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Distal and Proximal Influences on the Risk of Extramarital Sex: A Prospective Study of Longer Duration Marriages

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Abstract

Previous models of the risk of extramarital sex (EMS) rely largely on cross-section samples and retrospective reporting. This may well conflate causes with consequences of EMS in the same model. Instead, this study employs panel data with an event-history approach to re-assess the influences on the risk of EMS. The sample consists of 1,270 married respondents, with no prior history of EMS, who were followed up in five subsequent surveys spanning a 20-year period. The quality of the conjugal bond emerged as a paramount influence on the outcome. The hazard of EMS was higher for respondents who had ever experienced a trial separation, reported marital violence, scored higher on a marital instability index, or spent less time in activities with the spouse. The risk of EMS was lower the longer respondents had been married at baseline, the longer the duration since baseline, and the greater the respondent's religiosity.

The expectation of sexual fidelity in marriage is nearly universal in our culture. Treas and Giesen (2000), for example, found that 99% of respondents in their national sample expected their spouse to have sex only with them, and 99% assumed that their spouse subscribed to the same creed. Nevertheless, a nontrivial proportion of married adults report having engaged in extramarital sex (EMS). National sample estimates range from 1% to 26%, depending on the particular data source used (Atkins, Baucom, & Jacobson, 2001; Atkins & Kessel, 2008; Blumstein & Schwartz, 1983; Forste & Tanfer, 1996; Treas & Giesen, 2000; Whisman & Snyder, 2007). Not surprisingly, the revelation of infidelity tends to have a devastating impact on the course of a marriage. Atwood and Seifer (1997) reported that affairs are given as a reason for marital separation by 31% of men and 45% of women. Work by Amato and his colleagues found infidelity to be the most commonly reported reason for divorce, as well as the single strongest proximal determinant of divorce in a hazard analysis (Amato & Previti, 2003; Amato & Rogers, 1997). Identifying risk factors for EMS is, therefore, a pressing task for behavioral scientists.

Several studies have taken up that challenge. However, virtually all of them (Previti & Amato, 2004, is a notable exception) are based on a retrospective approach in which married individuals are asked whether they have ever engaged in EMS. The occurrence of EMS is then typically "predicted" using respondent characteristics, including the quality of the current marriage. A common limitation for researchers using this approach is the causal ambiguity that arises with retrospective data (Allen et al., 2005; Atkins et al., 2001; Burdette, Ellison, Sherkat, & Gore, 2007; Treas & Giesen, 2000). Treas and Giesen, for example, pointed out the difficulty in interpreting "effects" of predictors such as sexual interest or permissive sexual values. They noted that EMS might just as well stimulate interest in sex, or lead people to adopt more permissive values that are consistent with their

behavior. Studies using the General Social Survey (e.g., Atkins et al., 2001; Atkins & Kessel, 2008; Burdette et al., 2007; Wiederman, 1997) relied on a measure of EMS that asks whether respondents have ever had sex with someone other than their husband or wife while they were married. A negative “effect” of marital happiness on the probability of EMS in this case (Atkins et al., 2001) is especially thorny to interpret. Not only is it possible that current marital happiness is the result of having experienced EMS, but it is not even clear that the EMS took place in the current marriage (acknowledged as a limitation by Atkins et al., 2001).

I seek to address this limitation with this study. Drawing on previous research and theory in the area, I identify a collection of potential influences on the risk of EMS. In place of retrospective data, I utilize a six-wave national panel study of married respondents followed over a 20-year period. At the outset, all respondents indicated that their marriages were free from problems due to EMS. I then model the risk of EMS in a prospective manner using an event history approach. To my knowledge, this is the first study that employs a hazard-model strategy to examine the influences on EMS. Despite the study's other limitations (discussed below), it is hoped that the findings can be triangulated with those from retrospective studies to provide a more comprehensive picture of the etiology of EMS. I begin by reviewing theoretical issues and previous empirical findings.

Theoretical Considerations and Previous Findings

Focus of This Article

EMS encompasses a variety of behaviors. For example, some couples agree to each spouse having sexual relationships with other partners, and participate in organized activities targeted toward that end. This practice is known as “wife swapping,” or in more modern parlance, “swinging” (Bartel, 1971). Other couples may simply have a tacit understanding that occasional discrete sexual dalliances will be tolerated (Blumstein & Schwartz, 1983). Due primarily to measurement constraints, neither of these scenarios, *per se*, is the focus of this article. Rather, this study explores EMS that encompasses either a violation of an expectation of sexual fidelity, or that even if initially tolerated, has at some point caused problems in the marriage. Because for most couples EMS represents a breach of marital vows of sexual fidelity, the terms *affair* and *infidelity* are used interchangeably with EMS at various points in this article.

Intimacy Versus Passion

Although some spouses may deliberately seek out opportunities to be unfaithful, most incidents of EMS tend to be unplanned. As Allen et al. (2005) noted, “Generally speaking, people do not usually set out to have extramarital sex. The extramarital sex behavior is the result of an unfolding definitional process whereby a rationale for the activity is created over a period of time” (p. 114). Given the high level of condemnation of EMS at the societal, as well as the individual level, what renders individuals vulnerable to this event?

Long-term relationships, especially marital ones, entail countervailing forces that increase intimacy between partners while at the same time diminishing their passion for each other. Baumeister and Bratslavsky (1999) defined intimacy as involving the “mutual disclosure of personal information resulting in an empathic, sympathetic, mutual understanding that enables each person to feel that the other understands him or her” (p. 51). Intimacy is a fundamental component of companionate love, which is defined by Hatfield and her colleagues (Hatfield, Pillemer, O'Brien, Sprecher, & Le, 2008), as involving feelings of “attachment, commitment, and intimacy” (p. 36). Intimacy grows over time the longer couples have been together. Baumeister and Bratslavsky contended, however, that a ceiling is eventually reached in which not much more is to be learned about one another. Although a

high degree of intimacy forges a very close bond between partners, passion can be at a low ebb as a result. Baumeister and Bratslavsky defined passion as consisting of strong feelings of attraction for the partner that are further characterized by “physiological arousal and the desire to be united with the other person in multiple senses” (p. 52; for a similar definition of passionate love, see also Hatfield et al., 2008; Hatfield & Rapson, 1993). They further suggested that passion is a function of the *first derivative* of intimacy with respect to time. Hence, at times of rapidly increasing intimacy passion is especially high. On the other hand, when the growth in intimacy slows to a crawl—as in long-term marriages—passion is also at a minimum.

These dynamics have several implications for the risk of infidelity. First, passionate love and romance are routinely glorified in our culture through media such as television, movies, and popular music (Goldmeier & Richardson, 2005). Individuals in long-term marriages may, therefore, long for romance to re-enter their lives but find it difficult to cultivate in their own relationships. Passionate love has been found to wane over time in both newlywed and longer term marriages (Hatfield et al., 2008). Second, adultery, with its attendant requirements of secrecy and the fleeting nature of its opportunities for intimate contact, constitutes a fertile soil for the cultivation of such romance (Richardson, 1988). Third, opportunities abound to meet attractive others as we go about our everyday lives, particularly for those who are employed outside the home (South & Lloyd, 1995). Fourth, a correlate of passionate arousal is a corresponding obsession with the object of arousal, which may interfere with an objective appraisal of the costs and benefits of being unfaithful (Goldmeier & Richardson, 2005). In sum, regardless of the quality of the marital relationship, temptations to be unfaithful constitute an ever-present danger for married individuals. Some combination of incentive and opportunity is, therefore, most likely to be the trigger for this event.

Categorizing the Predictors of EMS

Treas and Giesen (2000) classified the myriad factors affecting the risk of EMS as falling into four domains: personal values of the individual, opportunities for EMS, the nature of the couple's relationship, and demographic risk factors. These can be further distinguished in terms of the more distal versus the more proximal influences, analogous to Amato and Rogers's (1997) classification of the predictors of divorce. Demographic characteristics and personal values are predisposing factors. They constituted more distal influences because they merely set the stage for the degree to which an extramarital affair would constitute a temptation (Allen et al., 2005). Hence, being male, for example, is associated with a heightened risk of EMS because of males' greater sexual interest, desire for sexual variety, and ability to separate sex from love; or greater religiousness is related to a lower incidence of EMS because this behavior is heavily censured in most faiths. Therefore, those who subscribe to religious teachings are substantially less likely to develop a disposition that is favorable to EMS. On the other hand, the quality of the couple bond and the existence of opportunities for affairs are more proximal influences on EMS. These factors are more strongly determinative of incentives or disincentives for infidelity. Those who are unhappily married or whose sexual relationship with the spouse is unsatisfactory, for example, are more vulnerable than others to the temptations of an alternative partner. All else equal, those with greater opportunities for affairs are also more likely to engage in EMS. In the following sections, I review empirical findings bearing on, respectively, the more distal versus the more proximal influences on EMS.

Distal Influences on EMS

Several demographic characteristics have been found associated with EMS. Gender is one such variable, as already noted, with men being more likely than women to engage in EMS

(Atkins et al., 2001; Burdette et al., 2007; Treas & Giesen, 2000; Wiederman, 1997). Men's greater interest in sex, coupled with a less restrictive sexual socialization, combine to raise their risk for this behavior (Barta & Kiene, 2005; Baumeister & Bratslavsky, 1999; Glass & Wright, 1992). Race is also a factor, with both African Americans and Hispanics registering higher rates of EMS than Whites (Allen et al., 2005; Burdette et al., 2007; Treas & Giesen, 2000; Wiederman, 1997). The reasons for these ethnic differences are not clear. Education has been reported to be associated with the risk of EMS, but findings are mixed with respect to the nature of its effect. Atkins et al. (2001) found having more education to be a risk factor for EMS. However, Treas and Giesen (2000) found lower education to elevate the cumulative incidence of EMS for married couples in their sample. Because higher education exposes individuals to more liberal views of sexuality, it would be expected to be a positive risk factor. Having experienced a divorce is associated with an elevated risk of EMS (Atkins et al., 2001; Atkins & Kessel, 2008; Burdette et al., 2007; Wiederman, 1997). Because infidelity is the major reason for divorce (Amato & Previti, 2003; Amato & Rogers, 1997), the experience of a parental divorce may signal exposure to a negative role model in the form of an unfaithful parent. Parental divorce is also associated with lower-quality marriages of offspring (Amato, 1996), which, in turn, raise susceptibility to EMS. Premarital cohabitation has been found to be predictive of an elevated risk of EMS (Forste & Tanfer, 1996; Treas & Giesen, 2000; Whisman & Snyder, 2007). Possible mechanisms for this effect include greater marital instability and more permissive sexual attitudes, which have both been found to be associated with cohabitation (DeMaris & MacDonald, 1993; Teachman, 2003). Other characteristics signaling sexual permissiveness and therefore likely associated with higher EMS rates are an early age at first intercourse, a greater number of previous sex partners (Forste & Tanfer, 1996; Whisman & Snyder, 2007), and more sexual experience outside of marriage.

Theoretically, the number of years married should be negatively related to the risk of EMS for two reasons. First, it represents an investment in a given marriage. The longer the marriage, the greater spouses' investment of time and other resources in it (Rusbult & Martz, 1995). Second, in view of the strong association of infidelity with subsequent divorce, longer duration marriages should be selective of more faithful couples. Research results to date, however, are mixed. In some studies, the risk of EMS has been found to increase with greater marital duration (Forste & Tanfer, 1996; Treas & Giesen, 2000). Liu (2000), on the other hand, showed a linear decline in the probability of EMS with marital duration for women. However, men exhibited a pattern in which the risk of EMS decreased with duration to a minimum around the 18th anniversary, and then increased thereafter. In a related vein, children, especially biological progeny of both spouses, represent another vital marriage-specific investment. The risk of EMS should, correspondingly, be lower in households containing children. Again, however, this is not empirically supported. One of the few studies to report on the effect of children in the household finds that they are associated with an elevated probability of EMS (Burdette et al., 2007). Finally, income level is associated with EMS, but the direction of association is not consistent across studies. Atkins et al. (2001) found a positive linear relationship between income and the risk of EMS among those earning more than \$30,000 per year. In contrast, Atkins and Kessel (2008) found an elevated risk of EMS among both the lowest and the highest income groups. Greater personal income should facilitate clandestine sexual encounters by providing the means for arranging romantic assignments. It can also signal a higher level job associated with overnight travel or the opportunity to interact with more appealing others.

Foremost among personal value orientations that address unfaithfulness is religiosity. Most religions forcefully condemn adultery; hence, the more religious would be expected to be at lower risk for EMS. It is, therefore, not surprising that religiosity, as reflected in standard measures such as church attendance or the stated importance of religion, tends to lower the

probability of EMS (Atkins et al., 2001; Atkins & Kessel, 2008; Burdette et al., 2007; Forste & Tanfer, 1996; Treas & Giesen, 2000; Whisman & Snyder, 2007). Others report the incidence of EMS to be lower among more conservative individuals (Allen et al., 2005), but higher among those with more permissive sexual attitudes (Treas & Giesen, 2000). Because divorce is the primary consequence of the revelation of infidelity, it might be expected that a greater tolerance for divorce would also be associated with a higher likelihood of EMS, all else equal—that is, those who are less inhibited by the prospect of divorce may be more willing to risk it by engaging in EMS.

Proximal Influences on EMS

Regardless of one's predisposition toward EMS, actually engaging in this behavior requires an opportunity (Barta & Kiene, 2005). Opportunities are factors that facilitate engaging in EMS such as time spent away from the spouse, the anonymity afforded by living in large urban areas, or the willingness of a prospective partner. Treas and Giesen (2000), for example, found central city residence to predict the cumulative incidence of EMS for married and cohabiting persons. Workplace arrangements, such as being employed per se, or the opportunity to work alone with customers, clients, or coworkers, has been cited in some work as enhancing the risk of EMS (Atkins et al., 2001; Burdette et al., 2007; Liu, 2000; Treas & Giesen, 2000). A more subtle such influence on the risk of EMS is the sex ratio at work. South and Lloyd (1995) found that the percentage of a labor market area's unmarried females who were employed or enrolled in school was associated with an elevated risk of divorce. They suggested the most likely reason was that a surfeit of unmarried women in the workplace enhances opportunities for married men to meet attractive alternative partners in their workday routine.

Perhaps most importantly, because sexual unfaithfulness approaches the nature of a taboo for most couples, a strong incentive is typically necessary for an affair to develop (Barta & Kiene, 2005). The quality of the couple bond would seem to be the most salient incentive or disincentive. Previti and Amato (2004), for example, found that the perceived instability of the marriage, or divorce proneness, was the only significant predictor of EMS in their sample. Others have found marital unhappiness or relationship dissatisfaction to be associated with an elevated incidence of EMS (Atkins et al., 2001; Atkins & Kessel, 2008; Treas & Giesen, 2000). Relationships that are inequitable or imbalanced with respect to each spouse's power are also more prone to EMS. Engaging in an affair may be a means of either restoring equity or making up for a deficiency in marital power (Allen et al., 2005; Prins, Buunk, & Van Yperen, 1993). At least one study has found sexual dissatisfaction in marriage to be correlated with the reporting of EMS for both genders (Liu, 2000). On the other hand, studies have not consistently found relationship quality to be a factor in EMS. Blumstein and Schwartz (1983), for example, found neither relationship happiness nor sexual satisfaction to be associated with non-monogamous behavior in their sample. Although the quality of the couple bond may not always predict EMS, high marital quality should nevertheless better insulate couples from the threat of an affair.

Hypotheses

This study tests a number of hypotheses based on the foregoing review. Unfortunately, due to a low base rate of EMS in the data source, I was not able to look at the influence of gender. Instead, as explained below (see the Methods section), EMS engaged in by *either spouse* had to be the focus of the analysis. The following associations were hypothesized.

To begin, several background factors were deemed important in accounting for EMS. I expected the risk of EMS to diminish with increasing marital duration. This pertains both to marital duration at the beginning of observation of the panel, as well as to the passage of

time over the course of the study. Relationship longevity represents both a selection effect and an investment in a particular marriage. Cohabiting before marriage was anticipated as being a risk factor for EMS. I expected the risk of EMS to be higher among minorities, in accord with previous research. It was anticipated that the experience of parental divorce would elevate the risk of EMS, as would greater sexual experience outside of a marital context. On the other hand, greater religiosity was expected to reduce the hazard of EMS. Having separated from the current spouse in the past is also considered a risk factor for EMS, for two reasons. First, it is a harbinger of a troubled marriage. Second, it represents an opportunity to establish a liaison with other romantic partners. Higher educational attainment was expected to elevate the risk of EMS by liberalizing sexual attitudes and tastes. A greater tolerance for divorce was expected to enhance the risk of EMS by reducing its perceived costs.

Several other explanatory variables are considered more proximal determinants of EMS. Having either preschool or school-age children in the home was expected to reduce the risk of EMS, as children constitute investments in a given marriage. The hazard of EMS was expected to be higher the more either spouse had work-related opportunities for free time away from the other's surveillance. In contrast, I anticipated the risk of EMS to be lower the more time spouses spent doing things together as a couple. As with the experience of separation, spending little time together is both emblematic of a poor relationship and an opportunity factor. EMS was expected to be more likely in lower quality marriages and those exhibiting an imbalance in power between spouses. Finally, I expected dissatisfaction with the marital sexual relationship to be positively associated with the risk of EMS.

Method

The Data

Data are taken from the survey of Marital Instability Over the Life Course (Booth, Johnson, Amato, & Rogers, 2003). This is a panel study of individuals in the continental United States between the ages of 18 and 55 in 1980, with a telephone, who were married and living with the spouse. The sample was selected using a random digit-dialing cluster technique, with a second random procedure determining whether to interview the husband or wife. Data were collected via telephone interviews and mail-back questionnaires. Follow-up re-interviews were conducted in 1983, 1988, 1992, 1997, and 2000. The initial sample consisted of 2,033 respondents, which represents a 65% response rate among eligible households. The percentage of each previous panel that was successfully re-interviewed in the five successive follow-ups was: 78, 84, 89, 90.3, and 90.2, respectively. By 2000, only 962 of the original respondents remained in the study. Hence, attrition was greatest in the first follow-up interview, and then decreased in subsequent waves. The most common sources of attrition were refusal and inability to locate the respondent (Booth et al., 2003).

The sub-sample employed in this analysis consists of the 1,270 respondents (492 males and 778 females) who (a) reported in 1980 that there had been no EMS in the current marriage (see below for the measurement of EMS), (b) remained married to the original spouse throughout their duration at risk for EMS, and (c) had valid responses on the EMS question as long as they were at risk of EMS. The excluded respondents fall into two categories. One hundred and five respondents reported in the initial survey that either they or their spouse, or both, had had sex with someone else during the current marriage. These are left-censored cases—that is, they have already experienced the event of interest but its timing is unknown. These cases, as well as the other 17 respondents with missing data on this screening question, are necessarily excluded from this study. Of the remaining 1,911 at-risk respondents, 641 had missing data on the response. A comparison of this group with the 1,270 cases in the target sample showed the included group to be characterized by

significantly longer duration marriages, as well as greater educational attainment, religiosity, and marital quality. They were also less likely to have cohabited before the marriage, to be a minority couple, and to have only one spouse with work-related opportunities for affairs. In sum, the analytic sample appears, for the most part, to exhibit attributes associated with more durable marriages. The incidence of EMS is, therefore, in all likelihood, underrepresented in this sample.

Measures

Outcome variable—The occurrence of EMS was assessed with the following question: “I’d like to mention a number of problem areas. Have you had a problem in your marriage because one of you ...?”, followed by several potential problem choices, including “Has had a sexual relationship with someone else?” Response choices were “no,” “yes, spouse,” “yes, self,” or “both.” As Previti and Amato (2004) acknowledged, the incidence of EMS is most likely underestimated by this item. A report in the affirmative requires that respondents be aware of the EMS, experience problems because of it, and be willing to acknowledge it to the interviewer. Although this item has been used as a measure of “infidelity” in previous work using these data (Amato & Previti, 2003; Amato & Rogers, 1997; Previti & Amato, 2004), its wording precludes the conclusion that it is tapping “cheating,” per se. An anonymous reviewer correctly noted that some affirmative answers to this item may reflect EMS that was initially acceptable to both spouses, but nevertheless eventuated in problems for the marriage. Examples are swinging scenarios in which one of the spouses became too emotionally involved with a casual sex partner or dalliances at work that cost a spouse his or her job. Although most affirmative responses probably do reflect sexual infidelity, I use the more neutral EMS to refer to the response variable.

Across all five follow-up intervals, a total of 99 respondents reported problems in the marriage due to EMS on the part of one or both spouses. Sixty-four episodes involved only the husband, 27 involved only the wife, and eight involved both spouses. Due to the relatively low base rate of the event, I combined all such cases into *occurrence of EMS*, a single dichotomous indicator of EMS. The analysis therefore focuses on the prediction of EMS in the marriage, per se, without regard to gender, an approach also taken by Previti and Amato (2004).

Time-invariant predictors—Background characteristics of respondents were all taken from the 1980 wave of measurement, and do not vary over time. *Years married at baseline* was simply the number of years the respondent had been married as of 1980. *Cohabited before marriage* is a dummy variable indicating that the respondent had cohabited with his or her spouse before the marriage. *Minority respondent* is a dummy variable identifying respondents who reported being Hispanic, Black, or some ethnicity other than White, with the latter as the reference group. *Either spouse's parents have divorced* is a dummy variable indicating that one or both of the spouses' parents had divorced. *Ever separated due to marital troubles* is a dummy variable identifying respondents who reported ever separating for a time in the past, due to marital problems. *Religiosity* is based on a single item asking how much religious beliefs influence the respondent's daily life. Responses ranged from 1 (*none*) to 5 (*very much*). Total nonmarital sexual experience for both spouses was based on information on each spouse's marital history. Unfortunately, information on age at first sexual intercourse was not gathered. Therefore, it was assumed that respondents, on average, had initiated sexual intercourse by age 18 or the age at first marriage, whichever came first. Years of nonmarital sexual experience for each spouse were then calculated as the total number of years spent outside of marriage since initiation of sexual intercourse. *Average nonmarital sexual experience* was the average of these values across both spouses.

Time-varying predictors—Several characteristics of respondents' marriages were assessed at each follow up and were therefore time-varying covariates. All of these measures are lagged by one wave, to avoid endogeneity problems. For example, marital quality measures predicting the reporting of EMS in 1992 are taken from the 1988 survey to avoid their being influenced by the EMS itself. The same reasoning applies to the other time-varying covariates. *Preschool child at home* and *school-age child at home* are dummy variables tapping, respectively, the presence of preschool and school-age children in the household at any given time. Workplace opportunities for having EMS were coded from questions asking whether either spouse's work involved irregular hours, evening meetings, or overnight trips. Two dummy variables were created: *one spouse has opportunities* flags cases in which only one spouse has such work characteristics, whereas *both spouses have opportunities* captures the situation in which both spouses have them. Neither spouse having such opportunities is the reference group. *Respondent's years of schooling* is respondent's educational attainment. The *divorce tolerance scale* is the sum of six items measuring the respondent's endorsement of divorce. A typical item is, "The personal happiness of an individual is more important than putting up with a bad marriage." All responses are coded from 1 (*strongly disagree*) to 4 (*strongly agree*). Alpha reliabilities for the scale range from .62 to .66 across waves. Marital quality was measured via three separate variables assessing the occurrence of spousal violence, the stability of the marriage, and marital happiness. Spousal violence is based on the following question: "In many households bad feelings and arguments occur from time to time. In many cases people get so angry that they slap, hit, push, kick, or throw things at one another. Has this ever happened between you and your husband/wife?" *Spousal violence indicator* is a dummy variable coded 0 until the first wave in which violence is reported. It is coded 1 thereafter. *Marital instability index* is the 27-item measure of divorce proneness described by Amato, Johnson, Booth, and Rogers (2003). It is based on questions about the respondent's thoughts and actions regarding divorcing the spouse and captures the potential for a marriage to dissolve in the future. Alpha reliabilities range from .86 to .91. *Marital quality scale* is a 10-item scale of marital quality based on the respondent's reported happiness with different aspects of the marriage, such as the understanding from the spouse and the amount of agreement, as well as the strength of love for the spouse. Except for this last item, responses all ranged from 1 (*not too happy*) to 3 (*very happy*). Strength of love for the spouse ranged from 1 (*not strong at all*) to 5 (*extremely strong*). Because these items were in different metrics, they were standardized prior to summing. Alpha reliabilities range from .84 to .88. Power imbalance in the marriage was identified using the following item: "Overall, considering all the kinds of decisions you two make, does your spouse more often have the final word or do you?" *Power imbalance indicator* is a dummy for reporting that one or the other spouse has the final say, with "an equal compromise" as the reference category. *Marital interaction scale* is the six-item measure described by Amato et al. It taps the frequency with which the respondent and spouse jointly engage in activities such as going shopping or visiting friends. Alpha reliabilities range from .63 to .70. Finally, sexual dissatisfaction is captured by an item asking respondents how happy they are with their sexual relationship with the spouse, with response categories "very happy," "pretty happy," and "not too happy." *Sexual dissatisfaction indicator* is a dummy indicating the response "not too happy."

Statistical Analysis

The data are analyzed using an event history approach. This technique is optimal because it utilizes information from both uncensored and censored cases, and takes account of duration in the state of fidelity up until the event. In this case, "survival" time in the faithful state until the occurrence of EMS is theoretically a continuous variable. However, the exact timing of EMS is unknown, as information was only gathered in each wave regarding whether it posed a problem in the marriage—that is, survival time is interval censored.

There are five risk intervals in this study: 1980 to 1983, 1983 to 1988, 1988 to 1992, 1992 to 1997, and 1997 to 2000. The question about EMS in any given follow up is assumed to capture EMS in the preceding interval. Hence, a report of EMS in 1983 refers to its occurrence in the 1980 to 1983 interval, and so forth. The modeling of interval-censored data when survival time is continuous is best accomplished using the complementary log–log, or *cloglog*, model. This is a binary response model similar to that employed in logit or probit analysis, but based on an asymmetric underlying distribution (for details, see Agresti, 2002, or Allison, 1982). If survival times are generated by the Cox model and then grouped into intervals, the parameters in the cloglog model are identical to those in the underlying continuous-time version (Allison, 1982).

To estimate the model, I transformed the data to person–period format. Thus, respondents contributed a record to the resulting dataset for each interval in which they remained at risk of EMS. Respondents reporting no problems with EMS were considered right-censored in the last interval in which they were observed to be married to the original respondent. Four dummy variables were created to represent the five follow-up intervals, with the 1980 to 1983 interval being the reference period. Capturing duration at risk in this unstructured fashion mimics the unspecified nature of the hazard function exhibited by the Cox model (Allison, 1982). A total of 4,411 person–periods were employed in the analysis. The outcome variable is a dummy variable coded 0 in all intervals for censored cases. For those reporting EMS, it changes to 1 in the interval in which the EMS was reported. The cloglog model was then applied to the person–period data to model the log hazard of occurrence of EMS.

Most respondents were characterized by delayed entry into the risk set (Hosmer & Lemeshow, 1999), as they had been married for some time prior to the initial survey. Consistent with prior analyses of this dataset utilizing event history analysis (Amato & Rogers, 1997; Previti & Amato, 2004), I controlled for delayed entry by including years married as of 1980 as a covariate in the model. Very few problems with missing data were encountered. Fewer than 1% of the respondents were missing data on the explanatory variables in three of the follow ups. In the second follow up, marital instability was missing for 1.2% of the cases; and in the last wave, sexual dissatisfaction was missing for 2% of the cases. Given the infrequency of the missing-data problem, I employed simple mean—or mode, for dummy variables—substitution to replace missing values. Imputed means or modes were based on separate calculations for each time period. To counter the loss in power brought about by the low incidence of EMS in the sample, I use the .1 alpha level as the threshold for declaring coefficients significant.

Results

Descriptive statistics for all study variables are shown in Table 1. Statistics on EMS and the time-invariant predictors are based on the total number of respondents, or 1,270 persons. Statistics for time-varying covariates are based on the 4,411 person–periods. As noted above, 99 respondents, representing 7.8% of the sample, reported problems due to EMS at some point in the marriage. Some other attributes are worthy of mention. On average, marriages had lasted for about 13 years when respondents were first interviewed. Fourteen percent of marriages were preceded by cohabitation, and 8.8% involved minority couples. Parental divorce was not uncommon, with about one-fourth of respondents reporting either themselves or their spouses to have experienced this phenomenon. Nine percent of marriages had experienced a temporary separation due to discord. On average, spouses had about four years of nonmarital sexual experience prior to the current marriage. Children were present in the household during a substantial portion of the risk period. Preschool children were at home in 23.7% of the periods, and school-age children were present in

52.5% of them. Based on work conditions, opportunities abounded for EMS, with one spouse having such opportunities in 54% of periods, and both spouses having them in another 26.3%. Means for most measures indexing marital quality fall in the middle of their respective ranges, indicating marriages that are generally satisfactory. Nevertheless, approximately 23% of periods reflected marriages with a history of spousal violence, and almost one half reflected marriages with an imbalance of marital power. That said, respondents' sexual relationships with their spouses did not appear to suffer from such problems. Only six percent of periods registered respondent sexual dissatisfaction.

Table 2 presents maximum likelihood estimates for three separate cloglog models of EMS. Model 1 shows the effects of the time-invariant predictors, as well as the effect of passing time in the form of the interval dummies. Coefficients can be interpreted as additive effects on the log hazard of EMS because they are estimates of an underlying continuous model for the log hazard. Thus, each additional year married at baseline (i.e., in 1980) reduces the log hazard of EMS by .04. More intuitively, each year reduces the hazard by a factor of $\exp(-.04) = .96$, or effects about a 4% reduction in the hazard of EMS. The pattern of coefficients for the interval dummies also suggests a declining hazard with passing time in the marriage, with the last two intervals exhibiting significantly lower hazards of EMS, compared to the 1980 to 1983 interval. However, a declining hazard can also signal the presence of unobserved heterogeneity in the model (Allison, 1982) and must be interpreted tentatively. Judging from significance levels, the strongest impact on the hazard of EMS is for having separated in the past due to marital difficulties. This circumstance is associated with a risk of EMS that is 2.8 times higher than for marriages without such experiences. The hazard of EMS is also higher in marriages where either spouse's parents have divorced. On the other hand, greater religiosity is associated with a lower hazard of EMS—net of other factors.

Model 2 adds somewhat more proximal determinants of EMS in the form of time-varying characteristics of the marital household. Of these, only respondents' years of schooling have a significant effect on the risk of EMS. In particular, each additional year of schooling is associated with an 8.8% increase in the hazard of the event. In preliminary analyses, I also considered the effect of the average educational level across spouses, but it was not significant. As is evident from the other coefficients, the risk of EMS also does not appear to be influenced by children in the household, work opportunities, or tolerance of divorce. On the other hand, minority respondents are at marginally higher risk of EMS once these additional factors are taken into account. Similarly, the effect of parental divorce becomes slightly more significant in this second model.

Model 3 adds what would be considered to be the most proximal determinants of EMS: characteristics of the marital relationship itself. Three effects are at least marginally significant. The experience of spousal violence elevates the risk of EMS. Increasing marital instability, or proneness to divorce, is also associated with a greater hazard of EMS. Finally, the more spouses interact with each other on a regular basis, the lower the hazard of EMS. In this last model, both minority status and the experience of parental divorce cease to be significant, whereas the effect of previous marital separation drops by about one-fourth of its original strength. This suggests that these prior factors tend to raise the risk of EMS by influencing the quality of the current marital relationship itself. Although all models are globally significant, based on the model chi-squared, their predictive power is low. This is tapped by the generalized R^2 shown in the last row of the table, a measure suggested by Allison (1995) for assessing predictive power. I use the re-scaled version, which ranges from 0 to 1.0. With a value of .121, even the full model affords only modest predictive efficacy.

Discussion

The central aim of this study was to re-assess our ability to predict EMS by employing a prospective analysis that avoids some of the causal ambiguity in previous work. A handful of factors emerged as significant influences using this approach. Among the more distal influences on EMS, marital duration and religiosity emerged as key predictors. Contrary to studies finding the risk of EMS to be higher with greater marital duration (Forste & Tanfer, 1996; Treas & Giesen, 2000), I found just the opposite. The hazard of EMS activity appears to be lower the longer a marriage's initial duration. The risk of EMS also declined with the passage of time observed in the study. There are several reasons why this is intuitively reasonable. Certainly, couples are more invested in the marriage the longer they remain in it. All else equal, people are reluctant to lose what they are heavily invested in (Rusbult & Martz, 1995). Equally reasonable is the simple explanation of selectivity. Longer duration marriages at the outset of the study are in all likelihood better selected for fidelity because marriages characterized by EMS tend to dissolve. The same principle applies to the passage of time observed over the course of follow up. As a competing explanation, however, unmeasured heterogeneity, in the form of unobserved risk factors for EMS, can also produce a declining hazard, as others have cautioned (Allison, 1995). Greater religiosity was also found to reduce the risk of EMS, as expected. Adultery is heavily proscribed in most faiths; hence, adhering more closely to religious doctrines represents an effective barrier to EMS.

Additional background factors proved important. In particular, minority respondents were found to be at marginally higher risk of infidelity, consistent with prior studies (Allen et al., 2005; Burdette et al., 2007; Treas & Giesen, 2000; Wiederman, 1997). In this study, the minority effect appeared to be largely accounted for by differentials in the quality of the marital relationship. Other scholars have found that minorities tend to be less happily married and more prone to divorce, compared to nonminorities (Greenstein, 1995; Tzeng, 1992). The experience of parental divorce also raised the risk of EMS, an effect again accounted for by the tenor of the marital relationship. This is consistent with Amato (1996), who found that interpersonal behavior problems—including infidelity—tended to mediate the effect of parental divorce on respondents' own risk of divorce. More educated respondents were also more likely to report EMS, an effect not accounted for by characteristics of the current marriage. Higher learning is associated with more liberal attitudes, including those regarding sexuality. Nonetheless, spouses' average education was not significant. Greater respondent education may also be associated with more candid reporting, however, an explanation that cannot be ruled out here.

The most consistent predictors of EMS in this study pertained to the quality of the marriage itself, considered to be among the most proximal influences on this event. The risk of EMS was significantly higher among marriages characterized by spousal violence, divorce proneness, a past experience of marital separation, or the practice of spending relatively little time together. Although these last two factors can also reflect enhanced opportunities for EMS, they are most likely simply emblematic of a deteriorating relationship. Gottman (1993) described the process of a couple's moving toward divorce in terms of a “distance and isolation cascade” (p. 64). This often begins with verbal assaults on each other, followed by each spouse's sense of being overwhelmed by the other's negativity. Later stages of the process typically find spouses arranging their lives in parallel and spending less and less time together. Pasley, Kerpelman, and Guilbert (2001) described this uncoupling process as follows: “... when spouses can no longer connect in meaningful ways, they consciously or unconsciously elect to behave in ways that increase their independence from one another” (p. 14). In short, my results suggest that the primary influences on EMS pertain to the character of the couple bond itself.

Surprisingly, several factors found in past studies to be predictors of EMS, as noted above, proved to be nonsignificant in this study. These include cohabitation prior to the marriage, the presence of children, work opportunities, a tolerance for divorce, marital satisfaction, a power imbalance in the relationship, and sexual dissatisfaction in the marriage. The list is longer. In preliminary analyses, I considered a number of other predictors that have also been found important in prior work. All proved nonsignificant and, as they were not as theoretically compelling as those included here, were dropped from further consideration. Thus, no influence was found on the risk of EMS for one or both spouses having been previously married, spouses' average age at first marriage, respondent's religious affiliation, the spouse being of a different religious affiliation, age or education heterogamy, the respondent's rating of the spouse as less attractive or intelligent, family income level, one partner being physically disabled, and subjective or objective relationship inequity. That one or more of these factors has been found significant in retrospective studies (e.g., Atkins et al., 2001; Burdette et al., 2007; Forste & Tanfer, 1996; Prins et al., 1993), but not here, may well be due to differences in methodology. Studies relating the retrospective reporting of EMS to respondent characteristics could easily be conflating cause and effect. Current marital happiness or the experience of divorce, for example, may well be the result rather than the cause of EMS. This phenomenon would have the effect of conveying an exaggerated level of predictive power in such models. Predictive power using this prospective approach is, on the other hand, quite modest at best.

This study has a number of limitations that should be kept in mind. Not the least of these is low power. Only 7.8% of respondents reported an instance of EMS. This is in contrast to substantially greater base rates of the phenomenon shown in most retrospective analyses, as noted above. The measurement of EMS is also problematic, as the wording of the question encourages only the reporting of EMS that caused problems in the marriage. This automatically excludes affairs that are tolerated by spouses and have posed no problems in the marriage. However, EMS of this nature is not generally a focus of concern, and is not really the subject of this article. More importantly, however, is that this wording fails to uncover EMS that remains a secret to the other spouse. Although this would result in an underestimation of the rate of EMS, it is not yet clear that it results in biased estimators of predictor *effects*. Potentially more serious is the issue of timing. It was assumed in this study that a first report of problems due to EMS in a given survey wave implied a first occurrence of EMS in the interval culminating in that wave. However, this may not be the case for some respondents. The EMS may have occurred much earlier but only have been disclosed or discovered in the latest interval. The extent to which this might be a problem could not be ascertained in this study. Because average marital duration for the sample at the beginning of the observation period was just over 13 years, findings may not be generalizable to the experiences of newlyweds over time. Finally, the effects of time-varying covariates can be confounded by reciprocal causation (Singer & Willet, 2003). On the other hand, I have tried to circumvent that problem by following Singer and Willet's advice and lagging all such covariates by one wave of measurement.

Given the potential severity of the consequences of EMS for marriages, it is critical that behavioral scientists reach a more complete understanding of the dynamics of this phenomenon. To date, this has been an elusive goal. For both practical and ethical reasons we are limited to non-experimental studies on the topic. Most of these have used a retrospective approach. This study, using a prospective strategy, fails to confirm many of the factors found previously to be significant. However, much remains to be done to improve our ability to forecast this event. Missing in virtually all such studies is information about a key player in love triangles: the paramour. Clearly a major factor in the risk of EMS is the availability of an attractive and willing partner. Are there particular attributes of such partners that represent a special allure for married men and women? Are there particular

venues, say the workplace, the classroom, the church, the tavern, in which spouses are most likely to encounter available alternatives? Future surveys of sexual behavior should include substantially more detail about adulterous encounters, including information on these kinds of questions. Although EMS is a sensitive topic to pursue with respondents, the stakes are high enough to warrant the effort.

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Table 1
Descriptive Statistics for Study Variables

Variable	Range	<i>M</i>	<i>SD</i>
Outcome ^a			
Occurrence of extramarital sex	0–1	0.078	0.268
Time-invariant predictors ^a			
Years married at baseline survey (1980)	0–38	13.125	9.278
Cohabited before marriage	0–1	0.139	0.346
Minority respondent	0–1	0.088	0.284
Either spouse's parents have divorced	0–1	0.252	0.434
Ever separated due to marital troubles	0–1	0.093	0.290
Average nonmarital sexual experience	0–15	4.046	2.750
Religiosity	1–5	3.731	1.191
Time-varying predictors ^b			
Preschool child at home	0–1	0.237	0.425
School-age child at home	0–1	0.525	0.499
One spouse has opportunities	0–1	0.540	0.498
Both spouses have opportunities	0–1	0.263	0.440
Respondent's years of schooling	0–28	13.955	2.673
Divorce tolerance scale	6–24	13.988	2.333
Spousal violence indicator	0–1	0.233	0.423
Marital instability index	0–1.362	0.245	0.331
Marital quality scale	–29.937–8.163	0.583	6.152
Power imbalance indicator	0–1	0.452	0.498
Marital interaction scale	5–20	15.404	2.833
Sexual dissatisfaction indicator	0–1	0.060	0.238

^aDescriptive statistics are based on $n = 1,270$ respondents.

^bDescriptive statistics are based on $n = 4,411$ person-periods.

Table 2
Maximum Likelihood Coefficient Estimates (Standard Errors) for Complementary Log–Log Models of the Hazard of Extramarital Sex

Predictor	Model 1	Model 2	Model 3
Time-invariant predictors			
Intercept	–2.737 *** (0.410)	–4.462 *** (1.040)	–3.007 * (1.257)
1983–1988 interval	0.117 (0.242)	0.096 (0.244)	0.045 (0.247)
1988–1992 interval	–0.315 (0.300)	–0.391 (0.305)	–0.479 (0.313)
1992–1997 interval	–0.769 * (0.391)	–0.881 * (0.399)	–0.960 * (0.407)
1997–2000 interval	–0.921 * (0.441)	–1.009 * (0.455)	–1.142 * (0.462)
Years married at baseline survey (1980)	–0.040 ** (0.014)	–0.043 ** (0.015)	–0.041 * (0.016)
Cohabited before marriage	0.358 (0.257)	0.352 (0.259)	0.211 (0.262)
Minority respondent	0.475 (0.303)	0.516 † (0.304)	0.432 (0.306)
Either spouse's parents have divorced	0.399 † (0.214)	0.439 * (0.215)	0.316 (0.218)
Ever separated due to marital troubles	1.030 *** (0.251)	1.059 *** (0.252)	0.747 ** (0.263)
Average nonmarital sexual experience	–0.029 (0.039)	–0.055 (0.041)	–0.060 (0.042)
Religiosity	–0.181 * (0.084)	–0.161 † (0.088)	–0.171 * (0.088)
Time-varying predictors			
Preschool child at home		–0.049 (0.235)	–0.131 (0.239)
School-age child at home		0.302 (0.210)	0.191 (0.214)
One spouse has opportunities		–0.151 (0.274)	–0.183 (0.276)
Both spouses have opportunities		0.039 (0.307)	–0.010 (0.311)
Respondent's years of schooling		0.084 * (0.041)	0.096 * (0.042)
Divorce tolerance scale		0.037	0.014

Predictor	Model 1	Model 2	Model 3
		(0.046)	(0.046)
Spousal violence indicator			0.437 [†]
			(0.225)
Marital instability index			0.682 [*]
			(0.338)
Marital quality scale			0.004
			(0.020)
Power imbalance indicator			0.342
			(0.213)
Marital interaction scale			-0.104 ^{**}
			(0.039)
Sexual dissatisfaction indicator			0.110
			(0.365)
Likelihood ratio χ^2	66.163 ^{***}	74.284 ^{***}	104.088 ^{***}
Model df	11	17	23
R^2_{GSC}	0.077	0.086	0.121

Note. $n = 4,411$ person-periods.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

[†]
 $p < .1$.