The Changing Demography of Nonmarital Fertility in the United States

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In a press tour for her movie *The Switch* (2010), in which a professional single woman in her thirties has a baby using a sperm donor[1], actress Jennifer Aniston told reporters that women didn't need to "settle" for a man to have children. Talk show host Bill O'Reilly called these comments "destructive to society" because they encouraged a growing trend of single motherhood (*O'Reilly Factor* 2010). Both Aniston's remarks and O'Reilly's criticisms (and, presumably, the production of *The Switch* and similar movies such as *The Back-Up Plan* and *Baby Mama*) are based on the assumption that phenomenon of professional women in their thirties and forties choosing single motherhood has grown more common. Accounts in the popular press also suggest that childless older unmarried women are increasingly likely to view single motherhood as an acceptable and even attractive way to become a parent, and that this trend is partly responsible for the rise in nonmarital fertility and the changing composition of unmarried mothers (e.g., Egan 2006; Glanton and Miller Rubin 2006).

The research literature has had less to say about the possible increase in the prevalence of "choice moms," to use the terminology proposed by a recent movement to support women who choose single motherhood (Morrissette 2006). Descriptive reports clearly show that the proportion of births outside of marriage, the average age of unmarried (and married) mothers, and the average education level of mothers have all increased steadily, and that older and more educated women are more likely to report births as wanted (e.g., Chandra et al. 2005; Livingston and Cohn 2010; Ventura et al. 2001). However, the primarily bivariate statistics in most reports do not provide evidence for a joint increase in age, education, and wantedness among unmarried

[1] Or so it seems – as in Tina Fey's thematically similar *Baby Mama* (2008), insemination hijinks ensue.

mothers, and these trends are not necessarily overlapping. For instance, the greater proportion of planned births among older mothers is largely explained by the larger proportion of married women among these mothers (Hayford and Guzzo 2010). Similarly, the increase in education among all mothers may be driven by increasing education among married mothers. And the average age of unmarried mothers might be increasing as more women with unmarried first births at young ages progress to higher-parity nonmarital births at older ages; nonmarital higher-order births have increased over time (Wu, Bumpass, and Musick 2001) as women have become less likely to marry, but not less likely to have additional children, after a nonmarital first birth (Graefe and Lichter 2008)

This paper uses four cross-sectional waves of the National Survey of Family Growth (NSFG) to assess the changing demography of non-marital fertility in the United States over the past twenty years. We use Cycles 4-6 (1988, 1995, 2002) of the NSFG and the first release of the continuous NSFG (2006-08) to answer three questions about the changing demography of nonmarital fertility: Is the proportion of unmarried mothers who are age 30 and over increasing? Are unmarried mothers 30 and over becoming more advantaged? And are births to unmarried mothers age 30 and over increasingly likely to be wanted births? Nested regression models assess the contribution of compositional changes to trends for each of these three questions. In this extended abstract, we describe our data and methods and present preliminary results. The completed paper will refine analyses and expand discussion of the implications of the findings.

Data and methods

The National Survey of Family Growth (NSFG) is a series of repeated cross-sectional surveys designed to produce comparable information on fertility and family formation in the United

States over time. We use data from the surveys conducted in 1988 (N=8450), 1995 (N=10847), 2002 (N=7643 women), and 2006-08 (N=7356 women). These surveys are nationally representative of women aged 15-44 at the time of the survey. In 2002 and 2006-08, men were also interviewed; we limit our analyses to women in order to facilitate comparison across all four surveys and because our substantive interest is in single motherhood. In addition to sociodemographic data (e.g., race-ethnicity, age, education), each survey collects full birth histories as well as marriage histories and cohabitation histories. Respondents are asked about current fertility intentions, fertility intentions at the time of previous pregnancies, and past and current contraceptive use. These data are largely comparable over time; in our description of variables we discuss measures that vary across surveys and the implications of the variation for our analysis.

In order to estimate conditions in a finite time period and minimize recall bias, the sample for these analyses is restricted to births in the five years prior to the survey in each NSFG cycle. In most analyses the sample is further limited to nonmarital births, to births to women age 30 and over, or nonmarital births to women age 30 and over (see below). Multivariate analyses pool data from all four surveys and use dummy variables for survey year to assess change over time. All bivariate and multivariate statistics use SAS SURVEY procedures to account for the complex survey design of the NSFG[2]. The multivariate analyses of dichotomous outcomes use logistic regression.

We conduct three sets of analyses to answer our three research questions; sample sizes for these analyses are shown in Table 1. The first set assesses the contribution of compositional

[2] Survey design variables for the 1988 NSFG were never released. Thus, we treat the 1988 cycle as a simple random sample, and standard errors for this survey are likely to be underestimated.

changes to the increasing proportion of nonmarital births to women age 30 and over. These analyses use all nonmarital births in the five years prior to each survey as a sample and predict whether the mother is age 30 or over as a dependent variable. The second set of analyses examines whether unmarried mothers age 30 and over have become more advantaged, as measured by holding a bachelor's degree. For these models, the sample is nonmarital births to women age 30 and over at the time of the birth and the dependent variable is whether the mother has a college degree. The third set of analyses looks at the prevalence of "choice moms" among unmarried mothers age 30 and over by predicting whether a birth was wanted. The sample for these analyses is births to unmarried mothers age 30 and over. For each of the three sets of analyses, results are presented as a series of nested models. In each set of analyses, the first model includes only dummy variables for time period. These models show unconditional trends over time. Subsequent models add further control variables. Reduction in the coefficients for time dummy variables as controls are added would indicate that time trends are partially explained by compositional changes. Results from these analyses describe associations only and do not attempt to establish causality.

<Table 1 about here>

Measures

The samples for our analyses are constructed on the basis of age and marital status at the time of birth. We construct these measures for births within the five years prior to the survey using data from the birth history files and individual files from the four surveys. Age and marital status data are completely comparable with the exception of the marital history variables in the 2002 survey. Because of a routing error in the questionnaire in 2002, marriage end dates are missing for some

divorced and separated women. The completed paper will conduct sensitivity analyses to assess the impact of these missing data in 2002 on results; based on our previous research using these data, we expect the impact to be small. In addition to age and marital status, we also use measures of cohabitation, race-ethnicity, education, parity of the birth, and whether the birth was wanted. These variables were chosen because they are key stratifying factors in fertility in the United States.

Education Our measure of education is whether the respondent has a bachelor's degree or more. This information was collected differently in the four surveys. In 1988, the NSFG asked women how many years of education they had completed and the timing (in years) of their last school attendance. In 1995, a full education history was collected including attendance, degrees received, and timing. In 2002 and 2006-08, women reported the highest degree they had received and the date they received a high school degree. For consistency, in this extended abstract we measure education at time of survey in all four surveys. For the 1988 data, we use 16 years of completed education as the equivalent of a bachelor's degree. Education at the time of the survey may differ from education at the time of the birth if women return to school after having a child. The possibility for this type of error is reduced by the restriction of our sample to births in the five years before the survey. Additionally, the restriction in most models to births to women aged 30 and over means that most women have completed their education. In recent years, relatively few bachelor's degrees (16% of degrees) were awarded to individuals 30 and older (Bradburn et al. 2003). Furthermore, Goldrick-Rab and Sorenson (2010) showed that mothers have low rates of college attendance, and unmarried mothers have even lower rates of college completion. As such, it seems likely that few mothers would obtain a college degree within five years after the

birth, and for most mothers education at the time of survey is the same as education at the time of birth. The full paper will include sensitivity analyses to assess the impact on results of measuring education at the time of survey and of using years of education rather than degrees received to measure education in the 1988 survey.

Wantedness A birth is classified as wanted in the NSFG if the mother responds affirmatively to the question "At the time you became pregnant, did you yourself actually want to have a(nother) baby at some time?" (1988, 1995) or "Right before you become pregnant, did you yourself want to have a(nother) baby at any time in the future?" (2002, 2006-08). Although question wording changed slightly in 2002, the measure of wantedness appears to be consistent across the two questions (Abma and Mosher personal communication 10/7/2008). Several recent studies have recommended combining the measure of wantedness with a measure of pregnancy timing for unwanted births (Abma, Mosher, and Jones 2008; Chandra et al. 2005; Lindberg, Finer, and Stokes-Prindle 2008; Pulley, Klerman, Tang, and Baker 2002). Under this system, births that were wanted but occurred more than two years before the woman preferred are classified with unwanted births, and wanted births and births that were only slightly (two years or less) too early are grouped together. We are not able to use this measure because the 1988 NSFG did not include measures of how much earlier than ideal timing births occurred.

Cohabitation status Complete cohabitation histories were collected in 1995, 2002, and 2006-08. In 1988, questions about cohabitation were more limited; information was collected only about cohabiting relationships that were followed by marriage and about one additional cohabitation. Despite the difference in data collection methods, cohabitation data collected in 1988 appear to

be comparable to those from the later surveys in the period 5 years before each survey (Hayford and Morgan 2008).

Race-ethnicity Respondents in all four surveys reported their race (white, black, other) and Hispanic origin (Hispanic or non-Hispanic). We combine these variables to create four categories of race-ethnicity: non-Hispanic white, non-Hispanic black, non-Hispanic other, and Hispanic.

Parity Measures of parity are taken from the birth histories and are fully comparable in all four surveys. In these analyses parity is measured by a dichotomous variable indicating whether the birth was the respondent's first birth or not. The completed paper will explore other ways of measuring parity, for example distinguishing between high parity (third and higher order) births and all other births.

Preliminary results

Table 2 shows trends across the four surveys in the average age of unmarried mothers and the percent of nonmarital births that are to mothers age 30 and over. For comparison, the table also includes similar figures for marital births. There is a clear increase in the age of unmarried mothers across the four surveys. In the five years before the first survey, 1984-1988, the average mother was 23.0 years old; in the period before the final survey, 2002-2008[3], the average mother was 24.2 years old. Between wave differences are at most marginally statistically significant. The total change represents an increase in the average age of unmarried mothers of more than one year over a period less than twenty years long. During the time period described here, the

[3] The time period before the final NSFG survey covers more than five years because the survey was carried out continuously over 2006-08. For each woman surveyed, births in the five years prior to her interview were included in the sample.

proportion of nonmarital births taking place to mothers age 30 and over also increased, from 13.5% (1984-88) to 18.5% (2002-08). Between-survey increases are not statistically significant.

<Table 2 about here>

For mothers of marital births, the increase in average age between the 1988 and 2006-08 NSFG is greater than for mothers of nonmarital births, going from 27.1 years old in 1984-88 to 29.1 years old in 2002-08. The increases between the 1988 and 1995 and between the 1995 and 2002 surveys are statistically significant (t-tests, $p<.001$) for both the average age of married mothers and the percent of marital births to mothers age 30 and over. Because the increase in the average maternal age was greater for married mothers than for unmarried mothers, the age gap between married and unmarried mothers grew during the period described here.

The rising age of unmarried mothers and the increasing proportion of single mothers who are age 30 or over have been interpreted by some journalists as the result of increasing "choice" motherhood, that is, an increase in single women age 30 and over deciding to enter motherhood without marrying (e.g., Bazelon 2009; Clark-Flory 2010). However, these increases might also be the result of compositional changes in unmarried motherhood, for example the increasing likelihood that unmarried mothers will follow a first nonmarital birth with higher parity nonmarital births. To test the contribution of compositional changes to the increase in the proportion of unmarried mothers who are 30 or over, our first set of analyses predicts the likelihood that a nonmarital birth is to a mother age 30 or over as a function of time period and sociodemographic characteristics. Results from these models are shown in Table 3. The analytic sample for these analyses consists of nonmarital births in the five years before the survey, and the dependent variable is whether the mother was age 30 or over at the time of birth. These

analyses provide a multivariate description of the relationship between the increasing age of unmarried mothers and compositional changes in unmarried mothers.

<Table 3 about here>

Model 1 replicates the results from Table 2: the positive coefficients for the 1995, 2002, and 2006-08 surveys indicate that a higher proportion of unmarried mothers were age 30 and over in the later years. The difference between the 2006-08 survey (births in the years 2002-08) and the 1988 survey (1984-88) is statistically significant; other between-year differences are not statistically different from zero, but the magnitude of the coefficients suggest a reasonably steady increase in the proportion of nonmarital births that were to mothers age 30 and over. Models 2 through 5 control for compositional factors (cohabitation, race-ethnicity, education, parity) singly, and Model 6 includes all of the compositional factors. Models 2 through 5 each show a slight attenuation in the coefficients for survey year – that is, each compositional factor explains some portion of the change over time. In Model 6, where all factors are included, the differences between the 1988 survey and the 2002 and 2006-08 surveys are reduced to half the unconditional differences, and the increase between 1988 and 2006-08 is no longer statistically different from zero. That is, the increasing proportion of nonmarital births to mothers age 30 and over is primarily attributable to compositional changes.

The next set of models examines whether unmarried mothers age 30 and over have become more educated. The sample for these models is nonmarital births to mothers age 30 and over in the five years before each survey, and the dependent variable is whether the mother has a bachelor's degree. Results are shown in Table 4. As in Table 3, the first model is an

unconditional model, subsequent models add coefficients singly, and the final model includes all covariates. These analyses include measures of mother's age within the 30 and over group.

<Table 4 about here>

Table 4 shows that the proportion of unmarried mothers age 30 and over with a bachelor's degree increased between the 1988 NSFG and the 2006-08 NSFG. Coefficients for survey year are attenuated somewhat when other sociodemographic changes are included, but remain substantial in size in all models. The difference between 2006-08 and 1988 is not statistically significant in the full model (Model 6); sample sizes are relatively small in these models and reduce statistical power to detect differences. These results suggest that older unmarried mothers are becoming more educated, and that compositional changes explain some, but not all, of this increase in educational attainment.

The final analyses address the question of whether births to unmarried mothers age 30 and over are becoming more likely to be wanted (Table 5). These models test directly the proposition that "choice" motherhood – single women in their thirties and forties deliberately having children outside of marriage – is becoming more common. The sample for these analyses is nonmarital births to women age 30 and over in the five years before each survey; the dependent variable is whether the birth was wanted. As in the previous analyses, Model 1 shows the unconditional trend and subsequent models account for compositional changes in single mothers.

<Table 5 about here>

No clear linear trend in wantedness among births to older single mothers is apparent in these models. The unconditional model (Model 1) shows that births in the 1995 and 2002

surveys were more likely to be reported as wanted than in 1988, but births in the 2006-08 survey were slightly less likely to be wanted than in 1988. None of these differences are statistically significant at the $p<.05$ level. The coefficients measuring the time trends do not change substantially when additional independent variables are added to the model.

Discussion and conclusion

These analyses show that the proportion of nonmarital births that were to women age 30 and over increased between the mid-1980s and the early 21st century, but that this increase is small and primarily explained by compositional changes. These unmarried mothers who were age 30 and over were not more likely to have wanted their births; they were more likely to have received a college degree, but this increase was not statistically different from zero.

These results do not support the popular perception that the increase in births outside of marriage has been accompanied by an increase in births to older women who plan single motherhood and can support children alone. Why, then, is the idea of the "Murphy Brown" mother, the "choice" mother, or the "Jennifer Aniston" mother so persistent in the mainstream media? The small number of financially established women choosing to bear children outside of marriage may, like Murphy Brown, be important more for their social visibility than their overall proportion in the population. Studies of family change in diverse settings have suggested that personal exposure to new family formations has a strong influence on decision-making in contexts where norms are changing or in flux (e.g. Adgajanian 2005; Rindfuss, Choe, Bumpass, and Tsuya 2004). Well-educated, professionally accomplished "choice moms" may be more likely to appear in national media because they are more likely than young, low-income single mothers to be in the personal networks of the journalists who create news stories (Ludtke 1997).

The generally positive portrayal of these single mothers provides examples of successful single mothers and guidelines for the situations in which choosing single motherhood is appropriate.

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Table 1: Sample sizes

	Number of women	Births in 5 years before survey	Of births in 5 years before survey:	
			Nonmarital births	Nonmarital births to mothers age 30+
1988 NSFG	8450	3115	1033	132
1995 NSFG	10874	4575	1586	247
2002 NSFG	7643	2818	1186	181
2006-08 NSFG	7356	2734	1320	230
Total	34323	13242	5125	790

Table 2: Changing age patterns of fertility

	Nonmarital births			Marital births		
	Average age of mother		Percent to mothers age 30+	Average age of mother		Percent to mothers age 30+	
1988 NSFG	23.0		13.5	27.1		30.2	
1995 NSFG	23.3		14.7	28.0	***	38.4	***
2002 NSFG	23.8	†	16.1	28.9	***	46.6	***
2006-08 NSFG	24.2		18.5	29.1		49.6	

Data: NSFG as noted in table. T-tests were conducted on between wave-difference. Results of the t-test are listed next to the later wave. † p <0.1, * p <0.05, ** p <0.01, *** p <0.001.

Table 3: Logistic regression of whether mother is age 30 or older of nonmarital births

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
	b	SE		b	SE		b	SE		b	SE		B	SE		b	SE	
NSFG survey year																		
1988 (omitted)																		
1995	0.10	0.15		0.16	0.15		0.10	0.15		0.07	0.15		0.14	0.15		0.12	0.16	
2002	0.21	0.17		0.24	0.17		0.16	0.17		0.15	0.17		0.22	0.17		0.06	0.18	
2006	0.38	0.18	*	0.37	0.18	*	0.31	0.18		0.33	0.18		0.37	0.18	*	0.17	0.19	
Cohabitation																		
No (omitted)																		
Yes				0.21	0.10	*										0.16	0.11	
Race-ethnicity																		
White (omitted)																		
Black							-0.02	0.14								-0.15	0.15	
Hispanic							0.37	0.15	*							0.39	0.16	*
Other							0.54	0.29								0.42	0.30	
Education																		
No high school degree										-0.44	0.12	***				-0.67	0.13	***
High school degree																		
BA or higher										1.19	0.22	***				1.64	0.24	***
First birth																		
No (omitted)																		
Yes													-1.50	0.13	***	-1.70	0.14	***
Intercept	-1.86	0.13	***	-1.98	0.13	***	-1.95	0.15	***	-1.75	0.14	***	-1.35	0.13	***	-1.22	0.19	***
2LL	3305.254			3300.102			3287.276			3229.152			3074.975			2930.090		
N	5125			5125			5125			5125			5125			5125		

Data: 1988, 1995, 2002, and 2006-08 NSFG. Nonmarital births in the five years before each survey. † p <0.1, * p <0.05, ** p <0.01, *** p <0.001.

Table 4: Logistic regression of whether mothers of non-marital births have a bachelor's degree

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
	b	SE		b	SE		b	SE		b	SE		B	SE		b	SE	
NSFG survey year																		
1988 (omitted)																		
1995	0.33	0.51		0.34	0.51		0.23	0.51		0.32	0.51		0.25	0.52		0.04	0.52	
2002	1.00	0.51	†	0.99	0.50	*	0.93	0.51	†	0.96	0.52	†	0.99	0.53	†	0.78	0.52	
2006	0.97	0.58	†	0.98	0.58	†	0.99	0.58	†	0.92	0.57		0.87	0.58		0.82	0.55	
Age group																		
Age 30-34 (omitted)																		
Age 35-39				-0.50	0.39											-0.49	0.378	
Age 40-44				0.06	0.91											0.40	0.91	
Cohabitation																		
No (omitted)																		
Yes							-0.36	0.26								-0.58	0.28	*
Race-ethnicity																		
White (omitted)																		
Black										-0.32	0.35					-0.05	0.35	
Hispanic										-0.09	0.43					0.20	0.44	
Other										0.41	0.72					0.55	0.71	
First birth																		
No (omitted)																		
Yes													1.27	0.31	***	1.40	0.32	***
Intercept	-2.80	0.43	***	-2.69	0.44	***	-2.60	0.45	***	-2.70	0.52	***	-3.10	0.43	***	-2.74	0.55	***
2LL	398.507			598.638			396.829			396.546			379.726			371.790		
N	790			790			790			790			790			790		

Data: 1988, 1995, 2002, and 2006-08 NSFG. Nonmarital births in the five years before each survey to mothers age 30 and over. † p <0.1, * p <0.05, ** p <0.01, *** p <0.001.

Table 5: Logistic regression of wantedness for nonmarital births to mothers age 30 and over

	Model 1		Model 2			Model 3		Model 4			Model 5		Model 6		Model 7		
	b	SE	b	SE		b	SE	b	SE		b	SE	b	SE	b	SE	
Survey year																	
1988 (omitted)																	
1995	0.35	0.29	0.39	0.30		0.43	0.31	0.34	0.283		0.33	0.29	0.301	0.29	0.37	0.30	
2002	0.29	0.32	0.38	0.33		0.36	0.33	0.20	0.314		0.25	0.31	0.27	0.32	0.34	0.32	
2006	-0.08	0.36	-0.04	0.36		-0.09	0.36	-0.16	0.350		-0.09	0.36	-0.17	0.38	-0.21	0.36	
Age group																	
Age 30-34 (omitted)																	
Age 35-39			-0.18	0.28											-0.19	0.27	
Age 40-44			-0.96	0.52	†										-0.87	0.49	†
Cohabitation																	
No (omitted)																	
Yes						0.30	0.25								0.18	0.24	
Race-ethnicity																	
White (omitted)																	
Black								-0.69	0.249	**					-0.53	0.27	†
Hispanic								-0.30	0.334						-0.17	0.36	
Other								0.120	0.675						0.35	0.75	
Education																	
No h.s. degree																	
H.s. degree											-0.22	0.24			-0.04	0.26	
BA or higher											0.02	0.52			-0.25	0.56	

First birth																						
No (omitted)																						
Yes																		1.497	0.497	**	1.38	0.47	**
Intercept	0.91	0.24	***	0.97	0.25	***	0.73	0.28	**	1.25	0.286	***	0.98	0.25	***	0.746	0.246	**	1.00	0.37	**		
2LL	678.767			673.179			676.441			668.609			677.606			652.701			640.496			
N	790			790			790			790			790			790			790			

Data: 1988, 1995, 2002, and 2006-08 NSFG. Nonmarital births in the five years before each survey to mothers age 30 and over. † p <0.1, * p <0.05, ** p <0.01, *** p <0.001.