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## Past-Year Sexual Inactivity Among Older Married Persons and Their Partners

*Family scholars have focused on the onset of sexual activity early in the life course, but little is known about the cessation of sexual activity in relationships in later life. We use event-history analysis techniques and logistic regression to identify the correlates of sexual inactivity among older married men and women. We analyze data for 1,502 married people from the National Social Life, Health, and Aging Project, a nationally representative sample of 3,005 noninstitutionalized American men and women ages 57 to 85. We find 29% of the married persons report no sexual activity for the previous 12 months or more. Relationship duration, chronological age, and poor physical health are all independently associated with sexual inactivity. Characteristics such as marital happiness, premarital cohabitation, and remarriage are also associated with levels of inactivity or activity. Analyses also point to gender differences in the correlates of sexual inactivity.*

The onset of sexual behavior among adolescents is of great interest to family scholars (e.g., Baumer & South, 2001; Bersamin et al., 2008; Browning, Leventhal, & Brooks-Gunn, 2005) and is treated as a major life-course transition. The cessation of sexual activity in later life may

be equally significant but has not received much empirical attention. Information on sexuality in later life has the potential to help researchers identify the determinants of well-being in aging societies, including the United States, where the first Baby Boomers turned 65 in 2011. In contrast to the negative connotations of early-life sexual activity (sexually transmitted infections and unintended pregnancy), sexual activity in later life is associated with better physical health and higher overall well-being (American Association of Retired Persons, 2010; Brody, 2010). Nevertheless, little is known about sexual activity in later life, and what is currently known focuses on specific issues such as sexual dysfunction or frequency.

The study of sexual activity in later life is of particular relevance for scholars of the family and intimate relationships. Most sexual activity is coupled (Gagnon, Giami, Michaels, & de Colomby, 2001), and marriage is an important context for sexual activity, particularly at older ages (Lindau & Gavriloiva, 2010; Karraker, DeLamater, & Schwartz, 2011). This fact reflects cultural norms limiting intimate sexual activity to persons in committed relationships as well as increasingly imbalanced sex ratios due to excess male mortality, which affects partner availability for women (Austad, 2006). Furthermore, sexual activity is intertwined with the benefits of intimate relationships such as marriage. Research has repeatedly shown that marriage is related to positive outcomes (e.g., Waite, 1995) and marriage retains its positive impact throughout the life course (e.g., Schone & Weinick, 1998). Couple relationships provide

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instrumental and social support as well as opportunities for meaningful activity; as people age, the romantic partner may become more important as a primary, or the only, source of these rewards. In addition, sexual activity is not only sanctioned in marriage, it is often expected by society and by individuals. Thus, it is not surprising that sexual activity is an important correlate of relationship satisfaction in later life (DeLamater, Hyde, & Fong, 2008) and affects the stability and longevity of relationships (Yabiku & Gager, 2009). Finally, the link between marital quality and sexual activity is particularly important given that the health benefits of marriage vary by marital quality (Umberson, Williams, Powers, Lui, & Needham, 2006).

One limitation of past research on sexuality conducted by family scholars has been the almost exclusive focus on the frequency of sexual behavior after sexual debut in adolescence. Numerous empirical studies conducted in the United States and other developed nations report declining frequency of partnered sexual activity with age (Call, Sprecher, & Schwartz, 1995; Herbenick et al. 2010; Karraker et al., 2011), including among married people. Still, it is possible that sexual cessation by some couples, rather than declining frequency among all couples, might be driving this observed frequency decline (Call et al.; Karraker et al.). Within marriage, sexual inactivity is conceptually distinct from reduced sexual frequency, as cultural norms not only authorize sexual activity within marriage, but also expect it. Norms are less clear on the frequency of sexual activity. In addition, the relative importance of factors such as relationship duration, aging, and physical health may differ depending on whether one is examining sexual frequency or sexual inactivity. For example, prior research has noted a substantial decline in marital sexual frequency following the first year of marriage (James, 1981), suggesting the importance of marital duration for frequency. In contrast, sexual inactivity may be less affected by relationship acculturation than by health decline that may accompany aging due to the long duration of many marriages among older people.

The present study makes an important contribution to the literature on relationships in later life by using data from the National Social Life, Health, and Aging Project (NSHAP) to investigate the prevalence and correlates of

sexual inactivity among older married people. These data are the first nationally representative sample examining the intimate relationships of older Americans. Employing event-history techniques, we investigate the prevalence and correlates of sexual inactivity among older married people, focusing particularly on the roles of marital duration, chronological age, and physical health. These factors have been examined in the context of sexual frequency but not for sexual inactivity. In addition, in light of increasing diversity in family structure across the life course, including at older ages (Silverstein & Giarrusso, 2010), we also focus on the role of premarital cohabitation and remarriage on sexual inactivity. Finally, we examine how the correlates of inactivity vary by gender in order to understand how marital sexuality differs for older men and women.

#### FACTORS INFLUENCING MARITAL SEXUAL ACTIVITY

##### *Duration and Related Factors*

The majority of research on the relationship between sexual activity and marital duration has focused on the decline of sexual frequency with increasing marital duration. One of the most-discussed phenomena associated with this decline is the “honeymoon effect” (James, 1981). According to this explanation, the novelty of sexual experience declines as marital duration increases, resulting in lower sexual frequency (Blumstein & Schwartz, 1983; DeLamater & Sill, 2007). The sharpest frequency decline is experienced in the first year of marriage, with much slower subsequent decline, indicating that sexual activity is not a linear function of marital duration (Call et al., 1995). Work that has examined the role of marital duration in marriages of longer duration, however, suggests a negligible role of marital duration after controlling for related variables (Call et al.). Furthermore, in a recent qualitative study of married couples of middle and older ages (mean marital duration approximately 34 years), respondents reported that the decline in sexual activity was primarily due to health decline, not duration (Lodge & Umberson, 2012).

Premarital cohabitation adds “duration” to a subsequent marriage because it effectively lengthens an individual’s tenure in a marriage-like state (DeMaris & Rao, 1992), which would

be associated with increased odds of inactivity. Cohabitation is associated, however, with higher levels of marital sexual activity in younger samples (Call et al., 1995). This is at least in part because the characteristics of those who cohabit differ from those who do not. Research examining premarital cohabitation at earlier points in the life course finds that those who cohabit have lower educational attainment and income and are more liberal and egalitarian and less religious than those who do not engage in premarital cohabitation (see Smock, 2000). Though most research on the relationship between cohabitation and sexual activity focuses on younger people (e.g., Call et al.; Laumann, Gagnon, Michael, & Michaels, 1994), the fact that cohabitation is growing at older ages (U.S. Census Bureau, 2009) suggests that its role for marital sexuality at older ages should also be examined.

Remarriage is also an important factor related to relationship duration, especially for individuals later in the life course who have been exposed to longer periods of risk for divorce or widowhood. In addition, people who remarry differ from those in other marital status categories in important ways. People who remarry may possess more motivation to reenter an intimate relationship than those who do not (Clarke, 2006). Furthermore, some marriages may terminate due to sexual inactivity. For example, in a study of reproductive-age divorced men and women (Guminski Cleek & Pearson, 1985), about one third of both men and women listed "sexual problems" as a reason for divorce.

#### *Chronological Aging and Related Factors*

Age is also identified as a major determinant of sexual activity (e.g., Kinsey, Pomeroy, & Martin, 1948; Laumann et al., 1994) and remains a significant factor for sexual behavior when other factors (biological, psychological, and social) are controlled for (DeLamater & Moorman, 2007). Age may be important in its own right because chronological age is associated with one's social environment, including societal and personal expectations regarding sexual activity.

Age differences between partners may also influence marital sexual activity. Age hypergamy, the typical partnering of older men with younger women, may amplify asymmetries in physical and mental health between spouses. In an analysis of American women and men

aged 57 to 85, Lindau and colleagues (2007) found a mean difference of 3.2 ( $SD = 5.7$ ) years between male and female partners among the currently married and currently partnered. In addition, because remarried individuals tend to be older, there is more opportunity for individuals (all things being equal) to marry someone younger, particularly for men, given imbalanced sex ratios and gender norms about partnering.

#### *Physical and Mental Health*

Physical and mental health are closely tied to sexual activity. Specific physical illnesses have been associated with incidence of sexual activity or sexual dysfunction (e.g., erectile dysfunction), including cardiovascular disease, hypertension, diabetes, obesity, cancer, and lower urinary tract symptoms and prostate disease in men (DeLamater & Sill, 2005; Lindau et al., 2007; Rosen, Wing, Schneider, & Gendrano, 2005). In addition, because sexual activity is physical activity, conditions such as arthritis (Lindau et al.) and obesity (Rosen et al.) can compromise functional health, which reflects an individual's ability to perform daily tasks. Finally, physical health contains not only clinical and diagnostic components, but also subjective elements, such as an individual's rating of her current physical health status. Prior research has found that when self-rated health and objective health status (reports by physicians and reports of specific health conditions by respondents) are modeled jointly, self-rated health is more predictive of mortality than objective health status (Mossey & Shapiro, 1982), perhaps because individual assessments better capture global health status (Idler & Benyamini, 1997). Self-rated physical health has been used in other studies examining the correlates of sexual activity at older ages (e.g., Lindau et al.; Karraker et al., 2011).

Psychological well-being is also associated with sexual activity and may be as or more important than physiological factors for sexual function in both men and women (Bancroft, 2007; Kingsberg, 2002). Depression, anxiety, stress, and poor self-rated mental health have all been identified as correlates with poor sexual function (Laumann, Das, & Waite, 2008; Rosen et al., 2005). Conversely, sexual activity that incorporates other forms of physical intimacy is associated with lower depression in both men and women (Ganong & Larson, 2012).

The study of sexual activity and health is complicated by the fact that it is difficult to establish causal order between these two variables. Untangling this relationship is hampered in part by a dearth of longitudinal data containing measures on sexual activity and health.

Substantial evidence indicates that health can have a direct causal effect on sexual activity—physical illness (such as heart disease) can inhibit the physical ability to engage in specific sexual activities such as intercourse. Moreover, psychological illness (such as depression) can compromise the desire to engage in sexual activity. Also, medications used to treat both physical and psychological illness can have similar effects. In addition, doctors may caution individuals to refrain from sexual activity following a serious illness, such as a heart attack. Furthermore, both quantitative (Lindau et al., 2007) and qualitative studies (Gott & Hinchliff, 2003; Lodge & Umberson, 2012) have found reports of health decline as a leading reported reason for sexual activity cessation among older adults.

Although not as extensive, evidence also supports a causal effect of sexual activity on health. First, sexual activity can lead to negative health consequences, most notably sexually transmitted infections (STIs). In addition, there is theoretical support that sexual activity may also be linked to chronic health outcomes via indirect routes. Social support theories suggest that social ties—particularly those between spouses—promote health, including health for those with chronic disease (House, Landis, & Umberson, 1988; Thoits, 1995). For many individuals, sexual activity is an important part of building and maintaining an intimate relationship. In fact, a recent survey of Americans ages 45 and older found that the majority of respondents “somewhat” or “strongly” agree that sex is critical to a good relationship (American Association of Retired Persons, 2010). Given that prior research has found that health benefits of marriage vary by marital quality (Umberson et al., 2006), sexual activity may indeed confer positive health benefits via relationship maintenance and enhancement, at least for those couples who believe sexual activity is important for a “good” relationship.

In reality, it is plausible that health has a causal effect on sexual activity as well as vice versa (reciprocal causation) simultaneously. Establishing the causal ordering of the relationship

between sexuality and health is also complicated by the potential presence of feedback loops within the marital dyad. For example, a husband may have a physical health problem that makes sexual activity difficult because of sexual dysfunction. If his wife interprets her husband’s dysfunction as a reflection of her desirability, regardless of the objective reason for inactivity, she may experience negative psychological consequences such as depression. The negative mental health consequences of a partner’s sexual dysfunction in certain circumstances has been found in prior work (Hirayama & Walker, 2011). Wife’s depression in turn may exacerbate her own pre-existing chronic illness (Katon & Ciechanowski, 2002).

Research also identifies gender asymmetries in health over the later life course. Though women live longer than men, women have poorer physical health and more disability days than men at almost all ages across the life course (Austad, 2006). These differences may be particularly pronounced in middle and later life, periods when conditions emerge that are more likely to befall women, such as arthritis, which may compromise functional capacity. Laumann and colleagues (2008) found that physical health is more strongly associated with sexual problems among older women than among older men. Physical health does not necessarily impact men and women identically. Physical conditions indicative of poorer physical health, such as hypertension, may compromise the mechanics of vaginal intercourse for men and their partners through erectile dysfunction. But the same condition in a woman may not interfere with her capacity for vaginal intercourse. On the other hand, menopause is a nearly universal experience for women by their mid-50s (Nichols et al., 2006); it may negatively impact the mechanics of sexual intercourse via impaired vaginal lubrication if untreated.

In the past decade, medical advances and advertising have created greater awareness of sexual functioning in later life and of treatments for some problems of sexual functioning. The most prominent example is the advertising of drugs for erectile dysfunction. A recent survey of older Americans ages 57 to 85 estimated that more than one third of men experience erectile dysfunction and found that 14% of men were taking at least one prescription or over-the-counter medication to improve sexual function (Lindau et al., 2007). Conversely,

medications used to treat health conditions such as hypertension and depression are also linked to impaired sexual function (DeLamater & Sill, 2005).

### *Marital Quality*

Beyond individual health characteristics, qualitative aspects of marriages may also be salient factors influencing sexual activity. Researchers have used many measures to evaluate qualitative aspects of the marital relationship. Not surprisingly, many of these measures are also associated with marital sexual activity. Call and colleagues (1995) found that next to age, marital happiness is the most important covariate associated with marital sexual frequency. More generally, in a sample of individuals aged 18 to 59, Laumann, Paik, and Rosen (1999) found that higher levels of satisfaction with one's sexual partner are associated with less sexual dysfunction; dysfunction, of course, is associated with negative experiences in sexual relationships that may lead to sexual inactivity. A survey of 8,656 Australian men and women 16 to 64, 73% of them married, found that greater desired frequency of sex and sexual satisfaction were significantly associated with marital satisfaction for both men and women, controlling for duration (Smith et al., 2011).

### *Sociodemographic and Background Characteristics*

Individual demographic characteristics such as race/ethnicity, education, and religion are also important aspects to consider when examining marital sexual activity. Laumann and colleagues (1994) argued that traits such as race/ethnicity and education are fundamental, almost universally recognized elements of identity that play an important role in determining the individual's social environment and sexual attitudes. Although research has reported racial differences in adult sexual behavior (Treas & Giesen, 2000; Laumann et al., 1994), little research has focused on racial and ethnic differences in sexual activity within marriage in later life. Though prior work has identified racial differences in marital behavior, particularly lower marriage rates among African Americans (Oppenheimer 1997), it is also suggested that among the married, African Americans derive fewer benefits

than Whites (Umberson et al., 2005). Exploring racial differences in sexual behavior within a marital context enables an examination of how sexual activity—one particular benefit of marriage (Waite, 1995)—differs for African Americans and Whites. More generally, racial differences in other facets of sexuality have been observed. Among a population-based sample of Americans ages 18 to 59, modest differences in partnered sexual behavior were observed by race and ethnicity (Laumann et al., 1994). Larger racial differences were observed in attitudes about sexual behavior, with Blacks less likely to hold conservative views about sexuality than Whites after controlling for other demographic characteristics, and Hispanics more likely to hold conservative views (Laumann et al., 1994). Research among partnered older men and women finds racial differences in the prevalence of several sexual dysfunctions (Laumann et al., 2008), although not in a systematic way. Education is also associated with sexual activity, reflecting more liberal beliefs. DeLamater and Sill (2005) found that education is a positive predictor of sexual desire for older men and women, though the relationship becomes weaker for men and nonsignificant for women when attitudes are included. Finally, scholars have examined the relationship between sexual activity and religion, as religious affiliation is linked to attitudes and beliefs, behavior, and social networks (Thornton, Axinn, & Hill, 1992). Catholic religious affiliation in particular has previously been examined by other studies examining sexual behavior and activity and identified as influential (Call et al., 1995; Edwards & Booth, 1976; Laumann et al., 1994).

Prior research indicates that continued sexual activity is linked to physical, psychological, and relationship well-being in older adults. Thus, our primary aim is to identify the individual and dyadic factors associated with marital sexual inactivity. We pay particular attention to three distinct but empirically correlated factors associated with marital sexual activity: marital duration; chronological aging, as measured by respondent's and spouse's age; and respondent's and spouse's physical and mental health. We also examine the role of marital characteristics, including marital happiness, premarital cohabitation, remarriage, and age differences between spouses. Given that most prior work on sexual activity focuses on marital sexual frequency, we also discuss similarities and differences in

the correlates of sexual frequency and sexual inactivity. Second, we want to understand how marital sexuality differs by gender in the later life course, so we conduct our analysis both in a pooled model as well as separately for men and women.

## METHOD

### *Data*

The National Social Life, Health, and Aging Project (NSHAP) permits the first opportunity to study the marital sexual domain in a nationally representative older sample (defined as ages 57 to 85—adults older than 85 years of age are excluded due to small population size). NSHAP is a study of noninstitutionalized older adults; data were collected from summer 2005 to spring 2006. The NSHAP data contain information on the demographic characteristics; romantic, sexual, and social relationships; and physical and mental health of 3,005 Americans aged 57 to 85. The final response rate was 75% (O’Muircheartaigh, Eckman, & Smith, 2009). Most data (including all variables described in the Data section and used in the present analysis) were collected in an in-home interview. Analyses are restricted to individuals married to someone of the opposite sex. Although it also important to understand alternative contexts for sexual activity later in life, cell sizes were prohibitively small for complex statistical analyses for other unions (e.g., unmarried cohabiting, same sex). Men and women in the married sample are not married to one another.

### *Dependent Variable: (Timing of) Sexual Inactivity*

The NSHAP survey defines *sex* or *sexual activity* as “any mutually voluntary activity with another person that involves sexual contact, whether or not intercourse or orgasm occurs.” The questionnaire also asked respondents about the last time they had sex with their spouse (in year and month, if possible), allowing for more detailed analyses on the timing of sexual inactivity based on the definition above. If respondents could only remember the year but not month in which they last had sex, we assumed that they stopped having sex halfway through the reported year. This assumption is widely used in demographic life tables when information on

the year of an event is available but the month is not (Preston, Heuveline, & Guillot, 2001). The specific dates when specific sexual activities last occurred (such as vaginal intercourse) were not collected. Nevertheless, a broad definition of *sex* or *sexual activity* is advantageous in terms of capturing a socially salient definition of sex in an older population, as prior research indicates that people may expand their definitions of “sex” with age (Deacon, Minichiello, & Plummer, 1995; Clarke, 2006; Lodge & Umberson, 2012). This definition was also used in the National Health and Social Life Survey (NHSLs), the first nationally representative survey of sexual behavior among younger people (Laumann et al., 1994). Because other studies have used more restrictive measures of “sex” (such as vaginal intercourse), in the Results section we also discuss the frequency (e.g., always, usually, sometimes, rarely, or never) of specific sexual activities when “sex” occurs.

*Sexual inactivity* is defined as having not had sex for at least the past 12 months, which approximately corresponds to a date of last sexual activity prior to 2005. Due to uncertainty in interview date for all respondents (some time between July 2005 and March 2006), as well as missing information for month of last sexual activity for more than half of those who report last sex in 2004, the 89 individuals (6% of total analytic sample) reporting last sex in 2004 are coded as sexually inactive. Reanalysis coding these individuals as active does not change results appreciably but does slightly lower the point estimate for prevalence of sexual inactivity.

### *Key Covariates*

*Relationship duration.* Relationship duration is measured as marital duration (marriage beginning year/month to 2005 or 2006) for those who did not engage in premarital cohabitation. For individuals who engaged in premarital cohabitation, relationship duration was considered to begin in the year/month the couple began living together. If respondents could only remember the year but not month in which they married or began cohabiting, we assumed that the marriage or cohabitation began halfway through the reported year. Because remarriage and cohabitation are themselves associated with duration of current relationship, as well as attitudes and other characteristics that are associated with

sexual activity, dichotomous variables for both cohabitation and remarriage are included.

*Chronological age.* Measures of respondent's and partner's age in years are also included. In addition, the magnitude and direction of age differences between spouses is included. Categories for age differences between spouses are: husband 2 years older/younger than wife (reference), wife 3 or more years older, husband 3 to 5 years older, husband 6 to 10 years older, and husband 11 or more years older.

*Physical and mental health.* We include measures of respondent's self-reported current physical and mental health. Following a prompt indicating that the focus of the questions to follow pertained to physical health, all respondents were asked: "Would you say your health is excellent, very good, good, fair, or poor?" All respondents were also asked: "What about your emotional or mental health? Is it excellent, very good, good, fair, or poor?" Because marital sexual activity is dependent on the characteristics of both husband and wife, respondents' reports of their spouses' age and physical and mental health were included (spouses were not interviewed). Respondents answered the questions: "Would you say (partner's) health is (excellent, very good, good, fair, poor)?" and "How is (partner's) emotional or mental health? Would you say it is (excellent, very good, good, fair, poor)?" Responses were scored from 1 = *poor* to 5 = *excellent*. No other measures of partner health were available.

*Marital happiness.* Marital happiness is assessed through the following question: "Taking all things together, how would you describe your marriage with (partner) on a scale from 1 to 7, with 1 being very unhappy and 7 being very happy?" We used the scale indicated in the question.

*Sociodemographic and background characteristics.* Independent individual variables include sociodemographic characteristics as well as covariates associated with sexual activity. Respondent's race/ethnicity (0 = *White, non-Hispanic*, 1 = *Black*, 2 = *Hispanic*, 3 = *Other*), educational attainment (0 = *less than high school*, 1 = *high school or equivalent*, 2 = *some college*, and 3 = *college or more*), and a dichotomous variable for whether the respondent

identifies as Catholic (0 = *no/other religion*, 1 = *Catholic*) are included.

### Missing Data

Analyses are restricted to marital duration spells (comprising a total of 637,092 person-months or 53,091 person-years) that correspond to 1,502 of 1,801 married respondents (889 men and 613 women). Of the 299 excluded men and women, the majority of cases were excluded due to missing date of last sexual activity. Of the excluded cases, 217 (or 73% of total missing cases) occurred because respondents did not provide the year of last sexual activity (recall that for respondents missing month but not year of last sexual activity, we assumed sexual activity stopped halfway through the reported year). Of these 217 respondents, 91 were coded as "don't know" (49 men and 42 women) and 126 as "refused" (80 men and 46 women). An analysis of these 217 respondents (not shown, available on request) shows that those missing year of last sex are similar to those with complete information along many characteristics. Respondents with missing date of last sex are slightly older and have older partners, are in worse physical and mental health, and are less likely to have engaged in premarital cohabitation or to be in a remarriage. An additional 21 cases (7%) were lost due to other missing information on marriage history (e.g., start date). Finally, 61 respondents (20%) were excluded due to missing values on other covariates.

### Analytic Approach

First, we describe the proportion of marriages among older people that are sexually active, and among those inactive, the distribution of time to sexual activity cessation. Second, we employ logistic regression within an event-history analysis framework to estimate the independent odds of sexual inactivity for several covariates of interest, including marital duration, respondent and partner age, and respondent and partner physical and mental health, as well as marital happiness, premarital cohabitation, remarriage, spouse age differences, and sociodemographic characteristics. Discrete-time methods are appropriate because of our interest in the timing as well as prevalence of sexual inactivity. Cases are defined as right censored if sexual activity had been reported in the 12 months prior

to interview (year 2005 or 2006). Though the unit of analysis is the person-month, given the long duration of many marriages, duration is coded in years.

In Tables 3 and 4, Model 1 includes relationship duration (in years) as both a linear and quadratic term, the latter to account for the possibility of a curvilinear relationship between duration and sexual activity cessation. Fit tests (not shown) also reveal that including a linear and quadratic term for marital duration is preferable to the inclusion of only a linear duration term. Model 2 adds respondent's age (in years) and also includes demographic characteristics (gender, race, education) and Catholic religion as controls. Model 3 adds respondent's physical and mental health. Model 4 adds partner age (in years). Model 5 adds partner's physical and mental health. Model 6 adds dyadic characteristics (those that are characteristics of the union): age difference between spouses (absolute value in years), marital happiness, remarriage, and premarital cohabitation. We ran pooled models with both men and women (Table 3) as well as separate models by gender (Table 4) because of the established gender differences in characteristics related to sexual activity at older ages. Because men and women in the sample are not married to one another, the male and female samples can be treated as independent of one another in pooled analysis. Gender differences in associations between sexual inactivity and covariates were assessed via running a model with all covariates interacted with gender. All analyses are conducted in Stata version 12.0.

#### *What About Predicting the Past From the Present?*

A primary concern in event-history methods is the use of time-dependent covariates and causal order. If the covariates used to predict an event do not precede the event of interest, it is possible that reverse causality may explain findings. Many of the factors associated with sexual activity should be considered time invariant (demographic characteristics, education, and religion in the later life course) or changing at a constant rate (such as age), but some covariates may change over time, in particular aging processes related to partnered sexual activity. Three measures used in our analyses are of particular concern: current physical

health, current mental health, and current marital happiness. The level of uncertainty in these measures likely depends on how much time has elapsed between the event and the survey. Among married individuals in the analytic sample, date of last sex ranged from approximately 55 years before the survey to being currently sexually active. Seventy-five percent of respondents reported having sex within the past 3 years, and more than 90% reported having sex within the past 8 years. Thus, for most sexually inactive respondents, there is a lag of only a few years between the timing of sexual inactivity and the measurement of key covariates.

This paper uses current self-rated physical health as a proxy for respondent physical health at the time of sexual activity cessation. Earlier studies using longitudinal data found that, on average, self-rated physical health declines slowly in the later life course, with some individual variation in within-age self-rated physical health by poverty status and race/ethnicity, but not over time (McDonough & Berglund, 2003; Liang et al., 2010). Current self-rated mental health is used as a proxy for past mental health. Although aging is sometimes associated with poorer physical health (including self-rated physical health), aging is not necessarily associated with poorer mental health, including self-reports (Chappell, 2009). We use respondent reports of partner physical and mental health status. Unfortunately, little is known about the stability of proxy-reported physical and mental health over time, but no other measures are available in the data. In addition, proxy reports of spouses may largely conform to respondents' self-reports due to both spouse homogeneity and response bias. Thus, partner physical and mental health attributes should be interpreted cautiously.

The stability of marital happiness over time and in light of sexual activity cessation is the most problematic measure in terms of reverse causality. Call and colleagues (1995) found that marital happiness was the second most important predictor of marital sexual frequency, but infrequent sex may be qualitatively quite different from sexual inactivity. Donnelly (1993) found that among younger individuals (mean age about 40 years old, standard deviation about 15 years), lower marital happiness is associated with greater likelihood of sexual inactivity.

Mean marital happiness among NSHAP respondents in sexually active marriages was 6.40 compared with 6.01 among those in sexually inactive marriages (on a scale of 1 = *very unhappy* to 7 = *very happy*). The difference between groups is statistically significant at  $p < .001$ , but relatively small in substance considering the scale of the measure. There remains a possibility that sexual inactivity reflects a sharp drop in physical or mental health or marital happiness even over a short period of time, and thus estimates for these variables may reflect either risk factors for inactivity or results of inactivity. We return to this issue when acknowledging limitations in the Discussion section.

## RESULTS

### *Descriptive Statistics*

Table 1 displays summary statistics for both the pooled married sample as well as for men and women separately. Approximately 29% of respondents report no sexual activity within their marriages for the past 12 months or more at the time of the interview. Given that prior work has suggested the increasing importance of sexual inactivity in sexual frequency decline with age, we next discuss the distribution of sexual frequency in Table 2. Most notably, there is a steep increase in sexual inactivity across age groups. Also notable in Table 2 is the remarkable stability of the percentage of couples engaging in infrequent sex (once a month or less) across age groups, which suggests that the distinction between sexual inactivity and any frequency of activity is more important than the distinction between low frequency and high frequency as respondents age. Because age, health, and marital duration are correlated, we disentangle the independent association of each with inactivity in multivariate analysis below.

Though not the main focus of our analysis, we also discuss descriptive statistics about the specific sexual activities that sexually active respondents engaged in. We believe that the broad definition of *sexual activity* used by NSHAP is attractive, considering that individuals may broaden their definitions of "sex" with age (Deacon et al., 1995; Clarke, 2006; Lodge & Umberson, 2012), but because prior research on sexual frequency has often examined vaginal intercourse (e.g., Call et al., 1995; Herbenick et al., 2010; James, 1981), it is

useful to ascertain how often certain sexual acts are performed by sexually active respondents. The NSHAP survey did not collect dates of last sexual activity for specific activities, only how often (*always, usually, sometimes, rarely, or never*) respondents engaged in specific behaviors (e.g., vaginal intercourse) when they did engage in sexual activity. We find that the vast majority (more than 90%) of sexually active respondents report "usually" or "always" engaging in foreplay ("kissing, hugging, caressing, or other ways of sexual touching"), and a large percentage (84%) report "usually" or "always" engaging in vaginal intercourse. In contrast, only a minority of sexually active respondents (less than 10%) report "usually" or "always" either giving or receiving oral sex.

Because one of the reasons to focus on sexual inactivity is the extent to which it reflects complete cessation of sexual activity in marriages and potentially also in life, we also address whether individuals are indeed finished having sex in their marriages. The preferred way to assess whether individuals have completely ceased having sex is via long-term longitudinal data, but since the available data are cross-sectional, we must employ an alternative strategy. Respondents were asked whether they expected to have sex with their partner again. Of those respondents we determined had experienced no sexual activity for the previous 12 months or longer, approximately two thirds reported that they did not expect to have sex with their spouse again.

We now turn to gender differences in summary statistics (Table 1). Female respondents are more likely to report no sexual activity within their marriages than male respondents—a difference that is statistically significant. Though only about one quarter of older married men report no sexual activity, about 34% of older married women report no sexual activity. Of particular importance in explaining this difference in sexual inactivity by gender are potential differences in the characteristics of older married men and women and their partners. Male and female respondents are both about 67 years of age on average, but men's wives are on average only 63 years old, whereas women's husbands are on average 69 years old. This finding is consistent with research on age hypergamy in marriages (England & McClintock, 2009). In addition, though men and women are of similar

Table 1. *Sexual Inactivity Among Older Married People: Descriptive Statistics (N = 1,502)*

|   | Analytic Sample (N = 1,502) |       |           | Men (n = 889) |       | Women (n = 613) |         |
|---|-----------------------------|-------|-----------|---------------|-------|-----------------|---------|
|   | M                           | SD    | Range     | M             | SD    | M               | SD      |
| Inactive <sup>a</sup>                           | 0.29                        | 0.45  | 0–1       | 0.25          | 0.43  | 0.34            | 0.47*** |
| Marital duration (years)                        | 35.35                       | 14.41 | 1–69      | 34.37         | 14.45 | 36.77           | 14.25** |
| Female <sup>a</sup>                             | 0.41                        | 0.49  | 0–1       |               |       |                 |         |
| Race <sup>a</sup>                               |                             |       |           |               |       |                 |         |
| White   | 0.77                        | 0.01  |           | 0.76          | 0.01  | 0.77            | 0.02    |
| Black   | 0.1                         | 0.01  |           | 0.11          | 0.01  | 0.1             | 0.01    |
| Hispanic  | 0.11                        | 0.01  |           | 0.11          | 0.01  | 0.11            | 0.01    |
| Other   | 0.02                        | 0     |           | 0.02          | 0     | 0.02            | 0.01    |
| Education <sup>a</sup>                          |                             |       |           |               |       |                 | **      |
| Less than high school                           | 0.18                        | 0.01  |           | 0.18          | 0.01  | 0.17            | 0.02    |
| High school/GED                                 | 0.25                        | 0.01  |           | 0.23          | 0.01  | 0.29            | 0.02    |
| Some college                                    | 0.31                        | 0.01  |           | 0.28          | 0.02  | 0.35            | 0.02    |
| College or more                                 | 0.26                        | 0.01  |           | 0.31          | 0.02  | 0.2             | 0.02    |
| Catholic <sup>a</sup>                           | 0.31                        | 0.46  |           | 0.32          | 0.47  | 0.3             | 0.46    |
| Respondent age                                  | 67.58                       | 7.32  | 57–85     | 67.76         | 7.4   | 67.31           | 7.2     |
| Respondent physical health                      | 3.35                        | 1.08  | 1–5       | 3.36          | 1.08  | 3.33            | 1.06**  |
| Respondent mental health                        | 3.82                        | 0.95  | 1–5       | 3.88          | 0.92  | 3.74            | 0.98    |
| Partner age                                     | 65.76                       | 9.48  | 29–95     | 63.25         | 9.24  | 69.4            | 8.6***  |
| Partner physical health                         | 3.26                        | 1.14  | 1–5       | 3.32          | 1.08  | 3.17            | 1.21*   |
| Partner mental health                           | 3.71                        | 1.04  | 1–5       | 3.77          | 1.01  | 3.61            | 1.07**  |
| Spouse age difference <sup>a</sup>              |                             |       |           |               |       |                 | ***     |
| Husband 2 years older/younger or less           | 0.42                        | 0.01  |           | 0.4           | 0.02  | 0.46            | 0.02    |
| Wife 3+ years older                             | 0.07                        | 0.01  |           | 0.05          | 0.01  | 0.11            | 0.01    |
| Husband 3–5 years older                         | 0.25                        | 0.01  |           | 0.24          | 0.01  | 0.26            | 0.02    |
| Husband 6–10 years older                        | 0.15                        | 0.01  |           | 0.18          | 0.01  | 0.11            | 0.01    |
| Husband 11+ years older                         | 0.1                         | 0.01  |           | 0.13          | 0.01  | 0.05            | 0.01    |
| Marital happiness                               | 6.3                         | 1.18  | 1–7       | 6.43          | 1.04  | 6.11            | 1.35*** |
| Remarriage (n = 481) <sup>a</sup>               | 0.32                        | 0.47  | 0–1       | 0.35          | 0.48  | 0.28            | 0.45**  |
| Duration for remarriages (years)                | 20.96                       | 12.45 | 0–55      |               |       |                 |         |
| Premarital cohabitation (n = 336) <sup>a</sup>  | 0.22                        | 0.42  | 0–1       | 0.25          | 0.43  | 0.18            | 0.39**  |
| Duration of premarital cohabitation (years)     | 3.47                        | 5.48  | 0–41      |               |       |                 |         |
| Beginning year for cohabitation                 | 1980.06                     | 13.2  | 1943–2005 |               |       |                 |         |
| Duration for marriages preceded by cohabitation | 23.64                       | 12.85 | 0–56      |               |       |                 |         |

Note. Data are from National Social Life, Health, and Aging Project (NSHAP). Significance levels for two-tailed tests of gender differences in means/ $\chi^2$ /Wilcoxon-Mann-Whitney test.

<sup>a</sup>M column refers to proportion.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

age, male respondents report slightly better physical health than female respondents ( $p < .001$ ). Male respondents also report higher marital happiness and are more likely to be in a remarriage and to have engaged in premarital cohabitation than women.

#### *Multivariate Analyses: All Married People*

*Duration and related factors.* Table 3, Model 1, which includes only linear and quadratic terms

for marital duration, reveals only a very weak (though statistically significant) positive association between the linear marital duration term and sexual inactivity. The addition of respondent age in Model 2 dramatically changes the magnitude of the positive association between the linear duration term and odds of sexual inactivity. Longer marriages are more likely to be inactive, with each additional year of marriage associated with 22% higher odds of sexual inactivity (Model 2). The addition of covariates in

Table 2. *Sexual Frequency Distribution Among Older Married People by Age Group (%) (n = 1,462)*

|                      | Ages<br>57–64 | Ages<br>65–74 | Ages<br>75–85 |
|----------------------|---------------|---------------|---------------|
| Not sexually active  | 13.2          | 29.5          | 53.4          |
| Once a month or less | 26.3          | 24.0          | 23.3          |
| 2–3 times per month  | 28.5          | 23.8          | 14.2          |
| Once or twice a week | 27.1          | 19.5          | 6.8           |
| 3–6 times per week   | 4.0           | 2.8           | 1.9           |
| Once a day or more   | 0.8           | 0.4           | 0.3           |
| <i>n</i>             | 620           | 533           | 309           |

Note: Data are from the National Social Life, Health, and Aging Project (NSHAP). Sample size is smaller than entire analytic sample because of missing information on frequency for some sexually active respondents.

later models (Models 3–6) does not change the magnitude of this association much, though there is slight attenuation in the full Model 6 ( $OR = 1.18$ ). Model 6 also includes indicator variables for premarital cohabitation and remarriage—two covariates also associated with duration. Cohabitation is associated with 14% lower odds of sexual inactivity. Remarriage is associated with 82% lower odds of sexual inactivity. Throughout models, the quadratic duration term is of little substantive consequence, though statistically significant.

*Chronological age and related factors.* Chronological age of respondent is added in Model 2 of Table 3. As for those in longer marriages, older respondents are more likely to report being sexually inactive. In Model 2, each additional year of respondent age is associated with 22% higher odds of sexual inactivity, of equal magnitude to the positive association between each additional year of marriage and sexual inactivity across models. The addition of respondent health measures in Model 3 does not reduce the magnitude of this association, though the inclusion of partner age in Model 4 does. In the full model, which includes dyadic characteristics, each additional year of age is associated with 16% higher odds of inactivity (Table 3, Model 6).

Partner's age is also associated with odds of sexual inactivity and is of similar magnitude as respondent's age. Each additional year of partner's age is associated with 13% higher odds of sexual inactivity (Model 6). The similarity in magnitude and direction of the association between respondent and partner ages is

not surprising, given general age homogamy between spouses (though men tend to be older). The magnitude and statistical significance of the association between partner's age and sexual inactivity is robust to the inclusion of additional covariates, including partner's physical and mental health.

No consistent pattern is observed for the association between sexual inactivity and the direction and magnitude of age differences between spouses (Model 6). Compared with the reference group (marriages in which husbands and wives are within 2 years of one another), couples in which wives are 3 years older or more have the lowest odds of sexual inactivity of any age difference indicator, with 82% lower odds of sexual inactivity. Marriages in which husbands are 3 to 5 years older and 6 to 10 years older than wives have 11% and 47% lower odds of sexual inactivity, respectively. Marriages in which husbands are 11 or more years older than their wives have the highest odds of sexual inactivity, with 54% higher odds compared with the reference category.

*Physical and mental health.* The magnitude for the association between respondent's self-rated physical health and odds of sexual inactivity is quite large. Better physical health is associated with lower odds of sexual inactivity ( $OR = 0.59$ , Table 3, Model 6). Respondent's self-rated mental health, on the other hand, is not associated with inactivity in the full model. We also conducted sensitivity analyses adding a variety of comorbidities and indicators of anxiety, depression, and stress. Substantive results are quite similar, though there is some attenuation in the magnitude of the relationship between self-rated physical health and inactivity (results not shown, available on request).

For partner health characteristics, better physical health is associated with lower odds of sexual inactivity across all models ( $OR = 0.75$ , Table 3, Model 6). Better partner mental health is also associated with lower odds of sexual inactivity ( $OR = 0.89$ , Table 3, Model 6), but partner physical health is more strongly associated with lower odds of sexual inactivity than partner mental health. The limitations of proxy reports of partner health are discussed below.

*Marital quality.* Marital happiness is added in Model 6. Respondents with higher values of marital happiness are less likely to be sexually

Table 3. Summary of Logistic Regression Analysis for Variables Predicting Sexual Inactivity Among Older Married People (N = 1,502)

|                                     | Model 1   |      |      | Model 2    |      |      | Model 3    |      |      |
|-------------------------------------|-----------|------|------|------------|------|------|------------|------|------|
|                                     | b         | SE b | OR   | b          | SE b | OR   | b          | SE b | OR   |
| Duration (years)                    | .00*      | .00  | 1.00 | .20***     | .00  | 1.22 | .20***     | .00  | 1.22 |
| Duration <sup>2</sup>               | .00       | .00  | 1.00 | .00***     | .00  | 1.00 | .00***     | .00  | 1.00 |
| Female                              |           |      |      | .64***     | .01  | 1.89 | .64***     | .01  | 1.91 |
| Race/ethnicity <sup>a</sup>         |           |      |      |            |      |      |            |      |      |
| Black                               |           |      |      | .26***     | .01  | 1.29 | .21***     | .01  | 1.23 |
| Hispanic                            |           |      |      | -.08***    | .01  | 0.93 | -.29***    | .01  | 0.75 |
| Other                               |           |      |      | -.67***    | .02  | 0.51 | -.90***    | .02  | 0.41 |
| Education <sup>b</sup>              |           |      |      |            |      |      |            |      |      |
| High school/GED                     |           |      |      | -.14***    | .01  | 0.87 | .07***     | .01  | 1.07 |
| Some college                        |           |      |      | -.30***    | .01  | 0.74 | -.01       | .01  | 0.99 |
| College or more                     |           |      |      | -.67***    | .01  | 0.51 | -.24***    | .01  | 0.78 |
| Catholic                            |           |      |      | .01        | .01  | 1.01 | .04***     | .01  | 1.04 |
| Age                                 |           |      |      | .20***     | .00  | 1.22 | .20***     | .00  | 1.22 |
| Physical health                     |           |      |      |            |      |      | -.5***     | .00  | 0.61 |
| Mental health                       |           |      |      |            |      |      | -.12***    | .00  | 0.88 |
| Partner age                         |           |      |      |            |      |      |            |      |      |
| Partner physical health             |           |      |      |            |      |      |            |      |      |
| Partner mental health               |           |      |      |            |      |      |            |      |      |
| Spouse age differences <sup>c</sup> |           |      |      |            |      |      |            |      |      |
| Wife 3+ years older                 |           |      |      |            |      |      |            |      |      |
| Husband 3 – 5 years older           |           |      |      |            |      |      |            |      |      |
| Husband 6 – 10 years older          |           |      |      |            |      |      |            |      |      |
| Husband 11+ years older             |           |      |      |            |      |      |            |      |      |
| Marital happiness                   |           |      |      |            |      |      |            |      |      |
| Remarriage                          |           |      |      |            |      |      |            |      |      |
| Premarital cohabitation             |           |      |      |            |      |      |            |      |      |
| Constant                            | -1.01***  | 0.02 |      | -17.41***  | .06  |      | -15.29     | .06  |      |
| Person-years                        | 53,091    |      |      | 53,091     |      |      | 53,091     |      |      |
| Person-months                       | 637,092   |      |      | 637,092    |      |      | 637,092    |      |      |
| LR $\chi^2$                         | 124.34*** |      |      | 145,688*** |      |      | 176,909*** |      |      |
| Pseudo-R <sup>2</sup>               | .00       |      |      | .19        |      |      | .23        |      |      |
| BIC <sup>d</sup>                    | 768,193   |      |      | 622,696    |      |      | 591,489    |      |      |
| Duration (years)                    | .21***    | .00  | 1.24 | .21***     | .00  | 1.23 | .17***     | .00  | 1.18 |
| Duration <sup>2</sup>               | .00***    | .00  | 1.00 | .00***     | .00  | 1.00 | .00***     | .00  | 1.00 |
| Female                              | .05***    | .01  | 1.05 | .05***     | .01  | 1.05 | .07***     | .01  | 1.07 |
| Race/ethnicity <sup>a</sup>         |           |      |      |            |      |      |            |      |      |
| Black                               | .26***    | .01  | 1.30 | .25***     | .01  | 1.28 | .28***     | .01  | 1.32 |
| Hispanic                            | -.29***   | .01  | 0.75 | -.32***    | .01  | .73  | -.44***    | .01  | .65  |
| Other                               | -.78***   | .02  | 0.46 | -.76***    | .02  | .47  | -.75***    | .02  | .47  |
| Education <sup>b</sup>              |           |      |      |            |      |      |            |      |      |
| High school/GED                     | -.04      | .01  | 0.97 | .00        | .01  | 1.00 | -.15***    | .01  | .86  |
| Some college                        | -.14***   | .01  | 0.87 | -.09***    | .01  | .92  | -.29***    | .01  | .75  |
| College or more                     | -.43***   | .01  | 0.65 | -.31***    | .01  | .73  | -.63***    | .01  | .53  |
| Catholic                            | .05***    | .01  | 1.05 | .07***     | .01  | 1.07 | -.05***    | .01  | .95  |
| Age                                 | .11***    | .00  | 1.12 | .11***     | .00  | 1.12 | .15***     | .00  | 1.16 |
| Physical health                     | -.5***    | .00  | 0.61 | -.46***    | .00  | .63  | -.52***    | .00  | .59  |
| Mental health                       | -.13***   | .00  | 0.88 | -.04***    | .00  | .96  | .00        | .00  | 1.00 |
| Partner age                         | .12***    | .00  | 1.12 | .11***     | .00  | 1.12 | .12***     | .00  | 1.13 |

Table 3. *Continued*

|                                     | Model 4    |             |           | Model 5    |             |           | Model 6    |             |           |
|-------------------------------------|------------|-------------|-----------|------------|-------------|-----------|------------|-------------|-----------|
|                                     | <i>b</i>   | <i>SE b</i> | <i>OR</i> | <i>b</i>   | <i>SE b</i> | <i>OR</i> | <i>b</i>   | <i>SE b</i> | <i>OR</i> |
| Partner physical health             |            |             |           | -.25***    | .00         | .78       | -.29***    | .00         | .75       |
| Partner mental health               |            |             |           | -.17***    | .00         | .84       | -.12***    | .00         | .89       |
| Spouse age differences <sup>c</sup> |            |             |           |            |             |           |            |             |           |
| Wife 3+ years older                 |            |             |           |            |             |           | -1.73***   | .02         | .18       |
| Husband 3–5 years older             |            |             |           |            |             |           | -.12***    | .01         | .89       |
| Husband 6–11 years older            |            |             |           |            |             |           | -.63***    | .01         | .53       |
| Husband 11+ years older             |            |             |           |            |             |           | .43***     | .02         | 1.54      |
| Marital happiness                   |            |             |           |            |             |           | -.16***    | .00         | .86       |
| Remarriage                          |            |             |           |            |             |           | -1.73***   | .01         | .18       |
| Premarital cohabitation             |            |             |           |            |             |           | -.15***    | .01         | .86       |
| Constant                            | -16.09     | .07         |           | -14.74     | .07         |           | -14.31***  | .07         |           |
| Person-years                        | 53,091     |             |           | 53,091     |             |           | 53,091     |             |           |
| Person-months                       | 637,092    |             |           | 637,092    |             |           | 637,092    |             |           |
| <i>LR</i> $\chi^2$                  | 200,146*** |             |           | 213,246*** |             |           | 250,251*** |             |           |
| <i>Pseudo-R</i> <sup>2</sup>        | .26        |             |           | .28        |             |           | .33        |             |           |
| <i>BIC</i> <sup>d</sup>             | 568,260    |             |           | 555,175    |             |           | 518,220    |             |           |

Note. Data are from the National Social Life, Health, and Aging Project (NSHAP).

<sup>a</sup>Reference is White, non-Hispanic.

<sup>b</sup>Reference is less than high school.

<sup>c</sup>Reference is husband 2 years older/younger than wife or less.

<sup>d</sup>Bayesian information criterion.

\*  $p < .05$ . \*\*\*  $p < .001$ .

inactive ( $OR = 0.86$ , Table 3, Model 6). This association should be interpreted cautiously due to concerns of reverse causality.

*Sociodemographic and background characteristics.* Across models, Black respondents report the highest odds of sexual inactivity ( $OR = 1.32$ ), followed by Whites (reference group), Hispanics ( $OR = 0.65$ ), and Other race ( $OR = 0.47$ ; Table 3, Model 6). When we examine education, results generally indicate that higher educational level is associated with lower odds of inactivity (Table 3). Catholic religious identity is only weakly associated with inactivity, first positively so (through Model 5) and then negatively so (Model 6). Gender differences are discussed in greater detail in models below, but consistent with descriptive statistics, women are more likely to be sexually inactive across models.

#### *Multivariate Analyses: Men and Women Separately*

*Duration and related factors.* Table 4 displays covariates associated with sexual inactivity

separately for male and female respondents. All gender differences discussed are significant at  $p < .05$  unless otherwise noted. Across all models following Model 1, each additional year of marriage is associated with higher odds of inactivity for both male ( $OR = 1.26$ , Table 4, Model 6) and female respondents ( $OR = 1.12$ , Table 4, Model 6), but of larger magnitudes for male respondents. For both male and female respondents, the quadratic term is of little substantive importance in any model, but is slightly negative, indicating minor attenuation in the positive association of duration with inactivity over time.

Premarital cohabitation and remarriage are also associated with duration of sexual activity. For male respondents, premarital cohabitation is associated with 5% lower odds of sexual inactivity (Table 4, Model 6). For female respondents, premarital cohabitation is associated with 35% lower odds of sexual inactivity (Table 4, Model 6). Remarriage is associated with lower odds of sexual inactivity for both male (82%) and female (81%) respondents (Table 4, Model 6); the difference by gender is not significant.



Table 4. Continued

|                                     | Model 3    |             |           |           |             |           | Model 4    |             |           |            |             |           |
|-------------------------------------|------------|-------------|-----------|-----------|-------------|-----------|------------|-------------|-----------|------------|-------------|-----------|
|                                     | Men        |             |           | Women     |             |           | Men        |             |           | Women      |             |           |
|                                     | <i>b</i>   | <i>SE b</i> | <i>OR</i> | <i>b</i>  | <i>SE b</i> | <i>OR</i> | <i>b</i>   | <i>SE b</i> | <i>OR</i> | <i>b</i>   | <i>SE b</i> | <i>OR</i> |
| Spouse age differences <sup>c</sup> |            |             |           |           |             |           |            |             |           |            |             |           |
| Wife 3+ years older                 |            |             |           |           |             |           |            |             |           |            |             |           |
| Husband 3–5 years older             |            |             |           |           |             |           |            |             |           |            |             |           |
| Husband 6–10 years older            |            |             |           |           |             |           |            |             |           |            |             |           |
| Husband 11+ years older             |            |             |           |           |             |           |            |             |           |            |             |           |
| Marital happiness                   |            |             |           |           |             |           |            |             |           |            |             |           |
| Remarriage                          |            |             |           |           |             |           |            |             |           |            |             |           |
| Premarital cohabitation             |            |             |           |           |             |           |            |             |           |            |             |           |
| Constant                            | –15.28***  | .09         |           | –13.48*** | .09         |           | –16.31     | .09         |           | –15.95     | .10         |           |
| Person-years                        | 30,553     |             |           | 22,538    |             |           | 30,553     |             |           | 22,538     |             |           |
| Person-months                       | 366,637    |             |           | 270,455   |             |           | 366,637    |             |           | 270,455    |             |           |
| <i>LR</i> $\chi^2$                  | 108,397*** |             |           | 72,055*** |             |           | 114,620*** |             |           | 88,741***  |             |           |
| <i>Pseudo-R</i> <sup>2</sup>        | .26        |             |           | .21       |             |           | .27        |             |           | .26        |             |           |
| <i>BIC</i> <sup>d</sup>             | 315,194    |             |           | 269,879   |             |           | 308,979    |             |           | 253,199    |             |           |
| Duration (years)                    | .24***     | .00         | 1.28      | .17***    | .00         | 1.19†     | .23***     | .00         | 1.26      | .11***     | .00         | 1.12†     |
| Duration                            | .00***     | .00         | 1.00      | .00***    | .00         | 1.00†     | .00***     | .00         | 1.00      | .00***     | .00         | 1.00†     |
| Race/ethnicity <sup>a</sup>         |            |             |           |           |             |           |            |             |           |            |             |           |
| Black                               | .48***     | .02         | 1.61      | –.18***   | .02         | 0.83†     | .38***     | .02         | 1.46      | –.07***    | .02         | 0.93†     |
| Hispanic                            | –.04***    | .02         | 0.96      | –.65***   | .02         | 0.52†     | –.07***    | .02         | 0.94      | –.82***    | .02         | 0.44†     |
| Other                               | –1.09***   | .03         | 0.34      | –.22***   | .03         | 0.80†     | –1.18***   | .03         | 0.31      | –.26***    | .03         | 0.77†     |
| Education <sup>b</sup>              |            |             |           |           |             |           |            |             |           |            |             |           |
| High school/GED                     | .19***     | .01         | 1.21      | –.04      | .02         | 0.96†     | –.01       | .02         | 0.99      | –.18***    | .02         | 0.84†     |
| Some college                        | .02        | .01         | 1.02      | –.18***   | .02         | 0.83†     | –.18***    | .02         | 0.83      | –.44***    | .02         | 0.64†     |
| College or more                     | –.06***    | .01         | 0.94      | –.61***   | .02         | 0.54†     | –.5***     | .02         | 0.61      | –.89***    | .02         | 0.41†     |
| Catholic                            | –.11***    | .01         | 0.90      | .27***    | .01         | 1.32†     | –.28***    | .01         | 0.75      | .13***     | .01         | 1.14†     |
| Age                                 | .14***     | .00         | 1.15      | .07***    | .00         | 1.07†     | .28***     | .00         | 1.32      | .15***     | .00         | 1.16†     |
| Physical health                     | –.58***    | .00         | 0.56      | –.32***   | .01         | 0.72†     | –.59***    | .01         | 0.55      | –.45***    | .01         | 0.63†     |
| Mental health                       | –.08***    | .01         | 0.93      | –.02***   | .01         | 0.98†     | –.08***    | .01         | 0.93      | .07***     | .01         | 1.07†     |
| Partner age                         | .08***     | .00         | 1.08      | .15***    | .00         | 1.16†     | .00        | .00         | 1.00      | .13***     | .00         | 1.14†     |
| Partner physical health             | –.25***    | .00         | 0.78      | –.27***   | .01         | 0.76      | –.28***    | .01         | 0.75      | –.29***    | .01         | 0.75      |
| Partner mental health               | –.09***    | .01         | 0.91      | –.29***   | .01         | 0.75†     | –.01*      | .01         | 0.99      | –.26***    | .01         | 0.77†     |
| Spouse age differences <sup>c</sup> |            |             |           |           |             |           |            |             |           |            |             |           |
| Wife 3+ years older                 |            |             |           |           |             |           | –1.76***   | .03         | 0.17      | –1.24***   | .03         | 0.29†     |
| Husband 3–5 years older             |            |             |           |           |             |           | –.43***    | .02         | 0.65      | –.34***    | .02         | 0.71†     |
| Husband 6–10 years older            |            |             |           |           |             |           | –1.48***   | .02         | 0.23      | –.62***    | .03         | 0.54†     |
| Husband 11+ years older             |            |             |           |           |             |           | –1.68***   | .05         | 0.19      | 1.01***    | .06         | 2.75†     |
| Marital happiness                   |            |             |           |           |             |           |            |             |           |            |             |           |
| Remarriage                          |            |             |           |           |             |           |            |             |           |            |             |           |
| Premarital cohabitation             |            |             |           |           |             |           |            |             |           |            |             |           |
| Constant                            | –15.41     | .09         |           | –13.74*** | .10         |           | –15.79***  | .1          |           | –12.93***  | .11         |           |
| Person-years                        | 30,553     |             |           | 22,538    |             |           | 30,553     |             |           | 22,538     |             |           |
| Person-months                       | 366,637    |             |           | 270,455   |             |           | 366,637    |             |           | 270,455    |             |           |
| <i>LR</i> $\chi^2$                  | 119,178*** |             |           | 99,001*** |             |           | 141,302*** |             |           | 115,146*** |             |           |
| <i>Pseudo-R</i> <sup>2</sup>        | 0.28       |             |           | .29       |             |           | .33        |             |           | .34        |             |           |
| <i>BIC</i> <sup>d</sup>             | 304,434    |             |           | 242,952   |             |           | 282,357    |             |           | 226,853    |             |           |

Note. Data are from the National Social Life, Health, and Aging Project (NSHAP).

<sup>a</sup>Reference is White, non-Hispanic.

<sup>b</sup>Reference is less than high school.

<sup>c</sup>Reference is husband two years older/younger than wife or less.

<sup>d</sup>Bayesian information criterion.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . † Gender difference significant at  $p < .05$ .

*Chronological age and related factors.* Respondent age is independently associated with odds of sexual inactivity, and this association is substantively unchanged by the inclusion of respondent health characteristics for either male ( $OR = 1.22$ , Table 4, Model 3) or female respondents ( $OR = 1.23$ , Table 4, Model 3). The inclusion of partner age in Model 4 reduces the magnitude of the association for both male ( $OR = 1.14$ , Table 4) and female respondents ( $OR = 1.10$ , Table 4). This reflects age similarity between partners. When dyadic characteristics are included in the full model (Model 6), respondent age is more strongly positively associated with sexual inactivity for both male ( $OR = 1.32$ , Table 4) and female respondents ( $OR = 1.16$ , Table 4) than partner age, but the strength of this association is much stronger for male than female respondents.

Partner age is also positively associated with odds of sexual inactivity. Each additional year of partner age is associated with 9% higher odds of inactivity for male respondents and 16% higher odds of inactivity for female respondents (Table 4, Model 4). The magnitude of these associations changes little when partner health characteristics are included (Table 4, Model 5). When dyadic characteristics are accounted for in Model 6, partner age loses statistical significance for male respondents. But for female respondents, partner age remains associated with 14% higher odds of inactivity (Table 4, Model 6).

Age differences between spouses also factor differently into odds of sexual inactivity for male and female respondents. For male respondents (Table 4, Model 6), the omitted reference group (husbands and wives within 2 years of age of one another) has the highest odds of sexual inactivity. All other age differences are associated with lower odds of inactivity (between 35% to 83% lower odds). For female respondents (Table 4, Model 6), having a husband 11 or more years older had the highest odds of sexual inactivity (175% higher odds) relative to the comparison group. All other age differences are associated with lower odds of sexual inactivity relative to the comparison group, ranging from 29% to 71% lower odds of inactivity.

*Physical and mental health.* For both male and female respondents, better respondent and partner physical health are negatively associated with sexual inactivity, but the magnitude of the association varies by gender. As in the pooled

sample, better physical health is associated with lower odds of inactivity for both male respondents ( $OR = 0.55$ , Table 4, Model 6) and female respondents ( $OR = 0.63$ , Table 4, Model 6). Better respondent mental health is associated with lower odds of inactivity for male respondents ( $OR = 0.93$ , Table 4, Model 6), but the reverse is true for female respondents ( $OR = 1.07$ , Table 4, Model 6), though the relationship between mental health and inactivity is far weaker than for that between physical health and inactivity for both men and women. Sensitivity analysis including comorbidities and mental health indicators reveal some attenuation in the magnitude of the relationship between self-rated physical health and inactivity (results not shown, available on request).

For both male and female respondents, better partner physical health is associated with lower odds of inactivity ( $OR = 0.75$ , Table 4, Model 6). Unlike the majority of associations between covariates, this association does not differ by gender. Partner mental health is much more strongly associated with inactivity for female ( $OR = 0.77$ , Table 4, Model 6) than for male respondents ( $OR = 0.99$ , Table 4, Model 6). As in the pooled models, associations between health characteristics and inactivity should be interpreted cautiously because of the possibility of reverse causality and measurement uncertainty due to proxy reports.

*Marital quality.* For both male and female respondents, those who report higher levels of marital happiness are less likely to be inactive, though the relationship is slightly stronger for male respondents ( $OR = 0.83$ , Table 4, Model 6) than for female respondents ( $OR = 0.86$ , Table 4, Model 6).

*Sociodemographic and background characteristics.* Among men, Black men have the highest odds of inactivity across models. Hispanic men also have elevated odds of sexual inactivity in Model 2, but once physical and mental health are controlled for in Model 3, Hispanic ethnicity is associated with slightly lower odds of inactivity compared with Whites. Men who report Other race have the lowest odds of inactivity across models. Among women, Whites typically have the highest odds of inactivity, followed by Blacks, Other race, and Hispanics. For men, there is an inverse relationship between educational category and

inactivity in Model 2. In Models 3–5, the relationship between educational category and inactivity follows an inverted U-shape. In Model 6, higher educational categories are associated with lower odds of inactivity. For women, higher educational categories are associated with lower odds of inactivity across all models. Among men, Catholic identity is associated with lower odds of sexual inactivity. Among women, the reverse is true.

## DISCUSSION

In this paper we estimate the prevalence and correlates of sexual inactivity among older married people. Using data from the first nationally representative survey of sexual activity among older Americans, we find that about 29% of married people ages 57 to 85 report being sexually inactive for 1 year or more. Though prior research on sexual frequency has hinted at the increase in sexual inactivity within relationships with age (Call et al., 1995; Karraker et al., 2011), sexual inactivity at older ages has not been widely studied. Our study indicates that the prevalence of sexual inactivity increases substantially with age, whereas infrequent sex (i.e., once a month or less) remains remarkably stable across age groups.

Considerable attention has been paid to the onset of sexual activity in the early stages of the life course, but little work before ours has examined the extent to which sexual inactivity in relationships at older ages is synonymous with sexual activity cessation. Our results suggest that the majority of sexually inactive respondents (two thirds) in our sample believe their sexual relationships with their spouses are finished. For many of these individuals, this transition marks the end of their partnered sexual lives. Others will engage in sexual activity with someone other than their current partner, such as in a new union following divorce or widowhood, or will have sex with their spouse again, for example, after a spouse recovers from an illness.

Multivariate analyses reveal that longer marital duration, older age of individuals and their spouses, and poor physical health are all independently associated with inactivity. The finding that longer marital duration is associated with sexual inactivity is contrasted with prior work on sexual frequency that focuses on the first few years of marriage (Call et al., 1995). This relationship is true in pooled models, as well as

for men and women separately. The independent association of respondent and partner age with inactivity suggests the importance of attitudes, beliefs, and cohort effects. Societal and individual mores not only approve but also expect that younger married people be sexually active, but societal and individual beliefs and expectations about sexual activity at older ages are more complex, as older individuals are sent mixed messages about the acceptability and expectation of sexuality in later years.

Our interpretation of chronological age is complicated by the fact that the analytic sample is comprised of individuals born over almost three decades, who likely differ in several ways that are salient for our study, including age at marriage, sexual history earlier in life, and attitudes about sex. Because our sample is so heterogeneous, it is likely that an additional year of age has a different relationship to sexual inactivity for a Baby Boomer than for a child of the Great Depression. Future research should examine these forces. In addition, the lack of a consistent patterned relationship between spouse age differences and inactivity may point to unobserved different spousal criteria across the age-difference distribution, which also may vary by gender.

Our findings of positive associations between physical health and continued sexual activity later in life in pooled models, as well as separately for men and women, contrast with the usually negative health connotations of sexual activity earlier in the sexual life course (e.g., sexually transmitted infections). Our findings of independent roles of marital duration and age, as well as prior research, suggest that reliance on purely biological explanations for declining sexual frequency and inactivity is ill advised. For example, a recent study estimated that 30% of men prescribed sildenafil (Viagra<sup>®</sup>) discontinued use (defined as not refilling prescription within 6 months) even though the drug was effective at treating erectile dysfunction (Klotz, Mathers, Klotz, & Somer, 2005). Men in the study cited a lack of opportunity for sex, as well as lack of interest (either theirs or their partner's) as reasons for discontinuation. We return to cautions regarding the association between health and inactivity when discussing the study's limitations.

Marital happiness, premarital cohabitation, and remarriage, all of which are associated with higher sexual frequency (Call et al., 1995) are

also positively associated with continued sexual activity. In contrast to the strong relationship between sexual frequency and marital happiness among marriages in midlife (Call et al., 1995), the relationship between marital happiness and inactivity is relatively weak in later life, and mean marital happiness varies little between sexually active and inactive marriages. This may reflect the differential importance of sexual activity for different individuals and modified expectations of those in sexually inactive marriages, as well as the unidimensional nature of the question asked. We focus on the role of premarital cohabitation before marriage, but recent research suggests that among older people, cohabitation may become a substitute for marriage rather than a precursor. Cohabitation is an attractive alternative to marriage for older individuals who wish to take advantage of the economies of scale and companionship of living with a romantic partner while maintaining economic autonomy and avoiding the liabilities of long-term care costs and forgone pensions from former spouses (Brown & Kawamura, 2010). Like those who cohabited before marriage, those in remarriages likely differ on unobserved characteristics (such as motivation for sexual activity) from those in first marriages, which likely explains the negative association between remarriage and inactivity even after controlling for marital duration.

We also identify important gender differences. Prior research has identified that women's lower likelihood of being partnered at older ages is linked to their lower incidence of sexual activity and frequency (Lindau et al., 2007; Karraker et al., 2011), but our research indicates that older women are less likely to be sexually active even within marriage. This finding is echoed in recent work examining sexual frequency decline at older ages, which finds that marital status is less strongly linked to sexual frequency for women than for men (Karraker et al.). More generally, these findings suggest differential costs and benefits of marriage for men and women in marriage are not limited to health, strictly speaking, but also extend to sexuality (Kiecolt-Glaser & Newton, 2001).

As discussed already, health is intertwined with sexual activity, and the strength of this relationship varies by gender. Our analyses by gender indicate that the relationship between male respondent's physical health and inactivity is stronger than that between female

respondent's physical health and inactivity. This finding echoes prior research on reasons for sexual inactivity among partnered men and women who have not had sex for 3 months, with both men and women reporting the male partner's physical health as the most common reason (Lindau et al., 2007). We also note gender differences in strength of the association between other key covariates and inactivity. For example, marital duration is more strongly associated with inactivity for male respondents across all models. And respondent age is of similar magnitude (though the difference between male and female respondents is statistically significant) until the full set of partner characteristics is included, in which male respondent age is much more strongly associated with inactivity than female respondent age. These gender differences likely reflect both differences in the relative importance of male and female characteristics for sexual activity as well as heterogeneity among older married people by sex, as the number of married people declines with age due to higher male mortality.

Though not the primary focus of our analysis, we also find relationships between background variables and inactivity. When examined separately by gender, we generally find minority status associated with lower odds of inactivity, with the exception of Black men. Generally speaking, higher educational categories are associated with lower odds of inactivity for men and women. The relationship between Catholic identity and inactivity is more complicated. In the pooled model, the relationship between Catholic identity and inactivity is positive until the full model, when it becomes negatively associated with inactivity. Among men, Catholic identity is associated with lower odds of sexual inactivity, whereas the reverse is true among women. These findings suggest that future research should more closely examine how religious affiliation and practice shape sexual activity at older ages. Alternatively, reporting disparities by gender may play also play a role.

Throughout this paper, we have emphasized research on the potential benefits of continued partnered sexual activity. In specific relationships, the experience of mutual benefits depends upon a desire for continued sexual activity by both partners. In addition, the extent to which sexual activity is associated with general measures of well-being is also contingent on factors such as the importance of sex for individuals.

In addition, nonsexual physical intimacy (such as hugging) may fill the emotional needs for closeness of some or may enhance the benefits of sexual activity for others (Ganong & Larson, 2011). On a broader level, we also acknowledge that as nonmonogamous, dating, and cohabiting relationships become more common at older ages, greater attention should be paid to prevention of sexually transmitted infection.

Like any research, our work has limitations. First, sexual activity is a sensitive subject for many. That our analytic sample contains more than 80% of married individuals in the survey is impressive. Still, this affects confidence in our estimates of the prevalence of sexual activity. Prior research examining nonresponse to sexual experience questions in the General Social Survey has identified older individuals, as well as those with less sexual experience, as more likely to be nonresponders (Weiderman, 1993). In our examination of age patterns of nonresponse (“don’t know” and “refused”) for those missing date of last sex in NSHAP, we found nonresponse followed an inverted U-shaped curve, with individuals ages 65–74 comprising the largest share of both “don’t knows” and refusals. Nevertheless, it is probable that those who are missing information on date of last sex are more similar to sexually inactive than to active respondents. Thus, our estimates of sexual inactivity prevalence are likely conservative. Still, our estimates are of particular interest for scholars interested in sexuality at older ages, because sexual dysfunction estimates are usually based on samples of individuals who are currently sexually active. Our findings suggest that sexual dysfunction estimates are also likely underestimates, because those for whom dysfunction has prohibited sexual activity for longer periods of time are often not asked questions about sexual inactivity.

The cross-sectional nature of the data necessitates several caveats in considering the association between covariates and inactivity, particularly between health and inactivity. For sexually inactive respondents, the date of last sex often precedes observations of a decline in health by a nontrivial span of time. Though prior research finds relatively slow decline in self-rated health at older ages, it is plausible that health at the time of the survey is much worse than health at the time of sexual activity cessation, leading to overestimates of

the relationship between health and inactivity. For those who have been inactive for long periods of time, we cannot determine whether covariates caused inactivity, reflect its absence, or both. Another complication in establishing causal order is conceptual. Even if detailed longitudinal data were available, the presence of reciprocal causation and feedback loops creates difficulties in untangling the relative importance of sexual activity for health and health for sexual activity. It is possible that several mechanisms may simultaneously generate the association between health and sexual inactivity, flowing in both directions.

The connection between marital stability, physical and mental health, and sexual activity raises several concerns about selection issues into and out of the married sample we examine. Prior research has found that sexual activity is related to marital stability. Some individuals may have divorced prior to interview in the survey because of unhappiness with the level of marital sexual inactivity, which may be compromised, for example, by the illness of one partner. Similarly, individuals with physically ill partners may become widowed before the survey interview. Selection out of marriage due to poor health (leading to widowhood) or marital unhappiness (leading to divorce) will result in downwardly biased (i.e., towards odds ratios of 1.00) and thus more conservative estimates for these measures. Future longitudinal data can better estimate the extent of selection.

Finally, some measures used in analyses were not ideal. In particular, we are limited by the use of proxy reports of spouse health given by respondents, which are the only measures of partner health available. Some correlation between spouses’ health should be expected because of spousal health homogeneity (due to factors including shared environment and homophily), but measures of spouses’ health may be correlated because respondent and partner’s health are both reported by the respondent. If the correlation between spouses’ health is overstated, we would expect this to result in odds ratios closer to 1.00. In addition, we acknowledge that self-reported physical and mental health do not completely capture the ways health may impact sexual activity; future research should examine specific morbidities in greater detail.

Despite its limitations, our study provides foundational information on sexual inactivity

among older married people. We find that a substantial proportion of older married couples have been sexually inactive for 1 year or more, and two thirds of them do not expect to engage in sexual activity with their partner again. Marital duration, chronological age, health, remarriage, premarital cohabitation, and marital happiness are independently associated with odds of inactivity. As longitudinal data (including from the National Social Life, Health, and Aging Project) become available, future research will be able to better identify the extent to which these associations reflect selection, causation, or both.

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