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Original article

Pregnancy Intentions and Contraceptive Behaviors Among Adolescent Women: A Coital Event Level Analysis

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Abstract

Purpose: Measuring pregnancy intentions has been difficult. This study examines questions regarding pregnancy intentions and their association with adolescents' sexual and contraceptive behaviors longitudinally.

Methods: Adolescent women completed an interview about pregnancy intentions followed by a 3-month daily diary period reporting coital activity and contraception use. Interviews assessed pregnancy intentions with: "Are you trying to get pregnant now?," "Are you trying to keep from getting pregnant now?," and "I'm very committed to not getting pregnant at this time in my life." The measured outcome was the occurrence of contraceptive protected versus non-protected coitus collected from diary data. Logistic regression was used to assess this relationship.

Results: A total of 289 women completed 677 face-to-face interviews and subsequent 3 months of diary collection. In all, 194 reported having sex during diary collection. Women trying to keep from getting pregnant (n = 265) had 51.8% of 2533 coital events covered by contraception, whereas 13.1% of 818 coital events were protected in those women who were not trying to keep from getting pregnant (OR = 9.2, 95% CI = 6.0, 13.9). Women who agreed that they were committed to not getting pregnant were more likely to have coital events protected (50.5% of 2574 events) than those who disagreed (21.2% of 576 events) (OR = 9.8, 95% CI = 5.5, 17.3).

Conclusions: Adolescents' contraceptive behaviors were associated with reported intentions. However, approximately one half of coital events were not protected in women who agreed that they were committed to not getting pregnant. These women may represent a group at risk for unintended pregnancy.

Keywords: Adolescent behavior; Pregnancy in adolescence; Contraception; Pregnancy intentions

Each year almost 750,000 adolescent girls aged 15–19 become pregnant in the United States [1,2]. Most of these pregnancies are unplanned, accounting for about one fourth of all U.S. accidental pregnancies annually [3]. Reliable pregnancy prevention requires both contraceptive method choice and method adherence. "Method choice" involves evaluation of a small set of alternatives within the context of method-specific issues (e.g., medical contraindications, effectiveness, side effects, costs) and personal influences (e.g., attitudes about pregnancy and contraception, partner attitudes). "Method adherence" requires following relatively strict method use requirements to maximize method-specific contraceptive effectiveness.

Among the many factors associated with both method choice and method adherence, pregnancy intentions have the most obvious proximal relevance. Women–even young women–may form a specific intention to become pregnant and

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engage in coitus for this reason. Up to 40% of adolescent women express strongly positive or ambivalent feelings about immediate childbearing [3,4]. However, many young women do not intend to become pregnant, but simply fail to effectively use a contraceptive method. This lack of proactive pregnancy prevention may be due to either misinformation or ambivalence about pregnancy risk, or due to environmental concerns, such as poor access to contraception, self-esteem or influence of their partners and social circles [5].

The disjunction between intentions and behavior has led some to suggest that adolescents are too immature cognitively to adequately form intentions about matters as serious as pregnancy and childbearing. Others contend that factors such as behavioral impulsivity, emotional lability, and "raging hormones" sever any consistent relationship of intentions and behavior [6]. Another popular perspective suggests that "risk-taking" is an inherent aspect of adolescent development, leading to behaviors that contradict intentions [7]. However, there is limited empirical support for any of these perspectives.

Results of research on the relationship of pregnancy intentions and contraceptive behaviors are mixed. Measuring pregnancy intentions to identify an at-risk population, particularly among adolescents, has been difficult [8,9]. Stevens-Simon et al. proposed that asking about intentions to remain non-pregnant may better target young women at risk for pregnancy [10]. These questions asking about intentions to remain non-pregnant may be a more active question that demands that the patient critically evaluate her proactive behavior necessary to prevent pregnancy—the normal or default state for the sexually active woman. For the purposes of the present study, this more active question about intention to remain non-pregnant is important in that it may identify greater commitment in young women's adherence to a specific contraceptive method.

This study seeks to validate adolescent women's intentions regarding "trying to remain non-pregnant" as they relate to actual contraception behaviors evaluated prospectively. Validation of two other more traditional questions of pregnancy intentions is also assessed. By examining pregnancy intentions and subsequent daily sexual and contraceptive behaviors we tested the hypothesis that reported pregnancy intentions predict contraceptive behavior when reported longitudinally. In addition, we sought to identify factors associated with unprotected coital events among women who did not wish to become pregnant. These factors could then act as predictors to better identify and target those young women who may be at risk for unintended pregnancies.

Methods

Data were collected as part of an ongoing, longitudinal study of risk and protective factors associated with the acquisition of sexually transmitted diseases among women in adolescence. Briefly, the larger study consisted of interviews at 3-month intervals beginning at enrollment, complemented by self-report diary periods of approximately 84 days to follow every other quarterly interview. Each diary collection cycle was initiated and terminated by a face-to-face quarterly interview and was followed by a rest period of similar length in which no diary information was collected. During diary reporting periods, study personnel collected diaries at the women's home on a weekly basis.

Young women were recruited for this study from three primary care adolescent clinics in a moderately large city. These clinics serve urban areas characterized by high rates of poverty, early pregnancy, and sexually transmitted infections [11]. Entry criteria included age between 14 and 17 years, stated proficiency in English, and no current pregnancy per patient report and clinical suspicion. Participants remained in the study, however, if they became pregnant during the follow-up period. Sexual activity was not an entry criterion. Informed consent was obtained from each participant and their parent or legal guardian. The IUPUI Institutional Review Board approved this project. All women were reimbursed monetarily at enrollment, with each quarterly interview, and for each daily dairy page completed. Formal assessment was not carried out on those who refused to participate.

For this specific study, analysis focused on diary periods that were initiated by a quarterly interview that contained pregnancy intention questions followed by a 3-month diary period. Specific pregnancy intentions questions were added to the larger interview in early 2004, several years into the initiation of the original study. Quarterly interviews assessed pregnancy intentions. In these face-to-face interviews, women were asked, "Are you trying to get pregnant now?" and "Are you trying to keep from getting pregnant now?" with response choices of "Yes" and "No." Women also responded to a four-point Likert scale question, "I am very committed to not getting pregnant at this time in my life (strongly disagree, disagree, agree, and strongly agree)."

Recognizing that a partner's desire for a pregnancy has been an identified risk factor for a teen pregnancy [12], we examined partners' potential influence on pregnancy intentions indirectly. Young women were asked at quarterly interviews about reasons for having sex, including the importance of their partners' desire for them to get pregnant. Specifically, they were asked, "Would you state 'My partner wants me to get pregnant' is not important, a little important, or very important as one of your reasons to have sex?" If a subject reported more than one sexual partner, she was asked to comment on the pregnancy intentions of her perceived closest partner. All pregnancy intention questions were strategically placed within the interview to match content areas queried. The questions were piloted on the first 20 respondents to ensure that the questions were easily

understandable. Participants could decline or skip any question asked.

Diaries required that women report on a daily basis whether an oral contraceptive pill (OCP) was taken or another contraceptive was used that day, whether coitus occurred, and if coitus did occur, if a condom was used. Diaries have been shown to improve data reliability by affording relative anonymity and by increasing the temporal proximity of data collection to the events being measured [13,14]. Clinic charts were reviewed to collect depot medroxyprogesterone acetate (DMPA) administration data. A coital event protected by birth control was identified if DMPA was administered within 98 days of coitus, condom use was reported in the diary at the time of the event, or an oral contraceptive pill was taken the day before and the day of the coital event. Our rationale for defining coitus protected by pill use as day before and day of coitus assures that not more than two consecutive days of missed pills occurred around that specific coital event. This rationale is based on the following: (1) pituitary–ovarian suppression may decline as the number of missed pills increases, especially if the OCP contains less than 30 μg of estrogen [15], and (2) although ovulatory "escape" is rare even with early cycle pill omission, we believe two or more missed pills constitutes an OCP adherence pattern associated with increased risk of ovulation and pregnancy [16,17]. Contraceptive patch use was assessed, but seventeen women used the patch and only one coital event occurred among these women adding little to the analysis. Emergency contraception was not assessed during this study.

We expected situational influences to factor into a woman's decision to have sex and use protection during sex on any given day. The diary questionnaire asked each woman to report whether she used marijuana or alcohol on a given day. Other situational measures assessed mood, sexual interest, and partner support. Partner support was assessed by reports of partner talking about her feelings, letting the women knows he cares, making the participant feel loved, and making her feel special (Cronbach's α = .67). Positive mood (Cronbach's α = 0.86) was based on women's report of being happy, friendly, and cheerful on that specific day of having sex. Negative mood (Cronbach's α = .72) was based on reports of being angry, unhappy and irritable. Feelings of being in love and sexual interest were assessed by single items assessing what proportion of the day (on a five-point scale from "none" to "all day") the participant felt "in love" or "sexual." These specific daily reports were used to assess potential influences that could explain discrepancies between contraception use and pregnancy intentions.

Analysis was aimed at assessing each of the pregnancy intention questions' ability to predict contraception protection of subsequent coital events. Univariate logistic models for binary data were used to assess relationships between each pregnancy intention question and the likelihood of a condom or hormonal contraceptive-protected coital event. A random subject intercept was included to accommodate the potential correlation of events from the same subject. For those women who stated that they were not trying to get pregnant, univariate logistic models with random subject intercepts were used to assess associations between protection of a coital event and sentiments of partner support, being in love, and sexual interest as well as positive or negative mood and use of marijuana and alcohol. Univariate associations were also examined by fitting logistic models which included age and previous pregnancy. Each of these independent variables that were significant at .3 level were entered into a large multivariable model for the protection of a coital event. Backwards elimination was used to remove non-significant variables until a final multivariable model was reached where all independent variables were significant at the 0.05 level. SAS version 9.1 was used for analyses (SAS Institute, Cary, NC; www.sas.com).

Results

There were 387 enrolled subjects in the cohort. At enrollment the average age was 15.3 years, and 28% of subjects reported no lifetime coital experience. At the most recent follow-up fewer than 10% remained without coital experience. Of the 387 enrolled, 291 had reported previous sexual activity and had interview data that could be used for this analysis. However, two participants were excluded due to inconsistent responses in the interview, so final analyses consisted of 289 women. Mean age at time of the first interview that included the pregnancy intention questions was 17.2 years. The demographics of this study mirror that of our urban clinics as 261 study participants (90.3%) are African-American, 19 (6.6%) are white, and 9 (3.1%) are Hispanic or multi-racial.

The 289 women contributed 677 study periods consisting of an interview followed by a completed 3-month diary period. There were more study periods analyzed than women enrolled as each woman was able to contribute more than one interview and prospective diary data collection if she was enrolled in the larger study for two or more diary cycles. Of the 289 women, 194 reported sex during the subsequent diary reporting period (3450 coital events were noted in total). A minority (n = 17, 5.9%) reported, at least once during a quarterly interview, that they were trying to get pregnant, whereas 270 (94.1%) women stated they were not. When asked if they were trying to keep from getting pregnant a larger minority (n = 21, 7.3%) responded "no," but a majority (n = 265, 92.7%) stated "yes." Most women (n = 264, 94.6%) strongly agreed or agreed with being committed to not getting pregnant, whereas 15 disagreed or strongly disagreed with this statement (Table 1). Responses were consistent for the 17 women who reported that they were trying to get pregnant: 16 reported that they were not trying to prevent a pregnancy, and 13 stated that they disagreed or strongly disagreed with the statement that they

Table 1
Summary of pregnancy intentions (N = 289*) as assessed in face-to-face interviews

Intention	No. of female adolescents (%)
Trying to get pregnant?	
Yes	17 (5.9)
No	270 (94.1)
Trying to keep from getting pregnant?	
Yes	265 (92.7)
No	21 (7.3)
Committed to not getting pregnant?	
Strongly agree	227 (81.4)
Agree	37 (13.3)
Disagree	12 (4.3)
Strongly disagree	3 (1.1)

* Totals may be <289 due to non-responses.

were committed to not getting pregnant (one did not respond to this question). There were 16 subjects who reported simultaneously that they were not trying to get pregnant yet reported that they were not trying to prevent a pregnancy. Five of these 16 women disagreed or strongly disagreed with the statement that they were committed to not getting pregnant.

Although 194 (67.1%) reported having sex during at least one of the 3-month periods, no coital activity occurred for 92.8% (n = 44,599) of the days. The percent of coital events not protected by any form of contraception on days in which sex occurred was 57.4% (n = 1976).

For the 17 girls who stated they were trying to get pregnant, 89.7% of coital events were unprotected. Of those sexual events in women who responded "no" when asked if they were trying to get pregnant, only 44.8% of those events were protected by contraception; thus the odds of having a protected coital event were significantly lower if the subject says she is trying to get pregnant (OR = 0.18, 95% CI = 0.10, 0.35) (Table 2). Women who reported that they were trying to keep from getting pregnant had 51.8% of 2533 coital events covered by one or multiple contraceptive methods, whereas only 13.1% of 818 coital events that were protected by those women who were not trying to keep from getting pregnant (OR = 9.2, 95% CI = 6.0, 13.9). Women who agreed or strongly agreed that they were committed to not getting pregnant had significantly greater likelihood of having protected coital events (50.5% of total 2574 events) than those who strongly disagreed or disagreed (21.2% of 576 coital events; OR = 9.8, 95% CI = 5.5, 17.3). However, 49.5% of coital events were still unprotected for those who reported agreeing or strongly agreeing to being committed to not getting pregnant.

Complete stratification of women's responses to the Likert scale on commitment to not getting pregnant demonstrated a graduated increase in the percent of protected events between those that agreed to a commitment to not get pregnant (45.8% of 884 coital events) and those that strongly agreed to a commitment to not get pregnant (53.0% of 1690 coital events, $p = .0062$) (Table 2). There was no significant difference in the percentage of protected events between those that disagreed (24.8% of 431 coital events) and those that strongly disagreed (10.3% of 145 events) to being committed to not getting pregnant.

Of those sexual events that occurred with women who reported that their partners' desire for them to get pregnant was not an important reason for sex, 52.4% of coital events (n = 1631) were protected. Of those sexual events that occurred with women who stated their partner's desire for them to get pregnant was an important reason to have sex, only 29.6% of sexual events (n = 388) were protected by contraception (Table 2). This demonstrates a statistically significant decrease in the odds of a protected sexual event by contraception if the boyfriend's attitude on pregnancy is of importance in a woman's motivations for intercourse (OR = .44, 95% CI = .26, .74) (Table 3).

Multivariable logistic models with random subject intercepts were used to assess whether age or a previous pregnancy together with pregnancy intentions influenced the likelihood of event-specific contraceptive protection. When controlling for these variables, all three pregnancy intention questions still significantly predicted the likelihood of using contraception. Interestingly, having a previous pregnancy and being older was associated in all models except one (commitment to not getting pregnant) with reduced odds of having a protected coital event (Table 3).

Table 2
Summary of pregnancy intentions and associated contraceptive protection abstracted from daily diary data

	Number of sexual events	Number of sexual events protected (%)	p Value
Trying to get pregnant?			
Yes	261	27 (10.3)	
No	3121	1398 (44.8)	<.0001
Total	3382	1425 (42.1)	
Trying to keep from getting pregnant?			
Yes	2533	1311 (51.8)	
No	818	107 (13.1)	<.0001
Total	3351	1418 (42.3)	
Committed to not getting pregnant?			
Strongly agree	1690	897 (52.2)	
Agree	884	405 (45.8)	
Disagree	431	107 (24.8)	<.0001
Strongly disagree	145	15 (10.3)	
Total	3150	1423 (45.2)	
Reasons for sex: My partner wants me to get pregnant			
A little important/very important	388	115 (29.6)	.0020
Not important	1631	854 (52.4)	
Total	2019	969 (48.0)	

Table 3
Multivariate models for affect of age and previous pregnancy on coital protection

Model	Univariate estimate (SE)	Multivariate estimate (SE)	*p* Value
Committed to not getting pregnant	2.28 (.29)	2.21 (.30)	<.0001
Age		−1.06 (.16)	<.0001
Previous pregnancy		−.44 (.50)	NS
Trying to keep from getting pregnant	2.22 (.21)	2.06 (.21)	<.0001
Age		−.78 (.13)	<.0001
Previous pregnancy		−.91 (.43)	.04
Trying to get pregnant	−1.70 (.32)	−1.78 (.33)	<.0001
Age		−.92 (.14)	<.0001
Previous pregnancy		−1.04 (.44)	.02
My partner wants me pregnant	−.83 (.26)	−.77 (.27)	.005
Age		−.66 (.17)	<.0001
Previous pregnancy		−1.93 (.56)	<.0001

Many coital events are unprotected despite young women's stated wishes to avoid pregnancy. This suggests that specific situational events could lead to this intentions-behavior discrepancy. Therefore, other day-to-day variables were analyzed to determine potential influence on the use of contraception on a given day. These variables included subject's daily assessment of her partner's support, feelings of being in love, sexual interest, feelings of positive or negative mood, and use of marijuana or alcohol. We specifically looked at those individuals who reported they were not trying to get pregnant. Examining only coital events that were associated with women who reported that they were not trying to get pregnant, we found that the odds of having a protected event significantly decreased with increasing partner support (OR = .88, $p < .05$), more feelings of being in love (OR = .79, $p < .0001$) and increased negative mood (OR = .94, $p < .05$) (Table 4).

Discussion

Consistent with the work of Stevens-Simon, our data suggest that the majority of adolescent women are committed to not getting pregnant and that this commitment is generally associated with contraceptive behavior during the subsequent 3 months [10]. In fact, we found that two other questions about pregnancy intentions also predicted subsequent contraceptive behavior. Those who were as well as those who were not attempting pregnancy generally used contraceptives in a fashion consistent with intentions for the majority, albeit the simple majority of coital events. These findings argue against perspectives depicting adolescents as contraceptive risk-takers, or developmentally incapable of evaluating risk of pregnancy and taking appropriate preventive actions.

On the other hand, a substantial proportion of specific coital events were not protected by a hormonal or barrier contraceptive, even among young women who did not wish to become pregnant and were committed to avoiding pregnancy. This finding points to the need to consider the day-to-day variations in mood, emotions and interactions with a sex partner that influence decisions about sex as well as contraceptive decision-making. In fact, we found that the degree of negative mood on a given day, the degree of love felt for a partner, and the amount of support received from a partner were all independently associated with decreased likelihood of a coital event protected by a contraception. This suggests that subsequent research should give additional attention to the complex interactions of sex, fertility, and close personal interactions.

Our findings should be considered in light of limitations related to the type of sample we studied, the way in which data on event-specific sexual and contraceptive behaviors were collected, and the definitions used for event-specific contraceptive protection. In terms of the sample, the young women were mostly African-American, living in neighborhoods with high rates of early child-bearing and sexually transmitted infections. In this sense, the participants were high-risk and deserving of study. However, sexual and contraceptive behaviors, as well as attitudes about early pregnancy substantially vary according to racial/ethnic, educational and socioeconomic criteria. Our results cannot be directly generalized to other groups, although they should inform similar investigations in those groups.

Our analyses rely heavily on event-specific data collected by daily diary self-reports. Potential problems with diaries include missing diary days, back-filling, and diary reactivity. Missing diary reports of behaviors such as sexual activity or condom use may be important if a large proportion of days have missing data, or if the missing data occurs in a non-random fashion. However, we noted missing data for coitus and condom use for only about 1% of days, suggesting that these missing data have little or no effect on our results. Backfilling occurs when participants retrospectively complete diaries several days afterwards. We are aware of this occurrence in our sample but limited its impact

Table 4
Univariate and multivariate models for use of contraception at coitus for subjects not trying to get pregnant

Variable	Univariate OR (95% CI)	Mutivariate OR (95% CI)	*p* Value
Partner support	.83 (.73, .94)	.88 (.77, .99)	<.05
Feeling of being in love	.78 (.70, .86)	.79 (.70, .88)	<.0001
Sexual interest	.95 (.86, 1.06)		
Positive mood	.95 (.91, 1.00)		
Negative mood	.97 (.91, 1.02)	.94 (.89, .99)	<.05
Marijuana use	1.33 (.92, 1.93)		
Alcohol use	1.33 (.84, 2.11)		

by forming good rapport with our participants and picking up diaries once a week. Diary reactivity may occur when the daily process of diary completion acts to change behaviors. In the present case, for example, the daily process of reporting on sexual behavior and condom use could prompt young women to more conscientious condom use. Little research addresses diary reactivity among adolescents, although few studies report significant reactivity with older participants reporting on a number of issues [18]. We also saw little evidence of diary reactivity in extensive analyses not reported here (J.D. Fortenberry, personal communication).

Finally, our findings should be considered in light of the definitions of event-specific contraceptive protection used here. We used logical but arbitrary definitions of protection based on event-specific condom use, oral contraceptive pill-taking in temporal proximity to coitus, or coitus within a temporal window of DMPA effectiveness. Physiologic indicators of menstrual cycle or ovulation were not assessed. Therefore, the actual pregnancy risk associated with any given coital event was unknown. However, very few studies of adolescent contraceptive behavior judge pregnancy risk by physiologic measures. Most infer risk, as we did, based on absence of known impairments to fertility among the sample under study. Moreover, young women themselves seldom have a clear idea of their ovulation status and we must assume that any given coitus is associated with pregnancy risk.

This is the first study of which we are aware that has validated pregnancy intentions in a prospective fashion using daily reported behaviors. To date the clinical literature has documented more global measures associated with use of contraception for a period of time, but lacks attention to supporting factors that influence day-to-day consistency. Conventional measures such as use at first intercourse, use at last intercourse, or use over a given time period fail to capture alternating periods of use and nonuse as attitudes and motivation change. These broad measures of contraceptive behavior may underestimate pregnancy intentions while overestimating effective contraceptive use [19], and may further confound our understanding of adolescent women's sexual behavior.

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References

[1] Alan Guttmacher Institute, U.S. Teenage Pregnancy Statistics: National and State Trends and Trends by Race and Ethnicity. Available at: http://www.guttmacher.org/pubs/2006/09/11/USTPstats.pdf. Accessed December 20, 2006.

[2] Henshaw S. U.S. Teenage Pregnancy Statistics with Comparative Statistics for Women Aged 20–24. New York AGI 1999:5.

[3] 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.

[4] Rainey DY, Stevens-Simon C, Kaplan DW. Self-perception of infertility among female adolescents. Am J Dis Child 1993;147:1053–6.

[5] Stevens-Simon C, Sheeder J, Beach R, et al. Adolescent pregnancy: Do expectations affect intentions? J Adolesc Health 2005;37:243.e15–22.

[6] Adler NE, Kegeles SM, Irwin CE, Jr., et al. Adolescent contraceptive behavior: An assessment of decision processes. J Pediatr 1990;116:463–71.

[7] DiClemente R. Predictors of Risky Adolescent Sexual Behaviors. Sluice Dock, Connecticut: Dushkin Publishing Group, 1990.

[8] Speizer IS, Santelli JS, Afable-Munsuz A, et al. Measuring factors underlying intendedness of women's first and later pregnancies. Perspect Sex Reprod Health 2004;36:198–205.

[9] Rosengard C, Phipps MG, Adler NE, et al. Adolescent pregnancy intentions and pregnancy outcomes: A longitudinal examination. J Adolesc Health 2004;35:453–61.

[10] Stevens-Simon C, Beach RK, Klerman LV. To be rather than not to be–that is the problem with the questions we ask adolescents about their childbearing intentions. Arch Pediatr Adolesc Med 2001;155:1298–1300.

[11] Orr DP, Johnston K, Brizendine E, et al. Subsequent sexually transmitted infection in urban adolescents and young adults. Arch Pediatr Adolesc Med 2001;155:947–53.

[12] Cowley C, Farley T. Adolescent girls' attitudes toward pregnancy: The importance of asking what the boyfriend wants. J Fam Pract 2001;50:603–7.

[13] Fortenberry JD, Cecil H, Dimet GD, et al. Concordance Between Self-report Questionnaires and Coital Diaries for Sexual Behaviors of Adolescent Women with Sexually Transmitted Infections. Bloomington, IN: Indiana University Press, 1997.

[14] Leigh BC. Alcohol consumption and sexual activity as reported with a diary technique. J Abnorm Psychol 1993;102:490–3.

[15] Hamilton CJ, Hoogland HJ. Longitudinal ultrasonographic study of the ovarian suppressive activity of a low-dose triphasic oral contraceptive during correct and incorrect pill intake. Am J Obstet Gynecol 1989;161:1159–62.

[16] Elomaa K, Rolland R, Brosens I, et al. Omitting the first oral contraceptive pills of the cycle does not automatically lead to ovulation. Am J Obstet Gynecol 1998;179:41–6.

[17] van Heusden AM, Fauser BC. Residual ovarian activity during oral steroid contraception. Hum Reprod Update 2002;8:345–58.

[18] Shrier LA, Shih MC, Beardslee WR. Affect and sexual behavior in adolescents: A review of the literature and comparison of momentary sampling with diary and retrospective self-report methods of measurement. Pediatrics 2005;115:573–81.

[19] Glei DA. Measuring contraceptive use patterns among teenage and adult women. Fam Plann Perspect 1999;31:73–80.