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Variation in Pregnancy Intendedness Across U.S. Women's Pregnancies

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Abstract

How stable are women's pregnancy intentions across their reproductive lifespans? Are there demographic, social, or attitudinal characteristics that are associated with differing pregnancy intentions patterns? Patterns of intendedness across pregnancies were examined using a sample of 3,110 women ages 25–45 who have been pregnant at least twice from the National Survey of Fertility Barriers. Multinomial logistic regression analyses assessed associations between patterns of intentions and respondents' economic/social status, values and ideologies to determine if intentions are a stable characteristic or pregnancy-specific. The majority of women (60%) reported varying intendedness across individual pregnancies, indicating that intendedness tends to be pregnancy-specific. Sociodemographic status as well as values and ideologies were significantly associated with pregnancy intendedness patterns. Compared to women who intended each pregnancy, women who were ambivalent, did not intend each pregnancy, or had intermittent intendedness were more likely to be single, younger, Black, report lower importance of motherhood and religiosity and were less likely to be Hispanic. A substantial proportion of women report the intendedness of their pregnancies varied between pregnancies. Research and policy addressing unintended pregnancies should consider that pregnancy intentions are not a static characteristic of most women.

Keywords: Pregnancy intention, Pregnancy planning, Fertility intentions, Life course, Reproductive career

Introduction

Pregnancy intentions are an important predictor of subsequent reproductive behavior [1, 2] particularly in a context where there are increased reproductive options (e.g., access to affordable and effective contraception). Yet the notion of “intended pregnancies” assumes a more stable world than many women experience [3]. Indeed, pregnancy intentions are dynamic and responsive to changes in women's lives [4]. Instead of thinking of intendedness as a person-specific trait, therefore, it may be wiser to recognize that intendedness may vary within women from pregnancy to pregnancy.

Thus far, research has not sufficiently explored patterns of women's pregnancy intentions, including stability and change in intendedness pregnancy to pregnancy or examined how various characteristics predict these patterns. There is evidence that the intendedness of a first birth—or lack thereof—is associated with subsequent intendedness [5]. This has important implications for inter-conception care, life course, and behavioral risk factor research. Understanding the patterns and correlates of the patterns of women's pregnancy intentions across all of their pregnancies is therefore essential for maternal and child health outcomes. In addition, examining women's pregnancy intentions across all pregnancies

can reveal important insights for their reproductive outcomes. For example, women who have had multiple unintended pregnancies give birth to more children than women who intended all their pregnancies [6].

Recent investigations of pregnancy intendedness generally divide pregnancies into dichotomous categories of intended/unintended or planned/unplanned [7, 8] or into three categories of intended, mistimed, and unwanted [9]. The language of "intendedness" typically refers to attitudes about a pregnancy, whereas "planning" reflects behaviors [10]. A few studies have explored a middle ground regarding pregnancy intentions. Many pregnancies may be neither planned nor unplanned; nearly a quarter of American women identify themselves as "okay either way" when asked if they are trying to get pregnant [11]. A study of the complexity of pregnancy intentions revealed an ambivalent ("don't care") dimension [12], and a qualitative study suggests that some women report difficulty identifying their pregnancies as "planned" or "unplanned" because planning their pregnancies is not a salient concept for them [13].

For several decades, demographers have highlighted the importance of considering intentions to be "parity-specific." Important factors in these sequential decisions include experiences with prior births as well as the norms associated with parity (i.e., first and second parity births are more normative than third and beyond) [14].

Recent studies have focused on understanding the variations and meanings of childbearing intentions and plans for first or current pregnancies or intentions, with a particular focus on understanding women who appear "ambivalent" about pregnancies or parenthood [11–13, 15, 16]. Several factors are associated with the degree of intention for individual pregnancies, for example age at first pregnancy, economic situation, relationship status, employment status, values, religiosity and race/ethnicity. Yet there is little theory to guide which factors should be associated with patterns of pregnancy attitudes over a reproductive lifespan. Some characteristics (e.g., race/ethnicity) are stable, but others (e.g., values, employment status, or relationship status) may vary over time. We consider the main correlates of pregnancy intentions to assess if there are characteristics associated with differences across women's reproductive lifespans.

In this study, we use a nationally representative sample of women to investigate the extent to which women intend their pregnancies over time and what distinguishes women who consistently intend their pregnancies from women who are ambivalent about their pregnancies, from those whose pregnancies are always unintended, and from those who plan some pregnancies and not others (e.g., intermittent intendedness).

Methods

Data

We used a representative sample of women ages 25–45 from the National Survey of Fertility Barriers (NSFB). The NSFB is a national random-digit-dialing (RDD) telephone survey designed to assess social and health factors related to reproductive choices and fertility among U.S. women. The RDD sampling of landline telephone numbers over-sampled U.S. zip codes with over 40 % minority representation. Women with a biomedical fertility barrier were also over-sampled through screening questions, and the survey was conducted in Spanish and English. Weighted results are nationally representative. The sample design included a pre-notification letter with a \$1 or \$2 cash incentive for all telephone numbers with address matches. A minimum of 10 follow-up contact calls were made to potential participants. The NSFB includes 4,712 women and 926 of their spouses/partners. The estimated response rate (AAPOR RR4) for the sample is 53.0 %. The first wave of data was collected between 2004 and 2006. Methodological information, including the methodology report, introductory letters, interview schedules, interviewer guides, data imputation procedures, and a detailed description of the planned missing design can be accessed at: <http://sodapop.pop.psu.edu/codebooks/nsfb/wave1/>. Funding for the NSFB was received from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, and Institutional Review Board approval was obtained from the Pennsylvania State University and the University of Nebraska-Lincoln. This research complied with established survey research ethical standards and was approved by the lead author's IRB as an exempt study.

The NSFB includes detailed retrospective histories for up to ten pregnancies. For this study, we restricted the data to women who had at least two pregnancies in order to capture patterns of pregnancy intentions ($N = 3,110$). On average, the women in our sample have been pregnant 3.31 times and have given birth 2.46 times. In the pregnancy history section of the survey, respondents were first asked, "How many times have you been pregnant altogether? Please include pregnancies that ended in stillbirths, miscarriages, or abortion as well as those that ended in live births." For each pregnancy, respondents were asked, "When you got pregnant this time, were you trying to get pregnant, trying not to get pregnant, or were you okay either way?" Intendedness of each pregnancy was coded into indicator variables for always unintended, always ambivalent, and intermittent, compared to always intended.

Independent variables were selected based on associations with pregnancy or fertility intentions in prior

research. Research supporting the importance of prior reproductive experiences/contexts for subsequent reproductive behaviors and attitudes [17] led to the inclusion of age at first pregnancy (in years) and outcome of the first pregnancy (live birth, pregnancy loss, and abortion), which were included as dichotomous variables. In addition to measures of reproductive context, we included measures economic/social status and values/ideologies, both of which have been linked to pregnancy intentions in prior studies utilizing the NSFB [11, 18]. The economic/social characteristics we included were union status, economic hardship, race/ethnicity, and work status. Union status was captured by dichotomous variables for married and cohabiting. Education was measured in years. Economic hardship was a scale ($\alpha = .82$) comprised of three questions: “During the last 12 months, how often did it happen that you ...” [1] “had trouble paying the bills,” (2) “did not have enough money to buy food, clothes, or other things your household needed,” and (3) “did not have enough money to pay for medical care?” The mean of available items was used such that higher values indicate greater economic hardship, with a range of 1 (never) to 4 (very often). Maternal race/ethnicity was measured by non-Hispanic Black, Hispanic, or non-Hispanic “Other.” Those employed over 35 h per week were coded as employed full-time; those who worked 35 h or less per week or less as part-time; and those who reported currently being in school were coded as in school.

Value/ideological characteristics included importance of motherhood, career, and leisure, conservative gender-role ideology, and religiosity. Importance of motherhood was constructed by averaging responses to five questions measured on Likert scales (strongly disagree to strongly agree), for example: “Having children is important to my feeling complete as a woman,” and “I always thought I would be a parent.” These items formed a single factor ranging from 1 to 4 that explained 64 % of the variance. Higher scores indicate greater importance of motherhood. The Cronbach’s alpha was high ($\alpha = .86$ for the entire sample). Two subjective measures of the costs of parenthood were included as well. Valuing career success was a continuous variable (1 = not important to 4 = very important) measuring responses to the question, “How important is being successful in my line of work?” Valuing leisure was based on the response to, “How important is having leisure to enjoy my own interests?” (1 = not important to 4 = very important). Conservative gender role ideology attitudes were measured by a single dichotomous variable that indicates an “agree” or “strongly agree” response to the following statement: “It is much better for everyone if the man earns the main living and the woman takes care of the home,” or a “disagree” or “strongly disagree” to the statement: “If

a husband and a wife both work full-time they should share household tasks equally.” Religiosity was measured by four questions: (1) “How often do you attend religious services?” (2) “About how often do you pray?” (3) “How close do you feel to God most of the time?” and (4) “In general, how much would you say your religious beliefs influence your daily life?” The items were normalized and averaged for the full sample; they formed a single factor with a high reliability ($\alpha = .78$).

Analysis

After coding women’s pregnancy histories, we categorized women into four distinct pregnancy intendedness pattern groups and generated descriptive statistics for all variables in the analyses while testing for significant differences between intendedness groups. Second, we estimated multinomial logistic regression models to assess whether economic/social and value/ideological characteristics were associated with pregnancy intendedness patterns. Multinomial logistic regression analysis is an appropriate model for this analysis because the dependent variable (e.g., pregnancy intendedness group) consists of categories that are not ordinal [19]. Risk ratios (RR) illustrate how the covariates of interest are associated with the relative risk of being in the pregnancy intendedness groups of always ambivalent, always unintended, and intermittent as compared to the referent group: all pregnancies intended. The statistical software package Stata 13 [20] was used for the data analysis. RRR were calculated using a modified Poisson approach [21].

Results

The data show that economic/social status and values/ideologies differ significantly by pregnancy intendedness patterns group. Table 1 provides the descriptive findings (means or percentages and standard deviations) for the full sample and highlights the significant differences between groups. Missing data was low for all study variables, with the highest proportion missing (1.7%) for the “age at first pregnancy” variable. Three of the four pregnancy intendedness pattern groups involve “stable” intentions across pregnancies. Some women reported that they were “trying to get pregnant” at the time of each pregnancy, so their pregnancies were classified as “always intended” (21 % of the sample). Other women reported being “ambivalent” about each pregnancy (11% of the sample). These women were not committed to trying to achieve pregnancy or trying to avoid pregnancy for any of their pregnancies. A smaller proportion of women reported “trying not to get pregnant” for all of their pregnancies, so their pregnancies were classified as “always unintended” (8% of the sample). In addition to these

Table 1. Weighted descriptive statistics of NSFB respondents with two or more pregnancies at baseline (2004–2006), by pregnancy intention groups (N = 3,110)

Variables	Full sample		All pregnancies intended		Always ambivalent		Always unintended		Intermittent intendedness		p	Post-hoc	
	(N = 3,110)		(N = 605)		(N = 314)		(N = 278)		(N = 1,913)				
	M or %	SD	M or %	SD	M or %	SD	M or %	SD	M or %	SD			
<i>1st pregnancy context</i>													
Age at first pregnancy	21.18	4.85	23.73	5.09	21.68	4.58	19.03	3.77	20.47	4.62	***	b	1>2>4>3
Ended in live birth	76%	.43	86%	.35	85%	.35	68%	.47	72%	.45	***	a	1,2>4,3
Ended in pregnancy loss	16%	.37	13%	.34	12%	.33	13%	.38	18%	.38	**	a	1,3,2>4
Ended in abortion	7%	.26	1%	.08	2%	.14	17%	.48	9%	.29	***	a	3>4>2,1
<i>Economic/social status</i>													
Married	69%	.46	82%	.39	66%	.48	36%	.48	70%	.46	***	a	1>2,4>3
Cohabiting	10 %	.30	6%	.24	14%	.35	23%	.42	10%	.29	***	a	3>2,4>1
Education in years	13.19	2.87	13.50	3.40	12.86	2.56	13.20	2.70	13.13	2.74	**	b	1,3>4,2
Economic hardship	1.69	.79	1.52	.76	1.67	.78	1.95	.87	1.71	.78	***	b	3>4,2>1
Black (white)	15%	.36	2%	.15	19%	.40	25%	.44	17%	.38	***	a	3>2>4>1
Hispanic	21%	.41	27%	.44	17%	.38	21%	.41	20%	.40	***	a	1>3>4>2
Other race	5%	.22	4%	.20	8%	.27	5%	.22	5%	.22		a	
Full-time	48%	.50	44%	.50	51%	.50	57%	.50	48%	.50	**	a	3,2>4>1
Part-time	16%	.36	20%	.40	15%	.36	10%	.30	15%	.36	**	a	1>2,4>3
In school	4%	.20	4%	.19	2%	.15	7%	.26	4%	.21	*	a	3>1,4,2
<i>Values/ideologies</i>													
Importance of motherhood	3.37	.58	3.48	.52	3.33	.53	3.04	.75	3.38	.56	***	b	1>4,2>3
Importance of career success	3.29	.84	3.29	.80	3.30	.86	3.45	.78	3.26	.85	**	b	3>2,1,4
Importance of leisure	3.14	.87	3.19	.83	3.15	.92	3.25	.78	3.10	.88	*	b	3>1,2>4
Conservative gender role ideology	49%	.50	51%	.50	52%	.50	46%	.50	49%	.50		b	
Religiosity	.06	.80	.13	.76	.09	.80	-.06	.79	.05	.81	*	b	1>2,4>3

Means are weighted; N are unweighted

For post hoc group differences, 1 = "all pregnancies intended;" 2 = "always ambivalent"; 3 = "always unintended"; and 4 = "intermittent intendedness." Percentages due not always equal 100 due to rounding

*** p<.001

** p<.01

* p<.05

a. Significant group differences determined via Chi Square test

b. significant group differences determined via Tukey's HSD post hoc test

three stable patterns of intendedness, over half of the women reported "intermittent" pregnancy intendedness (60 % of the sample). The intermittent group reported varying intendedness across individual pregnancies. The post hoc tests revealed significant differences across intendedness groups for all variables except "other" race/ethnicity and conservative gender-role ideology.

The multinomial logistic regression results presented in Table 2 highlight these striking differences between women with different patterns of pregnancy intendedness with the inclusion of all covariates in the model. This analysis thus indicates the association between pregnancy intendedness patterns and economic/social status and values and ideologies while controlling for other variables. The pregnancy intendedness

groups "always ambivalent," "always unintended," and "intermittent intendedness" are compared to the reference group, "always intended." Compared to women who intended all pregnancies, women in all other groups were significantly younger at the age of first pregnancy. Women who experienced a miscarriage or stillbirth at their first pregnancy were significantly more likely to have had unintended pregnancies or intermittently intended pregnancies [Adjusted Relative Risk Ratio (aRR) = 1.38, CI 1.03–1.84; aRR = 1.11, CI 1.04–1.19]. Women who had an abortion with their first pregnancy were approximately 67 and 22% more likely, respectively, to always have had unintended pregnancies and intermittent intentions as opposed to intending all their pregnancies (aRR = 1.67, CI 1.27–2.20; aRR = 1.22, CI 1.14–1.30).

Table 2. Relative risk ratios (and 95 % confidence intervals) from modified poisson multinomial regression models examining associations between first pregnancy context, economic, social status, and additudinal variables and pregnancy intendedness groups (N = 3,110)

Variables	Always ambivalent group (N = 605)		Always unintended group (N = 314)		Intermittant group (N = 1,913)	
	RR	(CI)	RR	(CI)	RR	(CI)
<i>1st pregnancy context</i>						
Age at first pregnancy	.94	*** (.91-.97)	.88	*** (.85-.92)	.97	*** (.96-.97)
Ended in pregnancy loss	1.23	(.92-1.65)	1.38	* (1.03-1.84)	1.11	** (1.04-1.19)
Ended in abortion	1.62	(.97-2.72)	1.67	*** (1.27-2.20)	1.22	*** (1.14-1.30)
<i>Economic/social status</i>						
Married	.93	(.64-1.34)	.54	** (.38-.78)	1.00	(.91-1.10)
Cohabiting	1.46	(.93-1.04)	1.05	(.75-1.45)	1.02	(.90-1.02)
Education	.99	(.89-1.00)	1.03	(.97-1.10)	1.01	(.98-1.03)
Economic hardship	1.02	(.85-1.21)	1.14	(.98-1.32)	1.02	(.97-1.08)
Black	2.32	*** (1.74-3.10)	1.48	* (1.09-2.02)	1.22	*** (1.12-1.32)
Hispanic	.58	* (.38-.88)	.77	(.52-1.16)	.93	(.83-1.03)
Other race	1.60	(.85-3.01)	.75	(.31-1.81)	1.14	(.89-1.06)
Full-time	1.04	(.76-1.41)	1.24	(.85-1.80)	.98	(.90-1.08)
Part-time	.89	(.57-1.38)	.93	(.56-1.54)	.96	(.86-1.08)
In school	.69	(.38-1.24)	1.48	(.89-2.48)	.93	(.78-1.09)
<i>Values/ideologies</i>						
Importance of motherhood	.93	* (.88-.98)	.98	(.93-1.03)	1.00	(.98-1.01)
Importance of career success	1.01	(.74-1.11)	1.05	(.90-1.22)	.97	(.94-1.01)
Importance of leisure	.86	(.74-.99)	.88	(.76-1.01)	.96	(.92-1.00)
Conservative gender role ideology	1.32	(1.02-1.73)	1.18	(.88-1.57)	1.00	(.93-1.08)
Religiosity	.90	(.77-1.05)	.84	* (.73-.98)	.97	(.93-1.01)
<i>Model fit</i>						
χ^2	542.48	***				
df	54					
Nagelkerke R ²	.31					

The referent group is "all pregnancies intended"

*** p < .001

** p < .01

* p < .05

Being married decreased the likelihood of having unintended pregnancies by 46% (aRR = .54, CI .38-.78). The multinomial logistic regression results also reveal stark racial/ethnic differences between groups, particularly between Black and White women. The risk of being ambivalent about all of their pregnancies versus intending all pregnancies was significantly greater for Black women than for White women (aRR = 2.32, CI 1.74-3.10), as was the risk of having all unintended pregnancies and being intermittent intenders (aRR = 1.48, CI 1.09-2.02; aRR = 1.22, CI 1.12-1.32, respectively). Hispanic women, on the other hand, were 42% less likely than White women to ambivalent about their pregnancies as compared to the intended pregnancies group. Education, economic hardship, and work status covariates, however, were not associated with differences between groups in the model after controlling for other characteristics.

Results indicate that some measures of values/ideologies vary significantly by group as well. Higher importance of motherhood decreased the likelihood of being ambivalent about all pregnancies by 7% (aRR = .93, CI .88-.98). Being more religious were 16% less likely to be in the "always unintended" group, as compared to women who intended every pregnancy (aRR = .84, RR = .73-.98).

Discussion

Using a national sample of U.S. women, this study extends research in several ways. First, this is the first study to our knowledge to quantitatively examine patterns of women's pregnancy intendedness over time and across multiple pregnancies. We compared four distinct groups of women distinguished by pregnancy

intendedness patterns: women whose pregnancies were all intended, women whose pregnancies were all unintended, women who were ambivalent about pregnancy at the time of each conception, and women whose pregnancy intendedness changed across pregnancies. These diverse patterns of pregnancy intendedness suggest that more research focusing on women's pregnancies as a whole rather than a single pregnancy is warranted.

The second major finding was that for most women (intermittent intenders), pregnancy intentions depended upon the circumstances of specific pregnancies. It is critical that future research further explore this finding to better understand these circumstances. This may require a prospective study or a more complex event history calendar surrounding each pregnancy to fully capture circumstances such as job or income loss, partner characteristics, previous child characteristics, health, and so forth, and is beyond the scope of this paper. Yet, it is essential for researchers and policymakers to realize that pregnancy intentions are not a static characteristic of most women. Rather, women's intentions and behaviors regarding pregnancy change over time. Future research should focus on pregnancy specific intentions and why intentions change pregnancy to pregnancy rather than focusing primarily on women's stable characteristics.

Third, our results suggest that pregnancy intention patterns are significantly associated with social and economic factors. For the most part, historically more advantaged women were most likely to intend all pregnancies, less historically advantaged women were most likely to report all pregnancies were unintended, and those women who were always ambivalent or those who changed their intentions across pregnancies fell in between. An important consequence of this pattern is the fact that women who are experiencing multiple unintended pregnancies are subject to compounded disadvantages associated with social and economic factors as well as the negative maternal and child health outcomes that often result from unintended pregnancies [22].

The results of this study should be interpreted with caution in light of its limitations. Because not all of the covariates were measured at the time of each pregnancy, these analyses do not establish a causal link between women's economic and social characteristics or attitudes and pregnancy intention patterns. For example, importance of motherhood was only assessed once, so it is unclear whether lower motherhood values lead women to be ambivalent about their pregnancies, or if planning pregnancies increases women's scores on importance of motherhood because they have spent more time thinking about and planning their childbearing. Further, respondents' intentions for each pregnancy relied on retrospective reports. There has been considerable debate on the validity of retrospective reports of pregnancy intentions,

though confidence of reports of unintended births is high [5]. In this study, the time between the most recent pregnancy and the interview date was more than 7 years, which may lead to incorrect reporting in some cases. Finally, we investigated the intendedness of all pregnancies, not just those that resulted in live births. Examining the intendedness of only pregnancies resulting in live birth is beyond the scope of this paper. However, prior research [7] found that 43% of unintended pregnancies resulted in abortion in 2006. Thus, future research should compare the variation of pregnancy intendedness patterns to those of birth intendedness. Our findings, therefore, highlight the need for future inquiries into the predictors of pregnancy and birth intendedness patterns. Future research should also explore the implications of these findings for research, policy, and maternal and child well-being.

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