

**WOMEN, MARRIAGE, AND VIRGINITY:
COHORT TRENDS IN WHO DID AND DID NOT DELAY SEX UNTIL MARRIAGE**

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September 2012

Research funding from NICHD (R01 HD 29550) is gratefully acknowledged. Direct all correspondence to Lawrence L. Wu, Department of Sociology, Puck Building, 295 Lafayette Street, 4th floor, New York University, New York, NY 10012-9605, lawrence.wu@nyu.edu.

ABSTRACT

We use data from Cycles 3-7 of the National Survey of Family Growth to analyze cohort trends in who did and did not delay sexual activity until first marriage. Prior research has documented that the vast majority of women are now sexually active prior to marriage. This represents a marked shift from the behaviors of older cohorts of women, many of whom delayed sex until first marriage, yet we know surprisingly little about trends in delaying sex until marriage. We address the following: (1) For successive birth cohorts of women, what proportion report delaying sex until marriage? (2) Were trends gradual or abrupt? (3) Among those who married but who did not delay sex until marriage, what were trends in the duration between sexual onset and first marriage? (4) What were trends in the social and demographic composition of those who did and did not delay sex until marriage?

In this paper, we use data from Cycles 3–7 of the National Survey of Family Growth to analyze cohort trends in who did and did not delay sexual activity until first marriage. Findings from prior research on trends in premarital sexual activity have documented that in recent decades the vast majority of men and women are sexually active prior to marriage. This represents a marked shift from the sexual behavior of older cohorts of women, many of whom delayed sex until first marriage. Yet we know surprisingly little about trends in delaying sex until marriage.

In this paper, we propose to analyze cohort trends in who did and did not delay sexual activity until first marriage. Our analyses will use data from Cycles 3–7 of the National Surveys of Family Growth (NSFG), which provide data on women’s retrospective reports of their ages (to the nearest month) at first sexual intercourse and first marriage

Findings from prior research on trends in premarital sexual activity have documented that in recent decades the vast majority of men and women are sexually active prior to marriage (see, e.g., Hofferth, Kahn, and Baldwin 1987; Laumann et al. 1994; Joyner and Lauman 2001; Abma et al. 2004; Finer 2007; Regnerus and Uecker 2011). Other literatures have investigated factors associated with the onset of premarital sexual activity (Jessor and Jessor 1975; Inazu and Fox 1980; Newcomer and Udry 1984; Marsiglio and Mott 1986; Furstenberg, Moore, and Peterson 1985; Miller et al. 1986; Thornton and Camburn 1987; Haurin and Mott 1990; Billy, Brewster, and Grady 1994; Brewster 1994ab; Small and Luster 1994; Capaldi, Crosby, and Stoolmiller 1996; Oettinger 1999; Wu and Thomson 2001; Browning and Burrington 2006; Browning et al. 2008; Hotz 2008; Upchurch et al. 2008; Burdette 2009; Fomby, Mollborn, and Sennott 2010), the association between onset timing and subsequent outcomes (Hofferth and Hayes 1987; Bachrach 1998; Donnelly et al. 2001 Michael and Joyner 2001; O’Donnell, O’Donnell, and Stueve 2001; Meier 2007; Sabia and Rees 2008; Wu and Martin 2009; Wu and Martin 2012), and ongoing debates over policies intended to influence adolescent sexual behavior (Nathanson 1991; Kirby 1997; Sonfield and Gold 2001; Levine 2002; Lindberg et al. 2006; Luker 2006; Furstenberg 2007; Trenholm et al. 2007; Kim and Rector 2008; Murray 2012).

The fact that the vast majority young adult women are now sexually active prior to marriage represents a marked shift from the sexual behavior of older cohorts of women, many of whom delayed sex until first marriage. Yet we know surprisingly little about trends in delaying sex until marriage (for an exception, see Laumann et al. 1994), let alone the timing of when this shift occurred, compositional change among those who did and did not delay sex until marriage, and the correlates of these behaviors.

Our proposed PAA paper is intended as a first step toward filling this gap in our knowledge. We will address the following:

- For successive birth cohorts of women, what proportion report delaying sexual activity until marriage?
- Were cohort trends gradual, with smooth changes observed for successive birth cohorts, or abrupt, for example, corresponding to the “sexual revolution” that is thought to have occurred during the 1960s?
- Among those who married but who did not delay sex until marriage, what were trends in the duration between onset and first marriage? And more generally, were cohort trends in the proportions who did and did not delay sex until marriage affected by exposure to risk as generated by trends in first marriage and trends in premarital sexual activity?
- Because relatively few women now delay sex until marriage, it is likely that the selectivity of this group has increased across successive cohorts of women. If so, was this increasing selectivity mirrored in changes in the sociodemographic composition of those who delay sex until marriage? When did such compositional shifts occur and what was the nature and magnitude of compositional change?

DATA AND METHODS

We propose analyses pooling data from Cycles 3–7 of the NSFG, which were conducted in 1982, 1988, 1995, 2002, and the 2006–2010. When pooled, these data cover birth cohorts of women born between 1938 and 1995—that is, nearly six decades of cohort experience, corresponding to the historical period from roughly the mid-1950s to 2010, during which most women in these birth cohorts entered a first marriage or became sexually active while never-married. The NSFG also provide nationally representative samples of women and high quality data on women’s ages (to the nearest month and year) of first sexual intercourse and first marriage.

To examine cohort trends in who and who did not delay sex until first marriage, we will employ a continuous-time competing risk framework to model two transitions: (1) the onset of sexual activity prior to a first marriage, and (2) the transition to a first marriage prior to the onset of sexual activity. See Figure 1. We will convert estimated model parameters into more easily understood state probabilities at particular ages; see England, Wu, and Shafer (2012) for details.¹

¹The interpretation of Kaplan-Meier or estimated survivor probabilities as implied by semiparametric or parametric hazard regression models is considerably less straightforward in a competing risk framework (Cox and Oakes 1984; Wu 2003). For example, it is standard (and correct) practice to censor individuals at first marriage when analyzing the transition to premarital sexual activity (see, e.g., Finer 2007). However, it is less often acknowledged that the interpretation of quantities such as life table and Kaplan-Meier estimates when censoring at first marriage involves a counterfactual—that is, what are the proportions who have not yet initiated sexual activity by a given age under a counterfactual in which women remain exposed to risk during these ages. These considerations are especially important because of known trends in age at first marriage.

[Figure 1 about here]

England, Wu, and Shafer (2012) find a smooth upward trend in premarital conceptions taken to term and that resulted in a first birth for white and black women born between 1925-29 and 1945-49. These results are thus suggestive of a gradual increase in premarital sexual activity across successive birth cohorts of U.S. women. Longstanding comparisons of women's self-reports for age at first marriage and first birth with "gold" standards such as birth and marriage registration data have established the extremely high quality of such data. By contrast, there exists no comparable "gold" standard for data on age at first intercourse and it is plausible that the stigma attached to premarital sexual activity may affect the data quality of self-reported data. In an earlier study, we undertook a thorough examination of women's self-reports of age at first sexual intercourse and concluded that data quality for age at onset is reasonably good (Wu, Martin, and Long 2001). Nevertheless, our assessments of data quality were for women born in the mid-1950's and later, leaving open the question of data quality for older birth cohorts of women for whom the stigma of premarital sexual activity was likely greater.

As an admittedly very rough check on data, we will follow a procedure used by England, Wu, and Shafer (2012) that subtracts 9 months from dates of first births to operationalize women's age at a conception that is taken to term and that yields a first birth. We will then compare self-reports of age at onset with age at conception to identify apparently anomalous ages at onset and to determine if anomalies are more frequent in older birth cohorts.

REFERENCES

- Abma, J.C., G.M. Martinez, W.D. Mosher, B.S. Dawson. 2004. "Teenagers in the United States: Sexual Activity, Contraceptive Use, and Childbearing, 2002." *Vital Health Statistics* 23(24). Hyattsville, MD: National Center for Health Statistics.
- Bachrach, Christine A. 1998. "The Changing Circumstances of Marriage and Fertility in the United States." Pp. 9–32 in Robert Moffitt (Ed.), *Welfare, the Family and Reproductive Behavior*. Washington, DC: National Academy Press.
- Billy, John O. G., Karin L. Brewster, and William R. Grady. 1994. "Contextual Effects on the Sexual Behavior of Adolescent Women." *Journal of Marriage and the Family* 56(2): 387–404.
- Brauner-Otto, Sarah, and William G. Axinn. 2010. "Parental Family Experiences, the Timing of First Sex, and Contraception." *Social Science Research* 39(6): 875–93.
- Brewster, Karin L. 1994a. "Neighborhood Context and the Transition to Sexual Activity Among Young Black Women." *Demography* 31(4): 603–14.
- Brewster, Karin L. 1994b. "Race Differences in Sexual Activity Among Adolescent Women: The Role of Neighborhood Characteristics." *American Sociological Review* 59(3): 408–24.
- Browning, Christopher R. and Lori A. Burrington. 2006. "Racial Differences in Sexual and Fertility Attitudes in an Urban Setting." *Journal of Marriage and the Family* 68(1): 236–51.
- Browning, Christopher R., Lori A. Burrington, Tama Leventhal, and Jeanne Brooks-Gunn. 2008. "Neighborhood Structural Disadvantage, Collective Efficacy, and Adolescent Sexual Risk Behavior." *Journal of Health and Social Behavior* 49(3): 269–85.
- Burdette, Amy M., and Terrence D. Hill. 2009. "Religious Involvement and Transitions into Adolescent Sexual Activities." *Sociology of Religion* 70(1): 28–48.
- Capaldi, Deborah M., Lynn Crosby, and Mike Stoolmiller. 1996. "Predicting the Timing of First Sexual Intercourse for At-Risk Adolescent Males." *Child Development* 67(2): 344–59.
- Cox, D. R., and D. Oakes. 1984. *Analysis of Survival Data*. London: Chapman and Hall.
- Donnelly, Denise, Elisabeth Burgess, Sally Anderson, Regina Davis, and Joy Dillard. 2001. "Involuntary Celibacy: A Life Course Analysis." *Journal of Sex Research* 38(2): 159–69.
- England, Paula, Lawrence L. Wu, and Emily Fitzgibbons Shafer. 2012. "Cohort Trends in Premarital First Births: Premarital Conceptions vs. the Retreat from Marriage?" Unpublished manuscript, Department of Sociology, New York University.
- Finer, Lawrence B. 2007. "Trends in Premarital Sex in the United States, 1954–2003." *Public Health Reports* 122: 73–8.
- Fomby, Paula, Stephanie Mollborn, and Christie A. Sennott. 2010. "Race/Ethnic Differences in Effects of Family Instability on Adolescents' Risk Behavior." *Journal of Marriage and the Family* 72(2): 234–53.
- Furstenberg, Frank F. Jr. 1976. *Unplanned Parenthood: The Social Consequences of Teenage Childbearing*. New York: Free Press.
- Furstenberg, Frank F. 2007. *Destinies of the Disadvantaged: The Politics of Teenage Childbearing*. New York: Russell Sage Foundation. .
- Furstenberg, Frank F., Kristin A. Moore, and James L. Peterson. 1985. "Sex Education and Sexual Experience among Adolescents." *American Journal of Public Health* 75(11): 1331–32.

- Haurin, R. Jean, and Frank L. Mott. 1990. "Adolescent Sexual Activity in the Family Context: The Impact of Older Siblings." *Demography* 27(4): 537–58.
- Hofferth, Sandra L., Joan R. Kahn and Wendy Baldwin. 1987. "Premarital Sexual Activity Among U.S. Teenage Women Over the Past Three Decades." *Family Planning Perspectives* 19(2): 46–53.
- Hofferth, Sandra L., and Cheryl D. Hayes (Eds.). 1987. *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing*. Washington, DC: National Academy Press.
- Hotz, V. Joseph. 2008. "The Economic Approach to Modeling Adolescent Sexual Behavior: Empirical Implications." Pp. 213–19 in Ann C. Crouter and Alan Booth (Eds.), *Romance and Sex in Adolescence and Emerging Adulthood: Risks and Opportunities*. Mahway, NJ: Lawrence Erlbaum.
- Inazu, Judith K. and Greer Litton Fox. 1980. "Maternal Influence on the Sexual Behavior of Teenage Daughters." *Journal of Family Issues* 1(1): 81–102.
- Jessor, Shirley, and Richard Jessor. 1975. "Transition from Virginity to Nonvirginity among Youth: A Social-psychological Study over Time." *Developmental Psychology* 11: 473–84.
- Joyner, Kara, and Edward O. Laumann . 2001. "Teenage Sex and the Sexual Revolution." Pp. 41–71 in Edward O. Laumann and Robert T. Michael (Eds.) *Sex, Love, Health in America: Private Choices and Public Policies*. Chicago: University of Chicago Press.
- Kim, Christine C., and Robert Rector. 2008. "Abstinence Education: Assessing the Evidence." <http://www.heritage.org/Research/Welfare/bg2126.cfm>
- Kirby, Douglas. 1997. *No Easy Answers: Research Findings on Programs to Reduce Teen Pregnancy*. Washington, DC: National Campaign to Prevent Teen Pregnancy.
- Laumann, Edward O., John H. Gagnon, Robert T. Michael, and Stuart Michaels. 1994. *The Social Organization of Sexuality: Sexual Practices in the United States*. Chicago: University of Chicago Press.
- Levine, Judith A. 2002. *Harmful to Minors: The Perils of Protecting Children from Sex*. Minneapolis, MN: University of Minnesota.
- Lindberg, Laura Duberstein, John S. Santelli, and Susheela Singh. 2006. "Changes in Formal Sex Education: 1995-2002." *Perspectives on Sexual and Reproductive Health* 38(4): 182–189.
- Luker, Kristin. 2006. *When Sex Goes to School: Warring Views on Sex–And Sex Education–Since the Sixties*. New York: W.W. Norton.
- Marsiglio, William, and Frank L. Mott. 1986. "The Impact of Sex Education on Sexual Activity, Contraceptive Use and Premarital Pregnancy Among American Teenagers." *Family Planning Perspectives* 18(4): 151–154, 157–162.
- Meier, Ann M. 2007. "Adolescent First Sex and Subsequent Mental Health." *American Journal of Sociology* 112(6): 1811-47.
- Michael, Robert T., and Kara Joyner. 2001. "Choices Leading to Teenage Births." Pp. 72–104 in Edward O. Laumann and Robert T. Michael (Eds.) *Sex, Love, Health in America: Private Choices and Public Policies*. Chicago: University of Chicago Press.
- Miller, Brent C., J. Kelly McCoy, Terrance D. Olson, and Christopher M. Wallace. 1986. "Parental Discipline and Control Attempts in Relation to Adolescent Sexual Attitudes and Behavior." *Journal of Marriage and the Family* 48(3): 503–12.
- Murray, Charles. 2012. *Coming Apart: The State of White America, 1960–2010*. New York: Crown Forum.

- Nathanson, Constance A. 1991. *Dangerous Passage: The Social Control of Sexuality in Women's Adolescence*. Philadelphia, PA: Temple University.
- Newcomer, Susan F., and J. Richard Udry. 1984. "Mothers' Influence on the Sexual Behavior of Their Teenage Children." *Journal of Marriage and the Family* 46(2): 477–85.
- O'Donnell, Lydia, Carl R. O'Donnell, and Ann Stueve. 2001. "Early Sexual Initiation and Subsequent Sex-Related Risks among Urban Minority Youth: The Reach for Health Study." *Family Planning Perspectives* 33(6): 268–275.
- Oettinger, Gerald S. 1999. "The Effects of Sex Education on Teen Sexual Activity and Teen Pregnancy." *Journal of Political Economy* 107(3): 606–44.
- Regnerus, Mark, and Jeremy Uecker. 2011. *Premarital Sex in America: How Young Americans Meet, Mate, and Think About Marrying*. New York: Oxford University Press.
- Sabia, Joseph J., and Daniel I. Rees. 2008. "The Effect of Adolescent Virginity Status on Psychological Well-being." *Journal of Health Economics* 27(5): 1368–81.
- Small, Stephen, and Tom Luster. 1994. "Adolescent Sexual Activity: An Ecological, Risk-Factor Approach." *Journal of Marriage and the Family* 56(1): 181–192.
- Sonfield, Adam, and Rachel Benson Gold. 2001. "States' Implementation of the Section 510 Abstinence Education Program, FY 1999." *Family Planning Perspectives* 33(4): 166–171.
- Thornton, Arland, and Donald Camburn. 1987. "The Influence of the Family on Premarital Sexual Attitudes and Behavior." *Demography* 24(3): 323–40.
- Trenholm, Christopher, Barbara Devaney, Ken Fortson, Lisa Quay, Justin Wheeler, and Melissa Clark. 2007. "Impacts of Four Title V, Section 510 Abstinence Education Programs." Mathematical Policy Research, Inc., Princeton, NJ.
- Upchurch, Dawn M., Lené Levy-Storms, Clea A. Sucoff and Carol S. Aneshensel. 1998. "Gender and Ethnic Differences in the Timing Of First Sexual Intercourse." *Family Planning Perspectives* 30(3): 121–7.
- Upchurch, Dawn M., and Yasamin Kusunoki. 2008. "Adolescent Sexual Relationships and Reproductive Health Outcomes: Theoretical and Methodological Challenges." Pp. 221–31 in Ann C. Crouter and Alan Booth (Eds.), *Romance and Sex in Adolescence and Emerging Adulthood: Risks and Opportunities*. Mahway, NJ: Lawrence Erlbaum.
- Wu, Lawrence L. 2003. "Event History Models for Life Course Analysis." Pp. 477–502 in Jeylan Mortimer and Michael Shanahan (Eds.), *Handbook of the Life Course*, New York: Plenum.
- Wu, Lawrence L., and Steven P. Martin. 2009. "Effects of Exposure on Prevalence and Cumulative Risk: Direct and Indirect Effects in a Recursive Hazard Model." *Sociological Methodology* 39: 185–232.
- Wu, Lawrence L., and Steven P. Martin. 2012. "Sexual Onset and Premarital First Births: Insights from a Sequential Hazard Model." Unpublished manuscript, Department of Sociology, New York University.
- Wu, Lawrence L., Steven P. Martin, and Daniel A. Long. 2001. "Comparing Data Quality of Fertility and First Sexual Intercourse Histories." *Journal of Human Resources* 36(3): 520–55.
- Wu, Lawrence L., and Elizabeth Thomson. 2001. "Racial Differences in Family Change and Early Sexual Initiation." *Journal of Marriage and the Family* 63(4): 682–96.

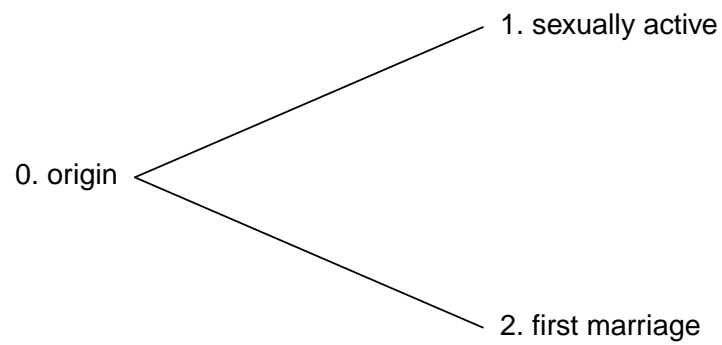


Figure 1: Conceptual model of the competing risks of the transition to sexual activity before entering a first marriage ($0 \rightarrow 1$) vs. the transition to a first marriage before engaging in sexual activity ($0 \rightarrow 2$).