. A coefficient with an odds ratio greater than 1 represents a positive effect – one that accelerates the rate of union dissolution. An odds ratio less than 1 represents a negative effect – one that slows dissolution. Because odds ratios are multiplicative, an odds ratio equal to or not significantly different from 1 is a null effect – i.e. the variable has no effect on the rate of dissolution.

In Model 1, we examine the relationship between the control variables and the rate of dissolution among cohabitors. Significant predictors include men's age, which significantly reduces the rate of dissolution, and relationship happiness. As expected, when partners are happier with their relationship they are less likely to break up ($p<.001$ for women, $p=.06$ for men). When both partners are ecumenical Protestant, the cohabitation is significantly more likely to dissolve, compared to the reference group (both partners another religion). In model 2, wave 1 logged sexual frequency is added as a predictor. Sexual frequency has a significant negative relationship with the dissolution of cohabitation: when partners have higher sexual frequency, the rate of cohabitation dissolution is significantly lower.

Models 3 and 4 repeat the analyses for married couples. Model 3 examines the relationship between control variables and the rate of divorce. Significant predictors include the woman's age, man's education, and both female and male relationship happiness. In model 4, wave 1 logged sexual frequency is added. While the coefficient is negative, it is not significant at the .05 level ($p=.13$). This coefficient suggests that the impact of sexual frequency in marital dissolution is less important than it is in a cohabitating one. The coefficient is not significant, and

the magnitude of the coefficient is smaller (the coefficient of .93 is closer to 1.00 for married couples, compared to the coefficient of .72 for cohabiting couples).

Note that in Table 2, some control variables in our models are not significant or have effects somewhat weaker than what has been found in the literature. This may be due to over-controlling our models: we included relationship happiness as a control, and it had strong effects on dissolution. Relationship happiness is likely a mediator through which other mechanisms operate, and thus the significance of these other predictors is weakened (e.g., employment, gender ideology). We control for relationship happiness in order to reduce possible spurious relationships between sexual frequency and union dissolution: it is important to control for all predictors that might be related to both sexual frequency and dissolution, and relationship happiness is a key factor.

(Table 3)

The sexual frequency coefficient is significant for cohabitation but not for marriage, which supports our hypothesis, but comparing this coefficient or its level of significance in models 2 and 4 is not a formal statistical test. To properly test if the coefficient significantly varies across marriage and cohabitation, we estimated a full interaction model in which all predictors are interacted with a dichotomous indicator of cohabitation (coded as 1=cohabitating union, 0=marital union). The hypothesis can be tested by the significance of the sexual frequency * cohabitation coefficient. We present these results in Model 1 of Table 3. This coefficient is significant ($p<.05$), which is evidence that the relationship between sexual frequency and union dissolution varies for marriage and cohabitation. The coefficients in Table 3, Model 1 exactly replicate the coefficients from Table 2: the main effect of sexual frequency in Model 1 of Table 3 (.93) is the effect of sexual frequency for married couples in Table 2, Model 4. In addition, the

effect of sexual frequency for cohabiting couples in Table 2, Model 2 (.72) can be derived through the coefficients in Table 3 (.93 * .78 = .72). Table 3 simply allows us to formally test if the coefficient for sexual frequency in cohabitation (.72) significantly differs from the coefficient for sexual frequency in marriage (.93)—which it does.

Given that a significant difference in the effect of sexual frequency exists between cohabiting and marital unions, the remaining models in Table 3 attempt to test what may be some of the mechanisms behind this difference. Model 2 introduces a measure of the presence of shared biological children in the household at wave 1. Shared biological children are a form of non-economic union-specific capital that makes it more difficult to end a union. As expected, the presence of a biological child significantly reduces the rate of marital dissolution by 30% (1.00 - .70 = .30) compared to marriages without a biological child in the home. The interaction with cohabitation is not significant, and thus this effect is similar for cohabitors, reducing the rate of dissolution by 34% (.70 * .94 = .66; 1.00 - .66 = .34). Also note that the coefficient for sexual frequency * cohabitation in Model 2 remains significant, which suggests that shared biological children do not explain the difference in the effect of sexual frequency on the dissolution of married versus cohabiting unions.

In Model 3, another form of union-specific capital is examined: home ownership. While the effect of home ownership is negative on the rate of dissolution for marital unions, it is not significant. The interaction of home ownership with cohabitation is also not significant. Since home ownership had little effect on union dissolution, it is not surprising that the sexual frequency * cohabitation coefficient is still significant in Model 3.

In Model 4, the costs to ending the union are examined. If partners believe their sex lives will not suffer if the union ends—or if they believe their sex lives will improve—then it may be

easier to leave a union due to low frequency of sexual relations. The belief that one's sex life will improve upon separation significantly increases the rate of divorce for married couples. Each point on this 1 to 5 scale raises the rate of divorce by 22%. For cohabitors, however, this effect is essentially null (1.22 * .82 = 1.00). Thus while sexual alternatives increase the rate of divorce for married partners, it appears less important for cohabitors. Despite these findings, the interaction coefficient between sexual frequency and cohabitation is still significant. This suggests that sexual alternatives do not explain the difference in the role of sexual frequency for marital and cohabitation union stability. Model 5 estimates all the predictors of Models 2 through 4 in a single model, yet the conclusion are the same: significant differences in the effects of sexual frequency on union dissolution remain.

Lastly, we note that a selection explanation might be proposed as a counter argument to our findings. The argument would state that sexual frequency is not causally linked to union dissolution, but that low sexual frequency is the consequence of some other relationship problem. While observational data cannot conclusively answer these questions, we argue that a simple selection argument is not sufficient to completely explain our results. We find that the effect of sexual frequency significantly varied across marriage and cohabitation. Thus, even if it were true that selection drives almost all of the effect between sexual frequency and dissolution, the degree of selection apparently varies between marriage and cohabitation. Even if not completely causal, this difference across the two types of unions still points to important differences in the role of sexual frequency in marriage and cohabitation.

Discussion

Drawing upon social exchange theory, we developed a theoretical framework and hypothesized that sexual frequency would have a stronger influence on the dissolution of cohabitation than marriage. The results indicated that while sexual frequency was negatively associated with dissolution for both types of unions, the effect was significantly more negative for cohabitations. These initial findings support our hypotheses. We investigated several mechanisms that might explain these differences between married and cohabiting couples: two measures of union-specific capital and a measure of costs to leaving the union in the form of perceived sexual alternatives. None of these measures, however, reduced the magnitude of difference in the effect of sexual frequency on marital or cohabitation dissolution.

Our findings are part of a larger debate in the research literature that has identified the important differences between cohabitors and spouses but has recently documented more and more commonalities (for a review, see Smock, 2000). For example, research has documented differences as varied as the ideal fertility -- cohabitors expect to have fewer children than married couples -- (Rindfus & Van den Heuvel, 1990) to attitudes about sexual fidelity and gender roles -- cohabitors expect less fidelity and more equality -- (Clarkberg, Stolzenberg, & Waite, 1995; DeMaris & McDonald, 1993). However, most importantly, cohabitors are less likely to view their relationship as one that will last a lifetime and few cohabiting couples continue for a lifetime without marriage (Bumpass, Sweet, & Cherlin, 1991; Bumpass & Lu, 2000). Thus, cohabitation, as a newer relationship form, has been described as less institutionalized compared to marriage (Waite & Joyner, 2001) and as an incomplete institution (Nock, 1995; Smock & Gupta, 2002).

A common stereotype proclaims that marriage is associated with low sexual frequency. However, our results suggest that low sexual frequency is not as problematic for married couples. Instead, it is cohabiting couples who face more problematic outcomes of low frequency. In other words, sex appears to be more important to cohabitors, as low sexual frequency is more detrimental to relationship success among cohabitors. It may be that stereotypes about low marital sexual frequency lead to low expectations for sex after marriage, but that cohabitors still expect an active sex life. When they don't experience it, cohabitors are more likely than married couples to leave the relationship.

Thus, we might conclude that cohabitation is not so much an incomplete institution but better described as a more narrow institution—both structurally and emotionally. In terms of structure, marriage typically involves a broader range of activities than cohabitation. More often than cohabitors, married partners engage in procreation, child rearing, sharing of financial assets, and closer relationships with in-laws. For example, as cohabitation is less institutionalized than marriage, kin relations can be far more problematic, which could reduce cohabitors' relations with in-laws (Milan, 1998). Because marriage encompasses more activities, sexuality occupies a less prominent role for married partners compared to cohabitors. Past research is consistent with this reasoning: Liu (2000) applied a rational choice framework to marital sex and proposed that marital unions make consumption choices from a broader set of familial goods and services. Marital sex decreases because couples reallocate resources from sex to other activities (Liu 2000).

Cohabitation may also be more emotionally narrow than marriage. Waite and Joyner (1992) suggested that a long-term marital contract facilitates emotional investment, but that cohabitors may be less likely to make such emotional investments in general, thus hindering the

development of relationship-specific capital. Cohabitors have been found to have lower levels of commitment than married couples (Nock 1995). Scanzoni, et al. (1989) proposed that initially, intimate relationships are often based on extrinsic rewards—partners continue the relationship in order to obtain sex—but over time the relationships develop intrinsic rewards—partners continue the relationship out of feelings of commitment and solidarity. These intrinsic rewards help to maintain the relationship by diversifying the factors in partners' cost/benefit calculations (Scanzoni et al., 1989). Compared to marriage, cohabitation may be more heavily based on extrinsic rewards, and sex may play a greater role. Thus, cohabitors might rely more upon sexual activity as opposed to long-term emotional attachment to keep their unions together. When sexual activity decreases in cohabitation, there is a lack of emotional investment to keep the partners together. In contrast, when sexual frequency in a marriage is low or of poor quality, there are other shared concerns or bonds that may keep a marriage together.

(Figure 1)

A shortcoming of our analysis is that we were unable to include a measure to investigate one of our explanations why the effects of sexual frequency vary for married and cohabiting partners: cohabitors' increased demands for sex. If cohabitors have higher preferences for sexual frequency, then sexual frequency could be a more important dimension of the union. Thus, low sexual frequency would be more likely to lead to dissolution for cohabitors. Unfortunately, the NSFH does not have a question that asks respondents how much they value sexuality, how important sex is to their relationships, or how much sex they ideally would want to have. Although the NSFH2 has a question about how satisfied respondents are with their current sex life, no information is available about their ideal frequency. Thus, an individual who wants no sex and has no sex would report being very satisfied, as would an individual who desires a lot of

sex and has a lot of sex. In other words, respondents reporting similar satisfaction levels could have very divergent preferences for sexual frequency. Thus, we turned to the National Health and Social Life Survey (NHSLS) to explore if it might be plausible to propose that cohabitors have higher demands for sex than married partners. The NHSLS is considered the best national survey on sexual practices in the United States. The data were collected in 1992, which is generally the same time period of the NSFH and should allow for comparative inference. Surprisingly, the only relevant measurement we found in the NHSLS was a question that asked respondents, "On the average, how often do you think about sex?" We crosstabulated this question with union status (cohabitation or marriage). We show the results of this simple analysis in Figure 1. Cohabiting respondents think about sex more frequently than married respondents. For example, 14% of cohabitors think about sex several times a day, whereas only 7%—half as many—married respondents think about sex that often. It appears, therefore, that cohabitors might have higher demands or preferences for sexual frequency (if thinking about sex is considered a good proxy measure). It is not possible, however, to make strong conclusions from this simple figure. It is not clear if thinking about sex leads to higher sexual frequency, or if higher sexual frequency results in respondents thinking about sex more often. Nevertheless, there may be some support for hypothesis that cohabitors have higher preferences for sexual activity than married respondents.

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Table 1: Descriptive Statistics

	Cohabiting Unions		Marital Unions	
	Mean	Std. Dev.	Mean	Std. Dev.
Experienced dissolution by wave 2	.53	.50	.12	.32
Sexual frequency (prior month)	12.18	10.91	7.17	6.77
Couple has biological child in home	.21	.41	.55	.50
Couple owns home	.17	.38	.75	.43
Couple's belief sex life improves if separated	2.39	.84	2.06	.80
Controls				
Woman's age	29.50	9.49	40.42	14.26
Man's age	32.28	9.57	43.04	14.74
Woman's education	12.19	2.39	12.76	2.65
Man's education	12.15	2.65	12.80	3.02
Couple's income	$33,886	$43,152	$43,258	$44,381
Woman's paid work hours	24.92	19.43	20.38	19.32
Man's paid work hours	36.39	18.69	35.33	19.94
Couple both White	.66	.47	.80	.40
Couple both Black	.18	.39	.10	.31
Couple both Hispanic	.05	.22	.05	.22
Couple both other race	.01	.09	.01	.09
Couple both ecumenical Protestant	.08	.27	.22	.42
Couple both exclusivist Protestant	.18	.38	.22	.42
Couple both Catholic	.16	.37	.18	.39
Couple interfaith	.49	.50	.29	.45
Woman's relationship happiness	5.74	1.41	6.01	1.27
Man's relationship happiness	5.71	1.21	6.08	1.19
Woman's self-rated health	3.94	.84	4.08	.78
Man's self-rated health	4.02	.79	4.07	.82
Woman's global happiness	5.38	1.31	5.62	1.28
Man's global happiness	5.24	1.27	5.58	1.25
Woman's traditional gender ideology	11.29	2.97	12.20	2.89
Man's traditional gender ideology	12.48	2.74	13.21	2.78
Duration of union as of wave 1 (years)	3.17	3.53	16.23	14.18
N	328		5440	

Table 2: Relationships Between Sexual Frequency and Union Dissolution

	Models			
	1	2	3	4
	Cohabiting Unions		Marital Unions	
Logged sexual frequency		0.72**		0.93
		(-2.85)		(-1.51)
Controls				
Woman's age	1.00	1.00	0.96***	0.96***
	(0.26)	(0.06)	(-4.21)	(-4.32)
Man's age	0.96*	0.96**	1.00	1.00
	(-2.38)	(-2.71)	(-0.06)	(-0.15)
Woman's education	0.95	0.95	0.97	0.96
	(-1.12)	(-1.10)	(-1.50)	(-1.58)
Man's education	1.09	1.08	0.95*	0.95*
	(1.68)	(1.54)	(-2.39)	(-2.41)
Couple's income, logged	1.01	1.03	0.98	0.98
	(0.11)	(0.25)	(-0.30)	(-0.29)
Woman's paid work hours	1.00	1.00	1.00	1.00
	(-0.31)	(-0.49)	(0.50)	(0.63)
Man's paid work hours	1.00	0.99	1.00	1.00
	(-0.92)	(-1.26)	(-1.17)	(-1.16)
Couple both White †	1.33	1.26	0.80	0.79
	(0.93)	(0.73)	(-1.35)	(-1.41)
Couple both Black †	1.25	1.07	0.96	0.95
	(0.60)	(0.17)	(-0.23)	(-0.28)
Couple both Hispanic †	1.13	0.96	0.69	0.67
	(0.23)	(-0.08)	(-1.51)	(-1.61)
Couple both other race †	0.66	0.39	0.72	0.72
	(-0.35)	(-0.75)	(-0.68)	(-0.69)
Couple both ecumenical Protestant ‡	2.60*	2.72*	0.95	0.95
	(2.35)	(2.51)	(-0.28)	(-0.32)
Couple both exclusivist Protestant ‡	1.53	1.64	0.92	0.93
	(1.08)	(1.22)	(-0.47)	(-0.44)
Couple both Catholic ‡	1.15	1.19	0.79	0.78
	(0.36)	(0.45)	(-1.31)	(-1.40)
Couple interfaith ‡	1.76	1.91	0.95	0.95
	(1.67)	(1.92)	(-0.31)	(-0.33)
Woman's relationship happiness	0.79**	0.81**	0.76***	0.77***
	(-3.09)	(-2.63)	(-8.54)	(-8.41)
Man's relationship happiness	0.85	0.88	0.85***	0.86***
	(-1.94)	(-1.51)	(-4.75)	(-4.54)
Woman's self-rated health	1.17	1.18	1.03	1.03
	(1.40)	(1.48)	(0.52)	(0.56)
Man's self-rated health	0.92	0.92	1.01	1.01
	(-0.70)	(-0.73)	(0.08)	(0.10)
Woman's global happiness	0.96	0.97	0.95	0.96
	(-0.44)	(-0.29)	(-1.23)	(-1.08)
Man's global happiness	1.03	1.05	0.96	0.96
	(0.29)	(0.52)	(-1.20)	(-1.17)

Table 2: Relationships Between Sexual Frequency and Union Dissolution (continued)

	1	2	3	4
	Cohabiting Unions		Marital Unions	
Woman's traditional gender ideology	1.00	1.00	0.97	0.97
	(0.10)	(-0.03)	(-1.77)	(-1.69)
Man's traditional gender ideology	0.99	0.99	0.99	0.99
	(-0.30)	(-0.20)	(-0.54)	(-0.51)
Duration of union	0.98***	0.98***	1.00	1.00
	(-4.21)	(-4.20)	(0.72)	(0.72)
Duration of union-squared	1.00**	1.00**	1.00**	1.00**
	(3.10)	(3.09)	(-2.71)	(-2.73)
Intercept	0.33	0.58	1.44	1.63
	(-0.98)	(-0.45)	(0.62)	(0.82)
N (couple months)	13363	13363	355705	355705

† Reference is interracial
‡ Reference is both other religion

Coefficients are odds ratios, with t-statistics in parentheses
*p<.05, **p<.01, ***p<.001, two-tailed tests

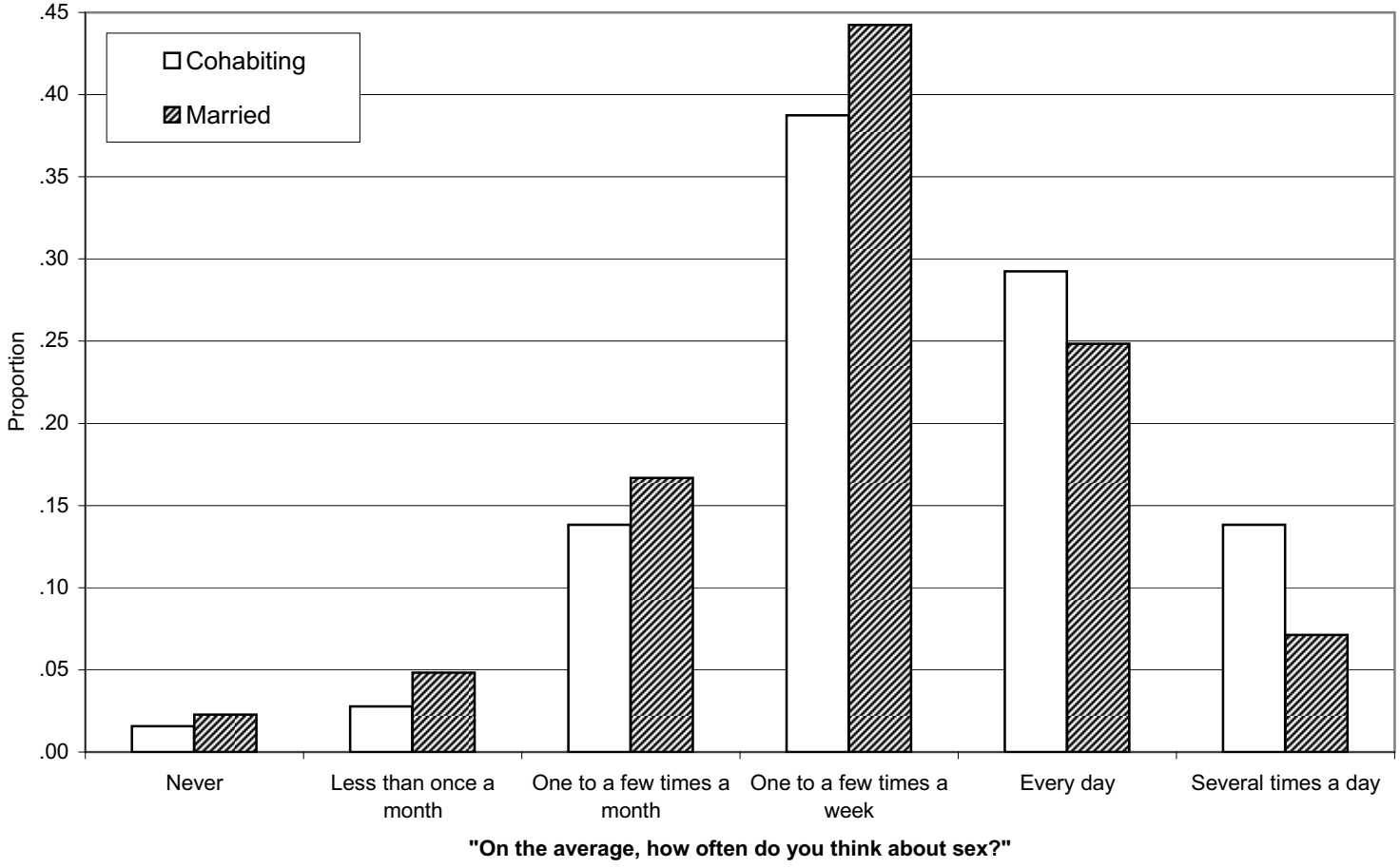
Table 3: Interaction models of Relationships Between Sexual Frequency and Union Dissolution

	Models				
	1	2	3	4	5
Logged sexual frequency	0.93	0.92	0.92	0.96	0.94
	(-1.51)	(-1.70)	(-1.55)	(-0.86)	(-1.08)
Cohabitation	0.35	0.42	0.36	0.93	1.21
	(-0.74)	(-0.59)	(-0.72)	(-0.06)	(0.13)
Logged sexual frequency * Cohabitation	0.78*	0.78*	0.77*	0.76*	0.73**
	(-2.05)	(-2.11)	(-2.15)	(-2.36)	(-2.58)
Couple has biological child		0.70***			0.71***
		(-3.67)			(-3.52)
Couple has biological child * Cohabitation		0.94			0.92
		(-0.25)			(-0.31)
Couple owns home			0.89		0.90
			(-1.22)		(-1.13)
Couple owns home * Cohabitation			0.81		0.81
			(-0.66)		(-0.64)
Belief sex life improves if separated (couple average)				1.22***	1.22***
				(3.74)	(3.62)
Belief sex life improves if separated * Cohabitation				0.82	0.80
				(-1.22)	(-1.37)
N (couple months)	369068	369068	369068	369068	369068

Note: Although not shown, all variables from Table 2 are also interacted with cohabitation

Coefficients are odds ratios, with t-statistics in parentheses
*p<.05, **p<.01, ***p<.001, two-tailed tests

Figure 1: Frequency of Thinking About Sex by Married and Cohabiting Respondents



Source: 1992 National Health and Social Life Survey