

Original research article

# Which young adults are most likely to use withdrawal? The importance of pregnancy attitudes and sexual pleasure

Jenny A. Higgins<sup>a,\*</sup>, Yu Wang<sup>b,\*</sup>

<sup>a</sup>Department of Gender and Women's Studies, University of Wisconsin-Madison, 3414 Sterling Hall, 475 North Charter St, Madison WI 53706, USA

<sup>b</sup>Department of Sociology, University of Wisconsin-Madison, 4412 William Sewell Social Sciences, 1180 Observatory Drive, Madison WI 53706, USA

Received 31 July 2014; revised 21 November 2014; accepted 13 December 2014

---

## Abstract

**Objectives:** Use of withdrawal (coitus interruptus) has consequences for reproductive health, but few nationally representative studies exist. We (1) examined patterns of withdrawal among 15- to 24-year-old women *and* men, and (2) explored withdrawal's associations with sociodemographic, psychological, and sexual factors.

**Study design:** Using data from the 2006–2010 National Survey of Family Growth, we assessed reports of *any* and *only* withdrawal use at last sexual episode in the last month from 3517 sexually active 15 to 24 year-old women and men at risk of unintended pregnancy. Logistic regression documented associations with withdrawal.

**Results:** Fourteen percent of young women and 17% of young men reported *any* use of withdrawal at last sex; 7% and 6%, respectively, reported *only* use of withdrawal. Though associated with few sociodemographic factors, withdrawal was significantly linked with pregnancy- and condom attitudes. In regression models, compared to those who said they would be upset if they discovered they were pregnant, young women who said they would be pleased about a pregnancy were 2.2–2.6 times as likely to have used any/only withdrawal ( $p < .01$ ). For both women and men, those who felt that condoms were likely to diminish sexual pleasure were more likely to have used any/only withdrawal (odds ratio=1.8–2.6,  $p < .05$ ).

**Conclusions:** At their last sexual episode, a greater proportion of young adults used withdrawal in conjunction with other methods than by itself. The psychological and sexual variables of orientation toward pregnancy and attitudes about condoms and pleasure were more strongly linked with withdrawal practices than most sociodemographic variables.

**Implications statement:** Since a substantial minority of young adults use withdrawal, providers may wish to speak directly to contraceptive clients about this method, though they should distinguish between *only* versus *any* withdrawal use. Practitioners may also be well served by assessing and responding to pregnancy orientation and pleasure attitudes in contraceptive counseling.

© 2015 Elsevier Inc. All rights reserved.

**Keywords:** Withdrawal; Coitus interruptus; Young adults; Pregnancy ambivalence; Sexual pleasure

---

## 1. Introduction

The majority of Americans will use withdrawal at some point during their lives [1]. Yet this method is largely disregarded by the family planning community, dismissed as a “non-method” [2] — or, at best, “better than nothing” [3]. The American Congress of Obstetricians and Gynecologists (ACOG) [4] and Centers for Disease Control and Prevention (CDC) [5] do not include coitus interruptus in their lists of contraceptive methods [2].

This disregard of withdrawal is potentially costly. Building evidence suggests widespread withdrawal use among young people in particular — and thus deserves further study. In a new national study of 4634 adult women, Jones et al. [6] found that 33% reported any use of withdrawal in the last 30 days, and 13% reported withdrawal alone — and women in their teens and early 20s were especially likely to report withdrawal. In a study of 1974 low-income African American adolescents, 60% reported withdrawal use in the last 3 months [7]. Given that withdrawal is less effective at preventing pregnancy than a number of contraceptive methods, its sole use could comparatively increase the likelihood of unintended pregnancy among these young adults. A recent analysis by Dude

---

\* Corresponding authors. Tel.: +1 608 890 4622.

E-mail address: [jenny.a.higgins@gmail.com](mailto:jenny.a.higgins@gmail.com) (J.A. Higgins).

et al. [8] of withdrawal patterns among 15 to 24 year-old women found associations between unintended pregnancy and withdrawal use in the last three years.

In addition to the general lack of research on this method, at least two specific gaps remain in our knowledge of withdrawal. First, few, if any, nationally representative analyses of withdrawal have included men. Despite interest in increasing men's responsibility for pregnancy prevention [9], contraceptive researchers have conducted few studies on the methods available to men, particularly withdrawal [10].

Second, though the recent Dude et al. [8] analysis examined some sociodemographic correlates of withdrawal use, few analyses have explored psychological or sexual associations with withdrawal. For example, pregnancy ambivalence, which can undermine more effective contraceptive practices, may be especially prevalent among young adults [11]. Another unexamined influence on withdrawal pertains to condom-related attitudes. Given that condoms are frequently used alternatively or in combination with withdrawal [12,13], a study of withdrawal patterns would be incomplete without assessing at least some aspect of condom-related attitudes.

We had the opportunity to fill these gaps with an analysis of the 2006–2010 National Survey of Family Growth (NSFG), a nationally representative study of US women and men between the ages of 15 and 44. For this paper, we included only 15 to 24 year-olds, which allowed us to focus on a group among whom withdrawal [6] and unintended pregnancies [14] are widespread. Our objectives were twofold: first, to explore prevalence of *any* and *only* use of withdrawal for both young women and men, and second, to document sociodemographic and select psychological and sexual correlations with withdrawal use.

## 2. Methods

### 2.1. Sample

Data were derived from 2006–2010 NSFG, a national probability sample of men and women aged 15–44 [15]. The NSFG collects detailed information about sexual behaviors, contraceptive use, pregnancy and births, and other topics. Weighted NSFG data are considered nationally representative. The 2006–2010 NSFG differed from previous cycles in that it adopted a responsive, continuous design, which oversampled black, Hispanic and teen respondents [15,16]. Approximately 5000 people were interviewed every year for 4 years, for a final sample of 10,403 men and 12,279 women [16].

We limited our sample to 15 to 24 year-olds who were not pregnant or trying to get pregnant at the time of interview. We excluded those who had been sterilized, had experienced infertility or had initiated sexual activity for the first time within the interview month or the month prior. Though contraceptive studies typically have respondents reflect back on the last 1–3 months [1], briefer recall periods can garner

more accurate reporting, particularly for event-specific methods such as condoms or withdrawal [17,18].<sup>1</sup> Thus, to maximize recall, we examined contraceptive use at last sexual episode, and we included only those respondents who had sexual intercourse within the last month. After excluding nonqualified respondents, we derived a sample of 1607 men and 1849 women aged 15–24.

### 2.2. Measures

#### 2.2.1. Withdrawal use

Each NSFG respondent could select up to four contraceptive methods used at last sexual episode. Respondents who included withdrawal anywhere on this list were classified as *any* withdrawal users. Respondents who listed withdrawal alone were classified as *only* withdrawal users.

#### 2.2.2. Sociodemographic measures

We included sociodemographic variables often associated with contraceptive use [1], including withdrawal [8]: respondent's age at the time of the interview [15–24], both respondent's and their mother's highest level of education (no high school diploma/GED, high school diploma/GED, and any college or more), race/ethnicity (non-Hispanic white, non-Hispanic black, non-Hispanic other and Hispanic), union status (married, cohabitating and single/not cohabitating), reception of public assistance in the last year (yes, no), religious affiliation (no religion, Catholic, Protestant or other) and health insurance status (none, any private insurance or any public insurance).

#### 2.2.3. Psychological and sexual measures

Pregnancy orientation was captured by the following survey question: "If you got pregnant [or got your partner pregnant] now, how would you feel?" Recoded response groups included upset (either a little or very), pleased (either a little or very) and wouldn't care. Condom-associated attitudes were captured as follows: "What is the chance that if you [or your partner] used a condom during sex, you would feel less physical pleasure?" Recoded response groups included little chance/no chance, a 50–50 chance, and a pretty good/certain chance.

### 2.3. Analyses

We performed all analyses in STATA/MP 13 and ran all analyses separately for women and men. All analyses used the *svy* command in STATA to adjust for the sampling and weighting scheme of the NSFG. For descriptive analyses, we estimated the weighted percentages of all sociodemographic, psychological and sexual control variables for the two withdrawal use types (*any* and *only*). For bivariate analyses,

<sup>1</sup> Dude et al.'s [8] recent analysis of young women in the NSFG examined withdrawal use over a 3-year period, which may have limited respondents' accurate recall of the method.

chi-squared tests gauged the strength of associations between both withdrawal profiles and all controls. For multivariate analyses, logistic regression examined the association between all control variables and both any and only withdrawal use.

Table 1  
Percent distribution of respondents' sociodemographic and psychosexual characteristics

Characteristics	Women (n=1849) [col % <sup>a</sup> ]	Men (n=1607) [col %]
<b>Sociodemographic variables</b>		
Age		
15–19	30.1	28.4
20–24	69.9	71.7
Education		
No HS diploma or GED	25.8	32.2
HS diploma or GED	27.7	26.4
Any college or more	46.6	41.3
Race/ethnicity		
White, non-Hispanic	63.2	57.8
Black, non-Hispanic	14.9	18.4
Other, non-Hispanic	5.7	3.8
Hispanic	16.2	20.0
Union status		
Married	17.3	13.3
Cohabiting	21.4	19.7
Single, not cohabitating	61.3	67.1
Mother's education		
Less than high school	16.6	15.9
High school graduate or GED	31.7	32.2
Some college or more	5.2	51.9
Reception of public assistance in last year		
Yes	33.9	28.3
No	66.1	71.7
Religion		
No religion	21.1	29.2
Catholic	25.3	24.3
Protestant	45.8	40.4
Other religions	7.8	6.1
Current health insurance <sup>b</sup>		
No insurance	23.9	28.0
Private insurance	53.4	55.2
Public insurance	22.7	16.9
<b>Psychosexual variables<sup>b</sup></b>		
If you got pregnant/got your partner pregnant, how would you feel?		
Upset	69.6	59.0
Pleased	30.1	39.4
Wouldn't care	0.3	1.6
Chances of reduced physical pleasure if condom used		
A little chance or no chance	61.5	30.8
50–50 chance	20.4	26.5
A pretty good chance or certain chance	18.2	42.8

<sup>a</sup> All percentages are weighted to account for survey design effects. Column % refers to percent among all women or men.

<sup>b</sup> Column numbers do not sum to total because of missing data on psychosexual variables.

### 3. Results

#### 3.1. Description of sample

As seen on Table 1, the majority of respondents were between the ages of 20–24 (70% of women, 72% of young men). Most respondents were white (63% of women, 58% of men), but a substantial minority were people of color (37% of women, 42% of men). The majority were neither married nor cohabitating (61% of women, 67% of men). Seventy percent of women and 59% of men said they would be upset if they discovered a pregnancy. In terms of condom attitudes, while 62% of women said there was little or no chance a condom would reduce their physical pleasure, the same was true for only 31% of men; 18% of women and 43% of men said there was a good or certain chance that condoms would reduce pleasure.

#### 3.2. Withdrawal practices

Among 15 to 24 year-old women, 14% reported *any* withdrawal use and 7% reported *only* withdrawal use at last sex in the last month (Table 2). Among men, 17% reported *any* and 6% reported *only* use of withdrawal. Table 2 provides information on other methods reported by any-withdrawal users. The majority of these respondents reported using withdrawal in conjunction with highly effective methods, primarily hormonal methods: 65% of any-withdrawal women and 64% of any-withdrawal men reported use of the pill, other hormonal method or intrauterine device (IUD) or implant at

Table 2  
Percent distribution of withdrawal use, by gender

Withdrawal use among all respondents	Women (n=1849) [% <sup>a</sup> ]	Men (n=1607) [%]
Any withdrawal	14.0	17.4
Only withdrawal	7.3	5.7
Withdrawal use among any withdrawal users using at least 2 methods	(n=104) [%]	(n=189) [%]
Two methods		
Withdrawal+condom	28.9	30.7
Withdrawal+hormonal <sup>b</sup>	50.0	41.3
Withdrawal+LARC <sup>c</sup>	1.0	1.1
Withdrawal+other barrier method <sup>d</sup>	2.9	2.7
Three or more methods		
Withdrawal+pill+condom	13.5	17.5
Withdrawal+pill+other barrier methods	0.0	1.1
Withdrawal+pill+other	0.0	0.0
hormonal methods		
Withdrawal+condom+other	2.9	0.5
barrier methods		
Withdrawal+condom+other	1.0	3.2
hormonal methods		
Withdrawal+2 other methods	0.0	1.6
Withdrawal+3 other methods	0.0	0.5

<sup>a</sup> All percentages are weighted.

<sup>b</sup> Hormonal methods=pills, patches, rings, injectables.

<sup>c</sup> LARC refers to long-acting reversible contraception, and includes IUDs, implants.

<sup>d</sup> Other barrier methods=diaphragms, female condoms, suppositories, jellies, creams, sponges, natural family planning methods.

last sex, sometimes in conjunction with a third method (e.g., condoms). Less than a third of any-withdrawal users reported additional use of a condom and no other method (29% of women, 31% of men).

3.3. Bivariate analyses

Few control variables were significantly and consistently associated with both types of withdrawal use at the bivariate level (Table 3). For women only, anticipated happiness upon

discovering a pregnancy was significantly associated with higher rates of both any and only use withdrawal. For example, 13% of those women who said they would be pleased by a pregnancy reported only use of withdrawal, compared to 6% of those who said they would be unhappy. Respondents who thought condoms would reduce their pleasure were also significantly more likely to report withdrawal use (any and only withdrawal use for men, only withdrawal use for women). For example, among men who said there was a good chance condoms would reduce

Table 3  
Distribution of Withdrawal Use by sociodemographic and Psycho-sexual Variables

	Any use of withdrawal		Only use of withdrawal		
	Women		Men		
	Row % <sup>a</sup>	p	Row %	p	
<b>Sociodemographic variables</b>					
Age					
15–19	17.6		21.0		
20–24	12.6		16.0		
Education					
No HS diploma or GED	14.0		13.2		
HS diploma or GED	13.3		19.6		
Any college or more	14.7		19.0		
Race/ethnicity					
White, non-Hispanic	15.3		18.6		
Black, non-Hispanic	12.2		13.8		
Other, non-Hispanic	13.9		14.8		
Hispanic	11.3		17.0		
Union status					
Married	11.8		7.0		<.001***
Cohabiting	11.7		10.5		
Single, not cohabiting	15.6		21.3		
Mother's education					
Less than high school	9.5		12.5		
High school graduate or GED	14.8		17.3		
Some college or more	15.1		18.7		
Reception of public assistance in last year					
Yes	11.5		12.8		<.05*
No	15.4		19.1		
Religion					
No religion	13.4		18.1		
Catholic	13.2		20.7		
Protestant	14.7		15.0		
Other religions	15.7		14.6		
Current health insurance					
No insurance	13.2		15.5		
Private insurance	16.0		19.4		
Public insurance	10.1		12.1		
<b>Psychosexual variables</b>					
If you got pregnant/got your partner pregnant, how would you feel?					
Upset	13.1		20.9		<.01**
Pleased	19.7		15.2		
Wouldn't care	48.2		26.8		
Chances of reduced physical pleasure if condom used					
A little chance or no chance	12.8		9.2		<.001***
50–50 chance	14.9		16.8		<.05**
A pretty good chance or certain chance	18.1		23.6		<.05*

<sup>a</sup> All percentage values are weighted to account for survey design effects. Row % refers to percent among subgroups by row.  
 \* p<.05.  
 \*\* p<.01.  
 \*\*\* p<.001.

pleasure, 24% reported any withdrawal use, compared to only 9% of those men who said condoms were unlikely to reduce pleasure.

### 3.4. Multivariate analyses

#### 3.4.1. Women: any use of withdrawal

Few covariates were significantly associated with withdrawal in the any-use model for women, save for mother's education and pregnancy and condom attitudes (Table 4). Women whose mothers had the highest levels of education were 2.2 times as likely to have used any withdrawal compared to respondents whose mothers had not completed high school ( $p < .05$ ). Compared to women who said they would be upset if they discovered they were pregnant, women who said they would be pleased had 2 times the odds of using any withdrawal [odds ratio (OR)=2.1,  $p < .01$ ]. In terms of condom attitudes, compared to women who said condoms were unlikely to diminish sexual pleasure, women who said condoms were likely to diminish pleasure were 1.7 times as likely to have used any withdrawal ( $p = .06$ ).

#### 3.4.2. Men: any use of withdrawal

Single, not-cohabitating men were significantly more likely to have used any withdrawal compared to married men (OR=6.3,  $p < .01$ ). Men with any type of public insurance were less likely to have used any withdrawal compared to those with no insurance (OR=0.48,  $p < .05$ ). Finally, compared to men who said condoms were unlikely to diminish their pleasure, men who said there was a 50–50 chance were 2.2 times as likely to have used any withdrawal ( $p < .05$ ), and men who said there was a good chance were 3.7 times as likely ( $p < .001$ ).

#### 3.4.3. Women: only use of withdrawal

Women with any type of public insurance were less likely to have used withdrawal only compared to those with no insurance (OR=0.39,  $p < .01$ ). Otherwise, only pregnancy and condom attitudes were significantly associated with women's only use of withdrawal. Women who said they would be pleased to discover they were pregnant were 2.6 times as likely to have used only withdrawal compared to women who said they would be upset ( $p < .01$ ). Also, women who said there was a good chance condoms would diminish their pleasure were 2.5 times as likely to have used only withdrawal compared to women who said there was little chance ( $p < .01$ ).

#### 3.4.4. Men: only use of withdrawal

Only condom attitudes were significantly associated with withdrawal-only for men. Compared to men who said condoms were unlikely to diminish their pleasure, men who said there was a 50–50 chance were 2.6 times as likely ( $p < .05$ ) to have only used withdrawal; men who said there was a good chance were 2.5 times as likely ( $p < .01$ ).

## 4. Discussion

### 4.1. Summary and notable findings

To our knowledge, this study is the first to use nationally representative data to analyze both young women's and young men's withdrawal practices. Our paper builds upon Dude et al.'s [8] analysis of young women's withdrawal patterns within the NSFG in several ways: we included young men, we focused on the last sexual episode, we distinguished between *any* and *only* use of withdrawal, and we included additional salient psychological and sexual attitudes. Our prevalence estimates ranged from 6%–7% of sexually active respondents having *only* used withdrawal to 14%–17% having used *any* withdrawal. Though slightly lower rates than other studies [6,7,19], these figures nonetheless suggest that up to one-in-six sexually active 15 to 24 year-olds reduce their risk of pregnancy with a method excluded from ACOG's [4] and the CDC's [5] lists of contraceptive methods.

Three other findings worth highlighting relate to men, any versus only withdrawal, and the importance of psychological and sexual associations.

First, our analysis sheds light on an important sexual risk reduction practice of young men, though men's findings were perhaps more notable in terms of their similarities versus differences to young women's. The literature usually classifies men's sexual "risk" as relating to sexually transmitted infections (STIs) alone. This absence of men in pregnancy prevention research may be influenced by the notion that men's reports of contraceptive use are less reliable than women's and/or the notion that men are less committed to pregnancy prevention [9]. However, withdrawal is a prophylactic that men can and do actively practice [7,20], and mounting evidence, including ours, suggests that men play a key role in couple-based contraceptive negotiation — especially condoms and withdrawal.

Second, our findings emphasize the important distinction between people who use *only* versus *any* withdrawal. In keeping with Jones et al.'s [6] recent analysis of withdrawal practices among adult women, significantly fewer people may practice withdrawal alone versus *in addition to* other methods such as pills, condoms or even IUDs. The majority of any-withdrawal users in our study also reported a hormonal method at last sexual episode. In these cases, and in keeping with qualitative research [20], withdrawal may serve as extra pregnancy protection. Such doubling or even tripling up of methods may represent various profiles of contraceptive users, including people extremely motivated to avoid pregnancy [6], couples in which men want to play their part in pregnancy protection (as in, "you take the pill, I'll pull out") or people who want to use withdrawal for some degree of STI/HIV prevention [22]. Future researchers may wish to further examine the relational, sexual, and pregnancy intention contexts in which people withdrawal as additional pregnancy or STI prophylaxis.

Table 4  
Multivariable logistic regression analyses of any only use of withdrawal, by gender

	Any use of withdrawal				Only use of withdrawal			
	Women		Men		Women		Men	
	OR <sup>a</sup>	95 % CI	OR	95 % CI	OR	95 % CI	OR	95 % CI
Sociodemographic variables								
Age								
15–19	Reference	–	–	–	–	–	–	–
20–24	0.59	(0.34–1.06)	0.74	(0.44–1.24)	0.67	(0.36–1.32)	1.75	(0.64–4.73)
Education								
No HS diploma or GED	Reference	–	–	–	–	–	–	–
HS diploma or GED	1.22	(0.70–2.11)	1.46	(0.80–2.69)	0.89	(0.40–2.00)	1.66	(0.60–4.64)
Any college or more	1.09	(0.52–2.25)	1.31	(0.64–2.67)	0.93	(0.36–2.39)	0.67	(0.16–2.77)
Race/ethnicity								
White, non-Hispanic	Reference	–	–	–	–	–	–	–
Black, non-Hispanic	0.81	(0.40–1.65)	0.93	(0.50–1.70)	1.11	(0.40–3.10)	1.28	(0.42–3.95)
Other, non-Hispanic	0.77	(0.28–2.13)	1.15	(0.46–2.87)	1.58	(0.48–5.23)	2.61	(0.91–7.54)
Hispanic	0.89	(0.41–1.92)	1.07	(0.53–2.16)	0.98	(0.40–2.44)	1.86	(0.62–5.60)
Union status								
Married	Reference	–	–	–	–	–	–	–
Cohabiting	1.07	(0.43–2.69)	2.74	(0.77–9.71)	0.45	(0.17–1.14)	1.11	(0.31–4.00)
Single, not cohabiting	1.39	(0.70–2.78)	6.25**	(2.07–18.90)	0.82	(0.38–1.79)	1.16	(0.41–3.33)
Mother's education								
Less than high school	Reference	–	–	–	–	–	–	–
High school graduate or GED	2.00	(0.92–4.37)	1.35	(0.65–2.80)	1.32	(0.52–3.34)	1.34	(0.43–4.19)
Some college or more	2.19*	(1.05–4.51)	1.46	(0.67–3.17)	1.46	(0.59–3.63)	1.62	(0.58–4.57)
Reception of public assistance in last year								
Yes	Reference	–	–	–	–	–	–	–
No	1.11	(0.63–1.97)	0.91	(0.56–1.48)	0.84	(0.38–1.88)	0.85	(0.42–1.72)
Religion								
No religion	Reference	–	–	–	–	–	–	–
Catholic	1.33	(0.75–2.37)	1.19	(0.65–2.16)	1.02	(0.39–2.65)	1.20	(0.40–3.63)
Protestant	1.03	(0.75–2.37)	0.81	(0.48–1.37)	0.91	(0.39–2.16)	0.59	(0.19–1.83)
Other religions	1.01	(0.45–2.62)	1.11	(0.34–3.62)	1.05	(0.37–2.98)	1.47	(0.33–6.61)
Current health insurance								
No insurance	Reference	–	–	–	–	–	–	–
Any type of private insurance	0.93	(0.52–1.64)	1.36	(0.68–2.07)	0.71	(0.35–1.44)	0.73	(0.30–1.81)
Any type of public insurance	0.60	(0.32–1.13)	0.48*	(0.25–0.95)	0.39**	(0.20–0.77)	0.58	(0.20–1.68)
Psychosexual variables								
If you got pregnant/got your partner pregnant, how would you feel?								
Upset	Reference	–	–	–	–	–	–	–
Pleased	2.11**	(1.30–3.42)	1.19	(0.68–2.09)	2.57**	(1.38–4.79)	0.83	(0.37–1.85)
Wouldn't care	6.48*	(1.21–34.79)	1.54	(0.34–6.93)	3.44	(0.56–21.2)	2.06	(0.40–10.54)
Chances of reduced physical pleasure if condom used								
A little chance or no chance	Reference	–	–	–	–	–	–	–
50–50 chance	1.53	(0.81–2.87)	2.22*	(1.17–4.23)	1.57	(0.72–3.42)	2.64*	(1.05–6.64)
A pretty good chance or certain chance	1.71†	(0.98–2.99)	3.73***	(2.31–6.02)	2.50*	(1.28–4.88)	2.54**	(1.31–4.93)

<sup>a</sup> All OR values are weighted to account for survey design effects.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

†  $p = .06$ .

Third, in terms of identifying populations for intervention, this study suggests that withdrawal may be more strongly associated with psychological and sexual attitudes than sociodemographic factors. Regarding pregnancy attitudes, we find it intuitive that women who would be pleased by a pregnancy would be using less effective contraceptive methods. Prior qualitative research suggests that it can be more appealing to let a pregnancy “just happen” than

deliberately setting out to get pregnant [21]. In terms of condom attitudes, our findings add to the evidence that condom and withdrawal practices can be closely connected. We included a measure related to condoms and pleasure not only because other research has documented condom–withdrawal combinations [6,12,13] but also because respondents in qualitative studies have described using withdrawal because condoms can reduce sexual pleasure [19,22]. We

were still surprised at the strength of the effect, for both men and women in our sample. The study thus underscores the importance of sexuality-related factors to contraceptive practices and acceptability.

#### 4.2. Clinical implications

We hope findings encourage clinicians to continue incorporating pleasure in their clinical work and counseling. The way both women and men sexually experience contraceptive methods can influence whether and how they use those methods [23]. Particularly if practitioners want to steer withdrawal-only users toward more effective methods, our results suggest that inquiring about pleasure-related concerns may be wise. People who experience condom-related pleasure reductions may also be advised to try a variety of condoms types and sizes and/or lubricants.

Findings may also support emerging efforts to better assess pregnancy attitudes and intentions as a standard part of reproductive health care [24,25]. Our study presents another example of how women's orientation toward pregnancy can be associated with contraceptive practices. We encourage the further development, testing and evaluation of tools to assess pregnancy orientation and ambivalence in clinical settings, even among clients assumed to be clear about wanting to avoid pregnancy (e.g., those seeking contraceptive services).

#### 4.3. Limitations

Since we restricted our study sample to 15 to 24 year-olds, findings cannot be generalized to all ages. The contraceptive profiles, including withdrawal practices, of young people just beginning sexual activity may differ from those who have been sexually active for longer periods of time. Another limitation pertains to our relationship-level data. Though we included union status, we did not have access to information on the length of the respondent's relationship with that partner, which may affect both condom use patterns [26] and withdrawal patterns [6]. Whenever possible, future contraceptive studies should include relationship length information.

#### 4.4. Conclusion

Understanding and addressing withdrawal use has important implications for sexual and reproductive health. Though withdrawal practices among 15 to 24 year-olds did not vary along many sociodemographic lines, they did vary significantly according to pregnancy orientation (women only) and attitudes related to condoms and pleasure (both women and men). Many young adults in the US use withdrawal regularly — especially women who experience pregnancy ambivalence and women and men who experience pleasure reductions during condom use.

#### Acknowledgments

During analysis and manuscript preparation, Dr. Higgins was supported by a National Institutes of Health K12 award (K12HD055894) from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD). Higgins and Wang also receive support from an NICHD Population Research Infrastructure grant (P2C HD047873). Finally, the authors acknowledge an internal grant from the University of Wisconsin-Madison Graduate School. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding organizations.

#### References

- [1] Mosher WD. Use of contraception in the United States: 1982–2008. DHHS publication no. (PHS) 2010–1981. National Center for Health Statistics; 2010 [Contract No.: 29].
- [2] Doherty IA, Stuart GS. Coitus interruptus is not contraception. *Sex Transm Dis* 2011;38(4):356.
- [3] Miller R. Withdrawal: “A very great deal better than nothing”. *Can J Hum Sex* 2003;12:189–90.
- [4] American Congress of Obstetricians and Gynecologists. [http://www.acog.org/For\\_Patients2013](http://www.acog.org/For_Patients2013).
- [5] Centers for Disease Control and Prevention. <http://www.cdc.gov/reproductivehealth/unintendedpregnancy/contraception.htm2013>.
- [6] Jones RK, Lindberg LD, Higgins JA. Pull and pray or extra protection? Contraceptive strategies involving withdrawal among US adult women. *Contraception* 2014;9:416–21.
- [7] Sznitman SR, Romer D, Brown LK, DiClemente RJ, Valois RF, Vanable PA, et al. Prevalence, correlates, and sexually transmitted infection risk related to coitus interruptus among African-American adolescents. *Sex Transm Dis* 2009;36(4):218–20.
- [8] Dude A, Neustadt A, Martins S, Gilliam M. Use of withdrawal and unintended pregnancy among females 15–24 years of age. *Obstet Gynecol* 2013;122(3):595–600.
- [9] Greene ME, Biddlecom AE. Absent and problematic men: demographic accounts of male reproductive roles. *Popul Dev Re* 2000;26(1):81–115.
- [10] Berer M. Male circumcision for HIV prevention: perspectives on gender and sexuality. *Reprod Health Matters* 2007;15(29):45–8.
- [11] Higgins JA, Popkin RA, Santelli JS. Pregnancy ambivalence and contraceptive use among young adults in the United States. *Perspect Sex Reprod Health* 2012;44(4):236–43.
- [12] Gray A, Chowdhury JH, Caldwell B, Al-Sabir A. Coitus-dependent family planning methods: observations from Bangladesh. *Stud Fam Plan* 1999;30(1):43–53.
- [13] De Visser R. Delayed application of condoms, withdrawal and negotiation of safer sex among heterosexual young adults. *AIDS Care* 2004;16(3):315–22.
- [14] Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspect Sex Reprod Health* 2006;38(2):90–6.
- [15] Lepkowski J, Mosher W, Davis K, Groves R, Van Hoewyk J. The 2006–2010 National Survey of Family Growth. Sample design and analysis of a continuous survey. Hyattsville, MD: National Center for Health Statistics; 2010 [Contract No.: 150].
- [16] Groves R, Mosher W, Lepkowski J, Kirgis N. Planning and development of the continuous National Survey of Family Growth. *Vital Health Stat* 2009;1(48):1–64.
- [17] Graham CA, Catania JA, Brand R, Duong T, Canchola JA. Recalling sexual behavior: a methodological analysis of memory recall bias via interview using the diary as the gold standard. *J Sex Res* 2003;40(4):325–32.

- [18] Weinhardt LS, Forsyth AD, Carey MP, Jaworski BC, Durant LE. Reliability and validity of self-report measures of HIV-related sexual behavior: progress since 1990 and recommendations for research and practice. *Arch Sex Behav* 1998;27(2):155–80.
- [19] Jones RK, Fennell J, Higgins JA, Blanchard K. Better than nothing or savvy risk-reduction practice? The importance of withdrawal. *Contraception* 2009;79(6):407–10.
- [20] Whittaker PG, Merkh RD, Henry-Moss D, Hock-Long L. Withdrawal attitudes and experiences: a qualitative perspective among young urban adults. *Perspect Sex Reprod Health* 2010;42(2):102–9.
- [21] Higgins JA, Hirsch JS, Trussell J. Pleasure, prophylaxis and procreation: a qualitative analysis of intermittent contraceptive use and unintended pregnancy. *Perspect Sex Reprod Health* 2008;40(3):130–7.
- [22] Higgins JA, Gregor L, Mathur S, Nakyanjo N, Nalugoda F, Santelli JS. Use of withdrawal (coitus interruptus) for both pregnancy and HIV prevention among young adults in Rakai, Uganda. *J Sex Med* 2013;11:2421–7.
- [23] Higgins JA, Davis AR. Sexuality and contraception (chapter 1). In: & Hatcher RA, et al, editor. *Contraceptive technology*. New York, NY: Ardent Media; 2011, pp. 1–8.
- [24] Bellanca HK, Hunter MS. ONE KEY QUESTION(R): preventive reproductive health is part of high quality primary care. *Contraception* 2013;88(1):3–6.
- [25] Bello JK, Adkins K, Stulberg DB, Rao G. Perceptions of a reproductive health self-assessment tool (RH-SAT) in an urban community health center. *Patient Educ Couns* 2013;93(3):655–63.
- [26] Fortenberry JD, Tu W, Harezlak J, Katz BP, Orr DP. Condom use as a function of time in new and established adolescent sexual relationships. *Am J Public Health* 2002;92(2):211–3.