A CONTROLLED STUDY OF THE EFFECTS OF INFORMATION ON PREMENSTRUAL EXPECTANCY AND DAILY MOOD RATINGS

by

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(ABSTRACT)

Previous research on premenstrual tension has typically focused on the hormonal or biological theories of premenstrual tension. Recent research, however, has begun to show a relationship between negative expectancies and reports of premenstrual suffering. In this study it was hypothesized that negative expectancies could be changed by exposing participants to information which either increased or decreased their sense of control over premenstrual symptomatology. It was proposed that information which offered participants a way to control premenstrual symptoms would decrease expectations while information which informed participants that they could not control their symptoms would increase negative expectations. In this study it was further hypothesized that participants exposed to information which decreased their negative expectancies would report more positive moods during the premenstrual phase

of the menstrual cycle than those subjects exposed to information which increased their expectations for premenstrual tension. Results from this study supported the hypothesis that expectancies for premenstrual tension are related to the participants' sense of control over premnstrual tension. However, results did not show a relationship between daily reports of mood during the premenstrual phase and negative expectations.

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Introduction

Premenstrual tension (PMT) has received attention from both the popular and research literature. There is no agreed upon definition for PMT (Beaumont, Richards, & Gelder, 1975; Clare, 1983; Rubinow & Roy-Bryne, 1984); however, this term generally refers to recurrent psychological and physical changes which occur one to four days before the onset of menstruation. Common psychological symptoms include anxiety, depression, irritability, tearfulness, mood swings and confusion. Physiological symptoms frequently mentioned are abdominal discomfort or pain, bloating and fatigue.

The interest in premenstrual tension in the popular and research literature is not surprising, considering it has been associated with violent crimes (Dalton, 1961; Ribeiro, 1962), accidents (Dalton, 1960), suicide attempts (MacKinnon, MacKinnon, & Thomsom, 1959; Mandell & Mandell, 1973; Wetzel & McClure, 1972), psychiatric admissions (Glass, Henninger, Lanskey, & Talan, 1971), and marital discord (Shabanah, 1963, cited in Reid & Yen, 1981). Moreover, prevalence estimates indicate that a large portion of the female population suffers from premenstrual tension; estimates range up to 97 percent (Sutherland & Stewart, 1965, cited in Friedman, 1984). Reid and Yen (1981) reviewed questionnaire reports and concluded that 70% to 90% of women experience cyclic premenstrual symptoms and that 20% to 40% of the female population report some degree of impairment. Sturgis(1982, cited in Friedman, 1984) states that 2% to 5% of women are incapacitated by premenstrual tension. Dennerstein and

Burrows (1979, cited in Olosov, 1985), after reviewing 24 prospective studies that researched the relationship between negative mood changes and the menstrual cycle, concluded that most negative mood changes occur during the premenstrual and menstrual phases.

Biological Theories

Traditionally, etiological theories of premenstrual tension have focused on hormonal or other physiological factors. Frank, who coined the term premenstrual tension in 1931, postulated that premenstrual distress was caused by fluid retention due to raised levels of estrogen (cited in Beumont, Richards, & Gelder, 1975). Rubinow and Roy-Bryne (1984) reviewed the major physiological theories of PMT. Most of these theories focus on circulating levels of gonadal steroids, prolactin or aldosterone (e.g. Green & Dalton, 1953; Horrobin, Mtabaji, Karmali, Manku, & Nassar, 1976; Janowsky, Berens, & Davis, 1973). In addition, endometrial toxins (Stieglitz & Kimble, 1949) and vitamin deficiencies (Abraham, 1981) have been proposed as causing the symptoms of premenstrual tension. Even though the above theories have gained some support from empirical research, current literature reviews indicate that the research has yet to adequately support a biological theory for PMT (Reid & Yen, 1981, Rubinow & Roy-Bryne, 1984). Despite this fact, the popular literature tends to endorse and publish physiological theories of PMT (e.g. Nolen, 1973; Norris & Sullivan, 1983).

Treatments for PMT follow the theoretical trends. Progesterone treatment has been strongly advocated by Katherine Dalton (1964), a pioneer in premenstrual research, women's magazines (see Harrison, Sharpe &

Endicott, 1985), and Norris and Sullivan (1983), authors of a popular book on premenstrual tension. Several uncontrolled studies support the effectiveness of progesterone (Dalton & Green, 1953; Appleby, 1960; cited in Rubinow and Roy-Bryne). However, a number of placebo control studies have failed to show that progesterone is more effective than a placebo (Swyer, 1955; Jorheim, 1972; Coppen, Milne, Outram et al., 1969). Outcome studies on vitamin therapies also report mixed results. Two uncontrolled studies found vitamin B to be effective in alleviating premenstrual symptoms (Baumblatt and Winston, 1970; Kerr, 1977; cited in Chakmakjian, 1983), while two controlled studies reached different conclusions. Stokes and Mendels (1972) found that vitamin B and a placebo were equally effective in reducing premenstrual distress, while Abraham and Hargrove (1980) found improved premenstrual symptomatology beyond a placebo effect. Research reviews indicate that other drug treatments such as contraceptives, diuretics, bromocriptine and lithium do not appear to be effective treatments of PMT (Chakmakjain, 1983; Clare, 1979; Rubinow & Roy-Bryne, 1984). Diet, exercise, and a reduction of stress are methods strongly recommended by Norris and Sullivan(1983), however, a review of the literature indicates that these treatments have not been empirically evaluated.

Cognitive Factors and Premenstrual Symptoms

In opposition to strict biological theories of premenstrual tension, a growing body of research indicates that social conditioning and cognitive factors may play a role in the self-report of premenstrual symptoms. Mood disturbances may be due, at least in part, to negative expectancies

(Clark & Ruble, 1978; Paige, 1973; Parlee, 1974; Sommer, 1973). Negative expectancies are hypothesized to result from prevailing cultural beliefs linking negative moods to the premenstrual phase of the menstrual cycle. It is proposed that these cultural beliefs are learned at an early age. A number of empirical studies appear to support these assertions.

Both men and women seem to share the belief that menstruation is associated with negative moods. Parlee (1974) had a group of 25 females and 34 males, between the ages of 18 and 27, rate how they thought most women experienced symptoms and mood changes during the premenstrual, menstrual, and intermenstrual phases. Both male and female participants reported that women experience greater symptom changes during the menstrual and premenstrual phases than during the intermenstrual phase. Moreover, the men and women reported almost identical patterns of symptoms and symptom changes. Similar results were found with adolescent boys and both pre- and post-menarchical girls (Clark & Ruble, 1978). The finding that symptom ratings between these three groups was strikingly similar indicates that self-reported symptoms associated with the menstrual cycle may reflect cultural stereotypes and that these stereotypes are adopted at a fairly young age.

In the above studies subjects were aware that they were participating in a study designed to investigate the relationship between mood and the menstrual cycle. Using a different methodological approach, several studies have kept subjects blind to the intent of the study. These studies have contradictory results. For example, Parlee (1982) had seven normally menstruating women, who were unaware that they were participating in a study on the menstrual cycle, monitor their moods for 90 con-

secutive days. Subjects were between 22 and 32 years of age and were not currently taking oral contraceptives. Time series analysis of the daily records revealed few significant fluctuation in mood. Analysis of group data indicated that several symptoms, including confusion, depression, and fatigue, were lower during the premenstrual phase. After daily monitoring was completed, the women were asked to retrospectively report the symptoms they experienced during the premenstrual phase of their cycle. The retrospective reports contradicted the results from the prospective daily reports. On the retrospective reports, women reported that they felt anxious, depressed, irritable, and tense during their premenstrual phase, even though their daily reports showed no increases in these moods premenstrually. The results imply that premenstrual tension is a fallacy or a societal myth. The sample size of this study is too small to conclude that premenstrual tension is only a figment of a woman's imagination; however, results do indicate that that some women retrospectively report that they suffer from premenstrual tension, possibly because of a learned association between negative moods and the menstrual cycle, when in fact their moods are similar in all phases of their cycle.

In a similar study, 118 female nurses monitored 47 symptoms, from the Moos Premenstrual Distress Questionnaire, on a daily basis for eight weeks (Slade, 1984). Subjects were told that they were participating in a study of general health. Results showed that pain and water retention were experienced premenstrually and menstrually, but there were no cyclic changes in concentration or emotions. A number of women showed elevations in symptoms during the menstrual and premenstrual phases, but the frequency of these occurrences was not beyond chance variation. Slade states

that the "results question whether higher levels of emotions premenstrually or menstrually are a genuine feature of the normal female experience" (p. 6). Slade further suggests that women attribute negative chance occurrences, which normally are attributed to personal or environmental circumstances, to the premenstrual phase of their cycle. For example, a woman may respond differently to a small accident, such as starting a kitchen fire or cutting herself with a knife when she is in the intermenstrual phase as compared to when she is in the premenstrual phase of her cycle. If the woman is intermenstrual, she may attribute the accident to uncoordination, stupidity, or some external distraction (e.g. a small child). But, the same woman, when she is in the premenstrual phase of her cycle, may attribute this accident or inability to concentrate to premenstrual tension. This process maintains the belief that negative emotions are associated with the menstrual cycle. Slade admitted that the population in his study was young and healthy and may not have adequately represented the female population.

In a carefully controlled study, Aubuchon and Calhoun (1985) examined the demand characteristic produced by informing subjects that they were participating in a study on the menstrual cycle. Mood scores from daily symptom monitoring were compared for three different groups: (1) a group of women aware that they were participating in a study on the menstrual cycle; (2) a group of women unaware of the purpose of the study; (3) a group of men. There were nine subjects in each group. All subjects, who were between 18 and 36 years of age, reported that they were healthy and none of the women suffered from dysmenorrhea. The women aware of the nature of the study reported significantly higher overall mood scores

during the premenstrual and menstrual phases. These scores were significantly higher than those of the other two groups. The group of men and the group of naive women reported similar mood patterns. AuBuchon and Calhoun concluded that their research findings were "consistent with those of recent research that points to the influence of social expectancies and other environmental factors on the report of premenstrual discomfort"(p. 44).

Expectancy Manipulation and Premenstrual Symptoms

Fradkin and Firestone (1986) directly manipulated premenstrual expectancies by exposing mothers with premenstrual tension to written and audio-visual information which posited either a biological or psychological theory of premenstrual tension. The information was discussed in small groups. A control group took only the expectancy questionnaires. They were not exposed to any information and they did not participate in a discussion group. The biological information was designed to increase expectancies of premenstrual tension. It consisted of detailed descriptions of chemical and hormonal changes, and the unavoidable fluctuations in mood and concentration were stressed. The intent of the psychological information was to decrease expectancies by rejecting a biological theory of PMT. Societal myths, self-fulfilling expectations, cognitive bias, misattribution, and the negative labelling of ambiguous physiological arousal were given as explanations for premenstrual tension. Expectancies were measured before, directly after, and during the next premenstrual phase of their cycle. Results indicated that expectancies were manipulated in the desired direction; however, the expectan-

cies in the biological group were not significantly elevated. The authors propose that subjects already had a strong biological belief of PMT, and therefore, expectancies could not be raised any farther.

The significance of Fradkin and Firestone's findings is limited since they did not include a group which controlled for the effects of being exposed to an experimental manipulation or the presence of an experimenter. Moreover, the relationship between these expectancies and actual premenstrual symptoms was not ascertained. They used only retrospective reports: no daily measures were gathered.

In a similar study, Olosov (1985) manipulated expectancies by exposing 126 undergraduates between the ages of 17 and 25 to information given on videotapes. Subjects were divided into four groups. The first group was exposed to a lecture presentation created to increase expectancies (Group I), while the second group viewed a lecture presentation designed to decrease expectancies (Group D). The content of the information in Group I and Group D is similar to the information given in Fradkin and Firestone's (1985) biological and psychological groups, respectively. The other two groups were control groups. One control group was exposed to a neutral lecture on an unrelated topic (Group MC). The final group was a blind control group not exposed to any lecture material (Group BC). In groups I, D, and MC, expectancies were measured immediately before a video presentation of the information, immediately after, and at a 40 day follow-up. All participants monitored symptoms daily for 40 consecutive days following the information presentation. Results showed expectancies were manipulated in the desired direction and these changes were maintained at the 40 day follow-up. Immediately after the

presentation and at the 40 day follow-up, expectancy scores in I and MC were significantly higher than those of Group D. Daily mood ratings showed that subjects in Group I reported more negative overall moods than participants in the other three groups. Expectancy scores were significantly and positively correlated with both premenstrual and menstrual phase moods. Olosov concluded that the results from this study provide evidence of a cause-effect relationship between expectancies and mood. There was a phase effect. Olosov reported data which showed that negative moods of all participants were significantly higher for all groups during the menstrual and premenstrual phases, suggesting that the phase of the cycle had an effect independent of the experimental manipulations or group assignment. The above studies indicate that expectancies play a role in self-reported symptoms. However, Slade (1984) found that prospective self-reports of pain and water retention were reported more frequently during the premenstrual and menstrual phases than during the intermenstrual phase, even when subjects were blind to the purpose of the study. Olosov (1985) also found that that more negative moods were reported in the premenstrual and menstrual phases for subjects who were blind to the purpose of the experiment. These results suggest that there may be an underlying physiological mechanism which enhances or promotes premenstrual tension. Asso & Beech (1975) propose, and cite empirical evidence, that there is an increased state of physiological arousal during the premenstrual and menstrual phases. This idea is not incompatible with the hypothesis that negative expectancies influence premenstrual tension. For example, Koeske & Koeske (1975) used an attributional model to explain the interaction between emotional labels and autonomic arousal. In-

creased levels of physiological arousal may be labeled as negative due to negative expectancies or the learned association between negative moods and the menstrual cycle. This study assumes an underlying physiological mechanism (arousal) may influence the experience and self-report of premenstrual symptoms. The goal of this research project is to study the impact of different information on premenstrual expectancies and daily mood ratings.

Olosov's (1985) results indicate that a brief intervention can influence premenstrual expectancies and self-reported mood ratings. Both Olosov (1985) and Fradkin and Firestone (1986) found that psychological information decreases expectancies, while biological information increases expectancies. But why does the psychological information decrease expectancies? And why does biological information increase expectancies? One possibility is that the psychological information gives the subject a sense of control, while the biological information informs the subject that they are not in control of their premenstrual symptoms. Lefcourt (1973), after reviewing the literature, reported that control over an aversive stimuli reduces the negative reaction to the stressor. The effects of information on perceived control of premenstrual tension was evaluated in this study.

Overview of Study

There appears to be an association between expectancy and self-reported mood. Both Olosov (1985) and Fradkin and Firestone (1985) have shown that expectancies can be changed by exposing subjects to information. The purpose of this study was to evaluate the effects of four dif-

ferent types of information on premenstrual expectancy, perceived sense of control of premenstrual tension, and daily mood ratings.

The four information sets included: psychological, biological-passive, biological-active and neutral. The psychological information stated that premenstrual tension was due to self-fulfilling prophesies and negative expectations. The biological-passive information stated that premenstrual suffering was due to uncontrollable hormonal fluctuations. The biological-active information stated that premenstrual tension was due to hormonal fluctuations but that one could reduce premenstrual symptoms by exercising regularly, reducing salt, caffeine and sugar intake, decreasing stress and taking vitamins. The neutral information was unrelated to the menstrual cycle.

First, it was hypothesized that the psychological information and the biological-active information would immediately decrease expectations for premenstrual suffering, the biological-passive information would immediately increase negative expectancies, and the neutral information would have no effect on premenstrual expectancies. It was further proposed that these changes would be maintained at a 40-day follow-up.

It was also hypothesized that scores on a questionnaire which measured the subjects perceived sense of control over premenstrual tension would also change immediately after exposure to the information. The psychological and biological-active information were predicted to increase the subjects feelings of control, while the biological-passive information was predicted to decrease perceived sense of control of premenstrual symptoms. The neutral group was predicted to have no effect

on perceived sense of control of premenstrual tension. In addition, the above changes were predicted to be maintained at a 40-day follow-up.

Finally, a significant interaction effect was predicted between the three phases of the menstrual cycle (premenstrual, menstrual, and intermenstrual) and the groups exposed to the different information sets (psychological, biological-passive, biological-active, and neutral) . It was predicted that participants exposed to the psychological and biological-active information would report more positive moods during the premenstraul phase than the neutral or biological-passive group. Similarly, the biological passive-group was predicted to report more negative moods during the premenstrual phase than the psychological, biological-active or neutral groups.

Method

Subjects

Participants included 69 female psychology students of a large southern university. Participants were between the ages of 18 and 25 with a mean age of 19.4. Participants were predominately caucasian (90%) and only one participant was married. Subjects received course credit for participating in the study. Informed consent was obtained prior to the beginning of the experiment (see Appendix A). Participants were solicited through the psychology pool by means of a sign-up sheet which specified selection criteria for participation in the study. These criteria included: (1) 18 to 25 years of age, (2) regular menstrual cycle, (3) free from contraceptive use, (4) non-parious, (5) subjective report of mild to severe premenstrual distress (see Table 1).

A total of 78 women signed up to participate in the study. Based on responses given on the Demographic and Subject Selection Questionnaire, two individuals were not allowed to participate because one reported that she was over 25 years of age and the other stated that she could not predict when her next period would begin. The data from seven other participants were excluded because these subjects had failed either to menstruate during the 40-day monitoring period or to complete all necessary questionnaires.

Studies have indicated that women taking oral contraceptives report significant differences in affective symptomatology compared to those women who do not take oral contraceptives (Grounds, Davies, & Mowbray, 1970; Herzberg & Copper 1970; Marcotte, Kane, Obrist, & Lipton, 1970; Paige, 1971; Rossi & Rossi, 1980; Slade & Jenner, 1980; cited in Olosov

and Jackson, 1986) To eliminate the potential hormonal confound due to oral contraceptive use, only those subjects who had not taken oral contraceptives in the two months prior to the start of the study and those who reported they did not use oral contraceptives at any point during the study were included. Pregnancy has also been known to change hormonal fluctuation, therefore, only non-parious women were included in the study. To ensure that a complete cycle was represented in the 40-day monitoring period, only those women who claimed to have a fairly regular menstrual cycle were asked to participate (e.g. less than a two-week variation).

An additional criterion required subjects to claim that they experienced mild to severe premenstrual distress. Olosov and Jackson (1987) found that they could increase reports of negative moods compared with a control group by increasing negative expectancies. However, they were unable to decrease negative moods compared with a control group by decreasing negative expectancies. Olosov and Jackson (1987) accounted for their results by asserting that college-age students' moods are already relatively positive; thus, attempts to make them more positive were unsuccessful. By including the above criteria, this study tried to include premenstrual sufferers (who by definition should experience negative moods during the premenstrual phase) so that manipulations designed to decrease expectancies would also decrease negative moods during the premenstrual phase.

Materials

All subjects were administered the following questionnaires: (1) Demographic and Subject Selection Questionnaire, (2) Expectancy Ques-

tionnaires, (3) Daily Monitoring Forms, (4) Perceived Control of Premenstrual Tension Survey, (5) Post-Manipulation Questionnaire, and (6) Post-Study Questionnaire.

The Demographic and Subject Selection Questionnaire. The Demographic and Subject Selection Questionnaire (see Appendix B) was designed to gather general demographic information and to ensure that all subjects met the selection criteria.

Expectancy Questionnaire (EQ). The EQ was developed by Olosov (1984) to assess the expectancy of premenstrual symptoms (see Appendix C). The questionnaire attempts to assess how the participants will feel during their next premenstrual phase. The questionnaire consists of 16 adjectives and three questions. Participants rate how they expect to feel during their next premenstrual phase on a 1- to 6-point scale. The sum of these ratings on all 19 items gives an overall expectancy rating. The EQ is further divided into eight subscales: overall negative mood, overall positive mood, overall psychological mood, overall somatic mood, positive psychological mood, negative psychological mood, positive somatic mood, and negative somatic mood. There are, therefore, a total of nine separate scores for this questionnaire (total plus eight subscales scores). Expectancy ratings were obtained prior to the experimental manipulation, immediately following the manipulation, and at a 40-day follow-up.

Internal consistency and test-retest reliability of this questionnaire were assessed in an unpublished study conducted by this author. This study used a sample of 49 women from the same university. Test-retest reliability coefficients for the overall expectancy questionnaire

was .87. Alpha coefficient for the overall expectancy score was .93. Test-retest and alpha coefficients were as follows: overall positive mood (r=.89, alpha=.89), overall negative mood (r=.84, alpha=.88), overall psychological mood (r=84, alpha=.88), overall somatic mood (r=.84, alpha=.80), positive psychologic mood (r=.86, alpha=.87), negative psychological mood (r=.69, alpha=.81), positive somatic mood (r=.83, alpha=.72), and negative somatic mood (r=.72, alpha=.82).

Daily Monitoring Forms. The items on the Daily Monitoring Forms (see Appendix D) were identical to those on the Expectancy Questionnaires with the addition of one question used to determine the onset of menstruation. Because of an unfortunate photocoping error, however, the scale on the monitoring forms were from 1 to 5 on the three questions and from 1 to 4 on the 16 adjectives. Instructions on the Daily Monitoring Forms told subjects to rate how they felt during the past 24 hours. Participants were instructed to follow this monitoring procedure for 40 consecutive days.

This prospective method offers a significant advantage over the more frequently reported methods of using retrospective questionnaires. Research evidence indicates that retrospective reports are less accurate and may be more susceptible to social expectancies (May, 1976; McCance, Luff, & Widdowson, 1937; Parlee, 1973, 1974, 1982). Moreover, a study by May (1976) found no association between retrospective reports of moods experienced during the menstrual, premenstrual, and intermenstrual phases and prospective measures of mood during these different phases.

The importance of filling out diary forms each day was stressed. If subjects accidentally missed a day of monitoring, they were informed

to leave it blank rather than to fill it out retrospectively. To increase the probability of prospective monitoring, subjects were asked to hand in daily monitoring forms twice a week to a specified location on campus. The daily monitoring forms were scored in the same fashion as the expectancy questionnaire with eight sub-scale scores and an overall mood score. Higher scores indicated more negative moods.

Although subjects filled out the forms every day, only those daily monitoring forms which were filled out during the premenstrual, menstrual, or intermenstrual phases were used in the final analysis. The three phases of the menstrual cycle were defined in the following fashion. The premenstrual phase consisted of the five days prior to the onset of menstruation, the menstrual phase consisted of the first five days of menses, and the intermenstrual phase consisted of the five days directly at midcycle. If only one menstrual phase occurred during the 40-day monitoring period, the intermenstrual phase was based on a 28 day menstrual cycle. If participants had more than one menstrual or premenstrual phase during the 40-day monitoring period, one was selected at random.

Perceived Control of Premenstrual Tension Survey (PCPT). The PCPT was designed to assess the degree in which subjects feel they can actively change their premenstrual symptoms (See Appendix E). The questionnaire consists of 20 questions which were rated on a 1- to 7-point scale. Higher scores indicated a feeling of less control of premenstrual symptoms. Ratings on 16 of the items were totalled to give an overall sense of control score. The questions also were divided into subscales: (1) general, (2) diet and exercise, (3) environment, and (4) cognitive. Each

subscale consisted of four items. Items were place into a subscale based on the apparent content of that item. In other words, the subscales have face validity.

An unpublished study, conducted by this author, assessed the internal and test-retest reliability of this questionnaire using a sample of 49 college women from the same university. The alpha coefficients for the the overall sense of control score was .80. The alpha coefficients for the general, diet and exercise, environment, and cognitive subscales were .74, .73, .57, and .70, respectively. Correlation coefficients between scores obtained initially and scores obtained one-week later was .88 for the overall sense of control score. Test-retest coefficients were .84, .77, .76, and .73 for general, diet and exercise, environment and cognitive subscales, respectively.

An additional subscale, vitamins and medication, was intended to be included in scoring this questionnaire. However, both internal (alpha=.11) and test-restest (r=.34) coefficients were fairly low. Therefore, the four items intended for this subscale were not included in the overall sense of control score and the vitamins and medication subscale was excluded from the analysis.

Post-Manipulation Questionnaire. The purpose of the post-manipulation questionnaire (see Appendix F) was to see if subjects read the material or paid attention in the discussion group. It also assessed how interesting the article was to the participants and if participants changed their opinions about premenstrual mood changes. This questionnaire was modified from Olosov's (1985) Post-Manipulation Questionnaire.

All groups appeared to pay attention to the information and the interest ratings were approximately the same for all groups.

Post-Study Questionnaire. The Post-Study Questionnaire (see Appendix G) assessed subjects' memory of the information, whether subjects talked about the information with other women, and what they thought was the purpose of the study. Subjects also indicated whether or not they began to use oral contraceptives during the course of the study. All the participants appeared to remember the information that theyread. None of the Subjects began to use oral contrceptives duringthe course of the study.

Conditions.

There were four different sets of written information. Each of the information sets took approximately five to ten minutes to read. All of the information was derived from published articles and books. Three of the four informational sets were modified versions of Olosov's (1985) video lecture scripts which were used in her study. These three sets of information were referred to as psychological, biological- passive, and neutral.

Psychological information. The psychological information refuted the common assumption that mood fluctuations correspond to the menstrual cycle in college-age women (see Appendix H). The information indicated that the mood/menstrual cycle relationship may be true for women over 30, but that research was unable to find this relationship in college-age women. Reported mood changes were accounted for by social expectation. The psychological information was predicted to decrease expectancies for premenstrual suffering.

Biological-Passive Information. The biological-passive information emphasized the predictable fluctuations in mood because of normal hormonal changes (see Appendix J). Common premenstrual symptoms, such as irritability, fatigue, and depression, were mentioned several times. The cause of these symptoms was attributed to hormonal fluctuation, and the predictable and uncontrollable nature of these fluctuations was emphasized. No suggestions for alleviating premenstrual symptoms were given. The biological-passive information was expected to increase negative expectancies.

Biological-Active Information. The biological-active information gave the same information as the biological- passive information, plus additional information on how to alleviate premenstrual symptoms (see Appendix J). Ways to alleviate premenstrual symptoms included: progesterone treatment, vitamin therapy, change in diet, change in exercise, and a reduction of stress. These suggestions were given by Norris & Sullivan (1984) in their popular book, PMS: Premenstrual Syndrome. The ability to control premenstrual symptoms was emphasized. Pilot data, gather on an independent sample of 33 women from the same university, indicated that this information lowers expectancies. The biological-active information was, therefore, expected to decrease negative expectancies.

Neutral information. The neutral information was unrelated to the menstrual cycle (Appendix K). The neutral information served as a control for experimenter contact and exposure to an experimental manipulation.

Procedures

Subjects were randomly divided into four groups: psychological, biological-passive, biological-active, and neutral. The four groups met separately. The four groups were further subdivided into small discussion groups with four to ten subjects in each group. All participants were told that the purpose of the study was to "evaluate the readability of information for women with mild, moderate, and severe menstrual distress." Subjects were then asked to complete the Demographic and Subject Selection Questionnaire, the Expectancy Questionnaire, and the Perceived Control of Premenstrual Tension Survey. After completing the initial set of questionnaires, subjects read one of the information sets and participated in a discussion group. All subjects were given ten minutes to read the information. The discussion of the information was included to verify that the information was read and to ensure that the key points of the information were known and understood. Discussion in all groups lasted approximately 15 minutes.

After the experimental manipulation subjects were asked to complete the Expectancy Questionnaire, the Perceived Control of Premenstrual Tension Survey, and the Post-Manipulation Questionnaire. Once these were completed, daily monitoring forms were handed out and explained. Subjects were asked to monitor their symptoms daily for 40 days. They were further instructed to turn in daily monitoring forms twice a week to a specified location on the college campus.

Once daily monitoring was completed, after 40 days, subjects were again asked to complete the Expectancy Questionnaire and the the Perceived Control of Premenstrual Tension Survey. They were also requested to complete the Post- Study Questionnaire. Once subjects had completed the final

set of questionnaires, they were debriefed (see Appendix L for debriefing statement). Because negative moods were expected to increase in the biological-passive group, the members of this group were requested to read the information given to the biological-active group and participate in a discussion group before they were given the debriefing statement. Thus, participants in this group were allowed to think of ways that they could control their symptoms. All participants had the opportunity to have questions answered concerning the study and concerning their own personal experiences with premenstrual tension.

Results

Effects of Manipulation on Expectancies.

Results from a 4 x 3 (group by phase) repeated measures ANOVA on the overall expectancy scores from the Expectancy Questionnaire revealed a significant effect for group ($F(3,64) = 4.42$, $p<.007$), for phase ($F(2,128) = 49.01$, $p<.0001$), and a significant interaction effect ($F(6,128) = 2.45$, $P<.028$). At posttest, all groups were manipulated in the desired direction: scores increased in the biological-passive group and decreased in both the psychological and biological-active groups (see Figure 1, Table 2, and Table 3).

Pairwise comparisons using the Tukey's post hoc procedure ($p<.05$) revealed that the psychological group decreased significantly from pretest to immediate posttest and scores again declined significantly from posttest to the 40-day follow-up.

The biological-active group also declined initially, but the difference in scores from pretest to posttest was not significantly different. However, scores obtained by the biological-active group on the expectancy questionnaire did decline significantly from pretest to follow-up.

Scores increased from pretest to posttest for the biological-passive group, but not significantly. Contrary to the predicted hypothesis, scores declined significantly from posttest to follow-up. There were no significant differences between pretest scores and follow-up scores.

Pretest to posttest scores for the neutral group were not significantly different. However there was a significant decline of scores from pretest to follow-up and from posttest to follow-up.

A one-way ANOVA indicated that there were no significant differences between the groups at pretest. Significant differences between the groups at posttest and at follow-up were assessed using the Tukey's post hoc test procedure. At posttest and follow-up, the psychological and biological-passive groups were significantly lower than both the neutral group and biological-passive group. There were no significant differences between the biological-active group and the psychological group at posttest or at follow-up. Similarly, there were no significant differences between the biolgical- passive group and the neutral group at postest or at follow-up.

A repeated measures MANOVA was conducted with all of the subscales. A significant interaction effect was found ($F(24,128)=1.67$, $p<.03$). Univariate tests were significant for all but one of the subscales: overall positive mood ($F(6,128)=3.43$, $p<.004$), overall negative mood ($F(6,128)=4.03$, $p<.001$), overall psychological mood ($F(6,128)=6.01$, $p<.001$), overall somatic mood ($F(6,128)=2.62$, $p<.02$), positive psychological mood ($F(6,128)=3.84$, $p<.002$), negative psychological mood ($F(6,128)=4.85$, $P<.001$), positive somatic mood ($F(6,128)=1.64$, $p<.14$), and negative somatic mood ($F(6,128)=1.71$, $p<.12$)(See Table 4).

Pairwise comparisons on the subscales (except positive somatic mood and negative somatic mood) revealed results similar to those found for the overall mood score (see Table 5). Scores declined on all of these subscales for the psychological group from pretest to posttest, however, this decline was only significant for the overall psychological mood. Scores obtained by the psychological group were significantly lower from pretest to follow-up and from posttest to follow-up for all the subscales

except positive somatic mood and negative somatic mood which were not included in the analysis.

Scores obtained by the biological-active group also declined from pretest to posttest on all of the subscales with a significant univariate test. However, none of the subscales were significantly different from pretest to posttest. Pairwise comparisons revealed that there was a significant decline from pretest to follow-up and from posttest to follow-up for all of these subscales.

Mean scores obtained from the biological-passive group increased from pretest to posttest for all subscales with a significant univariate test. Only the overall negative mood score increased significantly from pretest to posttest. All but one of these subscales, overall somatic mood, declined significantly from posttest to follow-up.

As predicted, mean scores obtained by the neutral group did not change significantly from pretest to posttest. However, scores did decline significantly from posttest to follow-up for all the subscales with a significant univariate test. There was a significant decline from pretest to follow-up for the overall positive mood score, the overall psychological mood score, and the negative psychological mood score.

Scores obtained by the psychological group and biological- active group were significantly lower at posttest than the biological-active group and the neutral group for three of the subscales: overall negative mood, the overall psychologic mood, and negative psychologic mood. For these subscales at posttest, the psychological group was not significantly different than the biological-active group and the biological-passive group was not significantly different than the neutral group.

These results were found for all the subscales at follow-up (See Table 1).

Effects of Manipulation on Perceived Control of Premenstrual Tension.

Similar to the Expectancy Questionnaire, a 4 x 3 (group by phase) repeated measures ANOVA was also conducted on the overall sense of control score of the PCPT. A significant interaction effect was obtained on the overall sense of control score ($F(6,128) = 5.41$, $p < .0001$) (see Figure 2, Table 6 and Table 7).

Tukey's post hoc tests revealed that the overall sense of control score declined significantly from pretest to posttest for the biological-active group and that this drop was maintained at the 40-day follow-up.

The overall sense of control score also declined for the psychological group, but not significantly from pre- to posttest. However, there was a significant decline in overall scores from pretest to follow-up for the psychological group.

The mean score obtained from the biological-passive group increased from pretest to posttest, but not significantly. The scores from this group actually decreased significantly from pretest to follow-up.

Mean scores obtained from the neutral group did not change significantly from pretest to posttest, however, they did decline significantly from pretest to follow-up.

A one-way ANOVA was conducted between the four groups on initial scores of the PCPT. Even though subjects were randomly assigned to groups, significant differences were found between the neutral group and the biological-active group on the PCPT. Ranges in scores for each group

revealed that there were no outliers in either the biological-active group or the neutral group. The following ranges of scores were found for the psychological, biological-passive, biological-active and neutral groups respectively: 56 to 108, 56 to 94, 51 to 90, and 68 to 109. Looking at subjects individual scores, it appeared that the neutral group did not have subjects which represented the lower end of the range while the biological-active group seemed to be missing subjects who scored higher on the PCPT. This would work against obtaining significant results. The biological-active group started out with lower scores and so had less range in which to decrease. As noted above, however, there was a significant decline from pretest to post-test for the biological-active group despite this disadvantage.

To look at group differences a 2 (posttest and follow-up) x 4 (groups) ANACOVA was conducted using the the pretest as the covariate. A significant group effect was obtained ($F(3,64)=11.47$, $p<.001$).

Tuckey's post hoc tests revealed that the biological-active group had significantly lower scores than biological-passive group at posttest. There were no significant differences between the other groups at posttest. There were no significant differences between any of the groups at follow-up (see Table 8).

A repeated measures MANOVA was conducted with the subscales of the PCPT. A significant interaction effect was found ($F(24,168)=3.07$, $p<.001$). Univariate tests revealed a significant interaction effect for all of the subscales: general ($F(24,168)=5.37$, $p<.001$), cognitive ($F(24,128)=2.56$, $p<.02$), environment ($F(24,168)=5.01$, $p<.001$), diet and exercise ($F(24,168)=2.97$, $p<.01$).

Scores for the general, environment, and diet & exercise subscales yielded similar results. In these three subscales, only the biological-active group decreased significantly from the pretest to the posttest. The biological-active group was significantly different than the other three groups at posttest and at follow-up. On the cognitive subscale, however, analysis revealed that scores obtained by both the biological-active group and the psychological group decreased from pretest to posttest and that these scores were maintained at the 40-day follow-up (see Table 9 and Table 10).

Correlations between Expectancy and Perceived Control of Premenstrual Tension.

Correlations between the Expectancy Questionnaire and the PCPT at pretest ($r = .4341$), at posttest ($r = .5198$), and at follow-up ($r = 5362$) were all significant at the $p < .0001$ level.

Effects of Manipulations on Daily Mood Ratings

A 4 x 3 (group by phase) repeated measures ANOVA was used to assess the differences in daily mood ratings between groups, between the three phases of the menstrual cycle (intermenstrual, premenstrual, and menstrual), and the interaction between these two variables. Results from the repeated measures ANOVA on the five days sums of the overall scores from the Daily Monitoring Form indicated a significant main effect for phase of the menstrual cycle ($F = 18.01$, $p < .0001$) where women reported significantly higher moods during the premenstrual and menstrual phases than during the intermenstrual phase. However, there was no main significant effect for group ($F = .84$, $p < .477$), or for the interaction between

group and phase ($F=.82$, $p<.554$). Subscale scores on the daily monitoring form yielded similar results (see Table 11).

Discussion

Results show that exposing participants to information which gives them a way to control their premenstrual symptomatology (psychological and biological-active information) immediately decreases their expectation for these symptoms, while information that emphasizes lack of control (biological-passive information) immediately increases their expectations for premenstrual suffering.

As predicted, pretest to posttest scores on the Expectancy Questionnaire for the psychological group, biological-passive group, and neutral group replicated those found by Olosov and Jackson (1987). Expectancies significantly decreased for the psychological group, while expectancies increased, although not significantly, for the biological-passive group.

In addition, expectancy scores for the biological-active group decreased at posttest and decreased significantly at follow-up. This finding sheds light onto why the information changes expectancies for experiencing premenstrual tension. Both the psychological group and the biological-active group gave ways in which the subjects could alleviate premenstrual suffering. Thus, it appears that gaining a sense of control over symptoms decreases negative expectancies for premenstrual tension.

This hypothesis was further supported by scores obtained on the Perceived Control of Premenstrual Tension Survey. Results from the cognitive subscale on the PCPT indicated that the psychological group, immediately after exposure to the information and at follow-up, felt more capable of reducing premenstrual suffering by changing their cognitions

(i.e. these participants thought that changing their thoughts about the menstrual cycle could decrease their premenstrual symptoms). Analysis further indicated that at follow-up the psychological group felt that they could reduce premenstrual suffering by other means (i.g. diet) as indicated by significantly lower scores on all subscales of the PCPT. The biological-active group displayed significantly lower scores on all subscales of the PCPT at posttest, and these scores were maintained at follow-up. Therefore, the two groups with the lowest expectations for premenstrual tension, also felt that there were ways in which they could actively control premenstrual suffering.

Similarly, the biological-passive group displayed increases in scores on the Expectancy Questionnaire and on the PCPT at posttest. These results indicate that the participants in the biological-passive felt less able to control their premenstrual symptoms and they also expected to experience more premenstrual tension during the next premenstrual phase of their cycle. Interestingly, scores on both the PCPT and the Expectancy Questionnaire dropped at follow-up for the biological-passive group, again indicating the relationship between perceived control and expectancy for premenstrual tension. Significant correlations between the PCPT and the Expectancy Questionnaire also provided support for this contention.

In general, scores on both the Expectancy Questionnaire and PCPT decreased significantly at follow-up for all four groups. This may be related to the time in which the study was conducted. Participants began the study at the beginning of Spring Quarter and finished the final questionnaires during finals week. Thus, their next period would occur

during the summer time when they would be relieved from the pressures of school. Since stress is thought to be a factor in increasing premenstrual suffering (as expressed by a number of women in the discussion groups), it seems likely that subjects' scores on the Expectancy Questionnaire would decrease. Again, it is interesting to note the the PCPT also decreased with the expectancy scores. It seems possible that thoughts of summer may also increase the participants feeling of control over premenstrual tension. For example, students may feel that they have more time to exercise or can control their diet better when they are no longer on the school meal plan.

Results from the scales on the Expectancy Questionnaire indicated that the expectancy manipulations had a greater impact on psychological mood compared to somatic mood. In general, these results indicate that participants felt that by changing their attitudes about the premenstrual phase or by changing diet, exercise, stress level, or vitamins they would happier, more friendly, more loving, more mentally alert and less nervous. However, they did not feel that these changes would influence cramps or fatigue associated with the premenstrual phase of the menstrual cycle.

Despite the manipulations of expectancies and perceived sense of control, the groups did not differ on the daily monitoring measure. This result did not support the significant group main effect noted by Olosov (1985) who found that the biological-passive group reported significantly more negative moods at all phases of the menstrual cycle than the psychological or neutral group. Olosov (1985) also reported a significant phase effect, which was found in this study.

There are a couple of alternative explanations for the failure of this study to support Olosov and Jackson's findings. First, this study specifically selected women who stated that they were premenstrual sufferers; this criterion was not included in Olosov and Jackson's study. It is possible that one may be able to increase negative moods in non-premenstrual sufferers by increasing negative expectancies. On the other hand, premenstrual suffers daily moods may not be influenced by increasing or decreasing their expectations for premenstrual tension. This interpretation implies that premenstrual tension is primarily influenced by some other factor(s) such as hormonal fluctuation.

A confound to the above interpretation is that this study, by including the extra criteria, may have created a very strong demand characteristic. The subjects knew at the onset of the study that they were required to experience premenstrual tension. Consequently, subjects in all groups may have reported more negative moods during the premenstrual phase to "please the experimenter" (Slade, 1984). This demand characteristic may have glossed over actual differences between the groups.

The photocopying error on the Daily Forms may have also made it more difficult to find differences between the groups on daily moods. This explanation is less likely since strong phase effects were found despite the photocopying error.

The results of this study do not support the hypothesis that expectancies influence the daily reports of moods. These results suggest that other factors (i.e. biological factors) influence premenstrual tension. This study is limited in making these types of interpretations since it did not directly look at any other factors which may influence

premenstrual tension. Moreover, this study did not directly address expectancies of premenstrual which existed prior to the onset of the study. As mentioned above, the time in which the study was conducted (spring quarter), the method in which subjects were selected, and the photocopying error may have influenced the results of this study and thus make the results difficult to interpret.

The hypothesis that expectancies for premenstrual tension are related to the participants' sense of control over premenstrual tension was supported. This study did not, however, show that daily reports of moods could be changed by manipulating expectancies. It is possible that failure to obtain significance on the daily mood measure was related to the method of subject selection. It was suggested that women who report experiencing premenstrual tension, or premenstrual suffers, respond differently to the information designed to increase or decrease premenstrual expectations than non-premenstrual sufferers. Future research is needed to support this theory and to clarify the role of expectancies in self-reported moods during the premenstrual phase of the menstrual cycle.

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Table 1. Demographic and Other Information on all Participants

AGE:	18	19	20	21	22	23	24	25
	(26%)	(30%)	(20%)	(10%)	(3%)	(1%)	(0%)	(1%)

RACE:	Caucasian	Black	Oriental	Hispanic	Other
	(90%)	(3%)	(4%)	(1%)	(1%)

MARITAL STATUS:	Single	Married	
	(99%)	(1%)	

SEVERITY OF DESMENHOREA RATED ON A SCALE OF 1 (none) TO 7 (severe):

None		Mild		Moderate		Severe
1	2	3	4	5	6	7
(1%)	(2%)	(17%)	(15%)	(33%)	(28%)	(3%)

SEVERITY OF PMT RATED ON A SCALE OF 1 (none) TO 7(severe):

None		Mild		Moderate		Severe
1	2	3	4	5	6	7
(0%)	(3%)	(10%)	(12%)	(42%)	(29%)	(4%)

Table 2. Mean Scores and ANOVA results for Overall Expectancy

		Pretest		Posttest		Follow-up		Group x Phase
Variable	Group	Mean	S.D.	Mean	S.D.	Mean	S.D.	F(6,128)
Overall	Psych	75.37	8.48	68.63a	11.74	56.16a	15.88	4.65***
Expectancy	Bio-A	75.41	9.80	72.24a	14.22	56.82a	15.40	
	Bio-P	76.89	11.92	79.56b	12.62	73.50b	12.47	
	Neutral	80.93	14.10	81.53b	13.66	73.13b	18.06	

Note: Higher scores indicate greater expectancy to experience premenstrual tension. Means between the groups at posttest and follow-up followed by the same letter are not significantly different at $p<.05$. See Table 3 for significant differences between for each group from pretest to posttest, pretest to follow-up, and posttest to follow-up. *** $p<.001$

Table 3. Tukey Pairwise Comparisons Across Intervention Phases for Overall Expectancy

Variable	Group	Prettest-Posttest	Pretest-Follow-up	Posttest Follow-up
Overall Expectancy	Psych	*	*	*
	Bio-A	ns	*	*
	Bio-P	ns	ns	*
	Neutral	ns	*	*

Note: ns = nonsignificant

* $p < .05$

Table 4. Mean Subscale Scores on Expectancy Questionnaire and Results of ANOVA Tests of Significance for Group x Phase Interaction

		Pretest		Posttest		Follow-up		Group x Phase
Variable	Group	Mean	S.D.	Mean	S.D.	Mean	S.D.	F(6,128)
Overall Positive	Psych	29.16	3.72	26.37a	5.60	20.74a	6.56	3.43*
	Bio-A	29.41	5.34	28.82ab	7.57	22.47a	6.14	
	Bio-P	29.11	6.15	30.78b	6.70	27.00b	5.92	
	Neutral	31.73	5.54	31.87b	5.62	27.93b	7.54	
Overall Negative	Psych	34.16	5.09	31.11a	6.32	26.37a	8.57	4.03***
	Bio-A	33.88	4.20	31.11a	5.70	31.94a	5.70	
	Bio-P	35.61	5.94	36.56b	5.76	34.72b	7.10	
	Neutral	36.87	6.91	37.53b	6.21	33.87b	9.19	
Overall Psychologic	Psych	30.11	4.98	26.95a	6.35	20.95a	6.88	6.01***
	Bio-A	30.00	4.99	28.77a	6.14	20.94a	6.76	
	Bio-P	30.50	4.94	32.78b	5.00	28.33b	5.81	
	Neutral	33.27	6.09	34.07b	6.53	29.07b	8.46	
Overall Somatic	Psych	33.21	4.67	30.53	5.22	26.16	7.85	2.62*
	Bio-A	33.29	4.58	32.00ab	6.97	26.29a	7.03	
	Bio-P	34.22	5.92	35.56bc	6.34	33.39b	6.28	
	Neutral	35.33	5.89	35.33c	4.76	32.73b	7.95	
Positive Psychologic	Psych	14.00	2.63	12.47a	3.41	9.53a	3.27	3.84**
	Bio-A	13.71	3.06	13.53ab	4.22	10.18a	3.21	
	Bio-P	13.72	3.06	15.06b	3.61	12.67b	3.40	
	Neutral	15.13	2.85	15.60bc	3.36	13.27b	3.85	
Negative Psychologic	Psych	16.11	3.11	14.47a	3.36	11.41a	4.18	4.85***
	Bio-A	16.29	2.95	15.24a	2.86	10.77a	4.58	
	Bio-P	16.78	3.21	17.72b	2.49	15.67b	3.66	
	Neutral	18.13	3.74	18.47b	3.58	15.80b	5.12	
Positive Somatic	Psych	15.50	1.92	13.90	2.45	11.21	3.57	1.64
	Bio-A	15.39	3.63	15.72	3.56	14.33	3.07	
	Bio-P	15.71	2.78	15.29	3.80	12.29	3.84	
	Neutral	16.60	2.92	16.27	2.49	14.67	4.03	
Negative Somatic	Psych	18.05	3.55	16.63	3.76	14.95	4.86	1.71
	Bio-A	17.59	3.30	16.71	4.00	14.00	4.86	
	Bio-P	18.33	3.94	18.83	4.13	19.06	4.33	
	Neutral	18.73	4.14	19.07	3.47	18.07	4.86	

Note: Higher scores indicate greater expectancy to experience premenstrual tension. Means between the groups at posttest and follow-up followed by the same letter are not significantly different at $p<.05$. MANOVA F group x phase(24,126)=1.67, $p<03$.
*** $p<.001$ ** $p<.01$ * $p<.05$

Table 5. Tukey Pairwise Comparisons Across Intervention Phases for Subscales on the Expectancy Questionnaire

Variable	Group	Prettest-Posttest	Pretest-Follow-up	Posttest Follow-up
Overall Positive	Psych	ns	*	*
	Bio-A	ns	*	*
	Bio-P	ns	ns	*
	Neutral	ns	*	*
Overall Negative	Psych	ns	*	*
	Bio-A	ns	*	*
	Bio-P	*	*	*
	Neutral	ns	ns	*
Overall Psychologic	Psych	*	*	*
	Bio-A	ns	*	*
	Bio-P	ns	ns	*
	Neutral	ns	*	*
Overall Somatic	Psych	ns	*	*
	Bio-A	ns	*	*
	Bio-P	ns	ns	ns
	Neutral	ns	ns	ns
Positive Psychologic	Psych	ns	*	*
	Bio-A	ns	*	*
	Bio-P	ns	ns	*
	Neutral	ns	ns	*
Negative Psychologic	Psych	ns	*	*
	Bio-A	ns	*	*
	Bio-P	ns	ns	*
	Neutral	ns	*	*

Note: ns = nonsignificant
* $p < .05$

Table 6. Mean Scores and ANOVA results for Overall Sense of Control

		Pretest		Posttest		Follow-up		Group x Phase
Variable	Group	Mean	S.D.	Mean	S.D.	Mean	S.D.	F(6,128)
Overall	Psych	63.21	14.24	59.00	14.97	54,42	12.70	5.41***
Sense of	Bio-A	54.82	9.99	42.06	12.24	40.94	8.77	
Control	Bio-P	66.89	11.06	66.89	13.35	57.72	16.35	
	Neutral	68.99	10.21	66.67	10.61	60.67	10.39	

Note: Higher scores indicate less perceived control of premenstrual symptoms. *** $p<.001$

Table 7. Tukey Pairwise Comparisons Across Intervention Phases for Overall Sense of Control

Variable	Group	Prettest-Posttest	Pretest-Follow-up	Posttest Follow-up
Overall Sense of Control	Psych	ns	*	ns
	Bio-A	*	*	ns
	Bio-P	ns	ns	*
	Neutral	ns	*	*

Note: ns = nonsignificant

* $p < .05$

Table 8. Adjusted Means and ANACOVA Results for Overall Sense of Control

Variable	Group	Posttest Mean	Follow-up Mean	F Group (3,64)
Overall	Psych	58.04ab	53.46a	11.47***
Sense	Bio-A	47.67a	57.89a	
Control	Bio-P	67.05b	46.55a	
	Neutral	61.33ab	55.33a	

Note: Higher scores indicate less perceived control of premenstrual tension. Means followed by the same letter are not significantly different at $p<.05$. *** $p<.001$

Table 9. Mean Scores for Subscales on the PCPT and ANOVA tests of Significance for Group x Phase Interaction

		Pretest		Posttest		Follow-up		Group x Phase
Variable	Group	Mean	S.D.	Mean	S.D.	Mean	S.D.	F(6,128)
General	Psych	14.79	4.77	13.53	4.38	13.00	3.98	5.37***
	Bio-A	12.94	4.04	8.35	4.06	8.59	3.28	
	Bio-P	15.17	3.54	15.72	3.61	12.17	4.95	
	Neutral	16.00	3.68	16.13	3.42	13.93	4.52	
Cognitive	Psych	16.73	3.12	14.63	4.22	13.26	3.85	2.56*
	Bio-A	15.71	3.90	13.41	4.13	12.59	3.03	
	Bio-P	17.00	5.04	18.72	4.90	16.44	5.14	
	Neutral	19.67	3.66	17.27	4.77	17.20	3.72	
Environ-	Psych	18.42	3.55	16.84	3.48	15.74	4.38	5.01***
ment	Bio-A	16.18	3.86	12.47	3.88	12.06	3.63	
	Bio-P	17.28	4.14	18.44	3.93	16.78	5.92	
	Neutral	20.40	3.11	19.20	2.86	17.87	3.43	
Diet &	Psych	13.26	5.59	14.00	5.22	12.42	1.67	2.97**
Exercise	Bio-A	10.00	3.41	7.82	3.63	7.71	2.56	
	Bio-P	12.33	3.99	14.00	4.87	12.33	1.34	
	Neutral	13.73	2.87	14.07	5.03	11.67	2.35	

Note: Higher scores indicate less perceived control of premenstrual symptoms. MANOVA F group x phase (24, 168) = 3.07, $p<.001$.
*** $p<.001$

Table 10. Tukey Pairwise Comparisons Across Intervention Phases for Subscales of the Perceived Sense of Control Questionnaire

Variable	Group	Prettest-Posttest	Pretest-Follow-up	Posttest Follow-up
General	Psych	ns	ns	ns
	Bio-A	*	*	ns
	Bio-P	ns	*	*
	Neutral	ns	ns	ns
General	Psych	ns	*	ns
	Bio-A	*	*	ns
	Bio-P	ns	ns	*
	Neutral	ns	ns	ns
Environment	Psych	ns	*	ns
	Bio-A	*	*	ns
	Bio-P	ns	ns	ns
	Neutral	ns	*	ns
Diet & Exercise	Psych	ns	ns	ns
	Bio-A	*	*	ns
	Bio-P	ns	ns	ns
	Neutral	ns	*	*

Note: ns = nonsignificant
* $p < .05$

Table 11. Means Scores and ANOVA Results for Daily Moods

Variables	Groups	Premenstrual Mean	Premenstrual S.D.	Menstrual Mean	Menstrual S.D.	Intermenstrual Mean	Intermenstrual S.D.	F phase (2,128)
Overall Mood	Psych	205.90	41.27	210.79	42.10	187.42	38.76	30.10***
	Bio-A	207.59	28.46	218.82	37.55	177.24	34.91	
	Bio-P	217.89	57.21	226.06	45.38	175.39	22.89	
	Neutral	214.46	45.07	222.00	41.60	181.12	34.67	
Overall Positive Mood	Psych	94.11	19.15	93.47	18.50	88.32	17.69	18.01***
	Bio-A	95.94	13.30	100.24	16.08	84.82	16.86	
	Bio-P	94.78	24.92	97.61	17.74	82.00	17.17	
	Neutral	103.13	16.16	104.53	17.55	86.67	20.82	
Overall Negative Mood	Psych	75.79	19.60	80.68	22.68	66.58	18.24	40.72***
	Bio-A	75.29	14.81	80.24	16.78	61.12	13.31	
	Bio-P	81.67	26.33	88.06	24.52	61.22	9.89	
	Neutral	85.00	24.92	90.73	20.71	67.27	17.61	
Overall Psych. Mood	Psych	80.90	16.94	80.21	17.20	74.32	16.91	19.85***
	Bio-A	82.47	16.96	83.82	17.05	71.24	16.89	
	Bio-P	85.44	24.34	87.17	17.54	69.67	10.38	
	Neutral	85.06	20.28	85.50	18.28	72.20	15.33	
Overall Somatic Mood	Psych	89.00	18.64	93.95	19.99	80.58	15.32	38.20***
	Bio-A	88.77	10.79	96.65	13.22	74.71	12.83	
	Bio-P	91.00	24.66	98.50	21.71	73.56	11.90	
	Neutral	95.33	171.90	103.13	15.06	80.27	19.17	
Positive Psych. Mood	Psych	44.32	9.35	42.47	9.15	41.00	9.15	17.82***
	Bio-A	45.77	8.36	47.12	8.44	40.41	8.10	
	Bio-P	45.22	12.83	46.83	8.94	38.56	8.33	
	Neutral	50.53	7.86	50.87	10.67	40.73	10.50	
Negative Psych. Mood	Psych	38.58	11.12	36.74	11.90	33.32	9.90	17.60***
	Bio-A	36.71	12.05	36.71	10.18	30.82	9.89	
	Bio-P	40.22	13.57	40.33	11.66	31.11	5.12	
	Neutral	42.27	15.13	41.27	11.88	32.93	9.24	
Positive Somatic Mood	Psych	49.79	10.38	50.00	9.93	47.32	9.33	15.23***
	Bio-A	50.18	5.50	53.12	8.02	44.41	9.36	
	Bio-P	40.56	12.73	50.78	9.86	40.16	8.87	
	Neutral	52.60	9.30	53.67	8.28	45.93	10,87	
Negative Somatic Mood	Psych	39.21	10.55	43.95	13.01	33.26	9.72	50.02***
	Bio-A	38.59	9.24	42.53	7.93	30.29	5.28	
	Bio-P	41.44	13.87	17.72	14.36	30.11	5.87	
	Neutral	42.73	11.07	49.47	10.78	34.33	10.91	

Note: *** $p<.001$

Figure 1. Mean Overall Expectancy Scores at Pretest, Posttest, and Follow-up

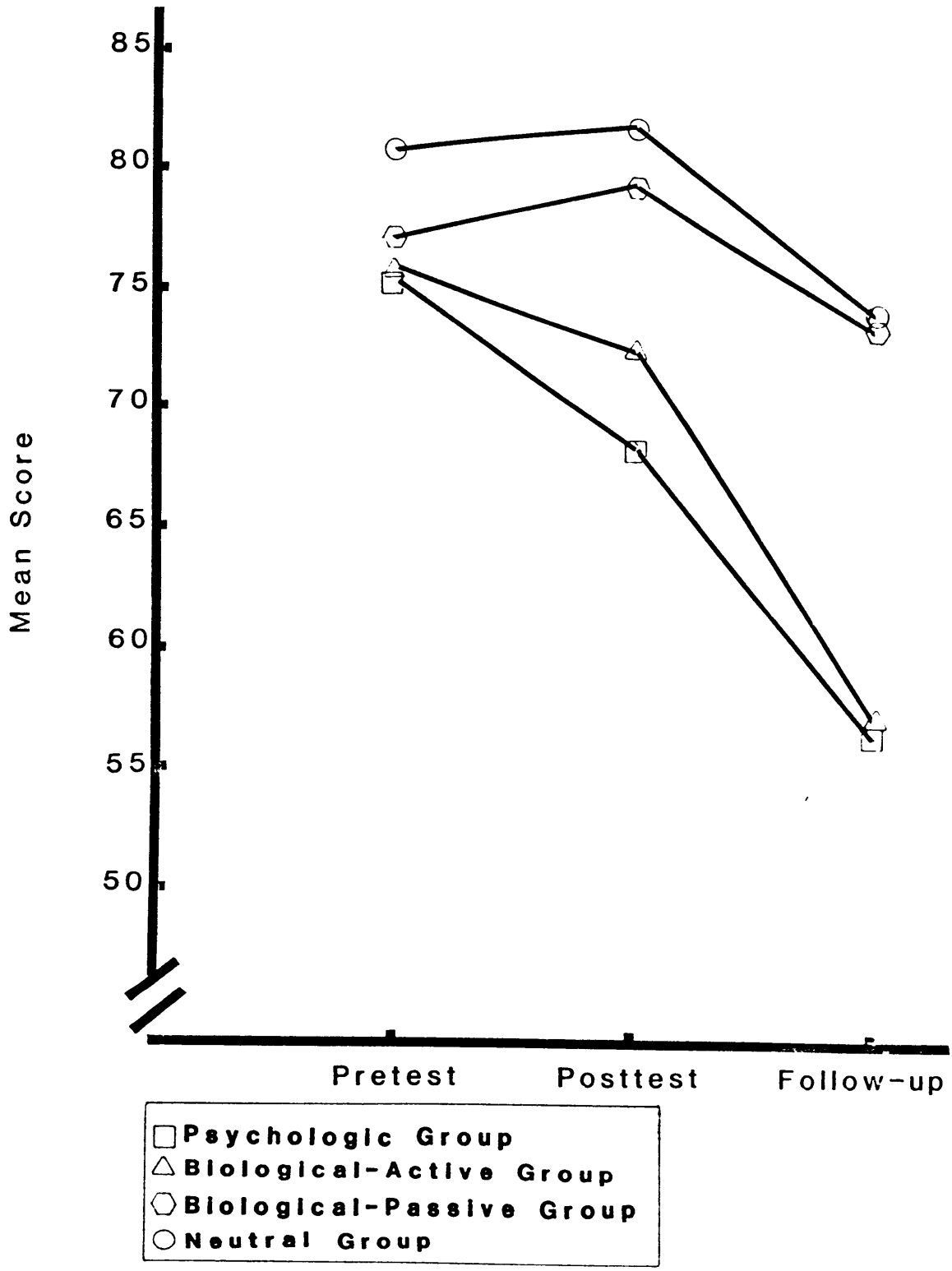
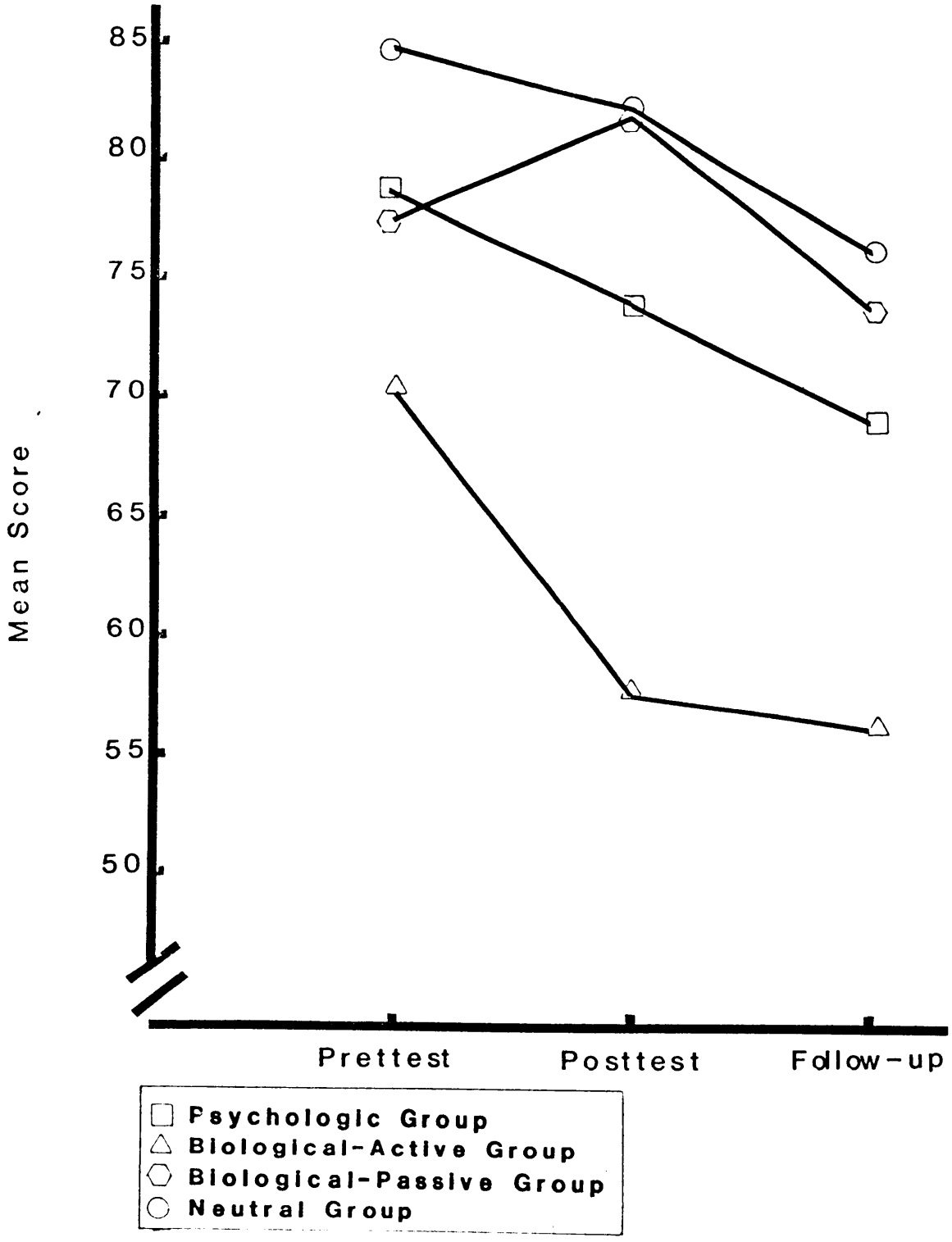


Figure 2. Mean Overall Sense of Control Score at Pretest, Posttest, and Follow-up



Appendix A

Consent Form

Consent Form

I understand that I am participating in a study designed to investigate the menstrual cycle. I will be required to take a number of psychological tests, to read some information, and to participate in a discussion group. The psychological tests will take approximately 40 minutes to complete. The information will take approximately ten minutes to read. The discussion group will last approximately 15 minutes. I also will be required to monitor my moods daily for 40 consecutive days. Monitoring will take less than five minutes a day. I will be required to hand in daily monitoring sheets twice a week. Then I will be required to take more psychological tests. These tests will take less than 30 minutes to complete. I will receive six extra credit points for my participation. This study will not take more than six hours of my time.

Potential Risks: There are no apparent risks associated with this study, although some questions may appear embarrassing. I do not have to answer when I feel uncomfortable about the question.

Potential Benefits: I may gain a better understanding of myself and my menstrual cycle from my participation in this study.

I understand that I may withdraw from this study at any time.

I understand that the principal investigator intends to maintain the confidentiality of records identifying subjects in this study. Names of individual subjects will be on the consent forms with subject numbers (but not Social Security numbers). All data will be identified through the subject number. Therefore, no names will be on the daily diaries or psychological tests.

This research project has been approved by the Human Subjects Research Committee. Questions about the project should be directed to the principal investigators:

Jane M. Kudlas 951-8610 or Dr. Debra Neff 961-5819

or to the chair of the Human Studies Committee:

Dr. Stephen Zaccaro 961-7916

I hereby do voluntarily participate in the research project described above.

Signature_____ I.D._____

Appendix B

Demographic and Subject Selection Questionnaire

Demographic Questionnaire

Subject #_____

1. Age:_____
2. Race: a)Caucasian b)Black c)Hispanic d)Oriental e)other
3. Marital status: a) single b) married c) divorced
4. Number of children:_____
5. Are you currently pregnant? yes no
6. Have you ever been pregnant? yes no
7. Are you currently taking oral contraceptives or any other medication that includes hormones: yes no
8. Have you taken oral contraceptives or medication with hormones in the past two months? yes no
9. Do you plan to start taking oral contraceptives in the next 40 days? yes no
10. Rate how much you think you suffer from dysmenorrhea (dysmenorrhea is typically defined as abdominal or other pains that occur AT THE ONSET of menstruation)

Not at all		Mild		Moderate		Severe
1	2	3	4	5	6	7

11. Rate how much you think you suffer from premenstrual tension. (Premenstrual tension is typically characterized by changes in mood or physical symptoms such as depression, irritability, anxiety, tension, fatigue, aches and pains that occur one to four days BEFORE THE ONSET of menstruation)

Not at all		Mild		Moderate		Severe
1	2	3	4	5	6	7

12. My last period began on (give a date)_____
13. I expect my next period will begin on (give a date)_____
14. I can predict when my next period will begin within a) one or two days b) three or four days c) four or five days d) five to seven days e) between one and two weeks f)three to four weeks g) I can't predict when my next period will begin.
15. What year are you in college? (please circle one) Freshman Sophomore Junior Senior Graduate
16. Do you take any medication regularly? If yes, what for? _____ name medication_____

Appendix C

Expectancy Questionnaires

How do you think you will feel during you next premenstrual phase?

A. I probably will be in:

1	2	3	4	5	6
very good spirits		rather good spirits	rather poor spirits		very poor spirits

B. My mood probably will be:

1	2	3	4	5	6
very changeable		somewhat changeable	quite stable		very stable

C. I probably will feel like crying:

1	2	3	4	5	6
very often		somewhat often	somewhat infrequently		not at all

I probably will feel:

	very much	2	somewhat	4	not too much	6	not at all
D. Energetic	1	2	3	4	5	6	
E. Calm	1	2	3	4	5	6	
F. Nervous	1	2	3	4	5	6	
G. Sick	1	2	3	4	5	6	
H. Mentally Alert	1	2	3	4	5	6	
I. Sexy	1	2	3	4	5	6	
J. Depressed	1	2	3	4	5	6	
K. Angry	1	2	3	4	5	6	
L. Loving	1	2	3	4	5	6	
M. Crampy	1	2	3	4	5	6	
N. Unhappy	1	2	3	4	5	6	
O. Healthy	1	2	3	4	5	6	
P. Achy	1	2	3	4	5	6	
Q. Tired	1	2	3	4	5	6	
R. Happy	1	2	3	4	5	6	
S. Friendly	1	2	3	4	5	6	

Appendix D

Daily Monitoring Forms

Did you start your period today? yes no

Please rate how you felt over the past 24 hours:

A. I was in:

1	2	3	4	5
very good spirits		rather good	rather poor	

B. My mood was:

1	2	3	4	5
very changeable		somewhat changeable	quite stable	

C. I felt like crying:

1	2	3	4	5
very		somewhat	somewhat	

Today I felt:	very much		some-what	not too much
D. Energetic	1	2	3	4
E. Calm	1	2	3	4
F. Nervous	1	2	3	4
G. Sick	1	2	3	4
H. Mentally Alert	1	2	3	4
I. Sexy	1	2	3	4
J. Depressed	1	2	3	4
K. Angry	1	2	3	4
L. Loving	1	2	3	4
M. Crampy	1	2	3	4
N. Unhappy	1	2	3	4
O. Healthy	1	2	3	4
P. Achy	1	2	3	4
Q. Tired	1	2	3	4
R. Happy	1	2	3	4
S. Friendly	1	2	3	4

Appendix E

Perceived Control of Premenstrual Tension Questionnaire

Please rate the degree to which you agree or disagree with the following statements according to the following scale:

Strongly Agree		Slightly Agree		Slightly Disagree		Strongly Disagree
1	2	3	4	5	6	7

_____ 1. There is nothing I can do to change my premenstrual symptoms

_____ 2. No matter what I do I will always suffer from uncontrollable negative mood and somatic changes just prior to my period.

_____ 3. By exercising regularly, I can reduce negative mood changes that occur prior to my period.

_____ 4. I believe that medication can help change my symptoms that occur before my period.

_____ 5. If I avoid stressful situations, I will experience no premenstrual symptoms.

_____ 6. There is nothing I can change at school, work, or home that will help me stop suffering from negative premenstrual changes.

_____ 7. Changing my views or thoughts about the premenstrual symptoms I experience never will affect my actual symptoms.

_____ 8. There are a number of ways I can affect the severity of my premenstrual symptoms.

_____ 9. If I change my diet, my premenstrual symptoms also will change.

_____ 10. My diet has nothing to do with my premenstrual symptoms.

_____ 11. Vitamins will help alleviate my premenstrual emotional and physical discomfort.

_____ 12. I can change my environment so that I feel less stress and subsequently less premenstrual distress.

_____ 13. If I think about my menstrual cycle as a positive experience, I will feel less premenstrual discomfort.

_____ 14. By changing my thoughts, I can relieve myself of my premenstrual symptoms.

_____ 15. By actively changing my lifestyle, I also can change certain symptoms that typically occur just prior to my period.

_____ 16. Exercising does not affect my premenstrual symptoms.

_____ 17. Vitamins have no effect on the severity of my premenstrual symptoms.

_____ 18. Hormone pills or injections will not solve my problems with premenstrual distress or discomfort.

_____ 19. No matter what good or bad things occur during the premenstrual phase of my cycle, I experience premenstrual distress.

_____ 20. My premenstrual complaints are due only to uncontrollable physical abnormalities; none of this

Appendix F

Post-Manipulation Questionnaire

A. Before the article, what was your opinion of premenstrual mood changes?

The premenstrual phase causes:

1	2	3	4	5	6
Very depressed moods					No changes in moods

B. Is there any change in your opinion now: Yes____ No___

C. What is your opinion now of premenstrual mood changes?
The premenstrual phase causes:

1	2	3	4	5	6
Very depressed moods					No changes in moods

D. When is the premenstrual phase of the menstrual cycle?_____:

E. In one or two sentences, state what the article is about:

_____

_____

_____

F. What effect has research shown the premenstrual phase to have on moods?
The premenstrual phase causes:

1	2	3	4	5	6
Very depressed moods					No changes in moods

G. How interesting was this article to you?

1	2	3	4	5	6
Not very interesting					Very interesting

Appendix G

Post-Manipulation Questionnaire

A. Briefly state what you think is the purpose of this study:

_____

_____

B. Have you taken oral contraceptives since the onset of this study? yes no

C. Are you currently pregnant? yes no

D. Have you talked with anyone about this study? yes no
If yes, did you talk to a) roommate; b) a friend; c) your mother; d) your sister e)someone else in this study who was in my group; f) someone else in this study who was not in my group (circle all that are appropriate).

E. What is your opinion now of premenstrual mood changes?
The premenstrual phase causes:

1	2	3	4	5	6
very depressed moods					no changes in moods

F. If you can remember, please briefly state the point of the article you read 40 days ago at the beginning of the study.

_____

_____

G. When is the premenstrual phase of the menstrual cycle?

_____

H. What effect has research shown the premenstrual phase to have on moods?
The premenstrual phase causes:

1	2	3	4	5	6
Very depressed moods					no changes in moods

Appendix H

Psychological Information

Introduction: You are going to read an article by Dr. Joan Jackson and Barbara Olosov, experts in the area of daily mood changes. Please read the article carefully, as you will be asked to discuss the contents of this article.

It is commonly believed that mood fluctuations and the menstrual cycle are related. The premenstrual phase, the week before menstruation, is thought to be associated with depression and irritability; the menstrual phase with irritability and feelings of unrest; and the intermenstrual phase, the days after menstruation and before the premenstrual phase, with happier and more confident feelings. However, the research has indicated that mood fluctuations and the phase of the menstrual cycle are completely unrelated for the majority of menstruating women. The only women that have been proven to suffer from what is commonly known as "Premenstrual Tension" are women over 30 (primarily those in their late 30's and 40's), and especially those women who have borne a child.

Research has shown that self-reports of negative moods premenstrually is actually due to social expectations and self-fulfilling prophecies. Social expectancies are beliefs that are widely held in a society. Our society seems to expect women to experience negative moods premenstrually. Thus, women may tend to notice and/or exaggerate feelings such as depression during the premenstrual phase. Self-fulfilling prophecies occur when people believe something to be true - - whether it actually is or not - - and then act as if it were true. These actions then reaffirm the belief. Self-fulfilling prophecies occur when women expect to ex-

perience negative moods, to be irritable, or to be short-tempered when they are are in the premenstrual phase of their cycle. They then behave in a manner consistent with these expectations such as being moody, or irritable towards others. Their behavior then justifies the original belief, "I am supposed to feel bad premenstrually." Remember, research proves that negative moods do not occur as a result of the biological changes associated with the menstrual cycle.

Paige (1973) commented that the negative attitudes associated with the menstrual cycle may be the result of "pervasive, negative cultural attitudes about menstruation" and that distress associated with the menstrual cycle may be a "social response to menstruation itself rather than a response to the coinciding changes in hormone levels."

Ruble's (1977) study, found that women reported experiencing many of the "typical" premenstrual symptoms when they were actually intermenstrual simply because they were led to believe that they were premenstrual. Clarke and Ruble (1978) had young adolescent boys and girls fill out the Menstrual Distress Questionnaire according to what they thought "girls in general" experience during the menstrual phase. Girls were also asked to fill out the Menstrual Distress Questionnaire one additional time according to what they actually experience themselves (for those girls who had reached menarche) or according to what they expect to experience (for those who had not reached menarche). The three groups (boys, pre-menarchical girls, post-menarchical girls) all reported comparable negative

symptomalogies, indicating that even nonmenstruating youngsters have expectations and attitudes about menstrual cycle changes. Clarke and Ruble concluded that "the responses may reflect cultural stereotypes . . . girls generalize to themselves the belief that they have learned about others. . . ." The similarity of the three groups also suggests that the cultural beliefs are readily accessible at a fairly young age, since all three groups showed a high degree of awareness.

Parlee (1982) a very respected leader in menstrual research, published a study that supported this idea that women report negative premenstrual moods in response to social expectancies. Women participating in her study, when asked for symptoms they experience during their menstrual cycle, reported experiencing negative emotional states premenstrually. But when these same women monitored their moods daily, they were actually in better spirits premenstrually.

Aubuchon and Calhoun (1985) had subjects monitor common premenstual sympotoms daily for ninety days. Subjects were divided into three different groups: (1) a group of women who were aware that they were participating in a study on the menstrual cycle; (2) a group of women who were unaware of the purpose of the study; (3) group of men. The women aware of nature of the study reported more negative moods during the premenstrual phase than the other two groups. Moreover, the group of men and naive women reported similar mood patterns. In other words, women aware of the study's intention reported many of the "typical" menstrual cycle moods and symptoms, whereas the two blind groups were almost identical in their reports

of negative moods. The authors concluded that social expectancy and demand characteristics influenced the reporting of the typical premenstual symptoms in the group of women who knew that they were participating in a study designed to investigate negative moods and the menstrual cycle.

In sum, we can conclude that the association between negative mood and the premenstrual phase of the menstrual cycle is incorrect. The research shows that self-reported premenstrual symptoms are due to social expectancies and self- fulfilling prophecies. Everyone is taught that women experience negative moods premenstrually, and from all this teaching, many women have convinced themselves that they actually do experience premenstrual tension.

Appendix I

Biological-Passive Information

Introduction: You are going to read an article by Dr. Joan Jackson and Barbara Olosov, experts in the area of psychological aspects of menstruation. Please read the article carefully, as you will be asked to discuss the content of this article.

It has been well documented in the literature that mood fluctuations follow a regular pattern which can be predicted from the phases of the menstrual cycle. There are three phases of the menstrual cycle: premenstrual, intermenstrual, and menstrual. The worst moods usually occur premenstrually or the week just before the onset of menstruation (premenstrual phase). The best moods usually occur at mid-cycle, around the time of ovulation (intermenstrual phase) Menstruation itself is often characterized by more physical complaints, feeling achy and crampy. (menstrual phase).

Some of the common moods many women report experiencing premenstrually include depression, irritability, crying, loneliness, anxiety, restlessness, mood swings, and tension. Together, these have been termed "Premenstrual Syndrome," or PMS for short. There has been a great deal of research conducted on mood fluctuations as a function of the menstrual cycle. Most studies have reported women experiencing negative moods premenstrually. For example, Dennerstein and Burrows (1979) reviewed 24 studies of menstrual cycle mood fluctuations and found that most of the studies reported cyclical changes for negative moods. The Menstrual Distress Questionnaire is commonly used to assess menstrual symptoms. It is comprised of eight scales. One of the scales, the Negative Affect Scale, consists of eight symptoms: depression, irritability, crying,

loneliness, anxiety, restlessness, mood swings, and tension. For Moos' (1964) sample of 839 women, the average score for the negative affect scale was highest for the premenstrual phase, next highest for the menstrual phase, and lowest for the intermenstrual phase. Ivey and Bardwick in 1968 found women's anxiety levels, as well as themes of hostility, depression, and noncoping, significantly higher for the premenstrual phase. Fifty percent of May's (1976) sample of women experienced their most depressed moods during the premenstrual phase. Consistent findings of negative mood changes accompanying the premenstrual phase (especially negative affect/depression) have been reported by Altman, Knowles, and Bull (1941); Brooks, Ruble, and Clark (1977); Dalton (1964); Golub (1976); Gottschalk, Kaplan, Gleser, and Winget (1962); Rossi and Rossi (1980); and Vila and Beech (1980).

Dalton (1959; 1964), a major researcher on Premenstrual Syndrome, found that women were involved in more accidents, admitted themselves more frequently to mental institutions, and committed or attempted suicide more frequently when they were in their premenstrual phase. She also found that in a women's prison, more crimes were committed during the offender's premenstrual phase than any other phase.

Rossi and Rossi (1980) found women's moods fluctuate as a function of the phase of their menstrual cycle. They found that women's moods were more positive during the intermenstrual phase. These positive moods were associated with day 14 of the menstrual cycle, the estimated time of ovulation. During the menstrual phase

women reported more negative than positive moods. The lowest moods were seen during the premenstrual phase.

Experts believe that the psychological and physical changes that have have been demonstrated to occur cyclically with the menstrual cycle are a result of actual physical changes in the body. Many believe that premenstrual symptoms reflect hormonal fluctuations. Two hormones that all women have, estrogen and progesterone, have been shown to fluctuate with the menstrual cycle. Medical testing of blood or urine of women has demonstrated a reliable pattern in these two hormones. During the menstrual phase, levels of both estrogen and progesterone are low. The intermenstrual phase can be subdivided into three subphases to describe the fluctuations of estrogen and progesterone. First, estrogen secretion rises, but progesterone stays low. Second, around the time of ovulation, estrogen peeks and progesterone secretion rises. Finally, both estrogen and progesterone are high, but start to decline toward the end of the phase. The premenstrual phase is characterized by a very rapid decline in levels of both estrogen and progesterone. Studies are currently being conducted to ascertain the combined and singular effects of these two hormones. At this time, it appears that the higher the levels of both progesterone and estrogen the better the moods. Thus, ovulation is characterized by the highest levels of estrogen and progesterone and the best moods. The premenstrual phase is characterized by the lowest levels of estrogen ad progesterone, and consequently the lowest, or most negative moods. This can explain changes in women's moods when they take birth control pill,

because birth control pills contain these hormones and consequently disrupt the naturally occurring changes.

To summarize, research definitely has shown that moods fluctuate as a function of the phases of the menstrual cycle. These mood fluctuations appear to be caused by the naturally occurring fluctuations in the hormones estrogen and progesterone. The intermenstrual phase usually produced the best, most positive moods, especially around ovulation. The premenstrual phase is usually characterized by the worst or most negative moods. Some of the typical premenstrual symptoms include depression, irritability, crying, loneliness, anxiety, restlessness, mood swings, and tension.

Appendix J

Biological-Active Information

Introduction: You are going to read an article by Dr. Joan Jackson and Barbara Olosov, experts in psychological aspects of menstruation. Please read the article carefully, as you will be asked to discuss the content of this article.

It has been well-documented in the literature that mood fluctuations follow a regular pattern which can be predicted form the phase of the menstrual cycle. There are three phases of the menstrual cycle: premenstrual, intermenstrual and menstrual. The worst moods usually occur premenstrually or the week just before the onset of menstruation (the premenstrual phase). The best moods usually occur at mid-cycle, around the time of ovulation (the intermenstrual phase). Menstruation itself is often characterized by more physical complaints, feeling achy and crampy (menstrual phase).

Some of the common moods many women report experiencing premenstrually include depression, irritability, crying, loneliness, anxiety, restlessness, mood swings, and tension. Together, these have been termed "Premenstrual Syndrome," or PMS for short. There has been a great deal of research conducted on mood fluctuations as a function of the menstrual cycle. Most studies have reported women experiencing negative moods premenstrually. For example, Dennerstein and Burrows in 1979 reviewed 24 studies of menstrual cycle mood fluctuations and found that most of the studies reported cyclical changes for negative moods. The Menstrual Distress Questionnaire (or MDQ) by Moos is commonly used to assess menstrual symptoms. It is comprised of eight scales. One of the scales, the

Negative Affect Scale, consists of eight symptoms: depression, irritability, crying loneliness, anxiety, restlessness, mood swings, and tension. For Moos'(1964) sample of 839 women, the average score for the negative affect scale was highest for the premenstrual phase, next highest for the menstrual phase, and lowest for the intermenstrual phase. Ivey and Bardwick in 1968 found women's anxiety levels, as well as themes of hostility, depression, and non-coping, significantly higher for the premenstrual phase. Fifty percent of May's (1976) sample of women experienced their most depressed moods during the premenstrual phase. consistent findings of negative mood changes accompanying the premenstrual phase (especially negative affect/depression) have been reported by Altman, Knowles, and Bull (1941); Brooks, Ruble, and Clark (1977); Dalton (1964); Golub (1976); Gottschalk, Kaplan, Gleser, and Winget (1962); Rossi and Rossi (1980); and Vila and Beech (1980) to name a few.

Dalton (1959; 1964), a major researcher on Premenstrual Syndrome, found that women were involved in more accidents, admitted themselves more frequently to mental institutions, and committed or attempted suicide more frequently when they were in their premenstrual phase. She also found that in a women's prison, more crimes were committed during the offender's premenstrual phase than any other phase.

Rossi and Rossi (1980) found women's moods fluctuate as a function of the phase of their menstrual cycle. They found that women's moods were more positive during the intermenstrual phase. These positive moods were associated with day 14 of the menstrual

cycle, the estimated time of ovulation. During the menstrual phase women reported more negative than positive moods. The lowest moods were seen during the premenstrual phase.

Experts believe that premenstrual symptoms reflect hormonal fluctuations. Two hormones that all women have, estrogen and progesterone, have been shown to fluctuate with the menstrual cycle. Medical testing of blood or urine of women has demonstrated a reliable pattern in these two hormones. During the menstrual phase, levels of both estrogen and progesterone are low. The intermenstrual phase can be subdivided into three subphases to describe the fluctuations of estrogen and progesterone. First, estrogen secretion rises, but progesterone stays low. Second, around the time of ovulation, estrogen peaks and progesterone secretion rises. Finally, still in the intermenstrual phase, both estrogen and progesterone are high, but start to decline toward the end of the phase. The premenstrual phase is characterized by a very rapid decline in levels of both estrogen and progesterone. Studies are currently being conducted trying to ascertain the combined and singular effects of these two hormones. At this time, it appears the the higher the levels of both progesterone and estrogen the better the moods. Thus, ovulation is characterized by the highest levels of estrogen and progesterone and the best moods. The premenstrual phase is characterized by the lowest levels of estrogen ad progesterone, and consequently the lowest, or most negative moods. This can explain changes in women's moods when they take birth con-

trol pill, because birth control pills contain these hormones and consequently disrupt the naturally occurring changes.

There are a number of methods or treatments that can alleviate premenstrual tension. For severe cases, progesterone therapy is suggested (Norris & Sullivan, 1984). Treatment of premenstrual tension with progesterone has been shown to be effective in a number of psychological studies (e.g. Dalton, 1964). In addition to progesterone therapy, some medical doctors recommend vitamins, regular exercise, and a modified diet. These latter three suggestions are applicable to anyone who suffers from mild to severe premenstrual tension.

A number of vitamins, primarily B complex vitamins, have been shown to be effective in relieving premenstrual tension. Complex B vitamins appear to help premenstrual symptoms of irritibility, fatigue, and depression. Some experts suggest that vitamin B is effective in relieving premenstrual symptoms because of its ability to metabolize estrogen.

Regular exercise is another weapon against premenstrual tension. It ameliorates symptoms of depression, anxiety, fatigue, irritability, nervous energy, and premenstrual headaches and cramps. Depression is especially helped by regular exercise. The improved cardiovascular and respiritory functioning speeds recovery of depression. Exercise increases secretions of beta endorphins which produce a sensation of mild euphoria. Patients who begin regular exercise programs report a lessening of severity of their premenstrual symptoms.

Changes in diet are also suggested to help the premenstrual sufferer. Norris and Sullivan strongly recommend that women suffering from premenstrual tension should increase the amount of potassium, magnesium, and zinc in their diets, while decreasing the amount of caffeine, salt, and sugar.

Reductions in stress also have been suggested as a way to decrease premenstrual suffering. Muscle or breathing relaxation techniques are recommended. Planning stressful events, whenever possible, around the premenstrual phase of the cycle is also helpful.

To summarize, research has definitely shown that moods fluctuate as a function of the menstrual cycle. These moods appear to be caused by natural fluctuations in the hormones estrogen and progesterone. The intermenstrual phase, especially around ovulation, usually produces the most positive moods. The premenstrual phase is usually characterized by the most negative moods. Some of the typical premenstrual symptoms include depression, irritability, crying, loneliness, anxiety, restlessness, mood swings, and tension. But one does not have to suffer from premenstrual tension. A number of methods or treatments can alleviate premenstrual distress. Progesterone therapy is suggested for those who suffer from severe premenstrual tension. Vitamin therapy, regular exercise, reduction in stress, and a diet low in sugar, caffeine, and salt is strongly recommended for any woman who suffers from premenstrual tension. You can take an active part to control unwanted premenstrual symptoms.

Appendix K

Neutral Information

Introduction: You are going to read an article by Dr. Joan Jackson and Barbara Olosov, experts in the area of daily mood changes. Please read the article carefully, as you will be asked to discuss the contents of this article.

The human body naturally tries to keep itself in a state of balance. This state of balance is called homeostatis. Homeostatic regulation often is anticipatory. In other words, it starts to work before something goes very wrong in the body. Clock mechanisms turn physiological and behavioral responses on and off before tissue damage or need occurs. One of these mechanisms is called a circadian rhythm (from the Latin circa, about, dies, a day). The circadian rhythm is a daily rhythm with a free-running period lasting almost 24 hours. In the presence of a synchronized repeated 24-hours signal, such as the rising and setting of the sun, circadian rhythm runs exactly twenty-four hours. Circadian rhythms run by themselves. In situations where an individaul is constantly in the dark, the rhythms continue in periods of somewhat more or less than 24 hours.

Circadian rhythms exist for virtually every homeostatic function of the body. Many of the rhythms are coordinated. Experts studying circadian rhythms believe that there is a "clock mechanism" located in the brain which coordinates the various circadian rhythms. Scientists have suggested that insomnia may be due to the desynchronization of the circadian rhythms.

Sleep is a periodic, recurring process. There is a strict periodicity to the sleep-wake cycle of the newborn and to the pattern of the child who naps in the afternoon. Adults also have a sleep-

wake cycle, however, the circadian rhythm of the adult becomes desynchronized and free-run with different periodicities.

Insomnia is the chronic inability to obtain the necessary amount or quality of sleep to maintain adequate daytime behavior. Evidence suggests that a patient's complaint of insomnia may not be sufficient grounds for a physician to conclude that there is something wrong with the physiology of an individual's sleep. When tested in the laboratory, many self-professed insomniacs, particularly those without other pathology, have been found to sleep, dream, and even snore, normally. When awakened, however, these sleepers may deny they have been asleep, particularly if aroused from REM sleep. In an early laboratory study, William Dement examined 137 self- professed "insomniacs" and observed average sleep onset time of 15 minutes and average sleep duration of 7 hours. He concluded that one cannot assume that "insomniacs" cannot sleep. One hypothesis or possibility is that these patients dream they are awake.

Of those who actually can not sleep, approximately 30% to 35% have a relatively simple organic explanation for the disturbance. The two most common are: first, disruptions of normal circadian rhythms, and second, the inevitable consequences of aging. Normal circadian rhythms can be disrupted by travel. Jet lag, for example, is the lay person's term for the disruption of circadian rhythms due to travel by airplane. Circadian rhythms of the sleep-wake cycle can also be changed by behavioral changes such as napping in the late afternoon while on vacation, alterations in meal times, and so on. Research has indicated that older individuals are more likely to

disrupt the circadian rhythms of the sleep wake- cycle, because of travel or or other behavioral changes, compared to their younger counterparts. In other words, the older one becomes, the more difficult it becomes to rapidly change one's biological clock. Thus, travel across time zones more seriously upsets the normal sleep patterns of the elderly. Even under stable conditions, most people over the age of 60 sleep no more than 5-1/2 hours per day. The reasons for these phenomenon are still unknown.

Possibly the most common causes of insomnia are psychological disturbances. Anxiety tends to be correlated with difficulty in falling asleep and depression with early awakenings. In a study of patients with insomnia at the Hershey Medical Center in Pennsylvania, an emotional problem was found to be the likely cause of insomnia in 70% of the patients, with depression heading the list.

There are also rhythms other than circadian rhythms, that is, rhythms with cyclicity longer than one day. For example, seasonal rhythms, moon changes, the tides, the 28-day menstrual cycle, to name a few. Often, however, these other rhythms are built out of circadian rhythms.

In sum, circadian rhythms are regulatory mechanisms which keep the body in homostatic balance. It is an anticipatory mechanism which works before something goes wrong in the body. Insomnia is often caused by the disturbance of the circadian rhythms. The circadian rhythms of the sleep-wake cycle can be disrupted by travel or other behavioral changes such as napping. These environmental

changes are more likely to effect the sleep-wake cycle of the elderly.

Appendix L

Debriefing Statement

DEBRIEFING STATEMENT

You have participated in a study designed to investigate the effects of different information on your expectancies of premenstrual symptoms and your daily rating of moods during the menstrual, premenstrual and intermenstrual phases. You have participated in one of the following groups. I have marked which group you were in:

Group 1: You read information that told you that premenstrual symptoms were due to uncontrollable hormonal fluctuations.

Group 2: You have read information that told you that premenstrual tension was caused by hormnal fluctuations, but that you could control these symptoms by exercising, reducing stress, taking vitamins, or reducing salt, caffeine and sugar intake.

Group 3: You have read information that stated that premenstrual tension was due to social expectancies tension was due to social expectancies and self-fulfilling prophecies.

Group 4: You have read information that was unrelated to the menstrual cycle.

I thank you sincerely for your participation in this study. If you have further questions please feel free to ask.

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