Motivational Factors Affecting Fluctuations of Female Sexual Activity at Menstruation

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The hypothesis was tested that pre-menstrual and post-menstrual increases in sexual activity are due to anticipation of deprivation and rebound following deprivation (Ford & Beach, 1951) Thirty-five married women completed daily questionnaires about their sexual activity for at least two menstrual cycles Evidence supported the hypothesis that the post-menstrual peak in intercourse is a rebound phenomenon There was less evidence to support the hypothesis that a pre-menstrual rise represents anticipation of deprivation In addition, there was a tendency to increase autosexual activity during periods of sexual abstention, which may represent a compensation phenomenon

Prior research has frequently reported a heightening of sexual feelings and coital frequency in the human female both immediately before and after menstruation (Davis, 1926, James, 1971, McCance, Luff & Widdowson, 1937, Spitz, Gold & Adams, 1975, Udry & Morris, 1968, 1970) In a recent experiment, Ruble (1977) has also demonstrated that women expect to feel increased levels of sexual arousal prior to menstruation. College students who were told that they would menstruate in one—two days reported greater sexual

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arousal than students who were told they would not menstruate for seven—ten days, even though both groups were at equivalent stages of the cycle Ford and Beach (1951) have hypothesized that these pre- and post-menstrual peaks occur because couples tend to abstain from intercourse during menstruation They interpret the rise in sexual activity prior to menstruation as an anticipation of abstinence during menstrual flow and the rise following menstruation as a rebound effect following sexual deprivation

Three predictions would appear to follow from the Ford and Beach hypothesis (1) similar increases in rates of heterosexual activity should be observed before and after other times of enforced abstinence, e g , when one partner is away from home, (2) during periods of abstinence or partner absence an individual should attempt to compensate for the drive deprivation by increasing use of alternative sexual outlets that do not require a partner e g , sexual fantasy, masturbation, and (3) the more one abstains from intercourse during menstruation, the greater should be the pre- and post-menstrual rises in heterosexual activity and the menstrual rise in fantasy and masturbation The present study tests the validity of the Ford and Beach hypothesis by examining data bearing on each of these three predictions

METHOD

The data were obtained in a panel study of the sexual behavior of 35 white, college educated, married women, aged 21 to 37 All participants had been carefully screened to eliminate individuals with marital or medical (especially gynecological) problems that might affect sexual activity or menstrual cyclicity Twelve participants had been taking combination oral contraceptives for at least six months, twelve used a diaphragm, foam, male condom, or combination of these techniques, nine used an intrauterine device (IUD), and two had husbands with vasectomies Because the patterns of sexual activity were similar for all three contraceptive groups, their data were combined for presentation and analysis

All participants filled out daily questionnaire sheets on which they recorded all sexual experiences, including data on the following intercourse, caressing, and autosexual activity, which was calculated as the sum of masturbation, fantasy and arousal due to books, magazines, films or dreams Participants also recorded the initiator of each heterosexual experience (mutual, self or partner), whether the partner had rejected an initiation by the participant or vice-versa, and whether they or their partners had spent the day and night away from home Completed questionnaires were deposited

with the experimenter at the end of each week, at which time additional questionnaires for the next week were distributed Reliability of the autosexual activity measure was 82, calculated as the correlation between each woman's rate from her first cycle and the rate from her second cycle We have previously demonstrated the validity of the measure by showing that it apparently reflects fluctuations in sex-related hormone levels at ovulation (Adams, Gold & Burt, 1978)

The 35 participants completed data for a total of 165 menstrual cycles, varying in duration from 23 to 36 days The number of cycles completed by each subject ranged from 2-12, with a median of 4 2, and a mode of 3 Duration of menstrual flow varied from 2-10 days with a median of 4 1 days Duration of partner absence varied from 1-7 days Only those absences of two or more days are used in the analyses in order to make the data comparable to that of menstrual flow Eighteen women reported such absences, for a total of 36 periods of partner absence The median length of these periods was 2 2 days These 18 women did not differ from the rest of the sample with regard to level of sexual activity or contraceptive group

RESULTS

Figure 1 presents data relevant to the first two predictions that sexual activity should exhibit the same pattern of fluctuations around periods of partner absence as around menstruation Graphs for intercourse and autosexual activities are presented separately Days of menstrual flow and partner absence are represented by the shaded areas on the graph Only the first five days of menstruation and the first four days of a period of partner absence are plotted because of the small number of subjects with longer periods of menstrual flow or partner absence Data from the four days directly preceding the onset of menstruation and partner absence and the four days directly following the cessation of menstruation and partner absence are also shown in the figure A baseline rate is drawn in each figure to show how rates at menstruation and partner absence compare to those from the entire cycle The rates represent the mean *number* of intercourse sessions or autosexual activities occurring on a single day The baseline corresponds to the overall average number of sexual activities for the women whose data are represented in the figure (all 35 subjects in the menstrual figure, 18 subjects in the partner absence figure). Because the lengths of some subjects' periods of menstrual flow (partner absences) were shorter than five (four) days, the number of participants upon which the points in the shaded areas are based decreases over time

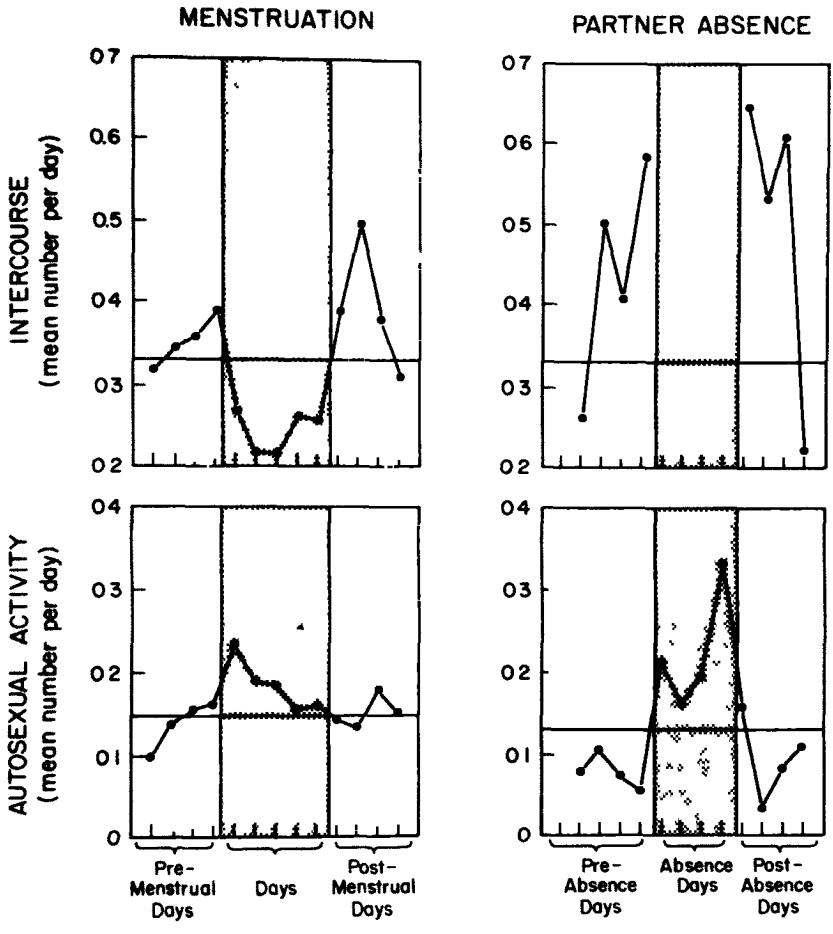

FIGURE 1 (A) Mean rates (number/day) of intercourse and autosexual activities before, during, and after menstruation Each mean is computed from the means of individual subjects for the day indicated Shaded area represents the first five (or fewer for subjects who always had fewer than five) days of menstrual bleeding The solid horizontal line represents the mean rates of intercourse and autosexual activities over the entire cycle for the 35 participants (B) Mean rates of intercourse and autosexual activities before, during, and after absence of partner Each mean is computed from the means of the 18 subjects who reported periods of partner absence of at least two days Shaded area represents first four (or fewer if not four in a given instance) days of partner absence The solid horizontal lines represent the mean rates of intercourse and autosexual activities over the entire cycle for these 18 participants

Most of the predicted effects are evident in the figure There was an increase in intercourse rate immediately preceding both menstruation and partner absence During menstruation there was a large decrease in intercourse frequency, which is analogous to the lack of intercourse during partner absence Autosexual activity showed the expected increase during menstruation and during partner absence Following both menstruation and partner absence, there was an increase in intercourse rate As described below in greater detail, most of these effects were statistically significant The increases in intercourse preceding menstruation and partner absence and the increase in autosexual activity during menstruation were not significant, however

We have also analyzed each of the three menstrual effects for pill and nonpill subjects separately Both groups exhibited all the effects Although there were no significant differences between the groups, the pill subjects tended to show greater increases in intercourse rates before and after menstruation

The third prediction, concerning the effects of the degree of abstinence upon menstrual sexual activity patterns, was examined by dividing the sample into two approximately equal groups on the basis of their relative coital abstention during menstrual flow This division was accomplished through a z score tranformation in which each woman's average rate of intercourse during menstruation was subtracted from her rate during the rest of the cycle The 19 subjects comprising the group of individuals who tended to abstain from intercourse during menstruation had an average z score rate of menstrual intercourse of -43 (S.D $= 21$) The 16 subjects who tended not to abstain had an average z score rate of 05 (S D $= 16$) The subjects in the two groups did not differ with regard to length of menstrual flow, level of sexual activity at other times during the cycle, or type of contraceptive method used As shown in Figure 2, the post-menstrual level of intercourse was greater for the group of subjects who abstained from intercourse during menstrual flow than for the remainder of the subjects who tended not to abstain during menstruation However, contrary to the prediction, not only the abstainer subjects, but also the non-abstainers as well, showed levels of intercourse prior to menstruation and levels of autosexual activity during menstruation which were above baseline rates.

All statistical tests for menstrual effects were done using 2×2 repeated measures of analyses of variance of intercourse and autosexual rates with the abstainer and non-abstainer groups as a between-subjects variable and appropriate cycle days as within-

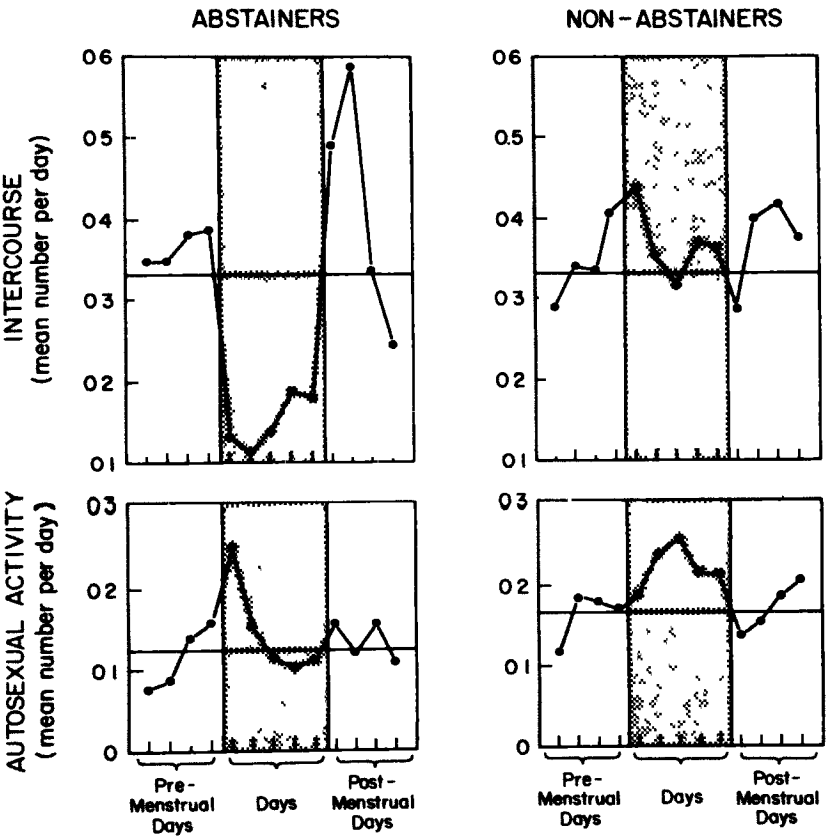

FIGURE 2 (A) Mean rates (number/day) of intercourse and autosexual activities before, during, and after menstruation for the 19 subjects who abstained from intercourse during menstrual bleeding Each mean is computed from the means of these subjects for the day indicated (B) Mean rates of intercourse and autosexual activities before, during, and after menstruation for the 16 subjects who tended not to abstain from intercourse during menstrual bleeding Each mean is computed from the means of these subjects for the day indicated Shaded area represents first five days of menstrual flow, and the solid horizontal lines represent baseline rates as explained in Figure 1

subjects variable The means and standard deviations upon which these analyses are based are presented in Table 1. For the premenstrual intercourse effect, the average of the rates for the two days directly prior to menstruation was compared to the average of the rates of the third and fourth days prior to menstruation (main effect of cycle days $F = 1\,41$, $df = 1, 33$, $p > 10$) A similar analysis of

Table 1

Mean Number of Intercourse Sessions and Autosexual Activities Prior, During, and After Menstrual Flow and Partner Absence

	Intercourse					Autosexual Activity				
	Pre-Days 3&4	Pre-Days 1&2	During	Post-Days 1&2	Post-Days 3&4	Pre-Days 3&4	Pre-Days 1&2	During	Post-Days 1&2	Post-Days3&4
Menstruation										
Abstainer	350	387	144	541	289	088	152	160	143	124
	(267)	(295)	(192)	(323)	(198)	(143)	(263)	(156)	(147)	(170)
Non-Abstainers	321	394	372	341	399	155	176	227	133	201
	(202)	(282)	(195)	(219)	(266)	(152)	(191)	(208)	(207)	(176)
Partner Absence	406	499	--	608	430	097	066	228	103	107
	(.371)	(628)		(645)	(383)	(229)	(161)	(334)	(193)	(198)

premenstrual autosexual rates was also performed, and again no significant effect was found (main effect for cycle day $F = 1\ 07$, $df = 1, 33$, $p > 10$) For the decline in intercourse during menstruation, the average scores during menstruation were compared to the average scores for the two days prior to menstruation (main effect for cycle day $F = 147.50$, $df = 1, 33$, $p < 001$) For the menstrual increase in autosexual activity, the average score during menstrual flow was compared to the average of four days—the two days prior to menstruation and the two days following menstruation (main effect for cycle day $F = 2\ 54$, $df - 1, 33$, $p > 10$) The post-menstrual rise in intercourse was tested by comparing the average intercourse scores of the two days following menstruation to the average of the subsequent two days (main effect for cycle day $F = 5\ 61$, df 1, 33, $p < 05$) The predicted interaction effect between degree of abstinence and time of cycle was found only for the post-menstrual analysis ($F = 13\ 45$, $df - 1, 33$, $p < 01$) A "simple effect" analysis of this interaction (Winer, 1962) revealed that the post-menstrual intercourse effect was significant among abstainer subjects ($F - 17\ 94$, $df = 1, 33$, $p < 01$), but not significant among non-abstainer subjects ($F < 1$) Other than the effects reported in this paragraph, no other effects of the four analyses of variance were found to be significant (except, of course, for the obvious interaction effect of abstention when analyzing menstrual intercourse rates ($F - 121\ 00$, $df - 1, 68$, $p < 001$))

Statistical tests for partner absence effects consisted of matched-pair t tests of average intercourse or autosexual z scores per day for each subject, comparing the same sets of days as compared for menstrual effects Although, as shown in Table 1, the difference between the means was substantial, the rise in intercourse prior to partner absence was not significant ($t < 1$) The predicted rise in autosexual activity during partner absence was significant at the 07 level ($t = 1\ 97$, $df = 16$), as was the rise in intercourse following abstinence ($t = 1\ 99$, $df = 16$, $p < 07$)

The somewhat elevated levels of menstrual sexual activity of nonabstainers, shown in Figure 2, suggested that female sexual drive might not decrease during menstruation A reanalysis of the intercourse levels of abstainer subjects supported such a hypothesis In a previous report (Adams, Gold & Burt, 1978) we have shown that hormonally-related female sexual drive at ovulation is most accurately assessed by analyzing incidents of sexual activity that are initiated by the female and excluding those initiated only by the male Therefore, abstainers' intercourse sessions at menstruation were divided into three categories. male-initiated, female-initiated, and

mutually-initiated. These three categories contributed almost equally to the average intercourse rate during the entire cycle (rates of 047, 049, and 046 respectively) However, during menstruation male-initiated and mutually-initiated sessions both decreased sharply to levels that were 36% and 37% of their respective baseline levels, while female-initiated sessions only dropped to a level that was 70% of its baseline. These data imply that a drop in male-initiation, rather than a drop in female sexual drive, is primarily responsible for the decrease in heterosexual activity during menstruation

DISCUSSION

The results of the study partially confirm the Ford and Beach hypothesis that pre- and post-menstrual rises in heterosexual behavior reflect anticipation of deprivation during menstruation and rebound following menstrual deprivation. The strongest support was obtained for interpreting the rise in intercourse rate immediately following menstrual flow as a rebound phenomenon due to abstinence from coitus during menstruation As predicted, we found both a significant rise after partner absence as well as a significant interaction with degree of menstrual abstinence. A hormonal explanation cannot account for these two findings. While it is certainly possible that both cognitive and hormonal factors produce the post-menstrual peak, hormone changes probably play a minor role Estrogen and androgen levels rise substantially only after cycle day 8, a time when our data show a decline in coital frequency following the post-menstrual peak (Ribiero, Mishell & Thorneycroft, 1974, Abraham, 1974; Johansson, 1975)

Although we found a trend toward a rise in autosexual activity during periods of partner absence as well as menstruation, these effects were not significant by conventional criteria In addition, whether or not these trends represent an attempt at compensation due to sexual deprivation is not certain since the predicted interaction with degree of menstrual abstinence was also not significant. We should point out, however, that ours is the first study, to our knowledge, that examines patterns of autosexual activity during menstruation Therefore, we hope that the lack of statistical significance does not deter future research on the compensation hypothesis.

There were also trends for an increase in intercourse rates prior to menstruation and partner absence, but their lack of statistical significance similarly precludes any conclusion that they represent an

anticipation of sexual deprivation These trends differed in an important regard from the mood shifts, EEG changes, and changes in reaction time which precede menstruation (Paige, 1971, Wuttke, Arnold, Becker, Cruetzfeldt, Langenstein, & Tirsch, 1975), because they were not diminished in women who were using oral contraceptives

Apart from the substantive findings regarding Ford and Beach's hypothesis, this investigation has important methodological implications Research on female sexuality has traditionally focused on measures of coital rate, which is heavily influenced by the male partner Two consequences of this research tradition are highlighted by our results First, some investigators have tended to dismiss menstrual days as "unavailable" because of low coital rates (e g , James, 1971) Our data indicate that this bias represents a "male-centered" perspective since the decline in intercourse rates during menstruation appears to be due primarily to the unwillingness of the male partner to engage in this type of behavior at this time rather than to the unwillingness of the female The female's auto sexual behavior, in fact, tends to increase during menstruation Second, the reliance on coital frequence as a measure of female sexual behavior confounds sexual desire of the female with that of the male In a recent paper Beach (1976) has proposed a three-component model of mammalian female sexuality: (1) attractivity, the attractiveness of the female to the male, (2) receptivity, the female's acceptance of and response to the male's invitations, and (3) proceptivity, the female's sexual invitations to the male. The latter component appears to be closest to what one might call female sexual drive In order to measure it, female-initiated behaviors must be separated from male-initiated ones Although much of the infrahuman primate research already makes this distinction (e g , Michael, 1968), human sexuality research has often failed to do so We would argue that a full understanding of female sexuality cannot be gained until researchers consider all phases of the menstrual cycle and all expressions of female-initiated sexual behavior—heterosexual and autosexual—as legitimate research avenues

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