Sexual behavior in lesbian and heterosexual women: relations with menstrual cycle phase and partner availability

Mary H. Burleson a,*, Wenda R. Trevathan b, W. Larry Gregory c

a Department of Social and Behavioral Sciences, Arizona State University West, PO Box 37100, Phoenix, AZ 85069-7100, USA
b Department of Sociology and Anthropology, New Mexico State University, Box 30001, MSC 3BV, Las Cruces, NM 88003, USA
c Department of Psychology, New Mexico State University, Box 30001, MSC 3452, Las Cruces, NM 88003, USA

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Abstract

Using a prospective design over three complete menstrual cycles, 147 heterosexual and 89 lesbian women made daily recordings of their basal body temperature (BBT), cervical mucus status, menses, and completed a daily checklist of various sexual behaviors (including sexual self-stimulation and sexual activity with a partner). They also gave their age, height, weight, age at menarche, number of pregnancies, duration of sleep, tobacco, caffeine, and alcohol use, and whether they had a live-in sexual partner. Using BBT, cervical mucus status, and menses information, cycle days were grouped into five discrete phases: menses, follicular, ovulatory, early luteal, and premenstrual. Daily frequencies of sexual behavior with a partner and autosexual behavior were computed for each phase. Mixed ANOVAs on the resultant proportional data revealed similar patterns for autosexual behavior across the phases for both heterosexuals and lesbians who did not have a live-in partner, in which autosexual behavior was highest during the follicular and ovulatory phases. For those with live-in partners, autosexual behavior did not vary across the phases. Lesbians engaged in more autosexual behavior overall. Allosexual behavior peaked during the follicular phase for both heterosexuals and lesbians, and the phasic pattern was unrelated to live-in partner status. Additional analyses suggest that the observed patterns were unrelated to anticipated changes in sexual activity due to menses.

* Corresponding author.
E-mail address: mary.burleson@asu.edu (M.H. Burleson).
Results are discussed in terms of social variables and hormonal fluctuations associated with the menstrual cycle. © 2002 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Unlike many female mammals, human females do not confine their sexual activity to the period around ovulation. Women have been described as “continuously sexually receptive” (Lovejoy, 1981) or as “lacking estrus” (Small, 1995), descriptions implying that sexual behavior is decoupled from the hormonal changes of the menstrual cycle. On the other hand, many researchers have reported significant phase-related peaks in sexual activity, desire, or arousability in human females. Unfortunately, the phase of peak sexuality varies across many of these studies. Further, some studies find no peaks. In short, results are conflicting and no conclusive patterns have emerged (see Hill, 1988; Regan, 1996; Pawlowski, 1999 for extensive reviews of this literature).

This lack of consensus may be due to methodological difficulties, such as small sample sizes, retrospective reporting, and differences in the determination of menstrual cycle phase. Another possibility is that conceptually imprecise or overlapping dependent variables may be obscuring patterns that actually exist. For example, some early studies make little or no distinction between proceptive and receptive female sexuality. If the goal is to determine whether and to what extent women’s menstrual cycles affect their sexual feelings and behaviors, it is important to include measures of sexual interest that are not confounded by partner interactions. The most straightforward is the frequency of autosexual behavior. A number of the studies reviewed in Hill (1988) and Regan (1996), and Pawlowski (1999) measured autosexual behavior in heterosexual women, but as with other studies of phase-related sexuality, the results are conflicting.

Because sexuality is a complex social behavior, it is probable that differences in the amount or pattern of sexual behavior are influenced by a number of social factors. An example is the availability of a partner. A woman who lives with her sexual partner may be more apt to respond proceptively to hormone-based changes in her own level of desire because there are fewer barriers to initiating sexual expression with a partner. On the other hand, a live-in partner is likely to experience his or her own fluctuating level of sexual interest and willingness to initiate sex. A further complication is the possibility that a woman’s hormonal cycles may influence not only her interest in sex, but also her attractiveness to her partner. Thus, the interaction between partners may conceivably obscure or enhance putative hormone-driven patterns in sexual behavior. Indeed, even autosexual behavior may be affected by the presence of a partner, although to our knowledge this has not been tested.

Relative to heterosexual women, far fewer studies of phase-related lesbian sexuality are available. As far as we have been able to determine, Matteo and Rissman (1984) provide the only existing data on lesbian sexual behavior in relation to phases
of the menstrual cycle. Their study of 13 lesbian women demonstrated a peak in orgasm, self-initiated sexual encounters, and total sexual encounters at the midpoint of the menstrual cycle. They also found no evidence for the decline in number of sexual encounters during menses or for the possibly related premenstrual and postmenstrual peaks in sexual activity that have been reported in heterosexual couples (Ford and Beach, 1951; Gold and Adams, 1981).

In the current study, we explored the level and pattern of sexual behavior for both women who lived with their sexual partners and those who did not. We wished to add to the available literature on lesbian sexuality and to explore whether some of the same factors reported to influence heterosexual behavior also operate for lesbian women. Eighty-nine lesbian and 139 heterosexual women recorded their sexual activity, menses, basal body temperature (BBT), and cervical mucus, along with a number of other variables, on a daily basis for three complete menstrual cycles. We were particularly interested in autosexual behavior, believing that this type of sexual activity may more closely reflect a woman’s sexual interest independent of that of her partner or of phase-related changes in attractiveness or receptiveness to partner advances. We also monitored sexual stimulation by a partner. These daily data were examined for evidence of patterns of sexual activity that may reflect underlying hormonal changes associated with menstrual cycling.

2. Method

2.1. Participants

Prospective participants were informed of the project through announcements that appeared in women’s publications, women’s health centers, campus women’s centers, gay and lesbian publications, and bookstores that specialized in women’s issues. A brief description of the study and of the $50 payment was presented, and eligible women who were interested in taking part were invited to contact us. To be eligible for participation, a woman could not 1) be taking oral contraceptives or have an IUD; 2) be pregnant, lactating, or menopausal; 3) have had a hysterectomy; or 4) be less than seven years past menarche. Participants who contacted us were told that the study concerned “factors affecting the menstrual cycle” and were asked to complete several questionnaires and to keep daily records of a number of behaviors for three complete menstrual cycles.

2.1.1. Lesbian sample

Ninety-seven women who self-identified as lesbian were enrolled in the study. Of these women, eight either did not ovulate or had no measurable early luteal phase according to our criteria (see below), so they were dropped from the data set. The remaining participants were between 21 and 49 years old (see Table 1). Their age at menarche ranged from 10 to 16 years; the number of years post menarche ranged from 9 to 36. Seventy-three of the women were nulliparous, 8 had one pregnancy of more than six months duration, 7 had two pregnancies, and 1 had three preg-
Table 1
Demographic, lifestyle, and menstrual-cycle related characteristics of lesbian and heterosexual samples

<table>
<thead>
<tr>
<th></th>
<th>Lesbian women Mean (SD)</th>
<th>Heterosexual women Mean (SD)</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>32.6 (7.4)</td>
<td>34.1 (7.1)</td>
<td>2.34</td>
</tr>
<tr>
<td>Height</td>
<td>65.1 (2.4)</td>
<td>64.9 (2.7)</td>
<td>0.24</td>
</tr>
<tr>
<td>Weight</td>
<td>146.9 (34.4)</td>
<td>138.0 (30.6)</td>
<td>4.11*</td>
</tr>
<tr>
<td>BMI</td>
<td>24.4 (5.9)</td>
<td>23.0 (4.7)</td>
<td>4.23*</td>
</tr>
<tr>
<td>Age at menarche</td>
<td>12.4 (1.4)</td>
<td>12.5 (1.4)</td>
<td>0.73</td>
</tr>
<tr>
<td>Years postmenarche</td>
<td>20.2 (7.4)</td>
<td>21.6 (7.4)</td>
<td>2.01</td>
</tr>
<tr>
<td>Nightly hours sleep</td>
<td>7.4 (1.1)</td>
<td>7.4 (0.8)</td>
<td>0.00</td>
</tr>
<tr>
<td>Daily cigarettesa</td>
<td>10.6 (7.2)</td>
<td>7.4 (5.8)</td>
<td>1.38</td>
</tr>
<tr>
<td>Daily caffeine drinksb</td>
<td>3.6 (3.5)</td>
<td>2.5 (1.9)</td>
<td>8.51**</td>
</tr>
<tr>
<td>Weekly alcohol drinksc</td>
<td>5.6 (6.4)</td>
<td>3.1 (3.0)</td>
<td>12.56**</td>
</tr>
<tr>
<td>Average annual income</td>
<td>21276.0 (11252.3)</td>
<td>17453.8 (10603.4)</td>
<td>3.45†</td>
</tr>
</tbody>
</table>

Percentage

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>(\chi^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lived with partner</td>
<td>43.8</td>
<td>8.99**</td>
</tr>
<tr>
<td>Nulliparousd</td>
<td>82.0</td>
<td>10.44**</td>
</tr>
<tr>
<td>Used tobacco</td>
<td>10.1</td>
<td>0.01</td>
</tr>
<tr>
<td>Used caffeine</td>
<td>79.9</td>
<td>1.59</td>
</tr>
<tr>
<td>Used alcohol</td>
<td>68.5</td>
<td>4.29*</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td>1.03</td>
</tr>
<tr>
<td>High school diploma</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree or higher</td>
<td>72.4</td>
<td>79.1</td>
</tr>
</tbody>
</table>

\(a\) Means taken from self-reported smokers only.
\(b\) Means derived from self-reported caffeine users only.
\(c\) Means derived from self-reported alcohol users only.
\(d\) No pregnancies of more than six months duration. \(†P<0.07; *P<0.05; **P<0.01.\)

nancies. Weight ranged from 103 to 270 pounds. Height ranged from 59 to 72 inches. Body Mass Index (BMI; weight in kg divided by square of height in m) ranged from 17.5 to 47.0. All had completed high school; 73% had bachelor’s degrees or higher. Approximately 73% reported per capita incomes of greater than $15,000 per year, and approximately 44% lived with their sexual partners. They reported sleeping a range of 4 to 12 hours on a typical night. Eighty were non-smokers, 17 did not use caffeine, and 28 did not drink alcohol. When the self-reported “non-users” were eliminated, the remaining participants reportedly smoked 0 to 20 cigarettes per day, drank 1 to 11 caffeine drinks per day, and consumed 0 to 40 alcohol drinks per week.

2.1.2. Heterosexual sample

One hundred and sixty-six women who self-identified as heterosexual women were enrolled initially in the study. Eleven were eliminated for extensive backfilling (see below), five returned incomplete data, one used birth control pills, one had cervical surgery during the study, and one became pregnant after her first cycle, leaving 147
participants. Of these women eight either did not ovulate or had no measurable early luteal phase (see below), so they were dropped from the data set. The remaining participants were between 19 and 53 years old (see Table 1). Their age of menarche ranged from 10 to 16 years; the number of years post menarche ranged from 7 to 42. Eighty-six of the women were nulliparous, 14 had one pregnancy of more than six months duration, 29 had two pregnancies, 9 had three pregnancies, and 1 had four pregnancies. Weight ranged from 88 to 291 pounds. Height ranged from 59 to 73 inches. BMI ranged from 15.4 to 48.5. All had completed high school; 79% had bachelor’s degrees or higher. Approximately 75% reported per capita incomes of greater than $15,000 per year, and 64% lived with their sexual partners. They reported sleeping a range of 5 to 10 hours on a typical night. One hundred twenty-five were non-smokers; 28 did not use caffeine, and 27 did not drink alcohol. When the self-reported “non-users” were eliminated, the remaining participants reportedly smoked a range of 0 to 20 cigarettes per day, drank 0 to 10 caffeine drinks per day, and consumed 0 to 15 alcohol drinks per week.

2.2. Measures and procedure

Each entrant into the study completed an Initial Questionnaire, covering age, height, weight, age at menarche, number of pregnancies of more than six months duration, household composition, tobacco, caffeine, and alcohol usage, and usual duration of sleep. The three cycles of daily data were recorded using Daily Checklists that were filled out each morning. Items were marked if they had occurred during the previous 24 hours. Basal body temperature and cervical mucus condition were recorded daily (prior to arising from bed) on a standard BBT chart at the bottom of the Daily Checklist. Detailed instructions were provided. Weight was recorded on a weekly basis.

For lesbian women, the Daily Checklist variables included the following: sleeping with a woman, sexual activity with a woman, sexual self-stimulation, orgasm, and menses. For heterosexual women, the Daily Checklist included the following items: sleeping in the same bed with a man, genital stimulation from a partner, intercourse, sexually-related breast stimulation, other intimate behavior (included kissing, cuddling, giving or receiving a massage), sexual self-stimulation, orgasm, and menses.

At the end of three cycles of data collection, each woman completed a checkout questionnaire regarding any changes in birth control methods, living arrangements, and drug, alcohol, tobacco, caffeine, and food use. All of the materials were then returned in the envelope provided. To increase the reliability of the data, a short questionnaire about backfilling and timeliness of Daily Checklist completion was sent to each participant with her payment. Participants who reported occasional backfilling after more than four days were eliminated from the sample because their data were considered unreliable.

A BBT pattern was deemed ovulatory when it demonstrated a rise in basal temperature (over the mean basal temperature for the previous six days) that was sustained for at least three days (Moghissi 1976, 1980). The last low temperature before the sustained rise was pinpointed. This was judged to be the BBT nadir if the reported
cervical mucus condition was appropriate (i.e., spinnbarkeit or wet, rather than dry or sticky; (Kambic and Gray, 1989). When mucus condition and BBT pattern were inconsistent, the cycle was excluded from the analysis. Ovulation was assumed to have occurred within four days following the nadir (Vermesh et al., 1987). Overall, the accuracy of BBT as an indicator of ovulation appears to be about 80 per cent. A biphasic temperature pattern is assurance that ovulation has occurred; however a monophasic pattern may occasionally occur in an ovulatory cycle (Moghissi, 1976), leading to a bias towards underestimating the occurrence of ovulation.

Total cycle length was determined by counting from the first day of menstrual bleeding for a given cycle up to, but not including, the first day of bleeding for the next cycle. Menstrual cycles were divided into five phases: menses (days of menses flow), follicular (first day after last menses day to last day before ovulatory phase), ovulatory (BBT nadir day plus the following four days (Vermesh et al., 1987)), early luteal (first day after ovulatory phase until last day before premenstrual phase), and premenstrual (final five days before onset of next menses). When ovulation did not occur, the cycle was not included in the analyses. We chose this five-phase division of the cycle for several reasons: 1) we were interested in the occurrence of sexual behavior during the menses flow; 2) we had BBT and cervical mucus information to define the ovulatory phase, when testosterone and estrogen are typically high; and 3) we wanted to explore the effects of the premenstrual phase on sexual activity. The timing and duration of the menses, ovulatory, and premenstrual phases was determined using reported events from the Daily Checklists (e.g., onset of menses, BBT); the appropriate intervals remaining between the defined phases were designated as the follicular and early luteal phases. Therefore, women with unusually short cycles might conceivably have follicular or early luteal phases (as we defined them) of zero days in length. If this occurred, the cycle was excluded from the analyses.

Allosexual behavior was defined as the occurrence of genital stimulation, intercourse, or sex with a woman or man. Autosexual behavior was defined as sexual self-stimulation in the absence of allosexual behavior. If sexual self-stimulation occurred on the same day as sexual behavior with a partner, it was not counted. In other words, we did not include autosexual behavior that had any possibility of involving another person. These variables were measured as the number of days in a menstrual cycle phase on which the behavior occurred (e.g., for autosexual behavior, days when sexual self-stimulation occurred but sexual stimulation by a partner did not) divided by the number of days in the phase. Software that was custom-designed for this purpose was used (Burleson et al., 1995).

3. Results

3.1. Preliminary analyses

Analysis of variance (ANOVA) and chi-square tests were used to evaluate potential differences between the heterosexual and lesbian women in demographic and
lifestyle characteristics as measured on the Initial Questionnaire. The results are shown in Table 1. The participants did not differ in education, average income, age, height, age at menarche, years past menarche, proportion of smokers or caffeine users, estimated number of cigarettes smoked per day, or usual hours of sleep per night. Relative to the heterosexual women, however, the lesbian women were heavier, had larger BMI, and were more likely to be nulliparous, less likely to live with their sexual partners, and less likely to drink alcohol. When the self-reported non-users were eliminated, the lesbian women drank more caffeine drinks per day and more alcohol drinks per week than the heterosexual women. All of these differences were statistically significant (alpha=0.05).

Therefore, to help rule out the possibility that demographic or lifestyle variables would account for any group differences we might find, we first examined the correlations between the continuous variables and the sexual activity variables of interest in our study. None were significant, suggesting that they were not a threat to internal validity. Second, we tested the difference in sexual activity between nulliparous women and those with pregnancies of more than six months duration. The difference was significant, but when we examined the distributions of the variables, we found that nulliparity covaried strongly with both sexual preference and living with a partner. Because these two variables were part of our design, we did not include nulliparity in subsequent analyses.

We also examined several sexual activity characteristics (derived from the Daily Checklists) that we believed might influence the results of our other analyses. There were no differences between the lesbian and heterosexual women in the proportion of women who never reported autosexual behavior (16.9% vs. 27.3%, respectively) or never reported allosexual behavior (12.4% vs. 18.7%, respectively) throughout the study. These findings alleviated our concern that women who did not engage in sexual activity might differentially weight the results between the preference groups.

Participants reported varying numbers of cycles, ranging from two to six (six women reported two cycles, 179 reported three cycles, 34 reported four cycles, five reported five cycles, and four reported six cycles). Therefore, our primary analyses used only the first three cycles reported by each woman (or two cycles for the six women who reported only two). Analyses using all reported cycles showed results identical to the primary analyses.

3.2. Effects of cycle phase, partner availability, and sexual preference on sexual behavior

To determine whether the women in our sample exhibited menstrual cycle phase-related changes in the frequency of sexual activity, and how sexual preference and partner availability might have influenced these patterns, we used two repeated measures ANOVA models (one for each category of sexual behavior) with one within-subjects variable (phase of the menstrual cycle; “phase”) and two between-subjects factors (lesbian versus heterosexual self-identification; “preference,” and presence versus absence of a live-in sexual partner; “live-in”). An alpha level of 0.05 was
used for all statistical tests. The phase by preference by live-in means are shown in Figs. 1 and 2.

3.2.1. Autosexual behavior

For autosexual behavior (see Fig. 1), the main effect of phase was highly significant, $F(4,221)=6.21, P<0.0001$. Deviation contrasts revealed that means for the menses, follicular, ovulatory, and premenstrual phases differed significantly from the grand mean, which did not differ from the mean for the early luteal phase. Repeated contrasts showed that the mean during the follicular phase was significantly higher than all phases except the ovulatory phase. Mean autosexual behavior was lowest during menses, early luteal, and premenstrual phases, which did not differ from each other.

The phase by preference by live-in interaction was not significant, nor was the phase by preference interaction. However, the phase by live-in interaction was highly significant, $F(4,221)=3.67, P<0.006$, suggesting that the presence of a live-in partner influenced the phase-related pattern of autosexual behavior. The main effect of live-in was also significant, $F(1,224)=41.37, P<0.0001$, as was the main effect of preference, $F(1,224)=4.97, P=0.027$, but the live-in by preference interaction was not. Exploration of the simple effects of phase within the levels of preference and live-in showed that both lesbian and heterosexual women displayed significant phasic

![Graph of Autosexual Behavior](image-url)

Fig. 1. Symbols represent mean number of episodes of autosexual behavior for each group during each menstrual cycle phase. Error bars represent standard errors of the mean. See text for description of significant differences.
patterns of autosexual behavior when they did not live with their sexual partners, $F(4,224)=4.05, P=0.003$, and $F(4,224)=3.31, P=0.012$, respectively, but did not show significant phasic patterns of autosexual behavior when they did live with their sexual partners. Further, across all of the phases, women without live-in partners reported more autosexual behavior than women whose sexual partners lived with them, and lesbian women reported more autosexual behavior than did heterosexual women (see Fig. 1).

### 3.2.2. Allosexual behavior

Examination of the pattern for allosexual behavior also showed a highly significant phase main effect, $F(4,221)=12.44, P<0.0001$ (see Fig. 2). The means for the menses, follicular, and early luteal phases differed significantly from the grand mean; the mean for the ovulatory phase was marginally different from the grand mean, and the premenstrual phase mean did not differ from the grand mean. Allosexual behavior during the follicular phase was significantly higher than during all other phases. The early luteal and menses phases did not differ from each other, but were significantly lower than follicular, ovulatory, and premenstrual phases in reported allosexual behavior.

None of the interactions with phase were significant, suggesting that neither sexual preference nor the availability of a live-in partner influenced the phasic pattern of
allosexual behavior. The preference main effect was not significant, but both the interaction between preference and live-in and the live-in main effect were highly significant, $F(1,224)=26.79$, $P=0.001$, and $F(1,224)=11.20$, $P<0.0001$, respectively. Examination of the means revealed that heterosexual women who lived with their sexual partners reported significantly more allosexual behavior during every phase than did heterosexual women who did not live with their sexual partners. In contrast, the amount of allosexual behavior reported by lesbian women was not influenced by whether they lived with their sexual partners (see Fig. 2). In addition, a simple effects test of the effect of preference within women who did and did not live with their partners showed that heterosexual women living with their sexual partners reported significantly more allosexual behavior than did lesbian women living with their sexual partners, $F(1,226)=13.81$, $P<0.0001$, and conversely that lesbian women who did not live with their sexual partners reported significantly more allosexual behavior than did heterosexual women who did not live with their sexual partners, $F(1,226)=4.60$, $P=0.033$.

3.3. Correlations among phase means

Previous researchers have proposed that premenstrual and follicular rises in sexual activity may occur in anticipation of or as a response to low levels of sexual activity during menses. If this were the case, we would expect negative relationships between sex during menses and sex during the premenstrual or follicular phases, so we examined the Pearson correlations among premenstrual, menses, and follicular phases for both categories of sexual behavior. For autosexual behavior, $r_{\text{premenstrual vs. menses}}=0.59$, $P<0.01$, and $r_{\text{menses vs. follicular}}=0.61$, $P<0.01$. For allosexual behavior, $r_{\text{premenstrual vs. menses}}=0.63$, $P<0.01$, and $r_{\text{menses vs. follicular}}=0.65$, $P<0.01$.

4. Discussion

In the current study, a large sample of women provided detailed daily information about their sexual behavior, menses, BBT, and cervical mucus throughout three menstrual cycles. To our knowledge, ours is the first study of this kind to monitor both lesbian and heterosexual women and to compare the amount and pattern of sexual behavior between women who live with their sexual partners and those who do not. Because we collected BBT and cervical mucus data, we were able to define menstrual cycle phases with less ambiguity than many previous studies, and to exclude cycles in which ovulation did not occur. We present information about the phase-related patterns of autosexual behavior and allosexual behavior. As we interpret them, autosexual behavior primarily reflects proceptive sexuality, whereas allosexual behavior likely reflects a combination of attractiveness to a sexual partner, receptiveness to partner advances, and proceptive seeking of sexual outlet.
4.1. Autosexual behavior

Across the entire sample of women, we found a highly significant relationship between the phase of the menstrual cycle and the amount of autosexual behavior that was reported (see Fig. 1). Autosexual behavior was most frequent during the follicular and ovulatory phases, which did not differ from each other. The sexual preference of the women was not related to the phasic pattern of autosexual behavior, although lesbian women reported more autosexual behavior than heterosexual women overall. The presence or absence of a live-in sexual partner, however, influenced strongly both the level and pattern of autosexual behavior. Not surprisingly, women without a live-in partner reported more autosexual behavior across all of the cycle phases. Further, the phase-related pattern was seen only in the women who did not live with their sexual partners; women whose sexual partners were roommates showed a pattern of self-stimulation more evenly distributed across the menstrual cycle. Although not definitive, these results support the idea that androgens (or estrogens), which rise during the follicular phase and peak during the late follicular or early ovulatory phase (as we have defined them), may influence women’s need for sexual release or expression (e.g., Alexander and Sherwin, 1993; Van Goozen et al., 1997). When a sexual partner is not readily available, hormone-related changes in sexual interest are likely to be expressed through autosexual behavior, which can be viewed as an indicator of proceptive sexuality. Our finding of no phasic pattern of autosexual behavior in women with live-in sexual partners also supports the results of a previous study of lesbian women (Matteo and Rissman, 1984), which found no midcycle peak in masturbation. All of the participants in that study had been living with their partners for at least one year.

Previous researchers have documented premenstrual peaks and menses-related troughs in various forms of sexual activity in heterosexual women (e.g., Udry and Morris 1968, 1977; Schreiner-Engel et al., 1981). Matteo and Rissman (1984) did not observe these phenomena in their lesbian sample. In the current study, we found no evidence for a premenstrual peak in autosexual behavior for either lesbian or heterosexual women. The notion of a trough during menses was supported—overall, our lesbian and heterosexual participants reported relatively low levels of self-stimulation during both the premenstrual and menses phases. Both of these phases are times of low estrogen and testosterone, hence low steroid levels may have contributed to this relatively low level of sexual activity. It must be noted, however, that menses-related discomfort is a potential alternative explanation.

4.2. Allosexual behavior

In our sample of women, allosexual behavior showed an even more striking phase-related pattern than did autosexual behavior (see Fig. 2). Allosexual behavior was reported more frequently during the follicular phase than any other phase. The lowest level was reported during the menses and early luteal phases, which did not differ from each other. Neither sexual preference nor availability of a live-in sexual partner significantly influenced this phasic pattern.
These results are similar to the results of several other researchers. For example, Harvey (1987) found midcycle peaks in both self- and male partner-initiated heterosexual encounters. Similarly, in their study of lesbian women, Matteo and Rissman (1984) found midcycle peaks in orgasm, self-initiated sexual encounters, and total sexual encounters (which included self-, partner-, and mutually-initiated sexual encounters with their partners). While our data are not completely comparable to these previous data because we did not ask our participants to keep track of who initiated sexual activity, our allosexual behavior variable does encompass both self- and partner-initiated sexual behavior.

As noted above, sexual activity with a partner is likely influenced not only by proceptive sexual interest, but also by attractiveness to the partner and receptiveness to partner advances. Because we find a similar phase-related pattern of sexual activity in the absence of a live-in partner for both auto- and allosexual behavior, our data provide no specific support for the idea that attractiveness to a partner changes as a function of menstrual cycle phase. In other words, a change in attractiveness is not needed to explain the phase-related pattern of allosexual behavior, because a change in proceptiveness (as shown in the autosexual behavior data) can account for it. On the other hand, neither do our findings rule out an effect on attractiveness, which may be influenced by both behavioral and biological factors. It is known that ovarian cycling influences pheromones, which in turn affect sexual attractiveness, in other mammalian species (reviewed in Vandenbergh, 1988), and possibly in humans (McClintock, 2000). More direct measures of women’s sexual attractiveness to their partners across the menstrual cycle are needed to clarify this issue.

Across the sample, premenstrual levels of allosexual behavior were significantly higher than during menses, but lower than during the follicular phase. Inspection of the means in Fig. 2 suggests that this pattern holds more strongly for heterosexual than lesbian women, although we did not test this difference due to a non-significant omnibus interaction between phase and preference. Future research should examine the possibility that the sex of one’s partner may influence menses-related inhibition in sexual expression (Ford and Beach, 1951).

Although it did not significantly influence the phasic pattern of allosexual behavior, availability of a live-in partner had a strong effect on the average level of allosexual behavior. Not surprisingly, women with live-in partners reported higher levels of allosexual behavior than women whose sexual partners did not live with them. The presence or absence of a live-in partner, however, had a much stronger effect in heterosexual than lesbian women. To illustrate, allosexual behavior was approximately four times more common for heterosexual women when the partner was a room mate than when he was not, whereas the presence of a live-in partner had only a small, non-significant influence on the level of allosexual behavior in lesbian women. Further, heterosexual women who lived with their partners reported significantly more allosexual activity than lesbian women who lived with their partners, whereas lesbian women who did not live with their sexual partners reported more allosexual activity than heterosexual women who did not live with their sexual partners.

Phase-related patterns were seen for both categories of sexual behavior measured
in this study, and the patterns themselves were quite similar: sexual behavior was most frequent during the follicular/ovulatory phases and least frequent during the menses/early luteal phases. We investigated the possibility that high levels of sexual activity during the follicular phase were due to a “rebound” effect from sexual deprivation during menses by examining the Pearson correlations between menses and follicular phases. Similarly, we tested the idea that a peak in premenstrual sexual behavior was due to anticipation of a menses-related lack of sexual activity by examining the correlations between menses and premenstrual phases. If either of these explanations were true, we would expect to find significant negative correlations between a given sexual behavior during menses and the same behavior during the follicular and premenstrual phases. None of the correlations was negative; in fact, all four were positive and highly significant. These results are conceptually similar to the findings of Gold and Adams (1981), and do not support the “deprivation explanation” of phase-related peaks in sexual activity (Ford and Beach, 1951).

In a review of the literature on lesbian sexuality, Schreurs (1993) suggested that lesbian sexual behavior is more similar to that of heterosexual women than to gay men. Our findings support the idea that some of the biological underpinnings of sexual behavior may be more similar than different between lesbian and heterosexual women. In the current study, sexual preference was not related to phasic patterns, nor was it related to the overall level of allosexual behavior. Only three significant differences in sexual behavior were found between the lesbian and heterosexual women, and two were dependent on partner availability, a social factor. First, lesbian women reported more autosexual behavior whether or not they lived with their sexual partners. Second, lesbian women who lived with their sexual partners reported less allosexual behavior than did heterosexual women who lived with their sex partners. Finally, lesbian women who did not live with their sexual partners reported more allosexual behavior than heterosexual women who did not live with their sexual partners.

The first of these differences echoes a previous finding (from a large representative sample) that approximately 70% of lesbian women masturbate compared to only about 40% of heterosexual women (Laumann et al., 1994). We cannot speak to the cause of this difference based on our data, but we offer several speculative possibilities. It may be the case that lesbian women are more comfortable with female genitalia than are heterosexual women — they may have fewer internalized prohibitions against self-masturbation. Supporting this notion, Califia (1979) reported that 76% of lesbians in her study felt good about masturbating and that 80% had positive feelings about their genitalia. Further, Coleman et al. (1983) report that lesbian women rated manual stimulation of their partners’ genitalia as more arousing than did heterosexual women. Alternatively, lesbian women may have more trouble finding partners over the course of their lives than do heterosexual women; hence they may be more accustomed to taking care of their own sexual needs. The significantly lower proportion of lesbian than heterosexual women with live-in partners found in our sample is consistent with this possibility. Finally, previous research has shown that sexual activity level within both heterosexual and homosexual relationships tends to decline over time (e.g., Blumstein and Schwartz, 1983; Loulan, 1988). Because
we did not measure the duration of our participants’ sexual relationships, we cannot rule out the possibility that any group differences we found, including the higher reported autosexual behavior in lesbian women, might be related to this variable.

In our current sample, sexual preference was not related to the overall level of allosexual behavior. However, when the availability of live-in sexual partners was taken into account, lesbian and heterosexual women differed. When looking only at participants who lived with their sexual partners, lesbian women reported less allosexual behavior than did heterosexual women. These results support those reported by Blumstein and Schwartz (1983), who found lower sexual activity in lesbian than in heterosexual couples using a cross-sectional design. In contrast, when we examine only participants who did not cohabit with their sexual partners, lesbian women reported higher levels of allosexual behavior. This finding may support the results of Coleman et al. (1983), who found significantly more sexual activity in lesbian than heterosexual women (again using a cross-sectional design with retrospective reporting), but did not report the relationship status of their participants. Thus, the disparity in results among these studies may be due to a difference in the way lesbian versus heterosexual couples negotiate their sexual relationships. Allosexual behavior may be higher in single lesbian than in single heterosexual women, but the level of activity may remain higher in cohabiting heterosexual couples over time.

5. Conclusions

The present study overcomes many of the methodological problems that may have led to conflicting findings in the research literature on the relationship between hormonal changes in the menstrual cycle and sexual behavior in human females. Employing a large sample, prospective design, with reliable and well-defined determination of the menstrual cycle phases, and distinguishing between proceptive and receptive female sexuality, we find clear fluctuations in sexual behavior associated with cycle phase. Further, we find a similar cycle phase pattern for both autosexual and allosexual behavior for both heterosexual and lesbian women. Our finding that autosexual behavior was related to the presence or absence of a live-in sexual partner supports the notion that distinguishing between proceptive and receptive sexual behaviors while taking into account partner availability is important. Taken together, the present study provides convincing evidence that while social variables may influence the type and timing of sexual expression, human female sexual behavior is also related strongly to changes in the menstrual cycle.

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References


