

## **Cohabitation, Sexual Experience, and Male and Female Fertility**

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In this article, I explore the links between cohabitation, sexual experience, and men's and women's childbearing behavior. During the past few decades, the number of unmarried partner households has increased dramatically in the U.S. In the mid 1970s, only 7 percent of women reported cohabitation experience by the age of 25. In the later 1980s, there were already two-fifths of married individuals living in informal unions before they entered marriage. By 1995, around half of the U.S. women aged 25 to 29 had cohabitation experience (Bumpass and Sweet 1989; Bumpass and Lu 2000).

Cohabitation seems to be more acceptable today in the U.S. society. Indeed, by the mid 1990s, American high school senior students even considered cohabitation as a "good idea" (Raley 2001: 59).

Along with the increasing proportion of cohabitants in the U.S., there is also a marked shift in people's sexual experience. This shift is indicated by the occurrence of sexual activity during early adolescence and the practice of multiple sexual partners in one's lifetime. As a result, a high teenage pregnancy rate and a prevalence of multipartnered fertility are part of current trends in marriage and family in the U.S.

(Alan Guttmacher Institute 1994; Browning, Leventhal, and Brook-Gunn 2004; Carlson and Furstenberg 2006; Cooksey, Rindfuss, and Guikey 1996; Harknett and Knab 2007).

Recognizing these changes, researchers have attempted to understand the roles of cohabitation and sexual experience in the American family system. Most recent research on the topic of cohabitation has been geared toward an exploration of the factors influencing the outcome of cohabiting (Berrington 2001; Heuveline and Timberlake 2004; Manning 1993; Manning 2001; Phillips and Sweeney 2005; Qian, Lichter, and Mellott 2005; Steele, Kalis, and Joshi 2006; Wu 1996), the determinants of cohabiting women's childbearing (Wu 1996), and the influence of cohabitation on the timing of first birth and the pace of family formation (Manning 1993; Manning 1995). Regarding the studies of sexual experience, many have concentrated on examining the determinants of age at first sexual intercourse, race and gender differences in the odds of experiencing early sexual activity, and problems associated with early sexual intercourse. These problems are such as ineffective contraceptive use, exposure to transmitted sexual diseases and unwanted fertility (Alexander, Ensmiger, Kim, Smith, Johnson, and Dolan 1989; Browning, Leventhal, and Brook-Gunn 2004; Rosenthal, M.A., and de Visser 1999; Singh, Wulf, Samara, and Cuca 2000; Sonenstein, Pleck, and Ku 1989).

One limitation of the above studies is that they seldom pay attention to the contribution of cohabitation and sexual experience to overall fertility outcomes in American families. As an important dimension of the family system, childbearing and childrearing behavior must have a certain correlation with people's sexual experience and patterns of coresidence with their sexual partners. Thus, it is necessary to know how

fertility behavior is shaped in the situation of increased cohabiting couples and multipartnered relationships. The other weakness of previous literature is that even though some analyses have addressed the influence of cohabitation and early sexual activity on fertility, most are very female oriented. They have rarely compared the manners in which sexual experience and cohabitation determine men's and women's fertility. Thus, the objectives of this article are to determine the following: first, whether cohabitation has an effect on fertility outcomes, specifically, whether people who have ever cohabited and who have greater number of cohabitation partners are more likely to have more children. Second, whether sexual experience influences childbearing behavior. That is, whether people who start their sexual activity in younger ages and who experience a greater number of sexual partners tend to have more children. Last, whether the effects of cohabitation and sexual experience on men's and women's childbearing behavior differ.

### **Linking Cohabitation and Sexual Experience to Fertility**

Previous studies link cohabitation and fertility by comparing the fertility level of cohabitants to that of married couples and not-cohabiting singles. Some researchers contend that cohabitation may have a negative effect on fertility given the application of contraception and the low expectation of childbearing in cohabiting unions (Bachrach 1987; Manning 1995). Also, cohabitation is often associated with less traditional points of view towards marriage and childbearing (Axinn and Thornton 1992). So cohabitants are more likely to delay their entry into marriage and also postpone childbearing.

This argument is, however, attacked by other researchers who expect cohabitation to have a positive effect on fertility. These researchers argue that cohabitants are exposed to a marriage-like setting in which sexual frequency and risk of pregnancy are high. They are therefore more likely to have a greater number of children. Moreover, cohabitants may enter into marriage earlier than people who have never cohabited because women who are pregnant in cohabiting unions are more inclined to legitimate their first births than women who are not cohabiting (Manning 1993). Entering into marriage would further augment the level of their fertility given that marriage has a positive effect on childbearing, a finding shown repeatedly in the literature (Bongaarts 1982b; Sanchez 1998; Zeng, Vaupel, and Yashin 1985). The assumption of a positive relation between cohabitation and childbearing is indeed supported by empirical analyses. For instance, Bachrach (1987) finds that cohabiting women have a higher expected rate of fertility than non-cohabiting singles. Manning's (1993) research on pregnancies between 1970 and 1984 also demonstrates that pregnant cohabitants have higher rates of marriage than pregnant singles.

Evidence corroborating this positive effect of cohabitation on fertility also comes from the analyses of fertility among married couples and cohabitants. Researchers find that cohabitants' fertility was once lower than that of married couples; but it then began to catch up to that of marital fertility. As Rindfuss and VandenHeuvel (1990) find, in the late 1970s, by age 25, cohabitants' fertility was more similar to singles than married couples. Examining the 1982 wave of the NSFG, Bachrach (1987) also finds a lower fertility level among cohabiting couples than married couples. Similar findings are

reported in the literature examining marital fertility in European countries as well (Blanc 1984; Carlson 1986). Moving towards the late 1980s, however, the number of births to cohabitants is found to be nearer that of married couples. Raley (2001) examines the 1995 NSFG dataset and the 1987-1988 National Survey of Families and Households (NSFH) and indicates that there is an increasing similarity in cohabiting and married couples' childbearing, which is explained by the increasing proportions of women who bear children outside of marriage, especially in cohabiting unions (Bumpass and Sweet 1989; Cherlin 1992).

Taken together, prior literature and empirical evidence seem to suggest that cohabitation is a push factor for fertility. This is especially the case in recent decades when non-marital fertility is high and cohabitation has become an alternative to marriage with regard to childbearing. Thus, I propose the following hypothesis:

*Hypothesis 1:* Cohabitation has a positive effect on fertility outcomes, controlling for all the other factors.

Since cohabitation is predicted to have a positive effect on fertility, I further expect that people who expose themselves to cohabitating unions more often, i.e., having a greater number of cohabitation partners, are more likely to have more children. Thus, my next hypothesis is as follows:

*Hypothesis 2:* The number of cohabitation partners is positively related to fertility, holding all the other variables constant.

In terms of the fertility differentials among men and women in the relation of cohabitation and childbearing, prior literature has not provided direct evidence. Previous

studies have mainly focused on comparing the impact of children on men's and women's entry into marital and cohabiting unions and on the union's stability (Berrington 2001; Stewart, Manning, and Smock 2003). Researchers have found that nonresidential children influence men's union formation in a positive way, with the opposite for women. But the gender differences exhibited in the relationship of children and partnership stability is believed to be artificial, which is in fact caused by the incomplete reporting of births among men (Berrington 2001). Given that previous literature has not shown significant gender differences with respect to cohabitation and fertility, I propose the following hypotheses:

*Hypothesis 3:* The effect of cohabitation on fertility does not vary by gender, controlling for all the other factors. And,

*Hypothesis 4:* Male and female fertility differentials in the relationship of number of cohabitation partners and fertility are not significant.

As to the influence of sexual experience on fertility, researchers have suggested a positive relationship between early sexual initiation and childbearing. They have found that early sexual intercourse is often associated with a high risk of unintended pregnancy due to the lack of using contraception (Hayes 1987; Mosher and McNally 1991).

Women who begin sexual activity at younger ages also tend to have a high premarital childbearing rate and are more likely to marry young (Miller and Heaton 1991).

Furthermore, the heterosexual intimacy created by early sexual activity (Thornton 1990) may also hasten the timing of first birth and entry into marriage (Miller and Heaton 1991). Based on these findings, I set forth my next hypothesis as follows:

*Hypothesis 5:* Age at first sexual intercourse is negatively related to fertility, holding all the other factors constant. In other words, early sexual activity has a positive effect on fertility.

In this article, I am also interested in examining whether having multiple sexual partners in one's lifetime increases the number of children ever born. This has not been addressed in the previous literature. I admit that, to a certain extent, the number of sexual partners overlaps with the number of cohabitation partners. But on the other hand, cohabitation exposes people to a greater risk of having children due to its family-like setting and the longer duration of partner relationship. Thus, it is necessary to distinguish the effect of sexual partners and the effect of cohabitation partners on fertility. Following the similar arguments about the influence of cohabitation partners on fertility, having multiple sexual partners is expected to be a push factor for fertility with other things being equal. So my next hypothesis is as follows:

*Hypothesis 6:* The number of lifetime sexual partners is positively related to childbearing, controlling for other factors.

With regard to the gender differences in the patterns of age at first sexual intercourse and childbearing, I expect that early sexual activity to have a stronger positive effect on women's than on men's fertility. This is because although researchers report that men tend to have higher odds of having early sexual activity than females and are more likely to initiate first sexual intercourse before marriage (Alexander et al. 1989; Singh, Wulf, Samara, and Cuca 2000), women are more likely to be influenced by early sexual activity. It is found that age at first birth caused by early sexual activity is more

critical for women than for men, given more barriers could be set up to women's educational and occupational outcomes (Miller and Heaton 1991; Rosenfeld 1980). Lower educational and occupational achievements caused by having early sexual activity in turn lead to a stronger positive effect on women's than on men's fertility outcomes (Dribe and Stanfors 2006; Smith-Lovin and Tickamyer 1978). Based on this rationale, I set forth the following hypothesis for testing:

*Hypothesis 7:* Early sexual activity has a stronger positive effect on women's than on men's fertility, controlling for other factors.

My prediction on whether number of sexual partners has significantly different effects on men's and women's fertility falls in line with the arguments regarding cohabitation partnership and childbearing stated in hypothesis 4. Thus, I propose the following:

*Hypothesis 8:* The effect of number of sexual partners on fertility does not vary by gender, controlling for all the other factors.

### **Data, Methods and Variables**

To test the above hypotheses, I use the same data from the NSFG Cycle 6 as previous articles. Poisson and zero-truncated Poisson (ZTP) regression models are applied to conduct the analyses. Variables used are discussed below and are presented in Table 1.

The dependent variable is, again, CEB. In terms of the independent variables, cohabitation is measured by two basic measures: *ever cohabited* and *number of cohabitation partners*. *Ever cohabited* is a dummy variable based on the NSFG question

regarding whether the respondent ever cohabited. It is coded as 1 if the respondent ever cohabited and 0 otherwise. The majority of the respondents in the dataset reported having never cohabited (70.5 percent for men and 80.3 percent for women). This is probably because respondents in the NSFG dataset are relatively young-around half of the respondents are 29 years or younger. *Number of cohabitation partners* is a continuous variable, which ranges from 0 to 40 for male respondents and from 0 to 13 for female respondents. On average, male respondents reported a greater number of cohabitation partners than their female counterparts (0.6 versus 0.3). And there is more variation in number of cohabitation partners among men than among women. For this measure of cohabitation, I also recode the original variable into a set of dummy variables: 0, 1, 2, and 3 and over (see Table 1). Respondents with no cohabitation partners are classified as the reference category since they have the highest percentage distribution among all respondents. In the NSFG questionnaire, there is also a question asking the age at which the respondent began cohabiting with the first partner. But the response rates are low for both sexes, especially for woman (only 472 cases). I thus decided not to use this measure.

When male respondents who were 25 and younger are dropped from the dataset, the percentage of male respondents with cohabiting experience increases from 29.5% to 35.3%. Accordingly, the average number of cohabitation partners reported by men changes from 0.6 to 0.8. For women who are in the age group of 26 to 44, the percentage of respondents with cohabitation experience is amplified from 19.7% to 23.6% (not reported in Table 1). But the average number of cohabitation partners stated by females

stays almost the same, with a similar standard deviation. This indicates that in the U.S., with increasing age, people are more likely to be at the risk of cohabiting. However, the correlation between number of cohabitation partners and age tends to be stronger among men than among women.

Sexual experience is measured by two variables: *age at first sexual intercourse* and *number of lifetime sexual partners*. *Age at first sexual intercourse* ranges from 4 to 43 for men and 3 to 39 for women. The very few cases of respondents who claimed extraordinarily young ages of starting sexual activity are most likely the result of reporting deviation and have been eliminated from the analyses. On average, male and female respondents reported comparable average ages at first sexual intercourse (17.0 for men and 17.3 for women) with male respondents having a relatively higher standard deviation (0.08 and 0.06, respectively) than females. When male respondents who are 25 and younger are dropped from the analyses, the corresponding value becomes 17.4, with a standard deviation of 0.10. Such an average age is still higher than that (17.6, which is not shown in Table 1) of their female counterparts in a similar age group. Including younger men in the dataset is not likely to cause significant changes in the age pattern of sexual activity initiation. In the analyses, I also recode age at first sexual intercourse into a set of dummy variables: 18 and younger, 19 to 25, and 26 and over. The majority of the respondents are found to have begun sexual activity at ages 18 or younger (77.4% for men and 74.1% for women). The respondent pool without younger men shows relatively older ages of starting sexual activity. This finding echoes the trend of the U.S. population starting sexual activity in younger ages.



Cohabitation variables

If ever cohabited			4,927			2,744			7,643
Yes	29.5			35.3			19.7		
No	70.5			64.7			80.3		
Number of partners ever cohabited with	0.6	0.03	4,926	0.8	0.05	2,743	0.3	0.01	7,643
0	70.5			64.7		2,743	80.3		7,643
1	16.2			17.6			14.1		
2	7.2			9.2			4.0		
3 and over	6.1			8.5			1.6		

Sexual experience variables

Age at 1 <sup>st</sup> sexual intercourse	17.0	0.08	4,108	17.4	0.1	2,612	17.3	0.06	6,785
18 and younger	77.4			74.4			74.1		
19 to 25	19.5			21.3			23.4		
26 and over	3.2			4.4			2.5		
Number of lifetime sexual partners	4.2	0.06	4,927	5.0	0.06	2,744	5.0	0.11	7,620
0	13.2			3.0			13.6		
1	13.1			12.0			21.4		
2 to 3	15.0			14.2			20.5		
4 to 6	19.8			21.7			22.1		
7 and over	38.9			44.1			22.4		

**Control variables**

Demographic factors

Age (mean)	29.8	0.23	4,927	35.3	0.16	2,744	30.0	0.17	7,643
Race			4,927			2,744			7,643
Hispanic	16.7			16.2			14.8		
Non-Hispanic white	65.4			67.0			64.7		
Non-Hispanic black	11.9			10.9			14.0		
Non-Hispanic other	6.03			5.9			5.6		
Nativity-if foreign born			4,925			2,733			7,643
Native born	84.7			83.3			85.7		
Foreign born	15.3			16.7			14.3		
Number of times R has been married	0.62	0.02	4,927	0.90	0.02	2,744	0.72	0.02	7,643
Metropolitan residence			4,927						
Yes	81.4			80.8		2,744	82.3		7,643
No	18.6			19.2			17.7		

Socioeconomic factors

Education			4,927			2,744			7,643
No diploma	22.9			15.6			21.2		
High school or less	31.5			33.5			28.3		
Some college/college	26.1			25.7			30.4		
University and above	19.5			25.3			20.1		
If R ever worked full time for 6+ months			4,925			2,742			7,636
Yes	79.1			96.7			74.1		
No	20.9			3.3			25.9		
Combined family income	\$35,000		4,927	\$35,000		2,744	\$30,000		7,643
	-			-			-		
	\$39,999			\$39,999			\$34,999		

<u>Socialization factors</u>						
Mother's education	Some college	4,927	Some college	2,744	High school	7,643
Father's education	Some college	4,505	High school	2,504	Some college	6,896
Lived in intact family till 18		4,927		2,744		7,643
Yes	68.4		70.8		65.3	
No	31.6		29.2		34.7	
If raised up with a religious affiliation		4,910		2,734		7,620
Yes	81.3		83.7		85.9	
No	18.7		17.3		14.1	
<u>Proximate determinant</u>						
If R ever had sterilization operation		4,925		2,742		7,643
Yes	6.4		9.8		18.2	
No	93.6		90.2		81.8	

Sources: derived from NSFG Cycle6 male and female datasets, 2002.

Note: some sub-categories may not add up to 100% due to rounding. \* The CEB value for women who are 26 and over is 1.8 with a standard deviation of 0.04.

Four types of control variables are included in the analyses: demographic composition, socioeconomic status, socialization factors, and proximate determinants. Extensive research exists in the literature on the relationships between demographic and socioeconomic factors and fertility (Ballard 2004; Bloom and Trussell 1984; Ellison, Echevarria, and Smith 2005; Freedman, Wehelpton, and Campbell 1961; Lehrer 1996; Rindfuss, Morgan, and Swicegood 1988; Sander 1992). In this analysis, age, gender, race and ethnicity, nativity, metropolitan residence, and number of times the respondent has married are controlled as demographic factors. Education, total combined family income, and whether the respondent worked full time for more than six months are used as measures of socioeconomic status. The measure of these demographic and socioeconomic variables is the same as in the previous article.

Measures of socialization include mother's education, father's education, whether the respondent lived in an intact family till age 18, and whether the respondent was raised with a certain religious affiliation at age 14. These socialization variables are controlled because previous research shows that women from families with lower social economic status reflected by parent's relatively lower educational attainment and income are more likely to enter motherhood sooner than those from families with higher social economic status (Manning 1995). Experiencing parental separation is also found to be related to an increasing likelihood of cohabiting, which impacts family formation and childbearing (Althaus 1997; Berrington and Diamond 1999). Additionally, as a socialization factor, religion is also found to have a positive effect on fertility (Bloom and Trussell 1984; Jurecki-Tiller 2004; McLanahan and Bumpass 1988; Mosher, Johnson, and Horn 1986; Rindfuss, Morgan, and Swicegood 1988).

The proximate determinant measure is sterilization, which represents whether the respondent had a sterilization operation. Ideally, contraceptive use should also be included as a control variable. In the NSFG questionnaire, females are asked if they have ever used any birth control methods; but for males, there is no question directly asking such information. Men are asked their contraceptive use history associated with each of their female partners. But the responding rates of men for those questions are low. I thus decided not to include contraceptive use as a control variable. Age at menarche could be another control variable as a proximate determinant, indicating biological maturation for females (Miller and Heaton 1991). Since the equivalent measure for males is not

available in the NSFG dataset, this variable is also not included in the analyses.

Descriptive information for all variables discussed is presented in Table 1.

## Results

Since the variable *number of cohabitation partners* contains information also found in the variable *ever cohabited*, a collinearity problem may exist between these two variables. In the analyses, I treat these two variables as alternative measures of cohabitation and place them into separate regression models. Table 2 shows the Poisson regression results focusing on the effects of cohabitation variables on CEB. The first three panels show results analyzing all male and female respondents and the last three panels display the results excluding male respondents 25 and younger. *Age at first sexual intercourse* can be viewed as a control variable here. The variable *number of sexual partners* is dropped from the analyses given that sexual partners may to a certain extent overlap with cohabitation partners.

In models 1 and 4, I include the variable *ever cohabited* and other control variables to test hypothesis 1, which focuses on whether experiencing cohabitation has an effect on fertility. Clearly, the regression coefficients for the variable *ever cohabited* in both models are not significant, which undermines hypothesis 1. It means cohabitation experience does not tend to make a significant difference in people's overall fertility. I then replace the variable *ever cohabited* with the variable *number of cohabitation partners* as a continuous variable to test hypothesis 2 in models 2 and 4. Results do not support this hypothesis due to the non-significant regression coefficients. Variable *number of cohabitation partners* is then transformed into a group of dummy variables in

models 3 and 6 to further test hypothesis 2. Such a hypothesis is still challenged by the non-significant regression coefficients. It suggests that the number of cohabitation partners does not have a significantly positive effect on CEB.

**Table 2. Poisson Regression Coefficients for Cohabitation Experience and CEB: U.S., 2002**

Variables	All male and female respondents			Males 26 + and all females		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Cohabitation variables</i>						
If ever cohabited (ref. = yes)	0.02	-	-	-0.03	-	-
Number of partners ever cohabited with	-	0.02	-	-	0.01	-
None (ref. group)			-			-
1			-0.04			-0.07
2			-0.10			-0.16
3			0.12			0.06
<i>Sexual experience variables</i>						
Age at 1 <sup>st</sup> sexual intercourse	-0.03***	-0.02***	-0.03***	-0.03***	-0.02***	-0.02***
Number of lifetime sexual partners	-0.01***	-	-	-0.01***	-	-
<i>Demographic factors</i>						
Age	0.05***	0.05***	0.05***	0.04***	0.04***	0.04***
Gender (ref. = male)	-0.20***	-0.20***	-0.19***	-0.09***	-0.08*	-0.08***
Race (ref. group = Hispanic)						
Hispanic	0.31***	0.32***	0.32***	0.27***	0.29***	0.29***
Non-Hispanic black	0.24***	0.25***	0.25***	0.23***	0.24***	0.24***
Non-Hispanic other	0.27**	0.26**	0.26**	0.25***	0.25**	0.26**
If foreign born	0.01	0.02	0.02	0.00	0.00	0.00
Metropolitan residence (re. = yes)	-0.02	-0.03	-0.03	0.00	-0.01	-0.01
Number of times R has been married	0.26***	0.26***	0.25***	0.24***	0.24***	0.23***
<i>Socioeconomic factors</i>						
Highest degree R ever earned	-0.05***	-0.05***	-0.05***	-0.05***	-0.06***	-0.06***
Total combined family income	-0.01**	-0.01*	-0.01*	-0.01**	-0.01	-0.01**
If R ever worked full time for 6+ months	0.26***	0.24***	0.24***	0.14*	0.11	0.12
<i>Socialization factors</i>						
Mother's education	0.00	0.00	0.00	0.00	0.00	0.00
Father's education	-0.04*	-0.04*	-0.04*	-0.03	-0.03	-0.03
Lived in intact family till age 18	0.02	0.02	0.02	0.02	0.03	0.03
If raised up with a religious affiliation age 14 (ref. = yes)	0.22***	0.23***	0.23***	0.21***	0.23***	0.22***
<i>Proximate determinant</i>						
If R ever had sterilization operation	0.30***	0.29***	0.29***	0.33***	0.33***	0.32***
Constant	-1.01***	-1.17***	-1.13***	-0.54***	-0.70***	-0.65***
N	9,732	9,751	9,751	8,392	8,411	8,411



26 or older have significantly fewer numbers of children. On average, these respondents' expected CEB is 34% ( $\exp(-0.41)$ ) lower than that of respondents who started their sexual activity at age 18 or younger. Similar results can be found when analyzing all females and males 26 and older (see model 4). Indeed, significant fertility differentials between respondents who started sexual activity at ages 19 to 25, and those started it at 26 and older are also found in the analyses (results are not shown in Table 3). So the story shown here is that starting sexual intercourse at younger ages does have a positive effect on fertility, but significant fertility differences won't show up except for people who start their sexual intercourse at ages 26 or later being compared to their counterparts who initiate sexual activity earlier.

With respect to the effect of number of sexual partners on fertility, the CEBs of respondents who had one, two, or three sexual partners are significantly higher than that of the respondents who had seven or more sexual partners. To illustrate, the average expected level of CEB for respondents with only one sexual partner is 1.42 ( $\exp(0.35)$ ) times of the CEB for those who reported seven or more sexual partners (see model 2). Respondents who reported two to three sexual partners also have a CEB that is 1.12 times ( $\exp(0.11)$ ) as high as that for respondents who reported seven or more sexual partners. The results of CEBs based on other combinations show that the group of respondents with only one sexual partner in their lifetime distinguish themselves with a significantly greater number of children than any other groups. Results rooted in other combinations do not show significant fertility differences. These results suggest that number of sexual partner does affect fertility in a negative direction, but significant

fertility differentials do not exist with every one additional increase in number of sexual partners. Instead, having only one sexual partner in lifetime is the key that largely promotes childbearing behavior.

**Table 3. Poisson Regression Coefficients for Ever Cohabited, Sexual Experience and CEB: U.S., 2002**

Variables	All male and female respondents		Males 26 + and All Females	
	Model 1	Model 2	Model 3	Model 4
<i><u>Sexual experience variables</u></i>				
Age at 1 <sup>st</sup> sexual intercourse		-0.04***	-	-0.04***
18 and younger (ref. group)	-		-	
19 to 25	-0.05		-0.05	
26 and over	-0.36***		-0.39***	
Number of lifetime sexual partners	-0.01**		-0.01**	
0		0.01		0.08
1		0.35***		0.38***
2 to 3		0.11*		0.14**
4 to 6		0.04		0.06
7 and over (ref. group)		-		-
<i><u>Cohabitation variable</u></i>				
Number of partners ever cohabited with	0.03	0.04	0.01	0.00
<i><u>Demographic factors</u></i>				
Age	0.05***	0.05***	0.04***	0.04***
Gender (ref. = male)	-0.19***	-0.15***	-0.07***	-0.03
Race (ref. group = Hispanic)				
Hispanic	0.31***	0.30***	0.28***	0.26***
Non-Hispanic black	0.27***	0.26***	0.25***	0.25***
Non-Hispanic other	0.26**	0.24**	0.25**	0.22**
If foreign born	0.02	0.01	-0.02	-0.01
Metropolitan residence (re. = yes)	-0.03	-0.03	-0.01	-0.01
Number of times R has been married	0.26***	0.27***	0.24***	0.25***
<i><u>Socioeconomic factors</u></i>				
Highest degree R ever earned	-0.05***	-0.05***	-0.06***	-0.05***
Total combined family income	-0.01**	-0.01*	-0.01**	-0.01*
If R ever worked full time for 6+ months	0.26***	0.28***	0.13	0.16*
<i><u>Socialization factors</u></i>				
Mother's education	0.00	0.00	0.00	0.00
Father's education	-0.04*	-0.04*	-0.03	-0.02
Lived in intact family till age 18	0.01	0.03	0.01	0.02
If raised up with a religious affiliation age 14 (ref. = yes)	0.21***	0.21***	0.21***	0.21***
<i><u>Proximate determinant</u></i>				
If R ever had sterilization operation	0.31***	0.29***	0.34***	0.32***

Constant	-1.43***	-1.11***	-0.94***	-0.63***
N	9,732	9,732	8,392	8,392
Prob > F	0.0000	0.0000	0.0000	0.0000

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Sources: derived from NSFG Cycle 6 male and female datasets, 2002.

Note: R refers to respondent. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001 (two-tailed tests).

So far I have tested the effects of cohabitation and sexual experience on fertility. Now I move to analyses of whether these effects vary by gender. Table 4 presents Poisson regression results for interaction terms of the cohabitation variables and gender on CEB, which test hypotheses 3 and 4. Model 1 concentrates on showing the interaction effect between *ever cohabited* and gender. Models 2 and 3 examine whether *number of cohabitation partners* affects men's and women's fertility differently. Models 4 through 6 are the Poisson regression results without including younger male respondents. Apparently, significant fertility differences among men and women do not show up in either of the relationships. That is, *ever cohabited* and *number of cohabitation partners* do not impact men's and women's childbearing in a significantly different manner, which supports hypotheses 3 and 4. Surprisingly, when male respondents 25 and younger are cut off from the equation, variable *ever cohabited* shows a significantly stronger positive effect on female than on male fertility. It shows a positive effect on women's fertility but a negative effect on men's fertility. On average, women with cohabitation experience reported an average CEB that is 1.07 times of CEB for women who did not have such an experience. For men, however, having cohabitation experience decreases their average expected by 11 percent ( $\exp(0.07-0.19)$ ). In this sense,

hypothesis 3 is undermined by the results. I will discuss why this discrepancy occurs in the conclusion.

**Table 4. Poisson Regression Coefficients for Cohabitation Variables, Gender Interaction Terms and CEB: U.S., 2002**

Variables	All male and female respondents			Males 26 + and All Females		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Cohabitation variable</i>						
If ever cohabited	0.07	-	-	0.07*	-	-
Number of partners ever cohabited with	-	0.00	-	-	0.00	-
None (ref. group)			-			-
1			-0.01			-0.01
2			-0.05			-0.05
3 and over			0.16			0.17
<i>Sexual experience variables</i>						
Age at 1 <sup>st</sup> sexual intercourse	-0.03***	-0.02***	-0.03***	-0.03***	-0.02***	-0.02***
Number of lifetime sexual partners	-0.01***	-	-	-0.01***	-	-
<i>Gender interaction terms</i>						
Ever cohabited * male	-0.11	-	-	-0.19*	-	-
Number of cohabitation partners * male	-	-0.02	-	-	0.01	-
None * male (ref. group)			-			-
1 * male			-0.07			-0.13
2 * male			-0.09			-0.20
3 and over * male			-0.06			-0.17
<i>Demographic factors</i>						
Age	0.05***	0.05***	0.05***	0.04***	0.04***	0.04***
Gender (ref. = male)	-0.17***	-0.20***	-0.17	-0.04***	-0.09***	-0.04
Race (ref. group = Hispanic)						
Hispanic	0.30***	0.32***	0.32***	0.27***	0.29***	0.29***
Non-Hispanic black	0.24***	0.25***	0.25***	0.23***	0.24***	0.24***
Non-Hispanic other	0.26**	0.26**	0.26**	0.24**	0.25**	0.24**
Number of times R has been married	0.26***	0.26***	0.26***	0.24**	0.24***	0.23***
<i>Socioeconomic factors</i>						
Highest degree R ever earned	-0.05***	-0.05***	-0.05***	-0.05***	-0.06***	-0.06***
Total combined family income	-0.01**	-0.01**	-0.01*	-0.01**	-0.01	-0.01*
If R ever worked full time for 6+ months	0.26***	0.24***	0.24***	0.13	0.11	0.11
<i>Socialization factors</i>						
Father's education	-0.04*	-0.04*	-0.04*	-0.03	-0.03	-0.03
If raised up with a religious affiliation age 14 (ref. = yes)	0.22***	0.23***	0.23***	0.21***	0.23***	0.22***
<i>Proximate determinant</i>						
If R ever had sterilization operation	0.29***	0.30***	0.29***	0.32***	0.33***	0.32***
Constant	-1.01***	-1.15***	-1.14***	-0.54***	-0.70***	-0.66***

N	9,732	9,751	9,751	8,392	8,411	8,411
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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Sources: derived from NSFG Cycle 6 male and female datasets, 2002.

Note: R refers to respondent. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$  (two-tailed tests). The regression results for variables nativity, metropolitan residence, mother's education and lived in intact family are not presented here due to the non-significant regression coefficients.

The tests of hypotheses 7 and 8 are presented in Table 5. In models 1 and 4, the two sexual experience variables are both treated as continuous variables. These two variables are then considered as sets of dummy variables in the rest of the models. The effect of age at first sexual intercourse on fertility does not seem to vary depending on gender (see models 1, 2, 4 and 5), which fails to confirm hypothesis 7. However, significant male and female fertility differences do show in the relationship of *number of sexual partners* and CEB. For women, respondents who reported two to three sexual partners show a fertility level that is 1.22 ( $\exp(0.20)$ ) times that of women who reported seven or more sexual partners. For men, such a value changes to 1.5 ( $\exp(0.20 + 0.21)$ ) times that of respondents who reported seven or more sexual partners (see model 3). When younger men are removed from the equations, male and female fertility differences between groups of respondents who reported two to three sexual partners and who reported seven or more sexual partners become not significant. Significant male and female fertility differences show between respondents who reported with only sexual partner and respondents who reported seven or more sexual partners. That is, on average, female respondents with only one sexual partner has an expected CEB that is 1.40 ( $\exp(0.34)$ ) times that of females who reported seven or more sexual partners. For men, the effect of having only one sexual partner on fertility is even substantial, the

corresponding value changes to 1.68 ( $\exp(0.18+0.34)$ ) (see model 6). It is noticeable that significant male and female fertility differences also occur among respondents with zero sexual partners. And being a man also considerably drops the respondent's CEB. This phenomenon occurs because in the NSFG dataset, there is a higher percentage of women who reported having children but at the same time claimed they had no sexual partners. Taking all these findings together, the point highlighted by the results here is that having fewer number of sexual partners has a positive effect on fertility, and this effect is much stronger on male fertility than on female fertility. This finding undermines hypothesis 8. Generally, except for the discrepancy regarding hypothesis 3, analyses excluding younger men show consistent findings with the estimations of all male and female respondents.

**Table 5. Poisson Regression Coefficients for Sexual Experience, Gender Interaction Terms and CEB: U.S., 2002**

Variables	All male and female respondents			Males 26 + and all females		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Sexual experience variables</i>						
Age at 1 <sup>st</sup> sexual intercourse	-0.03***		-0.04***	-0.03***		-0.04***
18 and younger (ref. group)		-				
19 to 25		-0.09*			-0.09*	
26 and over		-0.41***			-0.39***	
Number of lifetime sexual partners	-0.01***	-0.01**			-0.01***	
0			0.10			0.13
1			0.38***			0.34***
2 to 3			0.20***			0.18***
4 to 6			0.12**			0.12**
7 and over (ref. group)			-			-
<i>Cohabitation variable</i>						
If ever cohabited	0.02	0.04	0.04		-0.01	0.00
<i>Gender interaction terms</i>						
Age at 1 <sup>st</sup> sexual intercourse * male	-0.00			-0.00		
18 and younger * male (ref. group)		-			-	
19 to 25 * male		0.10			0.09	
26 and over * male		0.10			-0.00	
Number of lifetime sexual partners * male	-0.02	-		-0.05***	-	
0 * male			-24.1***			-23.0***

1 * male				0.01		0.18*
2 to 3 * male				0.21*		-0.10
4 to 6 * male				-0.16		-0.14
7 and over (ref. group) * male				-		-
<i>Demographic factors</i>						
Age	0.05***	0.05***	0.05***	0.04***	0.04***	0.04***
Gender (ref. = male)	-0.16	-0.21***	-0.07	0.33	-0.09***	0.00
Race (ref. group = Hispanic)						
Hispanic	0.31***	0.31***	0.29***	0.27***	0.28***	0.26***
Non-Hispanic black	0.25***	0.27***	0.26***	0.23***	0.25***	0.24***
Non-Hispanic other	0.26**	0.26**	0.24**	0.24**	0.25**	0.22**
Number of times R has been married	0.26***	0.26***	0.27***	0.24**	0.24***	0.25***
<i>Socioeconomic factors</i>						
Highest degree R ever earned	-0.05***	-0.06***	-0.05***	-0.05***	-0.06***	-0.05***
Total combined family income	-0.01**	-0.01**	-0.01**	-0.01**	-0.01**	-0.01***
If R ever worked full time for 6+ months	0.26***	0.25***	0.28***	0.12	0.13	0.15*
<i>Socialization factors</i>						
Father's education	-0.04*	-0.04*	-0.04*	-0.03	-0.03	-0.03
If raised up with a religious affiliation age 14 (ref. = yes)	0.22***	0.21***	0.21***	0.21***	0.21***	0.20***
<i>Proximate determinant</i>						
If R ever had sterilization operation	0.29***	0.30***	0.29***	0.32***	0.33***	0.32***
Constant	-0.98***	-1.43***	-1.14***	-0.56***	-0.94***	-0.60***
N	9,732	9,751	9,732	8,392	8,392	8,392
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Sources: derived from NSFG Cycle 6 male and female datasets, 2002.

Note: R refers to respondent. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$  (two-tailed tests). The regression results for nativity, metropolitan residence, mother's education and lived in intact family are not presented here due to the non-significant regression coefficients.

Similar to the analyses in previous articles, I run negative binomial Poisson (NBP) and zero-truncated Poisson (ZTP) regression models considering nearly half of the respondents reported zero children. Results show the NBP regressions can be reduced to the Poisson regressions. The results of the ZTP regressions (see the Appendixes) are distinct from those of the Poisson regression models in the following aspects: First, number of cohabitation partners shows a significantly positive effect on

fertility in the ZTP regression models, which is not shown in the Poisson regression results. This finding supports hypothesis 2 and suggests that cohabitation does play a role in determining fertility through the increased number of cohabitation partners, rather than whether having a cohabitation experience. A second distinction is that the significant overall effect of gender on fertility shown in the Poisson regression models disappears in the ZTP regression models. This could be due to the fact that there is a higher percentage of men who reported zero children compared to women. That is, it is not necessarily caused by underreporting of birth by men but could be due to the age pattern of male fertility that starts in later ages. Third, significant male and female fertility differences in the link of *ever cohabited* and CEB shown in the Poisson regression models disappear in the ZTP models. Moreover, significant fertility differentials between men and women in the effect of *number of sexual partners* on fertility still exist, but such differentials only occur when respondents with one sexual partner to the ones that reported seven or more sexual partners. Additionally, effects of some control variable on fertility are weakened or even disappear in the ZTP models. For example, the coefficient for the employment variable becomes non-significant, and the magnitude of racial composition and marriage on fertility are reduced in the ZTP models. A possible explanation for this phenomenon is that demographic and socioeconomic characteristics are influential to people's childbearing decision-making. But once people enter parenthood, the influence of these factors is diminished. Compared to the Poisson regression results, the ZTP estimations of respondents with and without younger men are more similar than dissimilar to one another. In sum, except for

the effect of *number of cohabitation partners* on fertility, leaving out respondents with zero children does not extensively change the general findings based on the Poisson regressions.

### **Conclusion and Discussion**

Cohabitation, early sexual activity and multi-partnered fertility have become more popular and acceptable in the U.S. today. Previous research has paid considerable attention to the consequences of these behaviors on family formation and union stability. Little is known about the influence of these behaviors on childbearing and overall fertility outcomes. Whether such influence varies by gender has not been discussed in the literature. So the primary goal of this article was to elucidate these issues in the American family system.

My expectations, based on previous studies, were that the cohabitation experience should have a positive effect on fertility, and an increased number of cohabitation partners should be associated with a greater number of children born to respondents. Unexpectedly, having a cohabitation experience does not appear to be a factor that considerably improves people's childbearing behavior. But the empirical findings do provide support for the hypothesis that an increased number of cohabitation partners raises the level of fertility. These results suggest that fertility is augmented by cohabitation not through people entering cohabiting unions, but via the extent to which people are exposed to cohabiting settings.

I should point out that the effect of an increased number of cohabitation partners on fertility only exists among respondents with at least one child. So from this point of

view, such an effect on fertility must be associated with people's experience of entering parenthood. Bachrach (1987) finds that formally married cohabiting women have a relatively higher level of fertility than cohabiting women who never married because formally married women tend to practice contraception less uniformly and are more likely to seek pregnancy. My research indicates that it is probably not only the formal marital status but the formal childbearing behavior along with the number of times people expose themselves to cohabitation, that play a role in how cohabiting unions determine fertility.

Then why does a cohabitation experience itself have no significant influence on fertility? This is a key question, especially under the situation that the premarital childbearing rate in cohabiting union is rising and cohabitation is claimed to now be "an alternative to marriage" (Raley 2001: 66). My analyses show that the influence of cohabitation on fertility remains significant in regression models until *age at first sexual intercourse* and the *socioeconomic* variables are controlled in the analyses (regression models are not shown). As shown in this article, people who initiated sexual intercourse in early ages are more likely to bear a greater number of children. Theoretically speaking, these people are also likely to have a higher risk of entering into cohabiting unions. Thus, it is possible that a higher level of fertility in cohabiting unions is not due to the cohabitation experience itself, but due to an early timing of sexual intercourse. Similarly, people with lower socioeconomic status tend to have more children, which has been shown in many previous studies. Previous research also shows that people with lower socioeconomic status are more likely to cohabit than people with more economic

resources (Martin and Bumpass 1989; Raley 2000). Thus, there is the possibility that the role of cohabitation in shaping people's childbearing behavior is indeed mediated by their socioeconomic status. The positive effect of cohabitation on fertility demonstrated in previous studies may be spurious because these studies are largely based on descriptive analyses without controlling other important demographic and socioeconomic dimensions. Another possible explanation for the non-significant impact of cohabitation on fertility is that fertility among singles has been rising rapidly in recent years (Raley 2001), which diminishes the importance of cohabitation in childbearing.

Based on my findings, age at first sexual intercourse is negatively related to fertility. But such a negative effect is only significant for people who begin to have sexual activity at ages 26 and over. Another notable finding is that an increased number of sexual partners is strongly related to having fewer numbers of children, controlling for other factors. Most striking, people with only one sexual partner in their lifetime have a considerably higher level of fertility than those who had multiple sexual partners. This is probably because people with only one sexual partner in their lifetime are more likely to be conservative and follow a traditional way of family formation and childbearing. They are also more likely to be staying in a stable and secure relationship compared to those who had multiple sexual partners. As a result, these people end up having a greater number of children.

One of the most important findings in this article concerns male and female fertility differences in the linkages between cohabitation, sexual experience and childbearing. Having a cohabitation experience was first found to have a stronger impact

on female than on male fertility, when the analyses are based on male respondents 26 and older and all female respondents. After the analyses are restricted to people with children, fertility differences no longer vary by gender. This finding echoes the results in Poisson regression when analyzing all male and female respondents. Fertility differences by gender shown in the analyses that exclude males 25 and younger are perhaps due to the fact that there are a higher percentage of men without children compared to women in cohabiting unions in the NSFG dataset. Once respondents without children are removed from the analyses, such differences are no longer significant. The reason male and female fertility differentials did not show up in the analyses with all male and female respondents may be because including males 25 and younger increases the percentage of male respondents without a cohabitation experience. These men are not likely to significantly increase the reported number of children, but they may lead to a decrease of the percentage of men who are in cohabiting unions. Consequently, there are relatively equivalent percentages of men and women who reported having children in cohabiting unions. This eliminates the significant differences that lie in male and female fertility. So I conclude whether cohabitation experience has a stronger positive effect on female than on male fertility depends on the age structure and the percentage of childless people in the population.

Gender differences are also shown in the correlation between number of sexual partners and childbearing. Having only one sexual partner contributes to male fertility to a greater extent than to female fertility. Following this rationale, a monogamous family system might impel male fertility to a higher level than female fertility. Such a finding

provides another perspective to explain why male fertility used to be higher than female fertility a few decades ago when sexual activity was restricted to married couples and premarital sex rate was low.

Even though men are found to have a greater average number of cohabitation partners, the influence of *number of cohabitation partners* on male and female fertility does not differ significantly. The effect of *age at first sexual intercourse* on fertility does not vary by gender even when respondents without children are eliminated from the analyses. This is possibly due to the similar age patterns of men and women starting their first sexual activity.

Several policy implications emerge from this analysis. Since early sexual intercourse is found to have a positive effect on fertility, family planning policies in countries with high fertility rates may need to work on sex education programs that reduce early sexual activity and prevent unintended pregnancies among teenagers. The disapproving impact of multiple sexual partnerships on fertility on the other hand reminds policy makers in low fertility countries to advocate incentives of marrying early and to encourage home-based sexual activities. This orientation is especially crucial for men as a means to enhance their fertility. Additionally, cohabitation does not seem to show a significant effect in determining fertility although an increasing number of births now occurs in cohabiting unions. This implies that the meaning of bearing and rearing children in cohabiting unions and in families is probably still different. Societies that desire people to have more births may need to improve their welfare systems for the purpose of promoting family formation and union stability.

This article is a first step at understanding male and female fertility differentials in the linkages between cohabitation, sexual experience and childbearing. The limitations of this research are the following: First, number of times the respondent married is controlled in the analyses, considering that marriage has a crucial effect on fertility. But marriage duration has not been taken into consideration. This variable is important because it represents the risk of being exposed to conception and childbearing, which is a proximate determinant of fertility (Bongaarts 1982a). Moreover, previous research shows that the amount of time spent living together affects the timing of marital motherhood rather than having a cohabitation experience (Manning 1995). This article has not examined if cohabitation still influences fertility depending upon gender after controlling the duration of time coresiding. Future research should take cohabitation duration into consideration. The third limitation, as noted earlier, lies in the lack of other direct measures of the proximate determinants. Future work should take into account contraceptive use and biological maturation for both men and women.

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