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Associations Between Premarital Factors and First-Married, Heterosexual Newlywed Couples' Frequency of Sex and Sexual Satisfaction Trajectories

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ABSTRACT

Sex is a defining feature of marriage with important implications for marital success. Nevertheless, frequency and quality of sex decline across the early years of marriage. Given many modern-day couples in the U.S. are delaying marriage and thus experiencing many traditional aspects of marriage before their nuptials, the current research explored the extent to which premarital factors such as courtship duration, cohabitation, and children are associated with trajectories of couples' sexual relationships during the early years of marriage. Using a 4-year longitudinal study of newlywed couples, results demonstrated that couples with longer (versus shorter) courtships or who did (versus did not) cohabit engaged in less frequent sex at the start of marriage; interestingly, couples with longer (versus shorter) courtships or with (versus without) children prior to marriage experienced less steep declines in frequency of sex over time. Couples who did (versus did not) cohabit were less sexually satisfied initially and over time; couples with longer (versus shorter) courtships experienced less steep declines in sexual satisfaction over time. Notably, each of these associations emerged independent of related individual differences and marital quality. These findings highlight the notion that premarital factors can explain, at least in part, differences in newlywed couples' sexual relationships.

Sex is a defining feature of marriage. Nevertheless, the sexual relationship changes across the early years of marriage. Whereas the first year is often rife with frequent and satisfying sex, couples engage in less frequent sex and report lower sexual satisfaction over time (Call, Sprecher, & Schwartz, 1995; McNulty, Wenner, & Fisher, 2016; McNulty & Widman, 2013). Given that the sexual relationship is strongly predictive of marital success (McNulty et al., 2016; Yabiku & Gager, 2009), it is crucial to develop a better understanding of the factors that influence the sexual relationship.

Western mores regarding dating and marriage have changed over time – most notably, individuals in the U.S. are increasingly delaying marriage (U.S. Census Bureau, 2010). Such delays provide some couples the opportunity to experience many traditional aspects of marriage such as extended duration, cohabitation, and even parenting prior to marriage (see Copen, Daniels, Vespa, & Mosher, 2012). It is possible that these premarital factors (extended duration, cohabiting, children) have implications for newly married couples' sexual relationships – most notably, their frequency of sex and sexual satisfaction. Little research, however, has examined this possibility (for somewhat related research, see Allen et al., 2008; Kahn & London, 1991; Whisman & Snyder, 2007). Accordingly, the aim of the current research was to explore the extent to which these premarital factors are associated with newly married couples' frequency of sex and each couple member's sexual satisfaction trajectories – that is, their frequency of sex and sexual satisfaction at the start of marriage as well as changes over time.

Premarital Factors and the Sexual Relationship

Frequency of sex and sexual satisfaction are two important aspects of married couples' sexual relationships. Couples who engage in less frequent sex are at greater risk for marital dissolution (Yabiku & Gager, 2009), and although frequency of sex is not directly associated with marital satisfaction (McNulty et al., 2016; Schoenfeld, Loving, Pope, Huston, & Štulhofer, 2017), it is strongly associated with both couple members' sexual satisfaction, which has important implications for marital satisfaction (McNulty et al., 2016; Schoenfeld et al., 2017; Yucel & Gassanov, 2010; for a review, see Christopher & Sprecher, 2000). It is thus important to identify and examine factors – of particular relevance to the current study, *premarital* factors – that may have implications for couples' frequency of sex trajectories and each couple member's trajectory of sexual satisfaction.

In line with this notion, prior work has demonstrated that numerous factors pre-dating spouses' nuptials can indeed have implications for aspects of their post-nuptial sexual relationships. For example, factors such as couples' premarital communication (Allen et al., 2008), each couple member's number of premarital sexual partners (Athanasiou & Sarkin, 1974), and premarital cohabitation (Whisman & Snyder, 2007) are associated with the likelihood of engaging in sexual infidelity during marriage, which itself is associated with couples' frequency of sex (Selterman, Garcia, & Tsapelas, 2019; for a review, see Thompson, 1983). Moreover, factors such as each couple member's sexual promiscuity, premarital

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self-esteem, and premarital communication are associated with their sexual satisfaction once they are married (see Christensen, 2004; Larson, Anderson, Holman, & Niemann, 1998). To our knowledge, however, little research has specifically examined the extent to which couples' courtship duration, premarital cohabitation, and premarital children are directly associated with their initial levels of or changes in frequency of sex or sexual satisfaction during the early years of marriage.

There is theoretical reason to believe that these premarital factors will negatively impact newly married couples' frequency of sex and sexual satisfaction *at the start of their marriages*. According to the inertia perspective (Stanley, Rhoades, & Markman, 2006), couples who are more invested in their relationships, or who have greater relationship constraints (e.g., shared social lives, shared resources), may inadvertently "slide" into marriage (for a similar argument, see Rusbult, 1983), regardless of the quality of their relationships. That is, even couples with relatively lower quality relationships, including relatively lower quality sexual relationships, may be more likely to marry if they have notable constraints. Consistent with this perspective (Stanley et al., 2006), couples with longer (versus shorter) courtships and couples who do (versus do not) cohabit prior to marriage – two notable factors that increase relationship constraints (see Rhoades, Stanley, & Markman, 2012) – are more likely to wed (see Lundberg & Rose, 2003; Rusbult & Buunk, 1993), even if they have poorer sexual relationships. Similarly, according to transactional theory (Lazarus & Folkman, 1984), the negative emotions associated with relationship stressors, such as extended courtship duration (i.e., as a result of increased relationship problems over time; Brock & Lawrence, 2008; Storaasli & Markman, 1990) and children (a notable source of stress; Belsky, Spanier, & Rovine, 1983), can negatively impact individuals' relationships (also see Neff & Karney, 2007), including their sexual relationships (Bodenmann, Ledermann, & Bradbury, 2007). Together, these theoretical perspectives suggest that couples who (a) have longer courtships, (b) cohabit prior to marriage, or (c) have children prior to marriage will engage in less frequent sex and be less sexually satisfied at the start of their marriages relative to those couples with fewer premarital constraints and stressors (i.e., shorter courtships, who do not cohabit prior to marriage, or who do not have children prior to marriage).

Theoretical perspectives regarding the extent to which these premarital factors might continue to impact *changes over time* in couples' frequency of sex and each couple member's sexual satisfaction are less clear. As previously noted, prior research has revealed that frequency of sex and sexual satisfaction decline on average across the early years of marriage (Call et al., 1995; McNulty et al., 2016; McNulty & Widman, 2013), and it is possible that courtship duration, premarital cohabitation, and premarital children account, at least in part, for the rates of such declines. We predicted two possibilities. On the one hand, couples may experience similar rates of decline regardless of their courtship duration or whether they cohabited or had children prior to marriage such that any associations between premarital factors and couples' sexual relationships that emerge at the start of marriage may remain over time. For example, it is possible that couples who did (versus did not) cohabit prior to marriage continue to engage in relatively less frequent sex over time – that is, they may experience similar rates of decline relative to couples who did not cohabit prior to marriage such that they continue to have less frequent sex several years later. On the other hand, however, it is possible that the impact of these premarital factors dissipates over time. Drawing from transactional theory (Lazarus & Folkman, 1984), although couples with shorter (versus longer) courtships and couples who did not (versus did) cohabit or have children prior to marriage may experience relatively fewer relationship stressors initially, stressors associated with increasing relationship length, cohabitation, and parenting will likely accumulate over time for these couples and thus negatively impact changes in their sexual relationships. To the extent that such stressors do not continue to accumulate (or accumulate at a slower rate) for couples with longer (versus shorter) courtships and couples who did (versus did not) cohabit or have children prior to marriage, any associations between premarital factors and couples' sexual relationships that emerge at the start of marriage may lessen or even disappear over time. That is, such couples may experience relatively less steep declines in their sexual relationships over time. For example, it is possible that couples who had longer courtships, and thus more stressors initially, experience relatively stable sexual satisfaction over time, whereas couples with shorter courtships, who thus accumulate such stressors over time, experience relatively steeper declines over time.

In addition to theoretical perspectives, there is empirical evidence similarly suggesting courtship duration, premarital cohabitation, and premarital children may negatively impact the trajectories of couples' sexual relationships. First, prior research has demonstrated that, regardless of couples' marital status (i.e., married, cohabiting, non-cohabiting), overall relationship duration (Pedersen & Blekesaune, 2003; Schmiedeberg & Schröder, 2016; Schröder & Schmiedeberg, 2015; Stafford, Kline, & Rankin, 2004) and the presence of children (Call et al., 1995; especially young children, Schröder & Schmiedeberg, 2015; for a review see, Schwartz & Young, 2009) are on average negatively associated with couples' frequency of sex and sexual satisfaction. Second, the transition to cohabitation is associated with a brief increase in sexual frequency (Rhoades et al., 2012; Stafford et al., 2004) and thus couples who do *not* cohabit prior to marriage may actually experience a boost in their frequency of sex at the start of marriage relative to their premarital frequency of sex (and, crucially, relative to couples who do cohabit prior to marriage). Third, couples who cohabit prior to marriage are, surprisingly, less committed than couples who do not cohabit prior to marriage (Stanley, Whitton, & Markman, 2004). Given that commitment is positively associated with individuals' sexual satisfaction (see Schwartz & Young, 2009; Sprecher, 2002), we might expect that couples who do (versus do not) cohabit prior to marriage will also be less sexually satisfied at the start of marriage (cf. Yucel & Gassanov, 2010). Finally, couples with premarital children experience more sexual distress (particularly wives; Blumenstock & Papp, 2017) and steeper declines in marital satisfaction over time

(across the first 16 years of marriage; Birditt, Hope, Brown, & Orbuch, 2012). Given marital satisfaction is associated with individuals' sexual satisfaction (McNulty et al., 2016), we might expect that couples who have (versus do not have) premarital children will similarly report lower sexual satisfaction initially and experience steeper declines over time. Nevertheless, little research, to our knowledge, has specifically looked at the associations between these premarital factors (i.e., courtship duration, premarital cohabitation, premarital children) and couples' frequency of sex and sexual satisfaction following their nuptials (i.e., at the start of marriage) and across the early years of marriage (i.e., over time).

The Current Research

Thus, the aims of the current research were threefold. Given that replication increases confidence in the existence of effects, our first aim was to replicate previous research (e.g., Call et al., 1995; McNulty et al., 2016; McNulty & Widman, 2013) demonstrating declines on average in frequency of sex and sexual satisfaction across the early years of marriage. Our second aim was to examine the extent to which courtship duration, premarital cohabitation, and premarital children are associated with first-married newlywed couples' initial frequency of sex and each couple member's initial levels of sexual satisfaction. Drawing from theory (e.g., Lazarus & Folkman, 1984; Stanley et al., 2006) and previous research (e.g., Allen et al., 2008; Call et al., 1995; Kahn & London, 1991; Pedersen & Blekesaune, 2003; Rhoades et al., 2012; Schmiedeberg & Schröder, 2016; Schröder & Schmiedeberg, 2015; Schwartz & Young, 2009; Stafford et al., 2004; Whisman & Snyder, 2007), we predicted that longer (versus shorter) courtships, cohabiting (versus not cohabiting) prior to marriage, and having (versus not having) children prior to marriage would be associated with less frequent sex and lower sexual satisfaction initially. Our third aim was to examine the extent to which these premarital factors are associated with *changes* in first-married newlywed couples' frequency of sex and each couple member's sexual satisfaction across the first several years of marriage; we did not make clear predictions regarding these associations.

Of course, only research based on sound methods will move our science forward, and there are several methods that may be particularly likely to do so. First, to best capture any associations between premarital factors and couples' frequency of sex and sexual satisfaction trajectories, research should assess the key outcomes as close to couples' nuptials as possible. There is notable variability in the trajectories of newlyweds' outcomes (Lavner & Bradbury, 2010), and premarital factors may account for such variability. Indeed, as other work has demonstrated, differences across individuals at the start of marriage account, at least in part, for changes in marital outcomes during the early years of marriage (Lavner, Bradbury, & Karney, 2012). Second, research may benefit from collecting data from both couple members in order to (a) increase the reliability of couple-level assessments (e.g., the frequency of sex) and (b) examine whether premarital factors equally impact both couple members' sexual satisfaction. Finally, given that our key premarital factors cannot be ethically manipulated, it is possible that related individual differences that make some couples more likely to experience longer courtships, premarital cohabitation, or premarital children (e.g., age, education, parental divorce status) could lead to spurious associations (see Kulu & Boyle, 2010; Lillard, Brien, & Waite, 1995). Moreover, given the interdependent nature of romantic relationships (Kelley & Thibaut, 1978), it is possible that third variables associated with individuals (e.g., depression, neuroticism, stress) as well as each couple member's perceived marital quality (e.g., marital satisfaction, marital conflict, perceived marital problems) actually account for any observed associations between premarital factors and trajectories of couples' sexual relationships. Thus, in order to increase confidence in any observed associations, research should control for related covariates.

To this end, we used data from a 4-year longitudinal study of first-married, heterosexual newlywed couples (who were recruited within the first 4 months of marriage) to examine the extent to which courtship duration, premarital cohabitation, and premarital children are associated with initial sexual outcomes (i.e., couples' frequency of sex and each couple member's sexual satisfaction) as well as changes in such outcomes over time. Notably, we used a growth-curve approach to examine such trajectories and, as noted above, we assessed and controlled for potentially related covariates to reduce the likelihood that any associations that emerged were spurious.

Method

Participants

Participants were 226 individuals (comprising 113 first-married, heterosexual couples) participating in a broader longitudinal study of marriage. We recruited all couples via letters sent to couples who had recently applied for marriage licenses in the county of the study location (Dallas County, Texas; a large metropolitan area in north Texas). Given that a large number of couples registered for marriage licenses each month, we sent letters to 700 randomly selected couples each month (or to all couples for months in which 700 or fewer couples applied for marriage licenses). A total of 389 couples responded to the invitation, and we screened each in a telephone interview to ensure they met the following study criteria: (a) both couple members were not previously married, (b) couples had been married less than 4 months, (c) both couple members were at least 18 years of age, and (d) both couple members spoke English (to ensure questionnaire comprehension); 159 couples (of the 389 who responded) did not meet the eligibility criteria. Recruitment began in Summer 2013 and was initially planned for 12 months, though we extended it one additional month to increase sample size.

On average, husbands and wives at baseline were 28.06 (SD = 5.55) and 26.80 (SD = 4.75) years of age, respectively. Seventy percent of husbands and 53% of wives were employed full time; 13% of husbands and 12% of wives were full-time students. Husbands' and wives' reported mean income was $42,990 ($SD$ = $47,162) and $33,320 ($SD$ = $35,712) per year, respectively. The sample was somewhat diverse; 48% of husbands and wives self-identified as Caucasian, 28% of husbands

and 26% of wives self-identified as African American, 16% of husbands and 17% of wives self-identified as Latinx, 3% of husbands and 4% of wives self-identified as Asian, and 4% of husbands and wives self-identified as another race/ethnicity (one husband and one wife did not provide their race/ethnicity).

Procedure

After enrolling in the study, participants completed a packet of surveys via Qualtrics.com or through the mail. Packets included a consent form approved by the local human-subjects review board, measures assessing courtship duration, premarital cohabitation, whether spouses had children, frequency of sex, and sexual satisfaction; measures assessing several covariates (i.e., age, education, parental divorce, employment status, neuroticism, depression, chronic stress, marital satisfaction, marital conflict, and perceived marital problems); additional measures beyond the scope of the current analyses; and a letter instructing spouses to complete their questionnaires independently of one another. We compensated couples $100 for participating in this initial phase of the study.

At approximately 6-month intervals during the subsequent 4 years (for a total of seven follow-up assessments), we recontacted couples who again completed a packet of surveys that included measures assessing individuals' frequency of sex and sexual satisfaction as well as measures assessing several covariates (at all follow-up assessments: employment status, postmarital children, depression, marital satisfaction, perceived marital problems; at the first four follow-ups only: chronic stress, marital conflict) as well as a letter of instruction reminding spouses to complete their forms independently of one another. We compensated couples $30 for each follow-up assessment. One hundred eighty-three (81.0%) participants completed at least two follow-up assessments; because multilevel modeling provides estimates for individuals who complete at least one assessment (see Box & Tiao, 1973), however, all individuals were included in all analyses (except for analyses examining trajectories of couples' frequency of sex – one couple failed to complete all assessments of this measure and thus was excluded from those analyses).

Measures

Courtship Duration

At baseline, individuals reported the length of their courtships by responding to the question, "How long were you and your spouse together before getting married?". We then converted their responses to months. Husbands' and wives' reports were nearly perfectly correlated (r = .99), suggesting husbands and wives highly agreed on their courtship duration. Nevertheless, in an effort to increase the accuracy of these reports, we averaged across couple members' reports to create an average courtship duration for each couple. A Shapiro–Wilks test of normality demonstrated that courtship duration violated the assumption of normality, $W(113) = 0.85$, $p < .001$. Indeed, this variable was positively skewed (skewness = 1.72) and leptokurtic (kurtosis = 4.04). Thus, we log-transformed courtship duration.

Premarital Cohabitation

At baseline, individuals indicated whether they cohabited prior to marriage by responding to the question, "Did you and your spouse live together prior to getting married?". Interestingly, couple members of five couples provided conflicting reports, which may reflect spouses' reluctance to report premarital cohabitation due to societal stigmas or may be a result of differing definitions of premarital cohabitation (we did not provide a definition). In an effort to increase the accuracy of individuals' reports, we coded couples as not cohabiting prior to marriage if both couple members reported no premarital cohabitation (coded as −1; n = 40; 35%) and we coded couples as cohabiting prior to marriage if at least one couple member reported premarital cohabitation (coded as 1; n = 73; 65%). It is worth noting that, in both of our final models (i.e., final model examining couples' trajectories of frequency of sex and final model examining individuals' trajectories of sexual satisfaction), a similar pattern of results emerged if we coded couples as cohabiting prior to marriage only if both couple members reported premarital cohabitation.

Premarital Children

At baseline, individuals reported whether they had at least one child by responding to the question, "Do you have any children?". Twenty-six husbands (23%) and 25 wives (22%) indicated that they had at least one child; of these 51 individuals, 22 reported their partner was the biological parent of at least one child. Given the interdependent nature of relationships (Kelley & Thibaut, 1978), however, we coded couples as having children prior to marriage if at least one couple member reported having at least one child (coded as 1; n = 29 couples; regardless of whether the other spouse was the biological parent), and we coded couples as having no children prior to marriage if both couple members reported being child-free (coded as −1, n = 84). It is worth noting that, in both of our final models, an identical pattern of results emerged if we coded couples as having children only if the child was biologically related to both couple members (n = 15 couples).

Frequency of Sexual Intercourse

At baseline and all follow-up assessments, individuals reported the number of times they engaged in sexual intercourse with their spouse during the prior 30 days by responding to the question, "Approximately how many times have you had sexual intercourse with your spouse over the past 30 days?". As others have documented (e.g., Meltzer et al., 2017), spouses do not always report the same frequencies of behavior, including sex. Indeed, in the current study, the correlation between spouses' reports at any given assessment ranged from .50 to .87. It is worth noting that further exploration of the raw data revealed that this somewhat lower-than-typical lower end of the range (i.e., r = .50) was driven by one couple who highly disagreed at the second and third assessments – if we exclude their reports at those two assessments, all rs ranged from .72 to .87. In an effort to maximize power, however, we retained these discrepant reports in the current

analyses. Given that individual reports of sexual behavior have been shown to be less reliable than averaged reports (e.g., Jacobson & Moore, 1981), we averaged couple members' reports to create an average frequency of sex for each couple. It is worth noting that, in our final model examining frequency of sex, a similar pattern of results emerged if we used husbands' and wives' individual reports of frequency of sex instead of their average [see the Supplementary Online Materials (SOM) for details regarding this analysis]. As previously noted, one couple failed to complete this measure at all assessments and thus was excluded from analyses examining frequency of sex.

Sexual Satisfaction

At baseline and all follow-up assessments, we assessed individuals' sexual satisfaction using the Index of Sexual Satisfaction (Hudson, 1998). Participants indicated the frequency with which 25 statements described their sexual relationship with their partner (e.g., "I think that our sex is wonderful") using a 7-point scale, where *1* = "None of the time" and *7* = "All of the time." We averaged items at each assessment to form measures of individuals' sexual satisfaction; higher scores reflect higher sexual satisfaction. Across all assessments, internal consistency was high (husbands' and wives' αs ≥ .91).

Covariates

To ensure that any associations were independent of covariates potentially associated with couples' premarital factors and postmarital sexual relationships, we additionally assessed and controlled for a variety of covariates in the final models. At baseline, we assessed each couple member's age, number of years of completed education, whether their parents divorced, and neuroticism. To assess each couple member's parents' marital status, participants indicated whether their parents were still married to each other or not; those participants who indicated that their parents were no longer married further indicated whether they were (a) separated, (b) divorced, or (c) widowed. We coded all responses such that −1 = "Parents divorced" and 1 = "Parents not divorced." We assessed each couple member's neuroticism at baseline using the 60-item subscale of the International Personality Item Pool (Goldberg, 1999). For each item, participants indicated the extent to which different statements (e.g., "I worry about things") accurately described them using a 5-point scale (*1* = "Very inaccurate;" *5* = "Very accurate"). We averaged items to form measures of each couple member's neuroticism; higher scores reflect more neuroticism (husbands' and wives' αs ≥ .95). Three husbands and four wives failed to complete this measure; in order to include all couples in the analyses, we replaced missing scores with the sex-specific average score [wives (M = 2.61, SD = 0.64) reported higher neuroticism scores than did husbands (M = 2.27, SD = 0.61), $t(105) = -4.30$, $p < .001$].

At all follow-up assessments, we assessed whether couples had a child during the course of the study. Specifically, each couple member responded to the question, "Have you had a child in the last 6 months?". Thirty-one husbands (27%) and 38 wives (34%) indicated that they had at least one child during the course of the study. We coded couples as having a child during the course of the study if at least one couple member reported having a child at least once across all follow-up assessments (coded as 1; n = 39 couples). We coded couples as not having a child during the course of the study if both couple members did not report having a child at all follow-up assessments (coded as −1; n = 74 couples).

At baseline and all follow-up assessments, we assessed each couple member's employment status, depression, marital satisfaction, and perceived marital problems. To assess employment status, individuals indicated whether they were employed full time (which we coded 1) or not employed full time (which we coded −1). To assess depression, we used the 20-item Center for Epidemiological Studies Depression scale (Radloff, 1977). For each item, participants indicated how often each statement (e.g., "I felt depressed") applied to them during the past week using a 4-point scale (*0* = "Rarely or none of the time;" *3* = "Most or all of the time"). We summed all items to form measures of individuals' depression; higher scores reflect more depression (across all assessments, husbands' and wives' αs ≥ .74). To assess marital satisfaction, we used the Quality of Marriage Index (Norton, 1983), which assesses individuals' agreement with six general statements about their marriage (e.g., "My spouse and I have a good relationship"). Five items require individuals to respond according to a 7-point scale (*1* = "Strongly disagree;" *7* = "Strongly agree") and one item requires individuals to respond according to a 10-point scale (*1* = "Very unhappy;" *10* = "Perfectly happy"). We summed items at each assessment to form an index of marital satisfaction that could range from 6 to 45; higher scores reflect higher marital satisfaction (husbands' and wives' αs ≥ .90). To assess perceived marital problems, we used the 19-item Marital Problem Inventory (Geiss & O'Leary, 1981). For each item, individuals indicated the extent to which an issue (e.g., communication, money management, trust) was a source of disagreement in their relationship using an 11-point scale (*1* = "Not a problem;" *11* = "Major problem"). We averaged items at each assessment to form an index of perceived marital problems; higher scores indicate more severe marital problems (husbands' and wives' αs ≥ .86).

At baseline and the first four (of seven) follow-up assessments, we assessed chronic stress and marital conflict. To assess chronic stress, we used a revised (see Neff & Karney, 2007) measure of the 15-item UCLA Life Stress Interview (Hammen et al., 1987). For each item, individuals indicated how stressful that domain of their lives (e.g., close relationships, finances, health) had been over the past 12 months using a 9-point scale (*1* = "Not at all stressful;" *9* = "Extremely stressful"). We averaged items at each assessment to form an index of chronic stress; higher scores reflect more chronic stress (husbands' and wives' αs ≥ .73). To assess marital conflict, we used the 17-item Conflict Tactics Scale (Straus, 1979). For each item, participants indicated the frequency with which they and their partner engaged in a conflict behavior (e.g., "Stomped out of the room, house, or yard") over the past 6 months using a 4-point scale (*1* = "Never;" *4* = "More [than twice]"). We averaged items at each assessment to form an index of marital conflict; higher scores reflect more marital conflict (husbands' and wives' αs ≥ .81).

Data Analytic Strategy

Given repeated assessments were nested within individuals, and given there was an unbalanced number of assessments per individual, we estimated a series of two-level models

(using HLM 7.03; Raudenbush, Bryk, Cheong, Congdon, & Du Toit, 2011) to examine the extent to which courtship duration, premarital cohabitation, and premarital children were associated with couples' trajectories of frequency of sexual intercourse as well as individuals' trajectories of sexual satisfaction across the first 4 years of marriage. To account for any bias due to attrition, we controlled for attrition (using each individual's total number of completed assessments; *range* = 1–8; as others have done, e.g., Galambos, Fang, Krahn, Johnson, & Lachman, 2015; McNulty et al., 2016; Scott, Post, Stanley, Markman, & Rhoades, 2017) in all primary analyses. It is worth noting that, when we excluded attrition from our uncontrolled models, an identical pattern of results emerged.

Preliminary Analyses

Before testing our three primary aims, we first modeled couples' frequency of sex trajectories and each couple member's sexual satisfaction trajectory to test whether, as others have demonstrated (Call et al., 1995; McNulty et al., 2016; McNulty & Widman, 2013), they on average decline (linearly) and level off (quadratically) over time. To estimate couples' frequency of sex trajectories, we estimated the following level-1 and level-2 equations of a two-level growth-curve model:

$$Y_{ij}(\text{Couples' Frequency of Sex}) = \pi_{0j}(\text{Intercept}) + \pi_{1j}(\text{Time}) + \pi_{2j}\left(\text{Time}^2\right) + e_{ij}, \quad (1)$$

$$\pi_{0j} = b_{00} + b_{01}(\text{Husbands' Attrition}) + b_{02}(\text{Wives' Attrition}) + r_{0j}, \quad (2)$$

$$\pi_{1j} = b_{10} + r_{1j}, \quad (3)$$

$$\pi_{2j} = b_{20} + r_{2j}, \quad (4)$$

where we (a) coded Time from 0 to 7 and entered it uncentered, (b) allowed all level-2 estimates to vary across couples (as indicated by the *r* parameters; deviance tests that compared the fit of different models with various random effects indicated this was the best model; West, Welch, & Galecki, 2007), and (c) regressed the level-2 Intercept parameter onto husbands' and wives' attrition (grand-mean centered[1] and constrained to be equal given that direct tests using the hypothesis-testing option revealed that husbands' and wives' parameters did not significantly differ and thus the most parsimonious model should constrain them to be equal; see Bolger & Laurenceau, 2013). We specified a Poisson sampling distribution given that couples' frequency of sex is a count variable and thus the Intercept represented the natural log of couples' expected initial frequency of sex. We used restricted maximum likelihood estimation (a common method for fitting multilevel models that produces unbiased variance and covariance estimates) and placed no restrictions on the unstructured covariance matrix.

To estimate each couple member's trajectory of sexual satisfaction, we estimated a two-level growth-curve cross model that estimated husbands' and wives' parameters separately but simultaneously using a multivariate technique suggested by Raudenbush, Brennan, and Barnett (1995). Specifically, we estimated the following level-1 and level-2 equations:

$$\begin{aligned} Y_{ij}(\text{Individuals' Sexual Satisfaction}) = {} & \pi_{1j}(\text{Husbands' Intercept}) \\ & + \pi_{2j}(\text{Wives' Intercept}) \\ & + \pi_{3j}(\text{Husbands' Time}) \\ & + \pi_{4j}(\text{Wives' Time}) \\ & + \pi_{5j}\left(\text{Husbands' Time}^2\right) \\ & + \pi_{6j}\left(\text{Wives' Time}^2\right) \\ & + e_{ij}, \end{aligned} \quad (5)$$

$$\pi_{1j} = b_{10} + b_{11}(\text{Husbands' Attrition}) + r_{1j}, \quad (6)$$

$$\pi_{2j} = b_{20} + b_{11}(\text{Wives' Attrition}) + r_{2j}, \quad (7)$$

$$\pi_{3j} = b_{30} + r_{3j}, \quad (8)$$

$$\pi_{4j} = b_{40} + r_{4j}, \quad (9)$$

$$\pi_{5j} = b_{50} + r_{5j}, \quad (10)$$

$$\pi_{6j} = b_{60} + r_{6j}, \quad (11)$$

where we (a) coded Time from 0 to 7 and entered it uncentered, (b) constrained husbands' and wives' parameters to be equal (direct tests revealed this was the most parsimonious model; see Bolger & Laurenceau, 2013), (c) allowed all level-2 estimates to vary across individuals (as indicated by the *r* parameters; deviance tests that compared the fit of different models with various random effects indicated this was the best model; West et al., 2007), and (d) regressed the level-2 Husbands' Intercept and Wives' Intercept parameters onto husbands' and wives' attrition (grand-mean centered), respectively. We used restricted maximum likelihood estimation and placed no restrictions on the unstructured covariance matrix.

Primary Analysis Examining Frequency of Sex

To examine the extent to which (a) courtship duration, (b) premarital cohabitation, and (c) premarital children accounted for between-couple variability in initial levels of or changes in frequency of sex, we re-estimated Equation 1 but additionally regressed the level-1 Intercept and Time parameters onto couples' courtship duration (log-transformed and entered grand-mean centered), premarital cohabitation (entered grand-mean centered), and premarital children (entered grand-mean centered) in the second level of the model.[2] Moreover, in our final model, to rule out the possibility that related covariates were driving any associations that emerged (see Kulu & Boyle, 2010; Lillard et al., 1995), we additionally controlled for each couple member's employment status, depression, chronic stress, marital satisfaction, marital conflict, and perceived marital problems at Level 1 as

[1]When grand-mean-centering variables, the Intercept estimate represents those who score at the sample mean of those variables.

[2]An early exploratory analysis revealed that premarital factors were not significantly associated with quadratic changes in frequency of sex and thus we excluded these estimates from the level-2 Time^2 parameters in our final model.

well as couples' postmarital children and each couple member's age, education, parental divorce, and neuroticism at Level 2 – we constrained husbands' and wives' parameters to be equal except for education, which we estimated separately (direct tests using the hypothesis-testing option revealed this was the most parsimonious model; see Bolger & Laurenceau, 2013). Moreover, given the well-documented association between sexual satisfaction and frequency of sex (for a review see, Schwartz & Young, 2009), we conducted a theoretical extension of this final model that additionally controlled for each couple member's sexual satisfaction (entered grand-mean centered at Level 1; we constrained husbands' and wives' parameters to be equal).

Finally, we conducted one follow-up analysis. To the extent that any premarital factors were associated with changes in frequency of sex over time, we examined whether such premarital factors remained associated with couples' frequency of sex at the end of the study. Specifically, we recoded Time such that the final assessment was coded 0 and thus the Intercept represented the natural log of couples' expected frequency of sex at the end of the study.

Primary Analysis Examining Sexual Satisfaction

To examine the extent to which (a) courtship duration, (b) premarital cohabitation, and (c) premarital children accounted for between-person variability in initial levels of or changes in sexual satisfaction, we re-estimated Equation 5 but additionally regressed the level-1 Intercept and Time parameters onto couples' courtship duration (log-transformed and entered grand-mean centered), premarital cohabitation (entered grand-mean centered), and premarital children (entered grand-mean centered) in the second level of the model.[3] Paralleling our analysis examining couples' frequency of sex, in our final model, we additionally controlled for couples' postmarital children and each couple member's related covariates – we constrained husbands' and wives' parameters to be equal (direct tests revealed this was the most parsimonious model; see Bolger & Laurenceau, 2013). Moreover, we again conducted a theoretical extension of our final model that controlled for couples' frequency of sex (entered grand-mean centered at Level 1).

Finally, paralleling our exploration of couples' frequency of sex, we conducted one follow-up analysis. To the extent that any premarital factors were associated with changes in sexual satisfaction over time, we recoded Time (so that the final assessment was coded 0) to examine whether such premarital factors remained associated with sexual satisfaction at the end of the study.

Results

Preliminary Analyses

Correlations among and descriptive statistics for our baseline variables and covariates are presented in Table 1 and Table 2, respectively (see the SOM for additional details). Results of our growth-curve models examining couples' frequency of sex trajectories as well as individuals' sexual satisfaction trajectories are presented in Table 3. As can be seen, at the start of their marriages,

[3]An early exploratory analysis revealed that premarital factors were not significantly associated with quadratic changes in sexual satisfaction and thus we removed these estimates from the level-2 Time^2 parameters in our final model.

Table 1. Correlations among variables measured at baseline.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)	Courtship	**.99*** **	.89***	.19*	.15	−.30**	−.20*	−.15	.09	−.15	−.09	.01	−.14	.03	.18+	.03	−.03	.30**	−.02
(2)	Log Courtship	.89***	**.96*** **	.21*	.08	−.40***	−.25**	−.13	.04	−.15	.03	.03	−.18+	.09	.14	.05	.01	.19*	.01
(3)	Premarital Cohabitation	.18+	.21*	**.91*** **	.30**	−.26**	−.04	−.25**	.11	−.21*	−.11	−.18+	−.34***	−.10	−.20*	−.12	−.05	.03	−.11
(4)	Premarital Children	.13	.04	.32**	**.82*** **	−.06	−.03	−.26**	.14	−.38***	−.19*	−.03	−.10	−.00	.21*	.05	−.31**	.28**	.14
(5)	Sexual Frequency	−.34***	−.44***	−.36***	−.20*	**.80*** **	.31**	.11	−.25**	−.06	−.05	−.12	.22*	.04	−.06	.07	.01	−.06	.06
(6)	Sexual Satisfaction	−.08	−.05	−.22*	−.22*	.26**	**.44*** **	−.03	−.06	.16+	.19*	−.27**	−.07	.01	−.49***	−.38***	.36***	−.24*	.39***
(7)	Attrition	−.12	−.06	−.13	−.26**	−.02	.00	**.91*** **	−.05	.30**	.31**	−.00	.46***	.05	−.09	−.04	.13	−.24*	−.11
(8)	Age	.07	−.06	.11	.20*	−.06	−.10	−.04	**.84*** **	.06	−.08	−.08	−.10	.07	.01	.14	−.18	−.05	−.02
(9)	Years of Education	−.17+	−.15	−.10	−.51***	.12	.01	.36***	.07	**.56*** **	.22*	.00	.03	−.00	−.24*	−.15	.08	−.32**	−.06
(10)	Parental Divorce	.03	.11	−.33***	−.31**	.01	.05	.06	−.15	.23	**.19***	−.03	−.02	.01	−.23*	−.04	.26**	−.28**	−.18+
(11)	Neuroticism	.08	.06	.18+	.28**	−.12	−.34***	−.05	−.04	−.22*	−.08	**.13**	−.02	.01	.40***	.25**	−.24**	.21*	.26**
(12)	Postmarital Children	−.16+	−.19*	−.19*	−.24**	.09	−.10	.45***	−.02	.16+	−.03	−.09	**.82*** **	−.00	.05	.01	−.04	.14	.07
(13)	Employment Status	.06	.06	.12	−.22*	−.11	−.15	.06	.13	.29**	.03	−.04	.06	**.18+**	−.04	−.17+	−.04	−.14	−.01
(14)	Depression	.09	.03	.12	.31**	−.03	−.43***	−.14	.10	−.31**	.00	.50***	−.04	−.05	**.42*** **	.38***	−.30**	.37***	.39***
(15)	Chronic Stress	.06	.03	.11	.17+	−.09	−.21*	−.04	−.01	−.02	.02	.35***	−.00	−.03	.42***	**.28** **	−.32**	.29**	.42***
(16)	Marital Satisfaction	−.16	−.05	−.08	−.26**	.13	.41***	.04	−.20*	−.00	.02	−.29**	−.07	−.02	−.46***	−.29**	**.45*** **	−.24*	−.60***
(17)	Marital Conflict	.18+	.12	.11	.30**	−.03	−.25**	−.22*	−.13	−.24*	−.09	.34***	.03	−.18+	.42***	.38***	−.38***	**.61*** **	.33***
(18)	Perceived Problems	.26**	.19+	.15	.31**	−.19+	−.46***	−.12	.11	−.10	.00	.28**	.06	.00	.50***	.31**	−.74***	.51***	**.43*** **

Husbands' correlations appear above and wives' correlations appear below the diagonal. Correlations between husbands and wives appear on the diagonal in bold. For Premarital Cohabitation and Premarital Children, −1 = No, 1 = Yes.
+$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. Descriptive statistics for variables measured at baseline.

	Husbands			Wives		
	M	*SD*	*N*	*M*	*SD*	*N*
Courtship Duration	39.85_a	32.46	113	40.28_a	33.91	113
Log Courtship Duration	1.46_a	0.37	113	1.47_a	0.38	113
Premarital Cohabitation	0.24_a	0.98	113	0.26_a	0.97	113
Premarital Children	-0.54_a	0.85	113	-0.56_a	0.83	113
Sexual Frequency	12.38_a	10.25	110	11.40_a	9.53	106
Sexual Satisfaction	5.95_a	0.82	112	5.89_a	0.84	111
Attrition	4.57_a	2.81	113	5.04_b	2.78	113
Age	27.97_a	5.61	113	26.91_b	4.87	113
Years of Education	15.20_a	2.77	113	15.81_b	2.86	113
Parental Divorce	0.19_a	0.97	113	0.20_a	0.98	113
Neuroticism	2.27_a	0.60	113	2.61_b	0.63	113
Postmarital Children	-0.45_a	0.90	113	-0.33_b	0.95	113
Employment Status	0.42_a	0.90	113	0.08_b	0.99	113
Depression	8.67_a	7.34	112	10.83_b	8.65	113
Chronic Stress	3.51_a	1.48	112	3.67_a	1.35	113
Marital Satisfaction	41.25_a	4.82	113	41.50_a	4.52	113
Marital Conflict	1.76_a	0.40	113	1.71_a	0.34	113
Perceived Marital Problems	2.48_a	1.35	113	2.63_a	1.26	112

For Premarital Cohabitation and Premarital Children, −1 = No, 1 = Yes. Means in the same row with different subscripts differ at $p < .05$.

Table 3. Results of growth-curve models examining trajectories of frequency of sexual intercourse and sexual satisfaction.

	Frequency of Sex			Sexual Satisfaction		
	β	$CI_{95\%}$	*r*	β	$CI_{95\%}$	*r*
Intercept	2.471	[2.325: 2.618]	–	5.909	[5.779: 6.039]	–
Attrition	0.009	[−0.017: 0.035]	.07	−0.010	[−0.051: 0.031]	.05
Time	−0.217***	[−0.309: -0.125]	.41	−0.180***	[−0.260: -0.099]	.39
$Time^2$	0.016*	[0.004: 0.029]	.25	0.016*	[0.003: 0.028]	.24

For Frequency of Sex, *df*s = 110 for the Intercept and Attrition; *df*s = 111 for Time and $Time^2$. For Sexual Satisfaction, *df*s = 111 for the Intercept and Attrition; *df*s = 112 for Time and $Time^2$. Effect-size *r* is reported. Time and $Time^2$ are level-1 variables whereas Attrition is a level-2 variable.
*$p < .05$. **$p < .01$. ***$p < .001$.

these newlywed couples on average reported engaging in sex 11.87 ($e^{2.47}$) times in the prior 30 days and individuals on average reported relatively high sexual satisfaction; moreover, the negative Time effects and the positive $Time^2$ effects suggest that both variables on average decreased linearly initially and then leveled off over time (see the SOM for a figure depicting these trajectories). It is worth noting, however, that there was notable between-couple variability in all parameters of these frequency of sex trajectories and notable between-person variability in all parameters of these sexual satisfaction trajectories (see the SOM for details regarding these analyses). That is, (a) some couples engaged in more or less frequent sex at the start of their marriages than others, (b) some couples experienced more or less steep declines in their frequency of sex over time than others, (c) some individuals had higher or lower levels of sexual satisfaction at the start of their marriages than others, and (d) some individuals experienced more or less steep declines in sexual satisfaction over time than others. Thus, we next examined whether courtship duration, premarital cohabitation, or premarital children accounted for such between-couple and between-person variability.

Are Courtship Duration, Premarital Cohabitation, or Premarital Children Associated with Couples' Frequency of Sex Trajectories?

Results of the uncontrolled model examining the associations between premarital factors and couples' frequency of sex trajectories without covariates are presented in the left-most columns of Table 4. As can be seen, couples with longer (versus shorter) courtships engaged in less frequent sex at the start of their marriages, though they also experienced less steep declines over time. Moreover, couples who did (versus did not) cohabit prior to marriage engaged in less frequent sex at the start of marriage and continued to engage in less frequent sex over time. Premarital children were not significantly associated with couples' frequency of sex trajectories.

Results of the final model examining associations between premarital factors and couples' frequency of sex trajectories, controlling for each couple member's age, education, parental divorce, neuroticism, postmarital children, employment status, depression, chronic stress, marital satisfaction, marital conflict, and perceived marital problems are presented in the right-most columns of Table 4.[4] As can be seen, the results are largely similar to the uncontrolled model. Namely, couples with longer (versus shorter) courtships engaged in less frequent sex at the start of their marriages, though they also experienced less steep declines over time. These effects are depicted in Panel A of Figure 1. At the start of marriage, couples with relatively longer courtships (1 *SD* more than the sample mean) engaged in relatively less frequent sex [on average 7.54 ($e^{2.02}$) times across the prior 30 days] than couples with relatively shorter courtships [1 *SD* less than the sample mean; on average 13.87 ($e^{2.63}$) times across the prior 30 days]; 2 years later, this discrepancy remained [couples with relatively longer courtships on average engaged in sex 7.03 ($e^{1.95}$) times across the prior 30 days whereas couples with relatively shorter courtships on average engaged in sex 8.58 ($e^{2.15}$) times across the prior 30 days], though it reversed directions after another 2 years (i.e., 4 years into marriage) such that couples with relatively longer courtships actually engaged in relatively more frequent sex [on average 5.37 ($e^{1.68}$) times across the prior 30 days] than couples with relatively shorter courtships [on average 3.86 ($e^{1.35}$) times across the prior 30 days; see Panel A of Figure 1].

Couples who did (versus did not) cohabit prior to marriage engaged in less frequent sex at the start of their marriages and experienced similar rates of decline over time (see Panel B of Figure 1). More specifically, at the start of marriage, couples who did cohabit engaged in relatively less frequent sex [on average 9.03 ($e^{2.20}$) times across the prior 30 days] than couples who did not cohabit [on average 12.94 ($e^{2.56}$) times across the prior 30 days]; and this discrepancy remained four years later [couples who did cohabit on average engaged in sex 3.53 ($e^{1.26}$) times across the prior 30 days, whereas couples

[4]An identical pattern of results emerged when we excluded couples who completed only one follow-up assessment; results of this analysis are provided in the SOM.

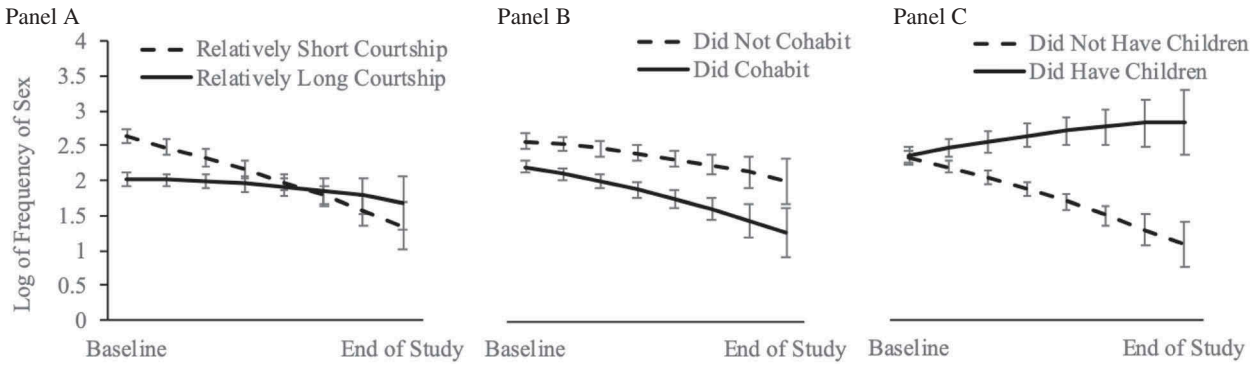

Figure 1. Panel A depicts trajectories of frequency of sex for couples who had relatively short courtships (1 *SD* below the sample mean) and for couples who had relatively long courtships (1 *SD* above the sample mean). Panel B depicts trajectories of frequency of sex for couples who did not and who did cohabit prior to marriage. Panel C depicts trajectories of frequency of sex for couples who did not and who did have children prior to marriage. Values represent the natural log of couples' expected frequency of sex at each assessment and error bars represent standard errors.

who did not cohabit on average engaged in sex 7.32 ($e^{1.99}$) times across the prior 30 days; see Panel B of Figure 1].

Compared to couples without premarital children, couples with premarital children engaged in similar rates of sex at the start of marriage but experienced relatively less steep declines over time. These effects are depicted in Panel C of Figure 1. More specifically, at the start of marriage, couples with and without premarital children engaged in sex on average 10.49 ($e^{2.35}$) and 10.18 ($e^{2.32}$) times across the prior 30 days, respectively, but those with (versus without) premarital children experienced relatively less steep declines in frequency of sex over time such that 4 years later they on average engaged in sex 16.44 ($e^{2.80}$) times across the prior 30 days whereas couples without premarital children engaged in sex 2.94 ($e^{1.08}$) times across the prior 30 days (see Panel C of Figure 1). Notably, given that we included all premarital factors in the model simultaneously, each of these associations emerged independent of one another.

When we additionally controlled for husbands' and wives' sexual satisfaction (grand-mean centered and entered separately at Level 1), an identical pattern of effects continued to emerge – courtship duration and premarital cohabitation remained negatively associated with couples' initial frequency of sex ($p < .001$ and $p = .012$, respectively), and courtship duration and premarital children remained positively associated with couples' changes over time ($p < .001$ and $p < .001$, respectively). This finding suggests that neither husbands' nor wives' sexual satisfaction accounted for these associations.

Given that the associations between (a) courtship duration and couples' frequency of sex as well as (b) premarital children and couples' frequency of sex changed over time, we conducted a follow-up analysis to examine these associations at the end of the study (i.e., 4 years later). According to this analysis, courtship duration was no longer associated with couples' frequency of sex at the end of the study, $b = 0.45$, $CI_{95\%}$ [−0.39: 1.28], $t(99) = 1.07$, $p = .286$. In other words, although couples with longer (versus shorter) courtships engaged in less frequent sex at the start of marriage, this effect dissipated over time such that courtship duration was no longer associated with frequency of sex 4 years into marriage (see Panel A of Figure 1). Also according to this analysis, premarital children were *positively* associated with couples' frequency of sex at the end of the study, $b = 0.86$, $CI_{95\%}$ [0.48: 1.25], $t(99) = 4.46$, $p < .001$, effect-size $r = .41$. That is, couples with (versus without) premarital children engaged in similar rates of sex initially, but those with children remained relatively stable over time, whereas those without premarital children experienced declines over time (see Panel C of Figure 1). Moreover, premarital cohabitation remained negatively associated with couples' frequency of sex at the end of the study, $b = -0.37$, $CI_{95\%}$ [−0.62: −0.11], $t(99) = -2.86$, $p = .005$, effect-size $r = .28$. That is, couples who did (versus did not) cohabit prior to marriage engaged in less frequent sex 4 years into marriage (see Panel B of Figure 1).

Are Courtship Duration, Premarital Cohabitation, or Premarital Children Associated with Individuals' Sexual Satisfaction Trajectories?

Results of the uncontrolled model examining the associations between premarital factors and individuals' sexual satisfaction trajectories without covariates are presented in the left-most columns of Table 5. As can be seen, courtship duration, premarital cohabitation, and premarital children were not significantly associated with individuals' sexual satisfaction trajectories.

Results of the final model examining associations between premarital factors and individuals' sexual satisfaction trajectories, controlling for each couple member's age, education, parental divorce, neuroticism, postmarital children, employment status, depression, chronic stress, marital satisfaction, marital conflict, and perceived marital problems, are presented in the right-most columns of Table 5.[5] As can be seen, individuals who did (versus did not) cohabit prior to marriage reported lower sexual satisfaction at the start of marriage and remained less satisfied over time (see Panel A of Figure 2); individuals with longer (versus shorter) courtships experienced less steep declines in sexual satisfaction over time (see Panel B of Figure 2). In contrast, premarital children

[5]An identical pattern of results emerged when we excluded individuals who completed only one follow-up assessment; results of this analysis are provided in the SOM.

Table 4. Results of multilevel models examining associations between premarital factors and couples' frequency of sexual intercourse trajectories not controlling and controlling for related covariates.

	Uncontrolled Model			Final Model (w/Controls)		
	β	$CI_{95\%}$	*r*	β	$CI_{95\%}$	*r*
Intercept	2.402	[2.284: 2.520]	–	2.325	[2.184: 2.467]	–
Attrition	−0.005	[−0.028: 0.017]	.05	−0.010	[−0.033: 0.014]	.08
Age	–	–	–	−0.019**	[−0.033: -0.005]	.26
Husbands' Education	–	–	–	−0.044^{+}	[−0.096: 0.008]	.17
Wives' Education	–	–	–	0.057*	[0.011: 0.104]	.24
Parental Divorce	–	–	–	−0.011	[−0.106: 0.084]	.02
Neuroticism	–	–	–	−0.112	[−0.254: 0.030]	.16
Postmarital Children	–	–	–	−0.024	[−0.153: 0.105]	.04
Courtship Duration	−0.799***	[−1.125: -0.472]	.43	−0.829***	[−1.168: -0.490]	.44
Cohabitation	−0.147*	[−0.273: -0.021]	.22	−0.181**	[−0.300: -0.062]	.29
Children	−0.056	[−0.199: 0.087]	.08	0.010	[−0.140: 0.159]	.01
Time	−0.197***	[−0.281: -0.112]	.41	−0.074	[−0.209: 0.061]	.11
Courtship Duration	0.092**	[0.027: 0.156]	.26	0.185**	[0.069: 0.300]	.30
Cohabitation	0.001	[−0.024: 0.027]	.01	−0.026	[−0.062: 0.010]	.14
Children	0.021	[−0.008: 0.050]	.14	0.125***	[0.071: 0.179]	.41
$Time^2$	0.015*	[0.003: 0.027]	.24	−0.005	[−0.036: 0.024]	.04
Employment Status	–	–	–	0.040	[−0.026: 0.105]	.07
Depression	–	–	–	−0.001	[−0.008: 0.006]	.02
Chronic Stress	–	–	–	0.019	[−0.027: 0.065]	.05
Marital Satisfaction	–	–	–	0.017*	[0.001: 0.033]	.12
Marital Conflict	–	–	–	0.091	[−0.078: 0.259]	.06
Perceived Marital Problems	–	–	–	0.034	[−0.018: 0.086]	.08

For the uncontrolled model, all *df*s = 107 for Intercept and all level-2 variables; *df*s = 108 for Time and all interactions involving Time except $Time^2$ (*df* = 111). For the full model, all *df*s = 99 for Intercept and all level-2 variables; *df*s = 106 for Time and all interactions involving Time except $Time^2$ (*df* = 109); *df*s = 287 for all other level-1 variables. Effect-size *r* is reported. Time, $Time^2$, Employment Status, Depression, Chronic Stress, Marital Satisfaction, Marital Conflict, and Perceived Marital Problems are level-1 variables; all others are level-2 variables.
$^{+}p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

Table 5. Results of multilevel models examining associations between premarital factors and each couple member's sexual satisfaction trajectories not controlling and controlling for related covariates.

	Uncontrolled Model			Final Model (w/Controls)		
	β	$CI_{95\%}$	*r*	β	$CI_{95\%}$	*r*
Intercept	5.9103	[5.7840: 6.0365]	–	5.9046	[5.5519: 6.2573]	–
Attrition	−0.0235	[−0.0646: 0.0176]	.11	−0.0292	[−0.0683: 0.0099]	.15
Age	–	–	–	−0.0132	[−0.0360: 0.0096]	.11
Husbands' Education	–	–	–	−0.0137	[−0.0472: 0.0197]	.08
Parental Divorce	–	–	–	0.0064	[−0.0641: 0.0769]	.02
Neuroticism	–	–	–	−0.1108	[−0.2346: 0.0130]	.17
Postmarital Children	–	–	–	−0.0492	[−0.1491: 0.0506]	.10
Courtship Duration	−0.2633^{+}	[−0.5355: 0.0088]	.18	−0.1800	[−0.4290: 0.0691]	.14
Cohabitation	−0.1129^{+}	[−0.2435: 0.0178]	.16	−0.1444**	[−0.2488: -0.0399]	.26
Children	−0.0565	[−0.2109: 0.0979]	.07	0.1049	[−0.0454: 0.2552]	.14
Time	−0.1810***	[−0.2608: −0.1012]	.40	−0.0642	[−0.1897: 0.0614]	.10
Courtship Duration	0.0352	[−0.0363: 0.1068]	.09	0.0906*	[0.0054: 0.1759]	.20
Cohabitation	−0.0181	[−0.0433: 0.0071]	.14	0.0047	[−0.0305: 0.0399]	.03
Children	−0.0022	[−0.0386: 0.0341]	.01	0.0287	[−0.0125: 0.0700]	.13
$Time^2$	0.0154*	[0.0032: 0.0277]	.23	0.0005	[−0.0293: 0.0303]	.00
Employment Status	–	–	–	−0.0458^{+}	[−0.0989: 0.0072]	.07
Depression	–	–	–	−0.0115*	[−0.0205: -0.0025]	.10
Chronic Stress	–	–	–	−0.0689**	[−0.1203: -0.0175]	.11
Marital Satisfaction	–	–	–	0.0340***	[0.0152: 0.0529]	.14
Marital Conflict	–	–	–	−0.1998^{+}	[−0.4402: 0.0405]	.07
Perceived Marital Problems	–	–	–	−0.1229***	[−0.1926: -0.0533]	.14

For the uncontrolled model, all *df*s = 108 for Intercept and all level-2 variables; *df*s = 109 for Time and all interactions involving Time except $Time^2$ (*df* = 112). For the full model, all *df*s = 103 for Intercept and all level-2 variables; *df*s = 109 for Time and all interactions involving Time except $Time^2$ (*df* = 112); *df*s = 636 for all other level-1 variables. Effect-size *r* is reported. Time, $Time^2$, Employment Status, Depression, Chronic Stress, Marital Satisfaction, Marital Conflict, and Perceived Problems are level-1 variables; all others are level-2 variables.
$^{+}p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

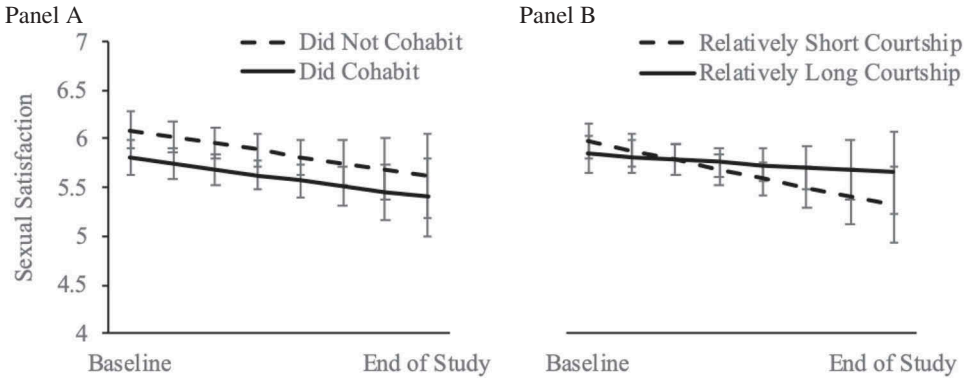

Figure 2. Panel A depicts trajectories of sexual satisfaction for couples who did not and who did cohabit prior to marriage. Panel B depicts trajectories of sexual satisfaction for couples who had relatively short courtships (1 *SD* below the sample mean) and for couples who had relatively long courtships (1 *SD* above the sample mean). Error bars represent standard errors.

were not significantly associated with individuals' sexual satisfaction trajectories.

When we additionally controlled for couples' frequency of sex (entered grand-mean centered at Level 1), a similar pattern continued to emerge – premarital cohabitation remained negatively associated with individuals' initial sexual satisfaction ($p = .017$). In this analysis, however, a positive association between premarital children and individuals' initial sexual satisfaction emerged as trending, $b = 0.14$, $CI_{95\%}$ [−0.001: 0.288], $t(101) = 1.98$, $p = .050$, effect-size $r = .19$, and the association between courtship duration and changes in individuals' sexual satisfaction over time was not significant ($p = .189$). Given that couples' frequency of sex was associated with their sexual satisfaction, $b = 0.01$, $CI_{95\%}$ [0.002: 0.021], $t(623) = 2.53$, $p = .012$, effect-size $r = .10$, we further examined whether frequency of sex mediated the associations between premarital factors and individuals' sexual satisfaction trajectories. Using the Monte Carlo method for assessing mediation (Selig & Preacher, 2008), we found couples' frequency of sex mediated the association between premarital cohabitation and individuals' sexual satisfaction at the start of marriage, $b = -0.002$, $CI_{95\%}$ [−0.0046: −0.0003], though couples' frequency of sex did not mediate the association between courtship duration and changes in individuals' sexual satisfaction over time, $b = 0.002$, $CI_{95\%}$ [−0.002: 0.007].

Given that the association between courtship duration and individuals' sexual satisfaction changed over time, we conducted a follow-up analysis to examine this association at the end of the study (i.e., 4 years later). According to this analysis, courtship duration was still not associated with individuals' sexual satisfaction at the end of the study, $b = 0.46$, $CI_{95\%}$ [−0.11: 1.03], $t(103) = 1.60$, $p = .112$. Interestingly, the association between courtship duration and individuals' sexual satisfaction did change from negative (although not significant) at the start of marriage to positive (although not significant) 4 years later (see Panel B of Figure 2). Moreover, premarital cohabitation was no longer associated with individuals' sexual satisfaction at end of the study, $b = -0.11$, $CI_{95\%}$ [−0.34: 0.13], $t(103) = -0.92$, $p = .360$, but premarital children were positively associated with individuals' sexual satisfaction at the end of the study, $b = 0.31$, $CI_{95\%}$ [0.05: 0.56], $t(103) = 2.40$, $p = .018$, effect-size $r = .23$. That is, couples with (versus without) premarital children reported higher sexual satisfaction 4 years into marriage.

Discussion

Study Rationale and Summary of Results

New marriages change across the first several years. One notable change is couples' sexual relationships – on average couples initially engage in relatively frequent sex that is satisfying, but they experience declines in frequency and satisfaction over time (Call et al., 1995; McNulty et al., 2016; McNulty & Widman, 2013). The current 4-year, longitudinal study sought to explore the extent to which first-married newlywed couples' courtship duration, premarital cohabitation, and premarital children accounted for these frequency of sex and sexual satisfaction trajectories. As we demonstrated, couples with longer (versus shorter) courtships engaged in less frequent sex at the start of their marriages but, interestingly, this association dissipated over time such that courtship duration was no longer associated with frequency of sex 4 years later; both couple members with longer (versus shorter) courtships also experienced less steep declines in sexual satisfaction over time such that, 4 years later, they reported relatively comparable levels of sexual satisfaction. This dissipation over time may be explained, at least in part, by the fact that the overall relationship lengths of those couples with shorter versus longer courtships more closely resembled one another 4 years into marriage compared to at the start of their marriages. Couples who did (versus did not) cohabit prior to marriage engaged in less frequent sex initially and continued to engage in less frequent sex over time; both couple members who did (versus did not) cohabit likewise reported lower levels of initial sexual satisfaction that remained relatively lower over time. Finally, and perhaps surprisingly, couples with (versus without) premarital children experienced less steep declines in frequency of sex over time such that, 4 years later, couples with (versus without) premarital children had more frequent sex. Notably, each of these associations emerged independently (given that we included them in the model simultaneously) and were not due to differences in attrition or related covariates.

Broader Implications and Future Research

The current research has at least four novel implications that help to inform future avenues of research. First, the current findings provide indirect support for both the inertia

perspective (Stanley et al., 2006) and transactional theory (Lazarus & Folkman, 1984; Neff & Karney, 2007); with the exception of the association between premarital children and husbands' and wives' changes in frequency of sex over time, factors that occurred during courtship were indeed negatively associated with couples' sexual functioning in marriage. The inertia perspective may best explain the negative associations between cohabitation and couples' sexual relationships. According to the inertia perspective (Stanley et al., 2006), such negative associations likely emerged due to relationship constraints that led some couples who might not otherwise marry – perhaps those who are less passionate or sexually compatible – to marry. Consistent with this possibility, couples who did (versus did not) cohabit had less frequent sex and were less sexually satisfied at the start of marriage and remained so across the first 4 years of marriage. Of course, we did not assess premarital relationship constraints in the current study and thus are unable to test this possibility; future research would benefit from doing so.

Moreover, both the inertia perspective and transactional theory (Lazarus & Folkman, 1984) likely explain the negative associations between courtship duration and couples' frequency of sex. According to the inertia perspective, such negative associations likely emerged due to relationship constraints that accumulate over time; according to transactional theory, such negative associations likely emerged due to the negative emotions associated with stressful events that frequently occur in extended courtships. Of course, as stressors associated with relationship length accumulated over time for couples with shorter courtships, differences stemming from courtship duration appeared to diminish. Thus, differences between couples with relatively longer versus shorter courtships at the start of marriage may stem from overall relationship length and dissipate over time as relationship length increases for all couples (such that those with shorter courtships more closely resemble those with longer courtships). Nevertheless, we were unable to test the specific mechanisms (i.e., premarital constraints and stressors) of these associations in the current research and thus future research would benefit from discerning whether the inertia perspective or transactional theory better explains the effects demonstrated here. It is worth noting, however, that if future research indeed provides further support for transactional theory, the current study suggests that stressors uniquely associated with extended courtships and premarital cohabitation *prior* to the nuptials rather than during marriage may account for the associations demonstrated here, given that they emerged independent of each couple member's chronic stress *during marriage*.

Second, the current findings demonstrate that if couples with longer courtships manage to remain married across the first several years of marriage, the negative impacts that emerged at the start of marriage seem to dissipate over time. Indeed, although couples with longer (versus shorter) courtships engaged in less frequent sex at the start of their marriages, this difference no longer remained 4 years into marriage. Of course, it is possible that the relatively less frequent sex at the start of marriage leads such couples to more frequently dissolve their marriages early on – which could ultimately account for the less steep declines reported here. Future research would benefit from examining this possibility. Future research would also benefit from examining potential protective factors that allow some couples to persevere through their poorer initial sexual relationships (i.e., remain intact over time). For example, drawing from Rusbult's (1983) investment theory, couples who are more (versus less) invested in their marriages may be more likely to stay together early in marriage, regardless of the quality of their sexual relationships – that is, investment may moderate the association between courtship duration and dissolution.

Third, the current findings demonstrate that certain premarital factors may actually *buffer* couples' sexual relationships against declines over time. Indeed, husbands and wives with premarital children did not have less frequent sex than couples who entered marriage without children, and 4 years later reported engaging in relatively more frequent sex. Given that we did not predict this finding, however, future research would benefit from replicating it and examining potential mechanisms.

Finally, future research should work to identify additional premarital factors that are associated with first-married newlywed couples' sexual relationships and overall marital quality. Although the current research explored key couple-level variables, future research may benefit from additionally exploring the extent to which aspects of each couple member are associated with subsequent marital outcomes. According to the vulnerability-stress-adaptation model of marriage (Karney & Bradbury, 1995), individuals' enduring vulnerabilities have downstream consequences for their own as well as their partners' marital outcomes (also see Kelley & Thibaut, 1978). Consistent with this model, it is possible, for example, that both couple members' sexual promiscuity prior to marriage may have implications for the trajectories of couples' sexual relationship following marriage – even if both couple members remain faithful to one another (for a related discussion, see French, Altgelt, & Meltzer, 2019). Future research would benefit from further exploring this possibility as well as the role that other individual-level premarital factors may play in later marital functioning.

Limitations

We would be remiss if we did not acknowledge that the conclusions of the current research should be drawn with caution in light of several limitations. First, our sample was comprised of relatively young, heterosexual couples who were all in their first marriages. Moreover, our sample was likely not a representative sample, limiting the generalizability of the current findings. Future research would benefit from utilizing representative samples of newlywed couples as well as older couples, same-sex couples, and couples that have been previously married. Moreover, the homogenous nature of our sample limited our ability to examine the extent to which individual differences such as race or ethnicity moderated the results demonstrated here. Although our sample was somewhat diverse, we did not have an adequate number of participants representing all races and ethnicities. Future research would benefit from obtaining a more representative sample. Second, couples' frequency of sexual intercourse was based on retrospective reports of the prior 30 days and thus may have been subjected to memory biases. Future research

may benefit from using daily-diary methods to more accurately assess newly married couples' sexual relationships (see Meltzer & McNulty, 2016). Third, we did not assess couples' frequency of other sexual behaviors. Future research may benefit from expanding the sexual behaviors examined beyond sexual intercourse. Finally, although the current study controlled for numerous covariates (i.e., each couple member's age, education, parental divorce, neuroticism, employment status, depression, chronic stress, marital satisfaction, marital conflict, and perceived marital problems as well as postmarital children), its correlational nature limits the extent to which we can draw causal conclusions. Specifically, third variables not measured and controlled here may account for our demonstrated associations. Of course, given that causal conclusions can only be drawn from experimental research, and given that it is not ethical to experimentally manipulate courtship duration, premarital cohabitation, or premarital children, the most ideal test of these associations would involve longitudinal data (to ensure temporal precedence) of somewhat homogenous individuals (to reduce self-selection variability) that controls for relevant covariates – as we did in the current research.

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