

UC Irvine

UC Irvine Previously Published Works

Title

Discordant pregnancy intentions in couples and rapid repeat pregnancy

Permalink

<https://escholarship.org/uc/item/6z51k297>

Journal

American Journal of Obstetrics and Gynecology, 214(4)

ISSN

0002-9378

Authors

Cha, Susan
Chapman, Derek A
Wan, Wen
et al.

Publication Date

2016-04-01

DOI

10.1016/j.ajog.2015.10.149

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

GYNECOLOGY

Discordant pregnancy intentions in couples and rapid repeat pregnancy

Susan Cha, PhD; Derek A. Chapman, PhD; Wen Wan, PhD; Candace W. Burton, PhD, RN; Saba W. Masho, MD, DrPH

BACKGROUND: Rapid repeat pregnancy (RRP) is a major problem in the United States. Few studies have explored the influence of partner agreement on pregnancy intention and RRP.

OBJECTIVE: We sought to examine the association between couple pregnancy intentions and RRP among women in the United States.

STUDY DESIGN: Data came from the 2006 through 2010 National Survey of Family Growth. Multiparous women who cohabited with 1 husband/partner before conception of second pregnancy were included (N = 3463). The outcome, RRP, was categorized as experiencing a second pregnancy within 24 months of the first pregnancy resolution, or ≥ 24 months from the first pregnancy resolution. Maternal and paternal pregnancy intentions were categorized into 4 dyads: both intended (M+P+); maternal intended and paternal unintended (M+P-); maternal unintended and paternal intended (M-P+); and both unintended (M-P-). Multiple logistic regression was conducted to determine the association between couple pregnancy intentions and RRP.

RESULTS: Nearly half (49.4%) of women had RRP. Approximately 15% of respondents reported discordant couple pregnancy intentions

and 22%, maternal and paternal unintendedness. Compared to couples who both intended their pregnancy (M+P+), the odds of RRP was higher when fathers intended pregnancy but not mothers (adjusted odds ratio, 2.51; 95% confidence interval, 1.45–4.35) and lower if fathers did not intend pregnancy but mothers did (adjusted odds ratio, 0.77; 95% confidence interval, 0.70–0.85). No difference was observed between concordant couple pregnancy intentions (M-P- vs M+P+).

CONCLUSION: Findings highlight the important role of paternal intention in reproductive decisions. Study results suggest that RRP is strongly influenced by paternal rather than maternal pregnancy intentions. Clinicians and public health workers should involve partners in family planning discussions and counseling on optimal birth spacing.

Key words: maternal pregnancy intention, National Survey of Family Growth, partner pregnancy intention, rapid repeat pregnancy, short interpregnancy interval, unintended pregnancy

Introduction

High rates of rapid repeat pregnancy (RRP), or pregnancy occurring < 24 months from a prior birth, continue to be a serious public health problem in the United States. Despite the availability of effective contraception, nearly a third of all births in the United States are not spaced in accordance to the recommended guidelines.¹ Women experiencing RRP have an increased risk for poor perinatal outcomes including preterm birth, small for gestational age, low-birthweight infants, and neonatal death.²⁻⁵ Risk factors for RRP include unmarried status, younger age, lower income or educational attainment, multiple prior births, and prior adverse

obstetrical outcomes.^{3,4,6,7} Women in abusive relationships are also disproportionately affected by RRP.⁸⁻¹⁰

The majority of RRP are unintended pregnancies.⁶ Nearly half of all pregnancies in the United States are unintended, of which 29% are mistimed (occurring earlier than desired) and 19% are unwanted.¹¹ Of unintended pregnancies, 43% end in induced abortion.¹² The direct health costs of unintended pregnancies amount to nearly \$5 billion annually, causing unnecessary burden on poor families and the health care system.¹³ The increase in unintended pregnancy rate over the last few years, currently 52 women per 1000,¹¹ is cause for concern given the adverse impacts on maternal and infant health outcomes and behaviors.¹⁴ Examples of these include premature birth, postpartum depression, substance use during pregnancy, delayed prenatal care, and poor contraceptive practices.¹⁵⁻¹⁸

Repeat unintended pregnancy and poor birth spacing are mainly due to inconsistent use of contraceptive

methods and lack of family planning.¹⁹ More than half of women with unintended pregnancies do not use contraceptive methods around the time of conception.¹² Disparities in unintended pregnancy rate persist particularly among certain subpopulations including women who are young, less educated, of low income, cohabiting, serving in the military, or of racial and ethnic minority groups.^{12,20-22} Non-Hispanic black and Hispanic women have higher prevalence of unintended births than non-Hispanic white women^{15,23} and more than twice the rate of unintended pregnancies than any other racial or ethnic group.¹¹

Central to the issue of RRP and unintended pregnancy is the role of male partners and their desire for conception. The bulk of research exploring predictors of RRP in the United States has focused on adolescent or minority populations.^{7,8,24,25} Boardman et al⁷ assessed risk factors for unintended and intended RRP among adolescents using data from the 2002 National Survey of Family Growth (NSFG). Having a

Cite this article as: Cha S, Chapman DA, Wan W, et al. Discordant pregnancy intentions in couples and rapid repeat pregnancy. *Am J Obstet Gynecol* 2016;214:494.e1-12.

0002-9378/\$36.00

© 2016 Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.ajog.2015.10.149>

TABLE 1
Weighted distribution of characteristics by couple pregnancy intention dyads

	M+P+ unweighted, n = 1915	M-P- unweighted, n = 917	M+P- unweighted, n = 232	M-P+ unweighted, n = 399
	Weighted column %			
Maternal characteristics				
Race/ethnicity^a				
Non-Hispanic white	63.6	55.3	51.9	42.5
Non-Hispanic black	8.2	17.7	14.4	25.2
Hispanic	19.2	19.4	25.6	24.2
Non-Hispanic other race	9.0	7.6	8.1	8.1
Age at interview, y^a				
≤19	0.2	2.5	0.9	2.4
20–24	3.3	11.9	8.6	13.2
25–29	13.7	20.2	21.4	20.9
30–34	20.1	19.7	27.7	20.5
35–39	32.3	20.1	23.0	21.2
40–44	30.4	25.6	18.4	21.7
Education^a				
Less than high school	15.2	22.3	26.0	27.0
High school	23.6	30.5	39.1	31.1
Greater than high school	61.1	47.3	34.9	41.9
Income to poverty level^a				
<150%	27.9	39.0	48.0	46.8
150–299%	31.2	37.1	30.1	31.8
≥300%	41.0	23.9	21.9	21.4
Childhood psychosocial and demographic factors				
Intact family until age 18 y^a				
No	30.6	45.9	45.9	50.6
Raised religion				
Catholicism	37.1	34.0	39.7	35.3
Protestantism	42.6	51.5	46.9	50.4
Other	12.1	6.9	5.9	7.4
None	8.2	7.6	7.6	6.9
Age of mother-figure at first birth, y^a				
<18	16.9	25.0	23.4	20.2
≥18	83.1	75.0	76.6	79.8
Born outside United States^a				
No	78.9	84.9	81.7	79.2

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

(continued)

partner intend the repeat pregnancy was associated with decreased likelihood of an adolescent unintended RRP. However, the study did not adjust estimates

for important covariates that might influence RRP, such as paternal characteristics. Another study reported on correlates of RRP using a nationally

representative data set of women in the United States.⁶ After adjusting for maternal age at first birth and conception of second or higher-order births

TABLE 1

Weighted distribution of characteristics by couple pregnancy intention dyads (continued)

	M+P+ unweighted, n = 1915	M-P- unweighted, n = 917	M+P- unweighted, n = 232	M-P+ unweighted, n = 399
	Weighted column %			
Sexual development and behavior				
Age of menarche, y				
<12	20.3	27.5	22.3	27.2
12	25.9	27.0	30.1	24.5
13	27.1	26.1	21.8	23.2
14	14.6	10.2	14.0	12.5
≥15	12.0	9.2	11.7	12.5
Age at first sexual encounter, y ^a				
<15	11.6	24.1	22.1	21.2
15–17	41.9	44.5	44.6	49.4
≥18	46.5	31.4	33.3	29.4
Effectiveness of contraception at first sexual encounter ^a				
Most effective	22.0	19.0	16.7	15.9
Somewhat effective	45.2	42.7	40.7	41.5
Least effective	0.9	0.4	0.02	1.2
Not effective	31.9	37.8	42.6	41.4
First pregnancy factors				
Maternal age at delivery, y ^a				
≤19	24.7	48.9	47.4	54.9
20–29	61.6	46.9	50.1	38.3
30–44	13.7	4.2	2.5	6.8
Marital status when pregnancy ended ^a				
Not married	36.2	65.0	72.1	66.7
Married	63.8	35.0	27.9	33.3
Poor pregnancy outcome				
Yes	15.1	10.3	18.0	11.7
Interval contraceptive use ^a				
No	87.4	80.4	80.4	84.4
Second pregnancy factors				
Maternal age at conception, y ^a				
≤19	7.3	30.3	17.3	32.7
20–29	61.9	59.1	65.8	57.5
30–44	30.9	10.6	16.9	9.8
Marital status when pregnancy began ^a				
Not married	21.9	59.4	65.7	63.2
Married	78.1	40.6	34.3	36.8

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

(continued)

TABLE 1

Weighted distribution of characteristics by couple pregnancy intention dyads (continued)

	M+P+ unweighted, n = 1915	M-P- unweighted, n = 917	M+P- unweighted, n = 232	M-P+ unweighted, n = 399
	Weighted column %			
Years of cohabitation, y ^a				
≤7	19.4	39.4	38.9	48.2
8–11	23.1	18.5	14.4	16.7
12–16	27.8	18.5	24.6	14.8
≥17	29.8	23.5	22.1	20.4

M+P+, both pregnancy intended; M-P-, both pregnancy unintended; M+P-, maternal pregnancy intended, paternal pregnancy unintended; M-P+, maternal pregnancy unintended, paternal pregnancy intended.

^a Statistically significant at $P < .05$.

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

(index pregnancy), women who reported an unintended index pregnancy were more likely to experience RRP. However, paternal pregnancy intention was not considered in the analysis. The evidence for the influence of partners' intention on RRP is therefore not yet clear and merits further attention.²⁵

Very few studies have explored the role of partner pregnancy desires and their contribution to the reproductive decision-making process.^{7,9,26-29} RRP has been typically described among adolescent females without considering the male perspective or the impact of concordance or discordance in couples' pregnancy intentions.^{7,25} The current study addressed these gaps in knowledge by examining the impact of discordant pregnancy intentions among couples on RRP. This study will examine the association between couple pregnancy intentions and RRP among women in the United States.

Materials and Methods

Data come from the 2006 through 2010 NSFG, which collects information on families, relationships, fertility, and health behaviors from a nationally representative sample of noninstitutionalized, English- or Spanish-speaking individuals residing in the United States.^{30,31} Teenagers and racial/ethnic minorities were oversampled to ensure an adequate sampling of non-Hispanic blacks, Hispanic adults, and those aged

15-19 years. Further details of the methodology are described elsewhere.^{30,31} Multiparous women with history of at least 2 completed pregnancies prior to the interview were included in the current study ($n = 5479$).⁶ To ensure that cohabiting partner characteristics could reasonably be used as proxy for paternal characteristics, the sample was restricted to women who cohabited with 1 husband or partner at the time of second pregnancy conception. Women who did not report cohabitation at the time of their second pregnancy ($n = 542$) and those who lived with multiple partners or husbands ($n = 1275$) were excluded. Respondents who did not provide information regarding the exposure and outcome of interest were also excluded ($n = 199$). The final sample size for analysis consisted of 3463 women. This study was approved as exempt by the Virginia Commonwealth University Institutional Review Board.

RRP, the outcome of interest, was defined as pregnancy onset within 24 months of a previous pregnancy outcome.^{7,25,32} Women who experienced a second pregnancy (herein referred to as the index pregnancy) within 24 months of their first pregnancy resolution were categorized as experiencing RRP. In contrast, women who experienced an index pregnancy ≥ 24 months from the first pregnancy resolution were categorized as not

experiencing RRP. The first pregnancy could have ended with a live birth, elective abortion, miscarriage, stillbirth, or ectopic pregnancy.^{7,25} Dates of events such as first pregnancy outcome and second pregnancy conception were recorded in month and year and converted to century-months, which are convenient for computing the intervals between dates because subtraction yields intervals in months.³¹ Interpregnancy intervals were calculated as the time elapsed in months between the completion date of the first pregnancy and the conception date of the index pregnancy.⁶

Couple pregnancy intentions for index pregnancies were based on questions regarding the wantedness of pregnancy prior to conception. Consistent with the literature, intended pregnancy was defined as a pregnancy that occurred to those who wanted a child at the time of the index pregnancy, wanted it sooner, or were indifferent.^{6,11,33} Unintended pregnancy was defined as one that was mistimed (eg, desire to get pregnant later in the future but not at conception) or unwanted (eg, no desire to get pregnant at the time of conception or in the future).^{7,11,34} Female respondents were also asked similar questions about their partner's pregnancy desires prior to the index pregnancy. Even if retrospective reporting could lead to biased estimates of health outcomes related to unintended births, the direction of such bias is unclear. Scant literature has explored

the reliability of women's report of paternal pregnancy intention. Nonetheless, extant studies have found women's assessments of paternal pregnancy intentions to be reliable and consistent with their partners' self-reports.³⁵⁻³⁸ For instance, Morgan³⁶ found that wives reported husbands' intentions accurately and concluded couple intentions could be estimated with information gathered from the mother. It has also been argued that random measurement error due to self-reports and proxy reports of intention may be more important to consider than systematic error stemming from proxy reports about spouse's intentions.³⁸ Thus, paternal pregnancy intentions were categorized similar to maternal pregnancy intention categories and 4 dyadic types were created: both intended (M+P+); maternal intended and paternal unintended (M+P-); maternal unintended and paternal intended (M-P+); and both unintended (M-P-).^{29,39,40} Concordant pregnancy intentions where both couples desired the index pregnancy were treated as the referent group since this group may be more likely to plan for the pregnancy and least likely to experience RRP.⁴¹

Potential covariates that could modify or confound the relationship between couple pregnancy intentions and RRP were considered.^{4,6,7,42,43} Individual maternal characteristics included race/ethnicity, maternal age at interview, highest completed year of school or degree received, and income relative to poverty level. Childhood psychosocial and demographic factors included intact family until age 18 years, raised religion, age of mother-figure at first child birth, and nativity or being born outside the United States. Sexual development and behavior variables consisted of menarche, age of first sexual encounter, and effectiveness of contraceptive method¹³ at first sex (most effective; somewhat effective; least effective; not effective). Most effective contraceptive methods include those that result in <10 pregnancies per 100 women per year (ie, vasectomy, sterilization, intrauterine device, implants, shots, pill, ring, patch, and emergency contraception).

TABLE 2
Weighted distribution of characteristics by rapid repeat pregnancy status

	Total unweighted, N = 3463	RRP unweighted, n = 1737	No RRP unweighted, n = 1726
Maternal characteristics			
Race/ethnicity			
Non-Hispanic white	59.0	60.5	57.5
Non-Hispanic black	12.3	11.4	13.2
Hispanic	20.1	19.0	21.2
Non-Hispanic other race	8.6	9.1	8.0
Age at interview, y^a			
≤19	1.0	1.7	0.3
20–24	6.5	7.9	5.1
25–29	16.3	17.5	15.1
30–34	20.5	20.8	20.2
35–39	28.0	26.4	29.5
40–44	27.8	25.8	29.7
Education			
Less than high school	18.5	18.6	18.5
High school	26.7	27.0	26.4
Greater than high school	54.7	54.3	55.1
Income to poverty level			
<150%	33.3	33.4	33.2
150–299%	32.5	33.6	31.4
≥300%	34.2	33.1	35.4
Childhood psychosocial and demographic factors			
Intact family until age 18 y			
No	36.8	37.5	36.1
Raised religion			
Catholicism	36.4	35.3	37.4
Protestantism	45.6	46.5	44.7
Other	10.1	10.5	9.7
None	7.9	7.6	8.2
Age of mother-figure at first birth, y			
<18	19.3	20.4	18.3
≥18	80.7	79.6	81.7
Born outside United States^a			
No	80.4	82.5	78.3

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

(continued)

Somewhat effective methods are those that have a pregnancy rate of 15-24 per 100 women per year (ie, diaphragm, male/female condoms, withdrawals,

sponge, cervical cap). Least effective methods result in 25 pregnancies per 100 women per year (ie, spermicide [foam, jelly, cream, suppository], fertility

TABLE 2
Weighted distribution of characteristics by rapid repeat pregnancy status (continued)

	Total unweighted, N = 3463	RRP unweighted, n = 1737	No RRP unweighted, n = 1726
Sexual development and behavior			
Age of menarche, y			
<12	22.7	24.9	20.6
12	26.2	24.7	27.7
13	26.2	26.5	26.0
14	13.4	12.4	14.4
≥15	11.4	11.5	11.4
Age at first sexual encounter, y			
<15	15.9	15.6	16.1
15–17	43.4	41.6	45.1
≥18	40.7	42.8	38.7
Effectiveness of contraception at first sexual encounter			
Most effective	20.4	21.8	19.1
Somewhat effective	44.0	44.2	43.8
Least effective	0.8	0.8	0.7
Not effective	34.8	33.1	36.3
First pregnancy factors			
Maternal age at delivery, y ^a			
≤19	34.3	31.2	37.3
20–29	55.4	55.0	55.8
30–44	10.3	13.8	6.9
Marital status when pregnancy ended ^a			
Not married	47.5	41.3	53.6
Married	52.5	58.7	46.4
Poor pregnancy outcome ^a			
Yes	13.9	21.1	6.8
Interval contraceptive use			
No	85.2	85.9	84.5
Second pregnancy factors			
Maternal age at conception, y ^a			
≤19	15.4	24.1	7.0
20–29	61.0	58.3	63.7
30–44	23.5	17.6	29.3

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

(continued)

awareness methods such as rhythm or safe period). Having no form of contraceptive use is not effective against pregnancy. First pregnancy factors included

maternal age at delivery, marital status when first pregnancy ended, and poor pregnancy outcome such as stillbirth, miscarriage, or ectopic pregnancy.

Factors specific to the index or second pregnancy included any contraceptive method used in the interval between the end of the first and index pregnancy, maternal age at conception, and marital status when the index pregnancy began.

Cohabiting partner characteristics at the time of the index pregnancy included the age of partner or husband and years of cohabitation. The NSFG did not directly inquire about paternal characteristics for each pregnancy, however, it did ask about the start and end dates of cohabitation with current and former husbands and partners, and dates of marriages. Dates of marriages were considered as the start of cohabitation for women who reported no premarital cohabitation with former husbands. Based on this information, cohabiting partner characteristics at the time of the index pregnancy served as proxy for paternal characteristics as long as the conception date occurred within the cohabiting time frame.

All analyses were conducted using software (SAS, Version 9.4; SAS Institute Inc, Cary, NC) to account for the multistage, complex sampling design. Descriptive statistics including unweighted frequencies and weighted percentages were generated to assess the distribution of characteristics by RRP and couple pregnancy intent. Using SAS Proc Survey procedures and appropriate analysis weights,³⁰ separate logistic regression models provided crude odds ratios (COR), adjusted odds ratios (AOR), and 95% confidence intervals (CI) to determine if couple pregnancy intentions were associated with RRP. Effect modification by race/ethnicity ($P = .118$) and interval birth control use ($P = .775$) were assessed using interaction terms but were not found to be statistically significant; therefore, these were assessed as potential confounding factors. An iterative process of modeling was used where variables considered as potential confounders were maintained in parsimonious regression models if their presence resulted in a $\geq 10\%$ change in the odds ratios for the association between couple pregnancy intentions and RRP.⁴⁴

Results

Table 1 shows the weighted distribution of characteristics by couple pregnancy intentions. Among couples with concordant pregnancy intendedness (M+P+), more of the women were highly educated (61.1%), of higher income (41.0%), aged 30–44 years at conception for index pregnancy (30.9%), and married at first and second pregnancy (63.8% and 78.1%, respectively) compared to other pregnancy intention dyad groups. Couples with discordant pregnancy intentions (ie, M+P–, M–P+) and mutual pregnancy unintendedness (M–P–) had greater percentage of women who were racial/ethnic minorities, less than high school educated, of low income, aged ≤ 14 years at first sexual encounter, aged ≤ 19 years at first and second pregnancy, and not married at first and second pregnancy compared to couples with mutually intended index pregnancy (Table 1). Among the dyadic groups, the average mean \pm SE number of months between the first and second pregnancies was: 38.0 ± 1.27 (M+P+), 26.3 ± 1.66 (M–P–), 40.1 ± 2.17 (M+P–), and 24.4 ± 1.56 (M–P+), $P = .0021$ (not shown in Tables 1–4).

Nearly half of all women reported RRP (49.4%, not shown in Tables 1–4). Most respondents reported concordant intended pregnancy (62.5%) while 22.0% reported both maternal and paternal unintended pregnancy (Table 2). Discordant pregnancy intentions were observed for 15.5% of respondents (5.5% M+P–, 10.0% M–P+). Overall, a third of women were < 20 years old at first delivery, 13.9% had poor first pregnancy outcomes, and 85.2% reported no interval contraceptive use (Table 2). The mean age of cohabiting male partners at the time of conception for index pregnancy was 25 years (SE 0.31). RRP was associated with nativity status, first pregnancy factors (ie, maternal age, marital status, and poor pregnancy outcome), and second pregnancy factors such as maternal age at conception, partner age, and years of cohabitation (Table 2). More women with RRP reported discordant pregnancy intentions where partners desired

	Total unweighted, N = 3463	RRP unweighted, n = 1737	No RRP unweighted, n = 1726
Marital status when pregnancy began			
Not married	36.7	36.3	37.0
Married	63.3	63.7	63.0
Years of cohabitation, y^a			
≤ 7	26.3	32.0	20.8
8–11	21.3	19.2	23.4
12–16	24.9	24.2	25.5
≥ 17	27.5	24.6	30.3
Mean age of cohabiting partner, \pm SE ^a	25.2 \pm 0.31	23.9 \pm 0.50	27.0 \pm 0.65
Couple pregnancy intention^a			
M+P+	62.5	55.1	69.8
M–P–	22.0	27.9	16.2
M+P–	5.5	3.8	7.2
M–P+	10.0	13.2	6.9

M+P+, both pregnancy intended; M–P–, both pregnancy unintended; M+P–, maternal pregnancy intended, paternal pregnancy unintended; M–P+, maternal pregnancy unintended, paternal pregnancy intended; RRP, rapid repeat pregnancy.

^a Statistically significant at $P < .05$.

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

the pregnancy (13.2%) and concordant pregnancy unintendedness (27.9%) compared to those with no RRP (6.9% and 16.2%, respectively, $P < .0001$).

Compared to US-born women, the odds of RRP (COR, 0.76; 95% CI, 0.66–0.89) were lower for foreign-born women. In terms of factors related to first pregnancy, compared to women aged 20–29 years at delivery, women aged 33–44 years had a 2-fold increased odds of subsequent RRP (COR, 2.02; 95% CI, 1.30–3.12). In contrast, maternal age ≤ 19 years was associated with decreased odds of RRP (Table 3). Women who experienced a poor first pregnancy outcome also had increased odds of RRP compared to women with no previous poor outcome (COR, 3.65; 95% CI, 3.29–4.04). At the time of conception for index pregnancy, odds of RRP increased among women who were aged ≤ 19 years (COR, 3.75; 95% CI, 2.94–4.78) and decreased for women aged 30–44 years (COR, 0.66; 95% CI, 0.57–0.76).

Compared to couples with concordant pregnancy intendedness (M+P+), those with concordant pregnancy unintendedness (M–P–) had more than twice the odds of experiencing RRP (COR, 2.18; 95% CI, 2.04–2.34) (Table 4). After adjusting for confounding factors (ie, maternal age at first and second pregnancy, marital status at first and second pregnancy, poor outcome of first pregnancy, years of cohabitation, and partner age), the estimate became nonsignificant (AOR, 1.85; 95% CI, 0.82–4.18). Discordant couple pregnancy intentions where only the male partner intended the pregnancy (M–P+) were positively associated with RRP (COR, 2.42; 95% CI, 1.67–3.50), which was significant even after controlling for confounding due to maternal age, marital status, poor pregnancy outcome, years of cohabitation, and partner age (AOR, 2.51; 95% CI, 1.45–4.35). Couples where only male partners did not intend pregnancy (M+P–) had significantly reduced odds

TABLE 3
Weighted prevalence of rapid repeat pregnancy by population characteristics and logistic regression analysis

	Weighted %	COR (95% CI)
Maternal characteristics		
Race/ethnicity		
Non-Hispanic white	50.7	1.00
Non-Hispanic black	45.6	0.82 (0.65–1.02)
Hispanic	46.6	0.85 (0.63–1.16)
Non-Hispanic other race	52.6	1.08 (0.76–1.54)
Age at interview, y		
≤19	84.7	3.70 (2.36–5.81) ^a
20–24	60.0	1.00
25–29	53.0	0.76 (0.61–0.93) ^a
30–34	50.1	0.67 (0.58–0.78) ^a
35–39	46.6	0.58 (0.31–1.10)
40–44	45.9	0.57 (0.45–0.72) ^a
Education		
Less than high school	49.6	1.02 (0.63–1.66)
High school	50.0	1.04 (0.79–1.37)
Greater than high school	49.1	1.00
Income to poverty level		
<150%	49.5	1.08 (0.86–1.34)
150–299%	51.1	1.14 (0.97–1.35)
≥300%	47.7	1.00
Childhood psychosocial and demographic factors		
Intact family until age 18 y		
No	50.4	1.07 (0.91–1.25)
Raised religion		
Catholicism	47.9	0.91 (0.77–1.08)
Protestantism	50.3	1.00
Other	51.2	1.04 (0.84–1.28)
None	47.3	0.89 (0.64–1.23)
Age of mother-figure at first birth, y		
<18	52.0	1.14 (0.74–1.76)
Born outside United States		
Yes	43.9	0.76 (0.66–0.89) ^a

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

(continued)

as likely to report RRP; however, after adjusting for confounding factors, the differences were no longer statistically significant (COR, 2.11; 95% CI, 1.74–2.57; AOR, 1.83; 95% CI, 0.81–4.10, not shown in Tables 1–4). The directionality and magnitude of effects were similar to main findings among discordant pregnancy intentions groups where the odds of RRP was increased for couples where only the male partner intended the pregnancy (M–P+: AOR, 2.47; 95% CI, 1.41–4.32) and decreased for couples where only male partners did not intend pregnancy (M+P–: AOR, 0.77; 95% CI, 0.70–0.84).

Comment

This study found a relationship between discordant couple pregnancy intentions and RRP. Specifically, there was 2.5 times increased odds of RRP among M–P+ couples compared to couples where both intended the pregnancy. In contrast, the reverse discordant couple pregnancy intentions (M+P–) were associated with reduced odds of RRP. No statistically significant differences were observed between the concordant pregnancy intention groups (M–P– vs M+P+).

Study findings indicate the odds of having RRP is primarily influenced by paternal rather than maternal pregnancy intentions. Male partner desires for or against pregnancy may overpower women's reproductive decisions, especially in relationships characterized by patriarchal or male dominance.^{45–47} Based on a large sample of Hispanic women, 1 study found that living in areas with high rates of male patriarchal control was associated with a 4-fold increase in the odds of unintended pregnancy.⁴⁶ Another possible explanation for the findings with respect to discordance in couple pregnancy intentions may be women's compromised ability to enforce reproductive decisions about contraceptive use in abusive or controlling relationships.^{27,48–51} While information on partner violence or coercive behaviors were not available in the NSFG data for the current study, a large cross-sectional study reported high proportions of reproductive

of RRP even in parsimonious adjusted models (AOR, 0.77; 95% CI, 0.70–0.85).

Similar results were obtained in separate logistic regression models after limiting the sample to younger women

(<32 years) at conception of the index pregnancy. Compared to couples with concordant intended pregnancy (M+P+), those with concordant unintended pregnancy (M–P–) were twice

coercion (coercive behaviors by male partners to promote pregnancy) among abused females with unintended pregnancy.⁴³ Similarly, in a qualitative study of women with history of intimate partner violence (IPV), themes related to reproductive control and partner's pregnancy promoting behaviors emphasized women's lack of negotiating power to insist on contraceptive use.⁵⁰ Nonetheless, existing literature lacks quantitative studies that adequately address male partner pregnancy desires or coercive behaviors in general, outside of abusive relationships. Reproductive coercion can occur in all relationships and has the same sequelae as when it is accompanied by IPV (eg, decreased contraceptive use, unintended pregnancy).⁵⁰

Although there were no statistically significant association between concordant couples whose pregnancy was unintended and RRP, the large magnitude of effect may have potential clinical significance. While not conclusive, it suggests that couples who both do not intend pregnancy may experience RRP due to inadequate access to or utilization of contraception. Challenges with access to and utilization of contraceptive methods may also be experienced in other dyadic types—eg, couples where only fathers did not intend pregnancy (M+P−)—given the similar prevalence of poor interval contraceptive use to couples with concordant unintended pregnancy (M−P−). Intentions to avoid pregnancy may not always translate into safer sexual behaviors due to lack of knowledge of contraceptive options or substance use—related impaired judgment (eg, alcohol or illicit drugs).⁵² One qualitative study explored perception of intentions about repeat pregnancy and decision-making about sexual activity and contraceptive use among teen mothers.⁵³ While all of the mothers stated that their repeat pregnancies were unintended, some respondents talked about engaging in impulsive or spontaneous, unprotected sexual activity. Participants discussed feeling pressured to have sex, coerced into not using birth control, or ambivalent

TABLE 3

Weighted prevalence of rapid repeat pregnancy by population characteristics and logistic regression analysis (continued)

	Weighted %	COR (95% CI)
Sexual development and behavior		
Age of menarche, y		
<12	54.2	1.35 (0.99–1.85)
12	46.7	1.00
13	49.9	1.14 (0.92–1.40)
14	45.8	0.97 (0.63–1.48)
≥15	49.6	1.13 (0.93–1.36)
Age at first sexual encounter, y		
<15	48.6	0.88 (0.71–1.09)
15–17	47.4	0.84 (0.64–1.09)
≥18	51.9	1.00
Effectiveness of contraception at first sexual encounter		
Most effective	52.7	1.00
Somewhat effective	49.6	0.88 (0.71–1.11)
Least effective	51.9	0.97 (0.57–1.63)
Not effective	47.1	0.80 (0.54–1.18)
First pregnancy factors		
Maternal age at delivery, y		
≤19	45.0	0.85 (0.76–0.95) ^a
20–29	49.0	1.00
30–44	66.0	2.02 (1.30–3.12) ^a
Marital status when pregnancy ended		
Not married	43.0	0.61 (0.52–0.72) ^a
Poor pregnancy outcome		
Yes	75.1	3.65 (3.29–4.04) ^a
Interval contraceptive use		
No	49.8	1.12 (0.78–1.63)

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

(continued)

complacency (ie, “a spur of the moment thing”; just “doing it”).⁵³

The current study considers maternal pregnancy intention in tandem with paternal pregnancy intention and contributes to discussions of comprehensive family planning that considers the influence of partners in pregnancy decision-making. Using data from the 2001 Early Childhood Longitudinal Study—Birth Cohort (obtained from both parents of children born in the United States in 2001), Hohmann-

Marriott²⁹ explored the role of couple relationship context on prenatal care and birth outcomes. The likelihood of delayed prenatal care and preterm birth was increased for partners who did not share intentions or when neither partner intended the pregnancy. In addition, the odds of no early prenatal care were significantly higher for couples with problematic relationships—ie, mother not telling the father about being pregnant ($P < .05$). The quality of the relationship between partners

TABLE 3
Weighted prevalence of rapid repeat pregnancy by population characteristics and logistic regression analysis (continued)

	Weighted %	COR (95% CI)
Second pregnancy factors		
Maternal age at conception, y		
≤19	77.0	3.75 (2.94–4.78) ^a
20–29	47.2	1.00
30–44	37.0	0.66 (0.57–0.76) ^a
Marital status when pregnancy began		
Not married	48.9	0.97 (0.79–1.19)
Years of cohabitation, y		
≤7	59.5	1.89 (1.44–2.49) ^a
8–11	44.0	1.01 (0.80–1.27)
12–16	47.6	1.17 (0.76–1.79)
≥17	43.8	1.00
Age of cohabiting partner		
		0.90 (0.84–0.96) ^a
Couple pregnancy intention		
M+P+	43.6	1.00
M–P–	62.7	2.18 (2.04–2.34) ^a
M+P–	34.2	0.67 (0.52–0.87) ^a
M–P+	65.1	2.42 (1.67–3.50) ^a

CI, confidence interval; COR, crude odds ratio; M+P+, both pregnancy intended; M–P–, both pregnancy unintended; M+P–, maternal pregnancy intended, paternal pregnancy unintended; M–P+, maternal pregnancy unintended, paternal pregnancy intended.

^a Statistical significance.

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

(eg, communication) is an important predictor of health care utilization or contraceptive use.^{29,54} Men who are sexually active are often neglected as a

target population for sexual and reproductive health services.⁵⁵ In the context of healthy, nonviolent relationships, clinicians may want to consider male

partner perspectives in family planning discussions to prevent unintended pregnancy and RRP.⁵⁶

Strengths of this study include using a nationally representative data set obtained with standardized collection protocols and instruments that minimizes information bias, and multiple modalities (eg, audio computer-assisted self-interviews; in-person interviews) for improved response rates. Other strengths include accounting for childhood factors that potentially affect pregnancy decisions and partner characteristics. A limitation of the study is the cross-sectional design, which renders it difficult to determine a causal relationship—however, questions on couple pregnancy intentions and pregnancy dates had temporal elements. In addition, although the analysis excluded women who reported cohabiting with multiple partners or no partners at the time of the index pregnancy, this exclusion was essential to control for partner characteristics. Similarly, due to the lack of information on partner characteristics for all pregnancies, the first interpregnancy interval was assessed. Uncontrolled confounding due to factors such as postpartum care, IPV, or couple communication may have also affected the results^{9,29,57} but were unavailable for examination in the data set. Furthermore, women's report of paternal pregnancy intention may be subject to recall bias; however, epidemiologic work in this area is scant. Using data from an intervention study, Kraft et al³⁵ examined couple's pregnancy motivations and participation in decision-making to women's contraceptive use. There was high level of agreement between women's perceptions of their partner's pregnancy motivations with their partners' self-reports (kappa 0.46, $P < .01$). Other studies have also found women accurately report their husbands' attitudes about fertility.^{36,37} Women's perception of partner pregnancy intent, regardless of accuracy, may influence reproductive health behaviors⁴⁰ and warrants examination. Lastly, the prevalence of RRP (as defined in the current study) may have been higher than if the outcome was defined using a shorter

TABLE 4
Odds ratios for rapid repeat pregnancy among couple pregnancy intention dyads

Couple pregnancy intention	COR (95% CI)	AOR (95% CI) ^a
M+P+	1.00	1.00
M–P–	2.18 (2.04–2.34) ^b	1.85 (0.82–4.18)
M+P–	0.67 (0.52–0.87) ^b	0.77 (0.70–0.85) ^b
M–P+	2.42 (1.67–3.50) ^b	2.51 (1.45–4.35) ^b

AOR, adjusted odds ratio; CI, confidence interval; COR, crude odds ratio; M+P+, both pregnancy intended; M–P–, both pregnancy unintended; M+P–, maternal pregnancy intended, paternal pregnancy unintended; M–P+, maternal pregnancy unintended, paternal pregnancy intended.

^a AOR controlling for maternal age (first and second pregnancy), marital status (first and second pregnancy), first pregnancy poor outcome (ie, stillbirth, miscarriage, or ectopic pregnancy), years of cohabitation, and partner age; ^b Statistical significance.

Cha et al. Pregnancy intentions and rapid repeat pregnancy. Am J Obstet Gynecol 2016.

time frame since more women are likely to conceive within 24 months of a previous pregnancy. Future studies may want to consider multiple inter-pregnancy intervals or time to next pregnancy. Small sample size issues prevented the assessment of multiple pregnancy intention levels (eg, indifference, intended, unintended) among respondents and their partners in the current study; however, this may also be of interest for future research.

More than 85% of women in the current study reported no interval contraceptive use. Results from this study highlight a major public health concern and could help public health workers and clinicians to improve care for women of reproductive age by considering male partners' perspectives in discussions about contraceptive methods²⁵ or considering long-acting and effective contraceptive methods (eg, intrauterine devices, implants, injections) for women who, contrary to their partners, have no desire for pregnancy.¹¹ Results may also support comprehensive family planning programs that better integrate services such as violence prevention or postpartum counseling to effectively reduce rates of unintended and RRP among high-risk populations. ■

References

- US Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Healthy people 2020. Family planning. Available at: <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicid=13>. Accessed Jan. 30, 2015.
- Conde-Agudelo A, Rosas-Bermúdez A, Kafury-Goeta AC. Birth spacing and risk of adverse perinatal outcomes: a meta-analysis. *JAMA* 2006;295:1809-23.
- Hogue CJ, Menon R, Dunlop AL, Kramer MR. Racial disparities in preterm birth rates and short inter-pregnancy interval: an overview. *Acta Obstet Gynecol Scand* 2011;90:1317-24.
- Nabukera S, Wingate M, Owen J, et al. Racial disparities in perinatal outcomes and pregnancy spacing among women delaying initiation of childbearing. *Matern Child Health J* 2009;13:81-9.
- Smith GC, Pell JP, Dobbie R. Interpregnancy interval and risk of preterm birth and neonatal death: retrospective cohort study. *BMJ* 2003;327:313-6.
- Gemmill A, Lindberg LD. Short interpregnancy intervals in the United States. *Obstet Gynecol* 2013;122:64-71.
- Boardman LA, Allsworth J, Phipps MG, Lapane KL. Risk factors for unintended versus intended rapid repeat pregnancies among adolescents. *J Adolesc Health* 2006;39:597.e1-8.
- Jacoby M, Gorenflo D, Black E, Wunderlich C, Eyler AE. Rapid repeat pregnancy and experiences of interpersonal violence among low-income adolescents. *Am J Prev Med* 1999;16:318-21.
- Scribano PV, Stevens J, Kaizar E. The effects of intimate partner violence before, during, and after pregnancy in nurse visited first time mothers. *Matern Child Health J* 2013;17:307-18.
- Hung KJ, Scott J, Ricciotti HA, Johnson TR, Tsai AC. Community-level and individual-level influences of intimate partner violence on birth spacing in sub-Saharan Africa. *Obstet Gynecol* 2012;119:975-82.
- Finer LB, Zolna MR. Unintended pregnancy in the United States: incidence and disparities, 2006. *Contraception* 2011;84:478-85.
- Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspect Sex Reprod Health* 2006;38:90-6.
- Trussell J. The cost of unintended pregnancy in the United States. *Contraception* 2007;75:168-70.
- Lindberg L, Maddow-Zimet I, Kost K, Lincoln A. Pregnancy intentions and maternal and child health: an analysis of longitudinal data in Oklahoma. *Matern Child Health J* 2015;19:1087-96.
- Pulley L, Klerman LV, Tang H, Baker BA. The extent of pregnancy mistiming and its association with maternal characteristics and behaviors and pregnancy outcomes. *Perspect Sex Reprod Health* 2002;34:206-11.
- Mercier RJ, Garrett J, Thorp J, Siega-Riz A. Pregnancy intention and postpartum depression: secondary data analysis from a prospective cohort. *BJOG* 2013;120:1116-22.
- Bennett IM, Culhane JF, McCollum KF, Elo IT. Unintended rapid repeat pregnancy and low education status: any role for depression and contraceptive use? *Am J Obstet Gynecol* 2006;194:749-54.
- Orr ST, James SA, Reiter JP. Unintended pregnancy and prenatal behaviors among urban, black women in Baltimore, Maryland: the Baltimore preterm birth study. *Ann Epidemiol* 2008;18:545-51.
- DeFranco EA, Stamilio DM, Boslaugh SE, Gross GA, Muglia LJ. A short interpregnancy interval is a risk factor for preterm birth and its recurrence. *Obstet Gynecol* 2007;109:264.e1-6.
- Finer LB. Unintended pregnancy among US adolescents: accounting for sexual activity. *J Adolesc Health* 2010;47:312-4.
- Goyal V, Borrero S, Schwarz EB. Unintended pregnancy and contraception among active-duty servicewomen and veterans. *Am J Obstet Gynecol* 2012;206:463-9.
- Kuroki LM, Allsworth JE, Redding CA, Blume JD, Peipert JF. Is a previous unplanned pregnancy a risk factor for a subsequent unplanned pregnancy? *Am J Obstet Gynecol* 2008;199:517.e1-7.
- Wildsmith E, Guzzo KB, Hayford SR. Repeat unintended, unwanted and seriously mistimed childbearing in the United States. *Perspect Sex Reprod Health* 2010;42:14-22.
- Rowlands S. Social predictors of repeat adolescent pregnancy and focused strategies. *Best Pract Res Clin Obstet Gynaecol* 2010;24:605-16.
- Dallas CM. Rapid repeat pregnancy among unmarried, African American adolescent parent couples. *West J Nurs Res* 2013;35:177-92.
- Taillieu TL, Brownridge DA. Violence against pregnant women: prevalence, patterns, risk factors, theories, and directions for future research. *Aggress Violent Behav* 2010;15:14-35.
- Dunn LL, Oths KS. Prenatal predictors of intimate partner abuse. *J Obstet Gynecol Neonatal Nurs* 2004;33:54-63.
- Stanford J, Hobbs R, Jameson P, DeWitt M, Fischer R. Defining dimensions of pregnancy intendedness. *Matern Child Health J* 2000;4:183-9.
- Hohmann-Marriott B. The couple context of pregnancy and its effects on prenatal care and birth outcomes. *Matern Child Health J* 2009;13:745-54.
- Groves RM, Mosher WD, Lepkowski JM, Kirgis NG. Planning and development of the continuous National Survey of Family Growth. *Vital Health Stat* 1 2009;48:1-64.
- National Center for Health Statistics. Public use data file documentation: 2006-2010 National Survey of Family Growth. Centers for Disease Control and Prevention. Available at: http://www.cdc.gov/nchs/data/nsfg/NSFG_2006-2010_UserGuide_MainText.pdf#TopicSpec. Accessed Jan. 1, 2015.
- Crittenden CP, Boris NW, Rice JC, Taylor CA, Olds DL. The role of mental health factors, behavioral factors, and past experiences in the prediction of rapid repeat pregnancy in adolescence. *J Adolesc Health* 2009;44:25-32.
- Clear ER, Williams CM, Crosby RA. Female perceptions of male versus female intendedness at the time of teenage pregnancy. *Matern Child Health J* 2012;16:1862-9.
- Joyce T, Kaestner R, Korenman S. On the validity of retrospective assessments of pregnancy intention. *Demography* 2002;39:199-213.
- Kraft JM, Harvey SM, Hatfield-Timajchy K, et al. Pregnancy motivations and contraceptive use: hers, his, or theirs? *Womens Health Issues* 2010;20:234-41.
- Morgan SP. Individual and couple intentions for more children: a research note. *Demography* 1985;22:125-32.
- Goldscheider FK, Kaufman G. Fertility and commitment: bringing men back in. *Popul Dev Rev* 1996;22:87-99.
- Williams R, Thomson E. Can spouses be trusted? A look at husband/wife proxy reports. *Demography* 1985;22:115-23.

39. Williams LB. Determinants of couple agreement in US fertility decisions. *Fam Plann Perspect* 1994;26:169-73.
40. Korenman S, Kaestner R, Joyce T. Consequences for infants of parental disagreement in pregnancy intention. *Perspect Sex Reprod Health* 2002;34:198-205.
41. Waggoner MR, Lanzi RG, Klerman LV. Pregnancy intentions, long-acting contraceptive use, and rapid subsequent pregnancies among adolescent and adult first-time mothers. *J Child Adolesc Psychiatr Nurs* 2012;25:96-104.
42. Coker AL. Does physical intimate partner violence affect sexual health? A systematic review. *Trauma Violence Abuse* 2007;8:149-77.
43. Miller E, Decker MR, McCauley HL, et al. Pregnancy coercion, intimate partner violence and unintended pregnancy. *Contraception* 2010;81:316-22.
44. Maldonado G, Greenland S. Simulation study of confounder-selection strategies. *Am J Epidemiol* 1993;138:923-36.
45. Gonzalez EU, Sable MR, Campbell JD, Dannerbeck A. The influence of patriarchal behavior on birth control access and use among recent Hispanic immigrants. *J Immigr Minor Health* 2010;12:551-8.
46. Pallitto CC, O'Campo P. Community level effects of gender inequality on intimate partner violence and unintended pregnancy in Colombia: testing the feminist perspective. *Soc Sci Med* 2005;60:2205-16.
47. Chung GH, Tucker MB, Takeuchi D. Wives' relative income production and household male dominance: examining violence among Asian American enduring couples. *Family Relations* 2008;57:227-38.
48. Miller E, Jordan B, Levenson R, Silverman JG. Reproductive coercion: connecting the dots between partner violence and unintended pregnancy. *Contraception* 2010;81:457-9.
49. Campbell JC, Pugh LC, Campbell D, Visscher M. The influence of abuse on pregnancy intention. *Womens Health Issues* 1995;5:214-23.
50. Moore AM, Frohwirth L, Miller E. Male reproductive control of women who have experienced intimate partner violence in the United States. *Soc Sci Med* 2010;70:1737-44.
51. Gee RE, Mitra N, Wan F, Chavkin DE, Long JA. Power over parity: intimate partner violence and issues of fertility control. *Am J Obstet Gynecol* 2009;201:148.e1-7.
52. Rocca CH, Hubbard AE, Johnson-Hanks J, Padian NS, Minnis AM. Predictive ability and stability of adolescents' pregnancy intentions in a predominantly Latino community. *Stud Fam Plann* 2010;41:179-92.
53. Herrman JW. Repeat pregnancy in adolescence: intentions and decision making. *MCN Am J Matern Child Nurs* 2007;32:89-94.
54. Kerns J, Westhoff C, Morroni C, Murphy PA. Partner influence on early discontinuation of the pill in a predominantly Hispanic population. *Perspect Sex Reprod Health* 2003;35:256-60.
55. Kalmuss D, Tatum C. Patterns of men's use of sexual and reproductive health services. *Perspect Sex Reprod Health* 2007;39:74-81.
56. National Campaign to Prevent Teen and Unplanned Pregnancy, Association of Reproductive Health Professionals. Studies and surveys. Providers' perspectives: perceived barriers to contraceptive use in youth and young adults. Available at: <http://www.arhp.org/publications-and-resources/studies-and-surveys/providers-prospectives-perceived-barriers-to-contraceptive-use-in-youth-and-young-adults>. Accessed Jan. 1, 2015.
57. Tocce KM, Sheeder JL, Teal SB. Rapid repeat pregnancy in adolescents: Do immediate postpartum contraceptive implants make a difference? *Obstet Gynecol* 2012;206:481.e1-7.

Author and article information

From the Division of Epidemiology, Department of Family Medicine and Population Health, School of Medicine (Drs Cha, Chapman, and Masho); Department of Biostatistics, School of Medicine (Dr Wan); and Department of Family and Community Health Nursing, School of Nursing (Dr Burton), Virginia Commonwealth University, Richmond, VA.

Received Aug. 10, 2015; revised Oct. 14, 2015; accepted Oct. 22, 2015.

This research was supported by Department of Health and Human Services, Agency for Healthcare Research and Quality grants R36HS023724 and 1R01HS021504-01A1. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Agency for Healthcare Research and Quality.

The authors report no conflict of interest.

Corresponding author: Susan Cha, PhD. chas@vcu.edu