CONSTRUCT VALIDATION OF PREMENSTRUAL SYNDROME

by

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B.A. (Hons), Simon Fraser University, 1983

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in the Department

of

Psychology

SIMON FRASER UNIVERSITY

December 1984

APPROVAL

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DEGREE: Master of Arts

TITLE OF THESIS: Construct Validation of Premenstrual Syndrome

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ABSTRACT

This study represents an attempt to validate the construct of premenstrual syndrome. Data were collected over two menstrual cycles from 11 women who self-defined as premenstrually symptomatic and 24 women who self-defined as either premenstrually asymptomatic or only mildly premenstrually symptomatic.

The measures used included both concurrent and retrospective self-reports of affective, cognitive, physical and behavioural symptoms experienced premenstrually, menstrually, and intermenstrually. In addition, an objective measure of cognitive abilities, in the form of short-term memory tasks, was administered at each phase over the two menstrual cycles.

Analyses of variance for repeated measures and t-tests were performed to examine interphase differences in symptomology for each group and between-group differences in symptomology at each menstrual phase. Results of the analyses of variance indicate that self-defined symptomatic women do experience significantly increased symptomology during the premenstruum when compared to the intermenstruum but not when compared to the menstrual phase. No significant interphase differences were evident in cognitive abilities as measured by the short-term memory tasks. In contrast, the control group showed little significant interphase variation in symptomology with the greatest degree of symptomology generally being experienced during the menstrual phase.

Significant between-group differences in symptomology were most evident during the premenstruum. However, contrary to expectations, a number of differences observed during both the menstrual and intermenstrual phases reached statistical significance indicating that premenstrually symptomatic women may differ from premenstrually asymptomatic women at all phases of the menstrual cycle rather than only premenstrually.

While the results obtained in this study confirm the existence of differences in menstrual cycle symptomology between self-defined symptomatic and asymptomatic women, there is not as clear an emergence of the premenstrual syndrome profile as previous researchers would suggest.

ACKNOWLEDGEMENTS

The completion of this document would not have been possible without the contributions, in numerous and varied ways, of many people. Dr. Richard Freeman has given support, encouragement, and extended patience throughout months of data collection and writing. He has also maintained a sense of humour throughout. For displaying these qualities and for his generous assistance when needed, I extend my sincere thanks to him.

My thanks also go to Dr. Ray Koopman who, in matters of a statistical nature, has been of invaluable help; to Dr. Vito Modigliani for his assistance with the intricate details of the memory tasks used in this study; to Joan Foster for always giving me the benefit of the doubt in my computing battles; and to Cheryl Thomas for her persistence in the face of adversity.

Special thanks must also go to all of the women in this study who never gave up despite repetitive and time-consuming data collection.

Finally, so much more than just thanks go to John for his assistance with the graphics in this document and for his seemingly unlimited patience and understanding.

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A. Introduction

The concept of cyclical changes in the mood and behaviour patterns of women has been acknowledged for centuries. Greek physicians of the Hippocratic period described premenstrual changes including "a sense of heaviness, headache, ringing in the ears and specks before the eyes" (Dennerstein & Burrows, 1979, p. 78). However, it is only in this century that empirical research has been devoted specifically to the investigation of premenstrual distress as a clinical syndrome.

The first attempt at delineation of the syndrome was made by Frank (1931) who also coined the term "premenstrual tension". The women who suffer from this condition are reported to

> especially complain of a feeling of indescribable tension from ten to seven days preceding menstruation which, in most instances, continues until the time that the menstrual flow occurs. These patients complain of unrest, irritability, 'like jumping out of their skin' and a desire to find relief by foolish and ill considered actions....Within an hour or two after the onset of the menstrual flow complete relief from both physical and mental tension occurs. (Frank, 1931, p. 1054)

Subsequently, the phenomenon has been variously labelled "toxaemia of menstruation" (Greenhill & Freed, 1940), "premenstrual syndrome" (Greene & Dalton, 1953), "premenstrual tension syndrome" (Rees, 1953a, 1953b), "cyclical syndrome" or "cylical tension state" (Sutherland & Stewart, 1965), and "premenstrual affective syndrome" (Friedman, Hurt, Clarkin, Corn, & Aronoff, 1982; Kashiwagi, McClure, & Wetzel, 1976;

Wetzel, Reich, McClure, & Wald, 1975). In view of the continued use of all three of the most popular terms (premenstrual tension, premenstrual syndrome, and premenstrual affective syndrome) in the literature, these terms will be used interchangeably throughout this paper.

The need for some consensus on a working definition of premenstrual syndrome was recognized by participants in a workshop on premenstrual syndrome in 1983. It was agreed that the operational definition of the syndrome should be: "marked changes in intensity of symptoms measured (daily) from cycle days 5 to 10, compared to the intensity within the six-day interval prior to menses, for at least two consecutive cycles" (Blume, 1983, p. 2866). However, most earlier reports (e.g. Frank, 1931; Israel, 1938) have stipulated that symptoms must change dramatically with the onset of menstruation (i.e. day 1 of the menstrual cycle).

Menstrual Cycle Terminology

Research in premenstrual syndrome is hampered by inconsistent nomenclature, particularly with respect to the stages of the menstrual cycle. While it is generally agreed that the cycle consists of definable stages, the premenstrual phase is variously defined as the two days (Pierson & Lockhart, 1963), three days (Cox, 1983), four days (Dalton, 1959, 1960b, 1960c, 1961, 1968; Jacobs & Charles, 1970; Mandell & Mandell, 1967),

five days (Dalton, 1960a), and seven days preceding the onset of menstruation (Glass, Heninger, Lansky, & Talan, 1971; Lamb, Ulet, Masters, & Robinson, 1953; Moos, 1968b; Sommer, 1972). Frank (1931) suggested that premenstrual tension can begin up to 10 days prior to the onset of menstruation. Furthermore, several researchers have distinguished only between the paramenstruum (premenstrual and menstrual phases combined) and other, intermenstrual, phases of the menstrual cycle (e.g. Bernstein, 1977; Wickham, 1958). The paramenstruum, in these instances, is defined as the four days preceding and following menstruation.

As noted by Sommer (1973), the issue is one of determining the hormonal states of individuals.

> Short of analyses of blood plasma or urine, one must rely on less direct measures such as basal body temperature changes...or the assumption of ovulation as occurring around the fourteenth day following onset of menstrual flow for women who have regular menstrual cycles. (p. 516)

Prevalence

The prevalence of premenstrual tension has been variously estimated between extremes of 25% and 100% of all women who are regularly menstruating. Reid and Yen (1981) suggested that "the general consensus based on questionnaire data is that 70% to 90% of the female population will admit to recurrent premenstrual symptoms and that 20% to 40% report some degree of temporary mental or physical incapacitation" (p. 86). However, these estimates vary according to how the syndrome is defined, the symptomatic severity considered necessary for diagnosis, and the

method used in the collection of data.

A recent study, using 1395 regularly menstruating women between the ages of 13 and 54 years who were not using oral contraceptives, found that 702 women (50.32%) reported experiencing at least some symptoms of premenstrual syndrome (Hargrove & Abraham, 1982).

Further complicating factors involved in estimating the prevalence of the syndrome include the age of subjects and their use of oral contraceptives. Golub (1976a) and Golub and Harrington (1981) found differences in the extent of mood changes experienced in the premenstruum between young females aged 15 to 16 years and older women aged between 30 and 45 years. While women over 30 showed significant mood changes in the premenstrual phase of the cycle compared to other phases (Golub, 1976a), the younger females did not show evidence of similar differences among cycle phases (Golub & Harrington, 1981). Rouse (1978) found similar differences in age group with respect to severity of premenstrual symptoms. A more recent study (Hargrove & Abraham, 1982) indicated that women between the ages of 31 and 40 are significantly more likely to suffer from premenstrual tension than those in the 16 to 25 year age group.

The confounding effects of oral contraceptive use in studies of premenstrual syndrome have been considered in several studies. Kutner and Brown (1972) and Paige (1971) found that a significantly smaller proportion of women using oral

contraceptives experienced symptoms of premenstrual depression than did women who used no hormonal forms of contraception. Oral contraceptive users were found by Moos (1968a) to report less water retention, pain, and negative affect than women using oral contraceptives. Furthermore, fewer changes in school or work performance and concentration during the paramenstruum were reported by pill users. However, women who used oral contraceptives in Banks and Beresford's (1979) study reported having more premenstrual symptoms. Several researchers (e.g. Hargrove & Abraham, 1982; Haskett, Steiner, Osmun, & Carroll, 1980; May, 1976; Moos et al., 1969) have specifically excluded women using oral contraceptives in their studies of menstrual cycle mood changes in order to avoid possible confounding effects.

Finally, there is some evidence to suggest that cycle irregularity may be associated with premenstrual symptomology (Hain, Linton, Ebor, & Chapman, 1958).

Cross-cultural studies (Ferguson & Vermillion, 1957; Janiger, Riffenburgh, & Kersh, 1972) have indicated that premenstrual syndrome is evident in a variety of different cultures although there does appear to be some variation in frequency and severity of symptoms among cultural groups.

Symptoms

As noted previously, the first attempt at delineation of the premenstrual syndrome was made by Frank (1931) who described the syndrome in terms of tension, unrest, and irritability. He also noted the presence, in some women, of severe headaches, swelling of the hands, feet and face and an increase in weight at this time.

Following Frank's (1931) description of premenstrual tension, further features of the premenstrual syndrome were noted by other researchers. Greene and Dalton (1953) summarized these as follows: tightness of clothing and stiffness of the hands, premenstrual asthmatic attacks, fever, lumbar pain, ulcerative stomatitis, transient nymphomania, various forms of "psychosexual disorder", abnormal hunger, painful breasts, emotional instability, backache, depression, aching in the thighs, "bloating" of the abdomen, lower abdominal pain, nausea, vomiting, increased sexual desire, and vertigo. All of these symptoms, and more, have been observed to a lesser or greater degree in women complaining of premenstrual tension.

In response to the observed lack of comparability among studies using different definitions of the syndrome and different data collection methods, Moos (1968b) attempted to standardize data collection by developing a Menstrual Distress Questionnaire. From responses given by 839 women, 47 symptoms of menstrual distress were intercorrelated and factor analyzed to produce eight symptom groups: pain, concentration, behavioural

change, autonomic reactions, water retention, negative affect, arousal, and control.

Despite this, and more recent attempts to standardize the diagnostic criteria for premenstrual syndrome (e.g. Endicott, Halbreich, Schacht, & Nee, 1981; Steiner, Haskett, & Carroll, 1980),there remains little consensus in the literature to date as to precisely which symptoms must be present, and the degree of severity of those symptoms, before a diagnosis of premenstrual syndrome is made. There does, however, appear to be some consensus with respect to general symptom areas that are thought to comprise the syndrome: despite considerable variation in specific symptoms investigated, research in premenstrual syndrome tends to focus on affective, cognitive, behavioural, and physiological changes during the premenstruum.

Etiology

Various theories have been advanced to explain the observed changes in mood and behaviour during the menstrual cycle. These include biological, psychodynamic, social learning and personality theories.

Biological Theories

Both progesterone and oestrogen are involved in the regulation of the menstrual cycle. During the menstrual phase the levels of both hormones are low while a gradual rise in the level of oestrogen is observed during the follicular

(pre-ovulatory) phase followed by high levels of both oestrogen and progesterone in the luteal (post-ovulatory) phase. During the premenstrual phase the levels of both hormomes fall (Blank, Goldstein, & Chatterjee, 1980).

Frank (1931) attributed the presence of premenstrual tension to the continued circulation in the blood of an excessive amount of oestrogen at this time. Israel (1938) also suggested that premenstrual tension is due to the action of oestrogen. However, he postulated a high oestrogen to progesterone ratio due to decreased production of progesterone.

Dalton (1969) is the major proponent of the theory that premenstrual syndrome results from an imbalance of progesterone and oestrogen. She has postulated that the low premenstrual progesterone to oestrogen ratio can occur in two ways: an excess of oestrogen may be produced during the follicular phase which blocks the function of progesterone produced in the luteal phase or, alternatively, normal quantities of oestrogen may be produced during the follicular phase while less than normal quantities of progesterone are manufactured in the luteal phase.

Smith (1976), however, reported that, while premenstrually symptomatic women were found to have significantly lower progesterone levels than asymptomatic women during the week preceding menstruation, these differences were small. Furthermore, levels of oestrogen were found to be equal in both groups and oestrogen to progesterone ratios were not found to be significantly different. Smith noted, further, that "there is a

large amount of overlap between the groups; it was noted that both the presence and degree of depression in any cycle and in any individual are unrelated to hormone levels for that cycle or individual" (1976, p. 394).

In a more recent investigation, Backstrom et al. (1983) found a similar lack of relationship between the degree of premenstrual negative mood change and levels of oestrogen and progesterone.

Fluid retention has been suggested by some (e.g. Greene & Dalton, 1953; Greenhill & Freed, 1941) to be responsible for premenstrual changes. Others (e.g. Bruce & Russell, 1962) have found no relationship between fluid retention and body weight and premenstrual symptomology.

Some have advocated the role of vitamin deficiency in the etiology of premenstrual syndrome. Reid and Yen (1981) noted two lines of evidence that have been used to suggest a role for vitamin B6 in premenstrual symptomology: a deficiency in vitamin B6 leading to the apparent excess of oestrogen in premenstrually symptomatic women and vitamin deficiency leading to abberant metabolism of dopamine and serotonin resulting in disorders of hypothalamic-pituitary function and disorders of mood and behaviour. However, Reid and Yen concluded that

> acceptance of any vitamin deficiency theory for PMS must await further clarification of the role of vitamins in hormonal metabolism in humans, demonstration of a vitamin deficiency in affected patients when compared to control subjects, and verification of the efficacy of vitamin therapy for this syndrome in large, controlled, double-blind trials. The possibility that a cyclic vitamin deficiency exists in the PMS seems remote.

(1981, p. 88)

Finally, less prominent theories include the suggestion that premenstrual hypoglycaemia may be a contributory factor in premenstrual syndrome and that a lack of exercise may contribute to the severity of premenstrual symptoms. With respect to the latter suggestion, Weideger (1975) noted: "While lack of adequate exercise may make the symptoms of PMS more severe, it is not the cause of the syndrome's initial appearance" (p. 51).

Psychodynamic Theories

With the use of analysis of dreams, fantasies and free associations, and indirect physiological measures of hormonal activity (basal body temperatures and vaginal smears), Benedek and Rubenstein (1939a, 1939b) investigated the relationship between psychological and physiological processes throughout the menstrual cycle. They suggested that during the premenstrual phase conscious and unconscious conflicts about pregnancy, having a child, castration fears and other unconscious concerns are intensified.

> Fear of what will happen to one's body often suffices to describe the emotional condition preceding the menstrual flow. Fear of pain, fear of mutilation, fear of birth, are expressed in the psychological material with a great individual variety of defenses. The tense, fearful psychosomatic state usually relaxes when flow starts. (Benedek & Rubenstein, 1939b, p. 480)

A series of psychoanalytically oriented interviews with subjectively symptomatic and asymptomatic women led Fortin, Wittkower, and Kalz (1958) to conclude that emotional factors

may play a significant role in the onset and maintenance of premenstrual syndrome. Interview material from symptomatic women revealed a negative attitude toward menstruation with fantasies of potential injury or even death in relation to the menstrual flow. Family histories of these women indicated negative experiences with respect to learning about menstruation and sexual intercourse, frequent marital discord between the parents, conflict over premarital sexual temptation, and hostile dependent relationships with their mothers. In contrast, asymptomatic women appeared to manifest a greater acceptance of the feminine role and "could satisfy their dependent needs without feeling depreciated and without expressing emotional tension in the form of pre-menstrual syndrome" (Fortin et al., 1953, p. 980). They regarded menstruation as a source of pride with no attached feelings of resentment or messiness and enjoyed less hostile relationships with their mothers.

Ivey and Bardwick (1968) analyzed free-association verbal samples of 26 college women using Gottschalk's Verbal Anxiety Scale (Gottschalk, Kaplan, Gleser, & Winget, 1962) in order to examine differences in preconscious and conscious anxiety levels during the menstrual cycle. Premenstrual anxiety was found to be significantly higher than anxiety at ovulation in all subjects. Furthermore, when specific content areas of anxiety (Death Anxiety, Diffuse Anxiety, Separation Anxiety, Mutilation Anxiety, Shame Anxiety, and Guilt Anxiety) were analyzed for premenstrual and ovulatory differences, all but Guilt Anxiety

were found to be significantly higher premenstrually. The authors also noted that women who reported more than eight premenstrual symptoms showed indications of either having received extreme gratification from the sick role as a child or, alternatively, expressed bitterness at being neglected during childhood illnesses. Those who reported less than six premenstrual symptoms did not show evidence of either pattern. Ivey and Bardwick concluded that

> the girls who received extreme gratification from childhood illness in the form of extra love and attention continued to seek this source of gratification with premenstrual symptoms. Those who were neglected when ill as children seemed to be reacting to this neglect by demanding that attention be paid to their premenstrual physical difficulties. (1968, p. 344)

Friedman et al. (1982) found that, of 28 women who satisfied criteria for probable or definite premenstrual affective syndrome, 16 had sexual histories which included incidents of rape, abortion, and/or incest, while in the asymptomatic group (n=17) only one woman had a comparably abnormal sexual history. Although these authors allowed that earlier unresolved traumas may be causally related to premenstrual symptomology, they also suggested that the presence of psychiatric illness (particularly borderline personality disorder and major depressive episode) may be an additional factor in this relationship.

Social Learning Theories

Social learning theories of etiology suggest that women develop negative attitudes toward menstruation and, consequently, experience symptoms of discomfort in anticipation of the actual menstrual flow. Women who experienced a reduction in menstrual flow as a consequence of using oral contraceptives were found by Paige (1971) to report lower anxiety and less concern about sexual activity during menstruation than non-pill users with normal menstrual flows. It was suggested that anxiety and adherence to the menstrual sex taboo during menstruation may be a socially mediated response which is alleviated by a reduced menstrual flow.

Both males and females have been shown to expect women to experience pain, negative affect, and fluid retention during the premenstruum (Parlee, 1974) while women who suffer from premenstrual symptoms have been found to reject or resent their feminine roles (May, 1976; Paulson, 1961). May (1976) suggested that premenstrual anxiety may be associated with "the tendency, rooted in centuries of tradition, to think of menstruation as both dirty and dangerous" (p. 129).

In an attempt to "explore the nature of women's attitudes toward menstruation and to examine possible styles of coping related to menstruation" (p. 503) Brookes-Gunn and Ruble (1980) developed a Menstrual Attitudes Questionnaire (MAQ). The 46 items included in the questionnaire were constructed to address four areas: beliefs about physiological concomitants of

menstruation; styles of dealing with menstruation; menstrual-related effects on performance; and general evaluation of menstruation. From an initial administration of the MAQ to 191 undergraduate women, 33 items loaded onto five factors which were labelled as follows: 1) menstruation as a debilitating event; 2) menstruation as a bothersome event; 3) menstruation as a natural event; 4) anticipation and prediction of the onset of menstruation; and 5) denial of any effect of menstruation.

Both the Menstrual Distress Questionnaire (MDQ) and the MAQ were then administered to college women with the MDQ completed "as if you were in the premenstrual phase of your menstrual cycle" and "as if you were in the intermenstrual phase of your menstrual cycle" ($\underline{n}$=191); for retrospective personal experiences of the premenstrual, menstrual, and intermenstrual phases ($\underline{n}$=77); and for what women in general experience in the three cycle phases ($\underline{n}$=77). Correlations were computed between the eight MDQ factors and the five MAQ factors for premenstrual and intermenstrual symptoms.

Results indicated that while the perception of menstruation as natural or bothersome was not related to the MDQ symptom factors, the three remaining MAQ factors (menstruation as debilitating, menstruation as predictable, and denial of effect of menstruation) were related to MDQ factors. Specifically, women who perceived menstruation as debilitating also reported higher MDQ symptom scores; those who perceived menstruation as predictable reported higher MDQ scores; and those who denied the

effects of menstruation reported less severe MDQ symptom scores. The authors concluded from this that "individualized beliefs may differentially affect women's responses to their own cycles, both in terms of behaviors and self-evaluations, and responses of both men and women to behaviors thought to be menstrual-related" (Brookes-Gunn & Ruble, 1980, p. 510).

Personality Theories

A number of studies have reported correlations between certain personality characteristics and premenstrual symptoms. It is suggested that these personality traits may directly contribute to premenstrual symptomology or may influence the perception of symptoms experienced. Rees (1953a) found that premenstrual syndrome occurred more frequently in neurotic than normal women and that there was a correlation between the intensity of the premenstrual syndrome and neurotic disposition. Similar findings were reported by Coppen and Kessel (1963) and Gregory (1957). Both neurotic and paranoid tendencies were discovered in women reporting symptoms by Levitt and Lubin (1967).

A more recent attempt by Taylor (1979) to replicate these earlier findings revealed that, on the Sixteen Personality Factor Questionnaire, premenstrually symptomatic women differed from asymptomatic women on six of the 16 subscales. This suggested the following personality profile for symptomatic women: emotionally unstable, suspicious, unpretentious,

guilt-prone, apprehensive, self-conflicted, tense and frustrated. Furthermore, neuroticism scores on the Eysenck Personality Inventory were shown to correlate positively with premenstrual affective symptom scores although no such relationship was demonstrated between neuroticism and premenstrual somatic symptom scores.

Golub (1976b), however, found that while state anxiety and depression were related to premenstrual mood changes no significant relationship was evident between trait anxiety and premenstrual state anxiety or depression.

Factors Associated with Premenstrual Syndrome

The phenomenon of premenstrual syndrome and its effects on behaviour and general disposition have been studied in a variety of contexts. However, the common feature to all of these areas of research is the suggestion that the premenstrual phase is one in which many women undergo at least some physical and/or psychological changes from their "normal" level of functioning and that these changes are, for the most part, manifested in negative ways.

Cognitive Performance

Although some studies have reported a premenstrual decrement in cognitive performance (Dalton, 1960a, 1968), others (Bernstein, 1977; Golub, 1976a; Sommer, 1972; Walsh, Budtz-Olsen, Leader, & Cummins, 1981; Wickham, 1958) have

indicated no significant changes in intellectual performance during the menstrual cycle.

Using archival records of academic performance on weekly tests and dates of menstruation for schoolgirls, Dalton (1960a) reported an overall pattern of premenstrual fall and postmenstrual rise in the academic performance of 217 schoolgirls aged 11 to 17. However, although 27% of the subjects showed a fall in test scores during the premenstruum, 50% showed no change at all and 17% actually showed an improvement. Furthermore, as Parlee (1973) and Sommer (1973) pointed out, no statistical tests of significance are reported in this study. Dalton (1968) also reported a decrement in performance on O-level and A-level examinations among schoolgirls during the premenstruum, although, once again, no statistical tests of significance are provided.

In contrast to Dalton's (1960a, 1968) findings, Wickham (1958) found no significant decrement in performance on tasks involving intelligence and spatial, mechanical, mathematical, and verbal abilities completed during the "period phase" (n=1525). However, since the period phase studied included four days before and after menstruation these results are inconclusive with respect to specific premenstrual deficits.

From a series of studies designed to investigate a possible decrement in intellectual performance during the premenstrual and menstrual phases, Sommer (1972) concluded that there is no support for the hypothesis that a decline in intellectual

performance is associated with a particular phase of the menstrual cycle. Tests of inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments were given to 57 college age females on four occasions at weekly intervals and to 79 college age females on three occasions at weekly intervals. Results of both studies indicated no significant differences in mean test performance among the cycle phases (premenstrual, menstrual, follicular, and luteal). Furthermore, no association was found between cycle phase and poorest test performance. A further study in this series, using scores on four actual examinations in a university course, yielded similar results.

Using women between the ages of 30 and 40 (n=50), Golub (1976a) specifically investigated the possible effects of premenstrual anxiety and depression on cognitive functioning and found that, despite the presence of increases in anxiety and depression during the premenstrual phase, women did not have an associated decrement in test performance on measures of sensory-perceptual factors, memory, problem-solving, induction, concept formation, and creativity.

Like Wickham (1958), Bernstein (1977) compared performance on cognitive tasks during the paramenstruum (four days before and after the onset of menstruation) and the intermenstruum among 126 college women and, similarly, found no significant decrement in performance on eight university course tests during the paramenstruum. However, as with Wickham's (1958) study, no

conclusive statements can be made with respect to specific premenstrual decrements in performance from this study since a distinction was not made between performance during the premenstruum and that of the menstrual phase.

Finally, Walsh et al. (1981) compared standardized examination scores for 244 female subjects aged between 17 and 27 at four phases of the menstrual cycle. No significant decrease in intellectual functioning was evident during the premenstrual phase. Since no significant differences in level of performance were found to exist among all four phases the authors concluded that "although its effects are manifold and sufficient to cause both mental and physical distress in a large proportion of women, it seems that the menstrual cycle does not represent a significant examination handicap to the majority of female students" (Walsh et al., 1981, p. 221).

Aggressive Behaviour

The association between the incidence of criminal acts and menstruation was first made by criminologists in the nineteenth century (d'Orban & Dalton, 1980). During this century several studies have specifically investigated this relationship. Cooke (1945) noted that, of all female crimes of violence commited in a Parisian precinct, 84% were perpetrated during the paramenstrual phase of the menstrual cycle. Oleck, in 1953, suggested that United States courts "should recognize premenstrual tension as a form of temporary insanity" (d'Orban &

Dalton, 1980, p. 353), while, in France, temporary impairment of sanity may be used in the defense of a woman who commits a crime during the premenstruum (Dennerstein & Burrows, 1979).

Similarly, in the United Kingdom, premenstrual syndrome has recently been accepted as "a disease of the mind" in two separate legal defenses which resulted in charges of murder being commuted to manslaughter (Brahams, 1981).

From archival prison records, Morton, Additon, Addison, Hunt, and Sullivan (1953) discovered that, in 42 instances of imprisonment for unpremeditated crimes of violence, 62% of the crimes were commited by women during their premenstrual phase while 17% were commited during menstruation. However, as Clare (1983) noted, "they did not define the duration of the latter two phases, and they failed to indicate precisely how they determined the phase of the cycle at the time of the crime" (p. 7).

Dalton (1961) conducted interviews with all newly convicted women under the age of 55 who were admitted to a prison over a six month period. In addition, all prisoners who were reported for bad behaviour during their sentence were interviewed. Of the 156 women whose crime had been commited during the 28 days preceding the interview, 22.4% reported being in the premenstrual phase at the time of the crime while 26.3% reported being in the menstrual phase. Premenstrual tension was complained of by 43 women and, of these, 27 (63%) commited their crimes during the premenstrual phase. Among the women who were

reported for bad behaviour during their sentence, 54% of those who were menstruating regularly were disorderly during the eight days of the paramenstruum.

Using the same division of the menstrual cycle into seven four-day phases as Dalton (1961), d'Orban and Dalton (1980) investigated the relationship between violent criminal acts and the menstrual cycle in 50 female criminals. Forty-four percent of these women were found to have commited their offences during the paramenstruum (four days before and after the onset of menstruation).

Response to Illness in Children

There is some evidence to suggest that women in the paramenstrual phase are more likely to take their children to a doctor or hospital than women in the intermenstrual phases. Dalton (1966) found that 54% of women who brought children to a family doctor for minor illnesses were in the paramenstruum. Tuch (1975), who defined the paramenstruum as "the 5 days before through the 6 days after the onset of menses" (p. 390), found that 51% of women whose children were brought to a hospital outpatient department were in the paramenstruum compared to an expected frequency of 39%. Furthermore, the children brought to the hospital by paramenstrual mothers were considered by doctors to be less sick, and had been sick for a shorter period of time, than children brought in by women during the intermenstrual phase. Tuch (1975) suggested three possible explanations for

these findings: paramenstrual mothers may be less tolerant of minor illnesses in their children; paramenstrual women may be more empathic toward their children during this time; or women in the paramenstruum may be less able to judge the severity of a child's illness than during the intermenstrual phase.

However, as with some research on cognitive performance, because no distinction is made between the premenstrual and menstrual phases, no conclusions can be drawn from these studies with respect to the premenstruum specifically.

Suicide Attempts

The relationship between attempted suicide and the menstrual cycle is an ambiguous one. Dalton (1959) reported findings of 39% of attempted suicides occurring during the menstrual phase while 22% occurred during ovulation and only 14% during the premenstruum. Of 26 women who commited suicide, Ribeiro (1962) found that 21 were menstruating at the time of death. Using data supplied by callers to a suicide prevention centre, Mandell and Mandell (1967) found that attempted suicide rates were highest for women during early menstruation followed by those in the premenstrual phase with a rise in midcyle also.

In contrast to these findings of increased incidence of attempted suicide during the menstrual phase, Tonks, Rack, and Rose (1968) found that, of 95 attempted suicides, 35 occurred during the premenstrual week compared to 21 during the menstrual phase.

Like Mandell and Mandell (1967), Wetzel, Reich, and McClure (1971) used women who called a suicide prevention centre to study the relationship between phase of cycle at the time of the call and self-judged lethality of the attempt. A significantly higher number of women called during the menstrual phase than would be expected, while figures for women at ovulation and in the late luteal phase (premenstrual) were no higher than expected frequencies. However, 57% of women in both the luteal and menstrual phases reported serious attempts at suicide while only 23% of women in the follicular phase judged their suicidal thoughts as serious. The authors admitted that the lower incidence of suicide attempts in the late luteal phase, when compared to the figures obtained in Mandell and Mandell's (1967) study, may have resulted from the fact that volunteers did not interview some women who reported seriously considering suicide and were in the luteal phase. It appears that these women were immediately referred for help.

In a further report on this same study the relationships among number of premenstrual symptoms, self-judged lethality, and phase of the menstrual cycle were discussed (Wetzel, McClure, & Reich, 1971). In comparison to non-psychiatric controls, attempted suicidees reported significantly more premenstrual symptoms and the number of symptoms reported varied with self-judged lethality and phase of cycle at the time of calling. Specifically, an average of 12.5 symptoms were reported by menstrual phase callers while luteal phase callers had an

average of 10.4 symptoms and those in the follicular phase reported an average of 7.2 symptoms. Those who considered their suicide attempt to be serious reported an average of 11.4 symptoms while the remainder reported an average of 8.9 symptoms. Thus, these results suggest that potential suicide attemptors may experience more premenstrual symptoms, however, they are more likely to attempt suicide during the menstrual phase rather then premenstrually.

In contrast to all of the above mentioned literature, some studies have found the incidence of suicide attempts to be randomly distributed throughout the cycle (Birtchnell & Floyd, 1974; Holding & Minkoff, 1973; Pallis & Holding, 1976) indicating no significant relationship between attempted suicide and phase of the menstrual cycle. Furthermore, Birchtnell and Floyd (1975) suggested that there is no obvious menstrual disturbance among suicide attemptors and that suicide attempts "may sometimes be precipitated by the woman's knowledge that she is, or fear that she may be pregnant" (p. 84). Pallis and Holding (1976), however, found that, despite no significant differences in rate of suicide attempts among the phases of the menstrual cycle, there was a significantly higher suicidal intent in those who attempted suicide during the premenstrual phase.

Psychiatric Illnesses

Dalton's (1959) investigation of the relationship between acute psychiatric illness and menstrual cycle phases revealed that, of 276 female admissions to a psychiatric hospital, 28% were admitted during the menstrual phase with 17% admitted premenstrually and 14% at ovulation. In similar studies Jacobs and Charles (1970) reported a 24.5% admission rate for menstrual women and a 22.5% admission rate for women in the premenstrual phase while Janowsky, Gorney, Castelnuovo-Tedesco, and Stone (1969) found that a significantly greater number of admissions to a psychiatric hospital occurred during the menstrual (15 of 44 women) and premenstrual (12 of 44 women) phases.

Glass et al. (1971), however, discovered that a significantly larger proportion of female psychiatric patients were admitted during the premenstrual phase. Specifically, premenstrual admissions were found to occur at twice the expected frequency while menstrual phase admissions occurred at the expected frequency.

More recently, Abromowitz, Baker and Fleischer (1982) found, like earlier studies (Dalton, 1959; Jacobs & Charles, 1970), that depressed patients were admitted to a psychiatric facility at a higher than expected rate (69%) during the paramenstruum. Furthermore, a significantly larger proportion (41%) than would be expected were admitted on the day before and the day after the onset of menstruation.

Clare's (1983) investigation specifically studied the association between psychiatric ill-health and self-reporting of premenstrual symptoms. Results revealed that women who were both psychiatrically ill and reported premenstrual symptoms tended to report significantly more premenstrual symptoms than women who were not psychiatrically ill but did report premenstrual symptoms. Furthermore:

> Psychiatrically ill premenstrual complainers are significantly more likely than psychiatrically healthy premenstrual complainers to complain of 'psychological' symptoms and, to a lesser extent, of symptoms which could be classed as 'behavioural', but there is no difference between these two groups in terms of their respective tendency to complain of so-called 'physical' symptoms premenstrually. (Clare, 1983, p. 41)

Studies have indicated that in many women recurrent psychotic disorders flare up premenstrually more often than would be expected by chance. An early study (Williams & Weekes, 1952) presented data on 16 patients with premenstrual tension associated with psychotic episodes of either a manic or catatonic nature. More recently, Endo, Daiguji, Asano, Yamashita, and Takahashi (1978) reported on seven case studies all of whom exhibited recurrent psychotic symptoms in close association with the menstrual cycle. Of these women, four manifested psychotic breaks in the premenstrual phase, two did so during the menstrual phase, and one displayed symptoms both before and after menstruation. The use of lithium premenstrually was found by Glick and Stewart (1980) to alleviate premenstrual exacerbation of psychotic symptoms in three schizophrenic women, and these authors have suggested that, for some schizophrenic

patients, the "continued use of lithium (beyond a 1-yr period) is essential to prevent the immediate return of premenstrual exacerbation of psychosis" (p. 286).

Neurosis and Personality Correlates

Benedek and Rubenstein (1939b) noted that

> The emotional reactions during the last premenstrual days are more acute than in any other phase of the cycle....During the premenstrual phase of every cycle, women may repeat the neurotic contellation, which they experienced at puberty as a preparation for or reaction to the menstrual flow. (p. 480)

Several studies have investigated the possible link between neurosis and premenstrual syndrome. From his study of 84 women attending a psychiatric outpatient clinic and a psychosomatic and allergy clinic, and 61 "normal" women, Rees (1953a) reported a significant association between severe premenstrual tension syndrome and neurotic constitution. However, Rees cautioned that premenstrual tension syndrome "cannot be dismissed as being neurotic or primarily psychogenic" (p. 67) since many severely neurotic women did not suffer premenstrual tension and many women experienced premenstrual symptoms long before the onset of neurosis.

Coppen's (1965) study of 151 psychiatric patients included 49 with a diagnosis of neurosis. In comparison to non-psychiatric controls neurotic patients experienced more severe premenstrual irritability, depression, anxiety, nervousness, and tension.

Coppen and Kessel (1963) found significant positive correlations between premenstrual irritability and neuroticism, between depression and neuroticism, and between premenstrual swelling and neuroticism. Furthermore, the authors noted that:

> It appears that a woman who complains of premenstrual irritability is more likely to be irritable at other times as well, and it therefore seems as though premenstrual symptoms are an exacerbation of personality traits which in turn are related to neuroticism. (Coppen & Kessel, 1963, p. 718)

Other attempts to determine personality correlates of the premenstrual syndrome have produced conflicting results. Koeske and Koeske (1975) suggested that the belief that negative moods (depression, irritability) are associated with the premenstruum biologically may contribute to the experience of negative mood states in the premenstrual phase. Furthermore, subjects "generally make more internal (personality) attributions when moods are inappropriate to the situation and emphasize aspects of the situation more when mood is appropriate" (Koeske & Koeske, 1975, p. 477). Thus, an expectation of negative mood during the premenstruum may lead women to believe that negative moods experienced at this time are due to biological causes rather than situational determinants. In contrast, positive moods experienced premenstrually are attributed to situational factors.

In an attempt to identify psychological correlates of menstrual symptomology Gruba and Rohrbaugh (1975) computed correlations between Minnesota Multiphasic Personality Inventory (MMPI) clinical scales and premenstrual and menstrual symptoms

for 60 college students. Their results support those of Coppen and Kessel (1963) with high correlations between premenstrual negative affect (irritability, tension, depression) and MMPI indices of neuroticism (Hs and Hy scales). In general, women with several menstrual or premenstrual symptoms tended to show elevations on the Sc (Schizophrenia), Hs (Hypochondriasis), Hy (Hysteria), and Pt (Psychasthenia) scales of the MMPI. Gruba and Rohrbaugh concluded that "this pattern suggests that women who report menstrual symptoms...are more likely than non-sufferers to be seen as emotional, high-strung, prone to worry, serious, sensitive, modest, frank, aesthetically inclined and generally concerned about bodily complaints" (1975, p. 272).

Finally, Maloney, Deitchman, and Wagner (1982) compared personality characteristics of women in the early part of the menstrual cycle (fifth to ninth days) and those of women in the premenstrual phase (20th to 25th days) and found no significant differences in the occurrence of negative personality characteristics.

Anxiety, Mood Changes and Depression

The psychological symptoms of premenstrual syndrome have been extensively investigated with a particular emphasis on anxiety, mood changes and depression. Although there are some exceptions (Abplanalp, Rose, Donnelly, & Livingston-Vaughan, 1979; Golub & Harrington, 1981; Lahmeyer, Miller, & DeLeon-Jones, 1982) the literature to date is in general

agreement with repect to the high incidence of increased anxiety, mood changes and depression observed in the premenstrual phase (e.g. Golub, 1976b; Ivey & Bardwick, 1968; Gruba & Rohrbaugh, 1975; Koeske & Koeske, 1975; May, 1976; Moos et al., 1969; Paige, 1971; Rubinow, Roy-Byrne, Hoban, Gold, & Post, 1984; Watts, Dennerstein, & Horne, 1980).

Recently attention has focused on the relationship between the depressive state experienced in the premenstrual syndrome and affective psychiatric disorders. However, this hypothesis is not new. Schick (1953) reported a case of premenstrual depression that was suggested to be "reminiscent of the depressive phase of manic-depressive psychosis" (Schick, 1953, p. 666). In their report of a study concerning menstruation and personality, Coppen and Kessel (1963) noted that

> The high prevalence of sensations of swelling in the breasts and abdomen premenstrually is of considerable interest....It is possible that these sensations are related to a redistribution of water and electrolytes between intra- and extracellular compartments of the body. It is of interest that such a redistribution is found in cases of severe depression, and perhaps the study of physiological changes in depression and menstruation may show factors in common, which in turn are related to the regulation of mood. (pp. 719-720)

A further study by Coppen (1965) indicated that women with affective disorder are more likely to report premenstrual depression than women with other psychiatric disorders.

Janowsky, Gorney, and Kelley (1966) refer to previous studies indicating that "the adrenocortical hormones fluctuate throughout the menstrual cycle, with an increase occurring premenstrually" (p. 244) and that there is evidence of "a

correlation between increased 17-hydroxycorticoid levels in the urine and extent of depressive illness in both men and women" (p. 244).

Several studies (Abromowitz et al., 1982; Dalton, 1959; Jacobs & Charles, 1970) have found that patients who received a diagnosis of depression were admitted to psychiatric facilities at higher than expected frequencies during the paramenstruum. Finally, Clare (1983) suggested that "the presentation of premenstrual depression in women might indicate the coexistence of psychiatric disturbance" (p. 46).

The relationship between premenstrual affective symptoms and bipolar affective disorder was investigated by McClure, Reich and Wetzel (1971). Five women from a study of the relationship between premenstrual phase and attempted suicide (reported in Wetzel, Reich, & McClure, 1971) were interviewed about personal or family history of mania. These women were found to frequently experience premenstrual symptoms suggestive of hypomania following typical premenstrual depressive symptoms. One woman reported a history of bipolar affective disorder, a second had been admitted to hospital for depression and also reported a prolonged period of manic-like symptoms, two had family histories of mania, and one had no personal or family history of bipolar illness. Although it was acknowledged that these data are suggestive only, the authors suggested, nevertheless, that "[premenstrual bipolar symptoms] may be a subtle indication of a tendency in a woman to have bipolar

affective disorder" (McClure et al., 1971, p. 527).

Schuckit, Daly, Herrman, and Hineman (1975) reported a "trend" for an association between premenstrual affective syndrome and the occurrence of affective disorder in a sample of university women. Although results were not statistically significant, women with premenstrual symptoms were reported to be twice as likely as asymptomatic women to have a history of serious depressive episodes and also twice as likely to have a close family member with depression. In the 12 months following initial interviews seven per cent of the premenstrually symptomatic women experienced clinical depression. None of the asymptomatic women were reported to be clinically depressed during that time.

A similar study with university students (Wetzel et al., 1975) found that, of 223 women who reported suffering premenstrual symptoms, 40 (18%) were diagnosed as affective disorder (depression, hypomania or mania) at the university's health centre over the following four year period. In the asymptomatic control group only 35 (10%) of 335 women presented with affective disorder over the same time period.

Kashiwagi et al. (1976) investigated the relationship between premenstrual affective syndrome and psychiatric disorder in a study of 81 women presenting to a Neurology Clinic with functional headache. Of 43 women diagnosed as having a depresssive syndrome (unipolar affective disorder, bipolar affective disorder, secondary depression), 28 (65%) also

reported premenstrual symptoms. Only seven (18%) of 38 women with other diagnoses (hysteria, anxiety neurosis, antisocial personality, mental retardation, undiagnosed) reported premenstrual symptoms.

In an attempt to clarify the existing confusion in the literature with respect to the precise clinical features of premenstrual syndrome Haskett et al. (1980) investigated the degree of depression (among other characteristics) present in women reporting severe premenstrual tension. Although there were significant differences observed in the degree of depression between the follicular phase and the premenstruum for subjects, the authors pointed out that the elevation of depression in the premenstrual phase is still much lower than that seen for endogenously depressed patients. Therefore it was concluded "that [premenstrual tension syndrome] is not typically a syndrome of anxiety or depression, in the usual sense of these diagnostic terms, and that it is not a clinical model of the recurrent affective disorders" (Haskett et al., 1980, p. 138).

The differential relationship between specific subtypes of premenstrual changes and specific subtypes of psychiatric disorders was investigated by Endicott et al. (1981). Using their Premenstrual Assessment Form (PAF) the authors categorized reported premenstrual symptoms into several subtypes of the syndrome including "Major" Depressive Syndrome, Water Retention Syndrome, General Discomfort Syndrome, Impulsive Syndrome, and Impaired Social Functioning. Four groups of subjects were

investigated: Major Depressive Disorder (n=58), Other Affective Disorder (n=12), Nonaffective Disorders (e.g. Panic Disorder, Generalized Anxiety Disorder, Other Psychiatric Disorder with Schizotypal Features: n=9), and No-Mental-Disorder (n=13). Results indicated that all premenstrual syndrome subtypes, with the exception of Impulsive Syndrome, were clearly more related to both affective disorder groups as compared to Nonaffective Disorder and No-Mental-Disorder groups. Of the women diagnosed as Major Depressive Disorder, 62% met the criteria for the PAF Major Depressive Syndrome, 60% met the criteria for Water Retention Syndrome, 66% had symptoms of the General Discomfort Syndrome, and 48% qualified for a diagnosis of Impaired Social Functioning syndrome. Similarly high percentages of women in the Other Affective Disorders group manifested the symptoms to qualify for categorization as Major Depressive Syndrome (50%), Water Retention Syndrome (67%), General Discomfort Syndrome (92%), and Impaired Social Functioning (67%). The authors concluded that

> If the differential associations between specific types of affective disorder and specific types of premenstrual changes are confirmed with larger samples, the search for premenstrual changes that can serve as a model for the study of specific affective disorders will be further supported. (Endicott et al., 1981, p. 527)

A further study (Halbreich, Endicott, & Nee, 1983) was designed to confirm the suggestion that premenstrual symptoms should not be considered as a single premenstrual syndrome. On this occasion the PAF was used, firstly, to discriminate between women who met criteria for a PAF "Depressive Syndrome" and those

who did not and, secondly, to discriminate among subtypes of the Depressive Syndrome. The criteria for PAF Depressive Syndrome were based on criteria for major depressive disorder (Research Diagnostic Criteria: RDC; Spitzer, Endicott, & Robins, 1978 and DSM-III; American Psychiatric Association, 1980 criteria) with differences in severity requirements and deletion of minimum duration and social impairment requirements. The PAF subtypes of premenstrual Depressive Syndrome were similarly based on requirements for subtypes of depressive change in patients with affective disorder. Results indicated that for the women who met the criteria for a premenstrual Depressive Syndrome (n=145) there was a definite lack of homogeneity with respect to type and severity of depressive features. Furthermore, subtypes of the depressive syndrome were found to be differentially related with other physical, organic, and behavioural-and ideational changes associated with the premenstrual syndrome.

It is evident from the above review that, while some research supports the proposed relationship between premenstrual affective syndrome and affective disorders, there is no conclusive evidence for such a relationship at this time.

Research Strategies

Research on the psychological characteristics of the premenstrual syndrome can be divided into four methodological categories: 1) correlational studies of specific behavioural acts and phase of the menstrual cycle; 2) retrospective studies

of symptoms and mood changes; 3) studies using daily self-reports of behaviours, symptoms, and moods; 4) studies using thematic analysis of unstructured verbal material (Parlee, 1973).

Correlational Studies

Correlational research has involved attempts to find relationships between a number of specified behaviours and phase of the menstrual cycle. Such behaviours include decreased intellectual performance (Bernstein, 1977; Dalton, 1960a; Golub, 1976a; Sommer, 1972; Walsh et al., 1981; Wickham, 1958), criminal acts (Cooke, 1945; Dalton, 1961; d'Orban & Dalton, 1980; Morton et al., 1953), response to illness in children (Dalton, 1966; Tuch, 1975), attempted suicide (Birtchnell & Floyd, 1974, 1975; Dalton, 1959; Holding & Minkoff, 1973; Mandell & Mandell, 1967; Pallis & Holding, 1976; Ribeiro, 1962; Wetzel, McClure, & Reich, 1971; Wetzel, Reich, & McClure, 1971), and psychiatric admissions to a hospital (Abromowitz et al., 1982; Dalton, 1959; Glass et al., 1971; Jacobs & Charles, 1970).

Although relationships have been found between each of these behavioural areas and phase of the menstrual cycle, Parlee (1973) has suggested that such results should be interpreted, with respect to causal statements, with caution. The majority of such studies have implicitly suggested that it is the premenstrual changes which cause the behaviour. Parlee suggested that more consideration should be given to the notion that the

behavioural acts may equally likely affect the menstrual cycle. Furthermore, "data from particular groups cannot provide a basis for a generalization about all women or about any woman selected at random unless it is assumed that women are equally likely to be or become a member of the groups in which the data were collected" (Parlee, 1973, p. 456).

Retrospective Studies

A number of questionnaires have been employed which ask women to report, retrospectively, their experience of symptoms and moods during the menstrual cycle (Coppen & Kessel, 1963; Endicott et al., 1981; Moos, 1968b; Steiner et al., 1980; Sutherland & Stewart, 1965). The most well-known and used of these questionnaires is undoubtedly Moos' (1968b) Menstrual Distress Questionnaire (MDQ). This is a rating scale which consists of 41 symptoms that may be associated with the menstrual cycle and a further six symptoms which are included as a control scale in order to obtain a measure of the likelihood that the respondent will complain of symptoms regardless of whether they are present or not. Women are asked to rate their experience of each symptom in the premenstrual, menstrual, and intermenstrual phases of their most recent menstrual cycle and their "worst" menstrual cycle. Each symptom is rated on a six-point scale from "no experience of the symptom" to "an acute or partially disabling experience of the symptom".

However, this assessment technique has received criticism of both a practical and methodological nature. Rouse (1978) reported that a large number of women found the questionnaire both complicated and difficult to understand and that, despite claims that the questionnaire takes only five minutes to complete, women routinely took 20 minutes or longer to complete it. Of more importance, however, are the methodological criticisms considered by Parlee (1973, 1974). Moos (1968b) failed to report that, of 839 women in the normative sample, 420 were taking oral contraceptives, 81 were pregnant, and 40 did not provide details about their use of contraceptives (Parlee, 1973). Furthermore, no data were provided on the reliability or external validity of the questionnaire (Parlee, 1974).

In an attempt to determine whether response patterns on the MDQ are necessarily related to subjective experience of change, Parlee (1974) administered the MDQ to both males and females. The original instructions were given with the exception that both males and females were asked what "women" experience rather than what "you" experience. Results indicated that males consistently scored higher than females on all subscales. Although it is possible that males were responding to learned stereotypic beliefs while females were responding to subjective experiences, Parlee suggested that it is also possible "that questionnaires concerning menstruation provide measures of stereotypic conceptions of menstrual distress or premenstrual tension rather than of any psychological states more directly

related to hormonal fluctuations" (Parlee, 1974, p. 239).

Steiner et al. (1980) developed research diagnostic criteria for premenstrual tension syndrome from data obtained on changes in symptomology from the follicular phase (day 9 of the menstrual cycle) to the luteal phase (2 to 6 days premenstrual) using the MDQ and several psychiatric symptom rating scales. Data were obtained from women (N=42) who were severely symptomatic with no psychiatric disorders and whose symptoms were alleviated with the onset of menses. The resultant operational criteria for premenstrual tension syndrome included eight psychological and behavioural symptoms of which five were necessary for diagnosis. However, while it was acknowledged that these symptoms frequently occur in association with physical symptoms, the physical symptoms were not regarded as necessary for the diagnosis of premenstrual tension syndrome. As Rubinow and Roy-Byrne (1984) noted, Steiner and his associates' failure to include somatic symptoms and their exclusion of women with other psychiatric disorders results in a homogeneous, though exclusive, group of women who meet the diagnostic requirements. In particular, women whose premenstrual symptomology is primarily somatic would be excluded from this diagnostic group.

Finally, the Premenstrual Assessment Form (PAF) was developed for use in differentiating among subtypes of premenstrual change (Endicott, Halbreich, Schacht, & Nee, 1981; Halbreich & Endicott, 1982; Halbreich, Endicott, & Nee, 1983; Halbreich, Endicott, Schacht, & Nee, 1982). This measure is a

checklist containing 95 items which describe specific types of change in mood, behaviour, and physical condition. Each item is rated on a six-point scale reflecting change from usual, nonpremenstrual state over the three previous premenstrual phases. Response options range from 1 (not applicable, not present at all, or no change from usual level) to 6 (extreme change).

Unlike previous assessment procedures, the PAF was developed specifically to meet the perceived need for a measure of premenstrual changes that

> 1) covers a broader and more clearly specified variety of changes in mood, behavior, and physical condition than is in existing questionnaires;
> 2) provides more sensitive measures suitable for describing dimensions of change and levels of severity;
> 3) provides specific criteria for typological categorization of different clinical types of change; and
> 4) defines different levels of severity of change. (Halbreich, et al., 1982)

Using data based on those of the Research Diagnositc Criteria (RDC; Spitzer et al., 1978), respondents can be classified into PAF Major and Minor Depressive Syndromes. Further classification is possible for Endogenous Depressive Features, Atypical Depressive Features, Hysteroid Depressive Features, Anxious-Agitated Depressive Features, Withdrawn Depressive Features, and Hostile Depressive Features. For those who do not meet the requirements of Major or Minor Depressive Syndromes, classification is possible in several other categories: Anxiety Syndrome, Increased Well-Being Syndrome, Impulsive Syndrome, Water Retention Syndrome, General Discomfort

Syndrome, Autonomic Physical Changes Syndrome, Fatigue Syndrome, Impairment in Social Functioning, and "Organic" Mental Syndrome.

From observed frequencies with which the developmental sample of women (N=154) met criteria for the various PAF typological categories, Halbreich and Endicott (1982) concluded that there are indications

> that while some subtypes of premenstrual change are relatively common, e.g., physical discomfort, the degree of differentiation is most impressive. Certainly there is no evidence here for one basic "premenstrual syndrome". Furthermore, such diversity in syndromal patterns suggests that stereotypic concepts are not the major source of the endorsement of the items as has been suggested by some authors.(p. 259)

Self-report Studies

Self-report assessment techniques involve ratings of symptoms and moods at regular intervals throughout the cycle. Various authors (e.g. Abplanalp, Donnelly, & Rose, 1979; Abplanalp et al., 1979; Haskett et al., 1980; Rees, 1953a, 1953b; Moos et al., 1969) have employed these strategies. Self-report measures used in studies of premenstrual syndrome have included the Nowlis Mood Adjective Check List (Nowlis, 1965), the Profile of Mood States (McNair, Lorr, & Droppleman, 1971), the Social-Sexual Activities Log (Abplanalp et al., 1979), and the Multiple Affect Adjective Checklist (Zuckerman & Lubin, 1965). From Dennerstein and Burrows' (1979) summary of studies of affective fluctuation during the menstrual cycle it is evident that, in measuring affective change, the Nowlis Mood

Adjective Check List has been most regularly employed.

Thematic Analysis of Verbal Material

Thematic analysis of unstructured verbal material also involves day-to-day collection of data but differs from self-report measures in that subjects do not rate themselves directly on specific symptoms. Instead, subjects are required to record daily five minute verbal talks on any life experience. This technique was originally developed by Gottschalk et al. (1962) as a general measure of emotions. Using psychodynamic interpretations of verbal material, measures are obtained for subjects' levels of hostility directed outwards, hostility directed inwards, and anxiety. This method was used by Ivey and Bardwick (1968) to study patterns of affective fluctuation during the menstrual cycle and by Paige (1971) in her study of the effects of oral contraceptives on affective fluctuation during the menstrual cycle.

Although no standardized scoring techniques were used, Benedek and Rubenstein (1939a, 1939b) used a similar method of day-by-day analysis of verbal content in their studies of psychodynamic processes in the menstrual cycle.

Current Status of Premenstrual Syndrome Research

The evidence in support of the existence of a premenstrual syndrome has been gathered from these four types of studies. Given the variation in methodologies and assessment measures it is not surprising that there is little consensus about precisely which symptoms, and their degree of severity, are required for a diagnosis of premenstrual syndrome.

Although there is evidence from studies employing only one of these methods of assessment that the premenstrual syndrome is a valid diagnostic entity, studies which have used more than one assessment technique have produced conflicting results. Abplanalp et al. (1979) found discrepancies in the incidence of mood changes over the menstrual cycle from data collected retrospectively (Menstrual Distress Questionnaire: MDQ) and from daily self-reports (Profile of Mood States: POMS). Specifically, while the MDQ revealed significant changes in mood states over the menstrual cycle the POMS revealed none. Silbergeld, Brast, and Nobel (1971), using a retrospective measure (MDQ), a daily self-report measure (NMACL), and the Gottscalk technique of thematic analysis, found that the scores on the three measures were only slightly correlated.

In contrast, Sanders, Warner, Backstrom, and Bancroft (1983) found that the results of daily self-report measures (Lorr-McNair Mood Adjective Check List, McNair & Lorr, 1964; NMACL; and Visual Analogue Scales, Aitken & Zealley, 1970) confirmed retrospective accounts of cyclical changes in moods,

physical health and sexuality on the MDQ.

In addressing the methodological problems inherent in much of the research on premenstrual syndrome to date, Rubinow and Roy-Byrne (1984) suggested that much of the confusion surrounding the nature, cause, and treatment of the syndrome can be attributed to "the inevitable product of serious errors in study design resulting in part from the failure of investigators to formulate a set of answerable questions before initiating their studies" (p. 163). They offered the following definition of the syndrome and suggested that, from this definition, a series of questions regarding the nature of the syndrome are apparent:

> A menstrually related mood disorder can be defined as the cyclic occurrence of symptoms that are of sufficient severity to interfere with some aspects of life and which appear with a consistent and predictable relationship to menses. Inherent in this definition are the following questions. 1. What are the symptoms that are experienced? 2. To what degree are the symptoms experienced, i.e., what is their intensity? 3. When do they occur in relationship to menstruation? 4. What is the symptomatic baseline on which symptoms fluctuate? (Rubinow & Roy-Byrne, 1984, p. 163)

As these authors point out, and as noted in the present paper, there is little consensus in the literature regarding the exact nature of the symptoms that comprise premenstrual syndrome: there is also little consensus (on the rare occasions when it is addressed) with respect to the severity of symptoms experienced. Furthermore the issues of the timing of symptoms (at what point in the menstrual cycle do they occur and for how long do they last?) and differentiation between symptom

occurrence and symptom exacerbation remain unresolved (Rubinow & Roy-Byrne, 1984).

Sanders et al. (1983) noted further methodological shortcomings in this field of research: an emphasis on the premenstrual phase alone rather than on the whole menstrual cycle; an emphasis on negative rather than positive experiences; ill-defined selection criteria for subjects; the use of retrospective measures alone; and the use of unsatisfactory indicators of different stages in the menstrual cycle.

The selection of subjects is an issue which is crucial to research in this area. A recent study (O'Neill, Lancee, & Freeman, 1984) investigated menstrual cycle fluctuation in mood and symptoms associated with psychological distress in randomly selected university women and women attending a psychiatric clinic and found that depression, anxiety and other symptoms of psychological distress did not vary significantly across the menstrual cycle for either group. The authors concluded that, although a minority of women may experience premenstrual symptomology, this group is best studied as a "vulnerable sub-group" and generalizations from such studies cannot be made to women in general. It would seem obvious, however, that if premenstrually symptomatic women were not, indeed, a vulnerable sub-group of women then there would be little need for a diagnostic category by which they could be distinguished. It would also seem obvious that, in order to investigate the presence of premenstrual symptomology in university women and

psychiatric patients, one should also ascertain the extent to which individuals would claim to experience such symptomology. It is possible that few, if any, of the subjects in this study subjectively experienced premenstrual symptoms. One cannot, therefore, discount the possibility that some university women and psychiatric patients are premenstrually symptomatic despite the authors' conclusion

> that in general university women between the ages of 18-30 who are mostly single, nulliparous, with or without significant psychopathology, seeking or not seeking psychiatric help do not experience significant or disruptive fluctuations in mood and symptoms of psychological distress during the phases of the menstrual cycle. (p. 377)

Furthermore, it would seem pointless to draw conclusions about "fluctuations in mood and psychological distress during the menstrual cycle" without attempting to include subjects who report experiencing such fluctuations in the investigation.

A further methodological issue of concern is that of knowledge of cycle phase and its potential influence in prospective reporting of symptoms. Ruble (1977) administered the MDQ during the premenstruum to 44 women between the ages of 18 and 24. All women were tested at either six or seven days before menstruation, however, some (n=15) were informed that they were in their premenstrual phase (defined as one or two days before the onset of menstruation), others (n=14) were told they were intermenstrual (seven to 10 days before onset), and the remainder (n=15) were given no information about their current cycle phase. The results indicated that, for two of the MDQ

scales (water retention and pain), and for two individual items (change in eating habits and sexual arousal), the symptom ratings for "premenstrual" women were significantly higher than those given by "intermenstrual" women. Ruble concluded, from these data, that the belief that one is in the premenstrual phase may lead to an overstatement of actual physical experiences. It is interesting to note, however, that no significant differences were discovered for the remaining six MDQ scales (negative affect, concentration, behavioural change, autonomic reactions, arousal, and control) and that, on the two scales where significant differences were observed, the means for the "premenstrual" (2.62 and 2.32) and control (2.35 and 2.12) groups were very similar, with the "intermenstrual" means (1.54 and 1.88) being the divergent ones. It could be suggested that, rather than the "premenstrual" and control groups (all of whom were in the premenstruum) overstating their symptomology, the "intermenstrual" group understated their symptomology, believing that they were, indeed, intermenstrual.

A related issue of particular relevance in studies using retrospective measures, concerns the influence of the particular phase one is in at the time of completion of information on one's perception of symptomolgy in previous premenstrual phases. However, Halbreich et al. (1982) reported that, for items on the PAF completed during the premenstrual period (19% of the sample), during menstruation (18%), during the week following menses (25%), and during the remainder of the cycle (38%), "only

one item was significantly different in level of severity among the four groups, with those completing the form during the menses scoring slightly higher" (p. 54).

As Slade (1984) has suggested, knowledge of the research topic (i.e. menstrual cycle changes) may bias subjects' responses when reporting symptoms. In an attempt to control for this, 302 trainee nurses were asked to complete daily ratings on the MDQ (with modified instructions) for a period of eight weeks as part of "an investigation into the general health of a non-patient population". Analyses were conducted for 118 women (48 of whom were using oral contraceptives) revealing that, while pain and water retention symptoms were significantly higher during the premenstrual and menstrual phases, the other symptom categories were not significantly different across the cycle. While these results may question "whether higher levels of negative emotions premenstrually or menstrually are a genuine feature of normal female experience" (Slade, 1984, p. 6) they should be interpreted with caution. Once again, it is possible that few, if any, of the women in this study would be classified (subjectively or objectively) as experiencing premenstrual syndrome and, thus, one would not expect consistent negative affect during the premenstruum. It would seem essential that, in any "blind" prospective study of premenstrual symptoms, information is obtained at some point about each woman's retrospective experience of premenstrual symptoms so that prospective reports can be interpreted in relation to the extent

of the individual's perception of premenstrual symptomology.

Finally, for the most part, research studies have based their conclusions on a data base of only one menstrual cycle. As Rubinow and Roy-Byrne (1984) noted: "prospective longitudinal symptom reporting is the only acceptable way of demonstrating a relationship between mood changes and menstrual cycle change" (p. 165).

In order to demonstrate the validity of premenstrual syndrome as a diagnostic entity it is essential to establish that interphase differences in symptomology exist for premenstrually symptomatic women. Moreover, differences between symptomatic and asymptomatic groups must simultaneously be present for premenstrual symptomology and absent for menstrual and intermenstrual phase symptomology. Thus, one must establish, a priori, criteria for inclusion of subjects in either group. In the absence of a demonstrably valid diagnostic tool, self-definition as premenstrually symptomatic or asymptomatic (with a clear indication of the subjective severity of symptomology) would appear to be the most adequate method of defining group membership. Validation of the syndrome, then, involves demonstrating both stability of symptomology over time (necessitating a longitudinal data base) and reliable differences between those included in the symptomatic group and those excluded from it. Furthermore, it is necessary to demonstrate concordance between retrospective and concurrent reports of symptomology in order to confirm the severity of

restrospective perceptions of premenstrual symptomology.

The Current Study

The current study represents an attempt to validate the premenstrual syndrome by investigating the presence of symptoms at different phases of the menstrual cycle in self-selected premenstrually symptomatic and asymptomatic women.

Despite the lack of consensus in the literature with respect to exactly which symptoms comprise the syndrome, there does appear to be some consensus regarding general symptom areas. Affect and mood changes have been found to be associated with the premenstrual phase, as have physical and behavioural changes. Although changes in cognitive performance have not been found, in recent literature, to be associated with the premenstrual phase, this phenomenon continues to be investigated and considered as a possible symptom of premenstrual syndrome. There is evidence, however, to suggest that depressed cognitive distortion is experienced in affective disorders (Krantz & Hammen, 1979; Norman, Miller, & Klee, 1983). If depression is indeed a consistent symptom of the premenstrual syndrome, then symptomatic women may show evidence of distorted perceptions of their cognitive efficiency during the premenstruum rather than a decrement in actual cognitive performance.

It is also possible, given the acknowledged problems that are inherent in retrospective reporting of subjective phenomena, that symptomatic women may perceive, retrospectively, that they

experience a stable syndrome of premenstrual distress which concurrent evidence would not support.

The present study, then, investigated the four symptom areas mentioned above (cognitive, affective, physical and behavioural changes) in order to ascertain their degree of association with the subjective experience of premenstrual syndrome. In addition, the degree of cognitive distortion associated with subjective evaluations of performance on cognitive tasks and the degree of concordance between retrospective and prospective reports of premenstrual experiences were investigated.

The following questions were addressed. Do women who subjectively experience premenstrual syndrome show changes in these symptom areas in the premenstrual phase of the menstrual cycle when compared with nonpremenstrual phases? Do subjectively symptomatic women differ from subjectively asymptomatic women at the premenstrual phase of the menstrual cycle? Furthermore, do differences exist between these groups at the menstrual and intermenstrual phases? Are retrospective reports of the presence or absence of premenstrual symptoms concordant with concurrent reports? Do women judge their performance on cognitive tasks more or less accurately during the premenstruum when compared with nonpremenstrual judgements?

Most definitions of premenstrual syndrome acknowledge that symptoms (or exacerbation of those symptoms) are experienced only during the premenstruum (variously defined from two to 10

days before the onset of menstruation) and that, with the onset of menses, most, if not all of the symptoms are alleviated. This suggests that, for subjectively symptomatic women, a significant increase in symptom severity would be experienced premenstrually with a return to the normal, nonpremenstrual, level of symptom experience during menstruation. Furthermore, in the absence of related pathology, the concept of premenstrual syndrome implies that symptomatic women should differ from asymptomatic women only during the premenstruum.

Much criticism has been directed toward research in the area of premenstrual syndrome because of the frequent reliance on retrospective self-reports. This issue may be further confounded by the possible expectations that women have of premenstrual and menstrual experiences. Jointly, these considerations point to retrospective reports of premenstrual changes that may be exaggerated when compared to concurrent ratings of the same symptoms.

Finally, given the empirical association between the presence of affective disorders and cognitive distortions, it can be suggested that women who show increased negative affect during the premenstruum may also manifest distorted cognitions with respect to their performance on memory tasks completed during that time.

In the current study the following hypotheses were tested:

1. Subjectively symptomatic women were expected to report significant changes from normal in symptom areas

premenstrually while subjectively asymptomatic women were not expected to report such changes.

2. It was expected that symptomatic women would differ with respect to the presence and severity of symptoms from asymptomatic women only during the premenstruum.
3. For all subjects, it was expected that there would be discordance between retrospective and concurrent reports of premenstrual symptoms.
4. Symptomatic women were expected to show more distorted evaluations of performance on memory tasks premenstrually when compared with nonpremenstrual testing sessions. Asymptomatic women were expected to show no such variation across the menstrual cycle.

Finally, in accordance with Halbreich et al.'s (1983) use of the PAF, subjects in both groups were assigned to PAF premenstrual subtypes on the basis of their initial (three month retrospective) reports of their experience of symptoms as outlined in the PAF.

B. Method

Subjects

Subjects in both the symptomatic (n=11) and control (n=24) groups were recruited from the population of students at Simon Fraser University and from the surrounding community with the aid of posters and by word of mouth.

Women in both groups had been menstruating regularly for the previous six months; had menstrual cycles that were not less than 21 days or more than 38 days in length; were not using any form of oral contraceptive; were not undergoing any form of medical treatment for premenstrual symptoms; and were not using any form of medication (e.g. cortical steroids, hormones, antidepressants) which may have influenced the nature and/or severity of premenstrual changes.

Symptomatic Group

The symptomatic group was made up of 11 women who were self-selected as experiencing severe premenstrual syndrome. Each woman reported experiencing severe premenstrual symptoms consistently for a period of at least one year and also reported having at least considered seeking treatment for those symptoms. None of the subjects were actually undergoing medical treatment

for premenstrual symptoms during the study.

The women in this group ranged in age from 19 to 41 years with a mean age of 30.45 years (SD= 6.502) and had experienced premenstrual symptoms for an average of 7.91 years (SD=6.457). Six of the women had been pregnant (whether carried full-term or not) on at least one occasion. Seven had either been hospitalized or received some other form of treatment for depression and two reported having a member of their family who had received treatment for depression.

Control Group

Subjects in the control group were women who reported experiencing either minimal or no premenstrual symptoms and had never considered seeking treatment for premenstrual distress. Thirty women began the study in the control condition and 24 had completed testing at the time of data analysis. One subject voluntarily ceased participation while three women were unable to complete testing because they were required, for medical reasons, to take medication that may have influenced their premenstrual status (i.e. hormonal medications and antidepressants). Two further subjects had not completed testing at the time of data analysis. Women in this group ranged in age from 22 to 43 years with a mean of 30.00 years (SD= 5.259). Eleven women reported at least one pregnancy and eight had received previous treatment for depression while six reported having a family member who had been treated for depression.

Measures

1. Premenstrual Assessment Form (PAF; Endicott et al., 1981).

This is a 95 item checklist which was developed to measure the presence and severity of changes in mood, behaviour, and physical condition during the premenstruum. Subjects were asked to rate each item with respect to their experience of change and degree of change from their usual (nonpremenstrual) state or level of functioning.

Ratings were obtained from all women at the beginning of the study with respect to changes experienced during the previous three premenstrual periods (Menstrual Symptoms Questionnaire: Form A, Appendix A); at the premenstrual, menstrual, and intermenstrual phases of each menstrual cycle with respect to changes experienced during the previous 24 hours (Menstrual Symptoms Questionnaire: Form B, Appendix A); and at the intermenstrual phase of each menstrual cycle with respect to changes experienced during the previous premenstruum (Menstrual Symptoms Questionnaire: Form C, Appendix A).

Each symptom was rated for change on a six-point scale from 1 (not applicable, not present at all, or no change from usual level) to 6 (extreme change). Intermediate points on the scale were described as 2 - minimal change; 3 - mild change; 4 - moderate change; and 5 - severe change.

This measure yielded a total score of change on all items ranging from 95 to 570. Since no empirically derived subscales have been established for this measure a "functional factor analysis" was carried out by the experimenter in order to generate subscale scores. Four individuals independently categorized each item on the PAF into one of four categories: affective, cognitive, physical, and behavioural symptoms. Each item was then included in a subscale if at least three of the four raters agreed on its membership in that category. Of the 95 items on the PAF, 80 were able to be included in one of the four subscales resulting in 18 items on the affective symptoms subscale, 11 items on the cognitive symptoms subscale, 23 items on the behavioural symptoms subscale, and 28 items on the physical symptoms subscale. Specific items included in each of the subscales and the remaining 15 items on the PAF are included in Appendix B.

2. Cognitive efficiency measure.

This measure consists of a series of short term memory tasks involving simple, well-known one- and two-syllable nouns (Appendix A). Each testing session comprised 11 three-word trials. Words were selected from a subset of Paivio, Yuille, and Madigan's (1968) list of 925 nouns rated for concreteness, imagery, and meaningfulness.

Only nouns of one or two syllables which were rated highly on both concreteness (at least 5.00 on a seven-point scale) and

imagery (at least 6.00) were included. Words were then selected from this subset for 99 three-word trials with the following considerations: a) random selection without replacement; b) two one-syllable words and one two-syllable word included in each trial; c) no obvious semantic relationships between words in consecutive positions within each trial; d) no consecutive words beginning with the same letter. The 99 trials were then randomly assigned to nine groups of 11 trials and, further, into three blocks of three groups. The order of groups of trials used in testing was then counterbalanced for subjects in both the symptomatic and control conditions using a 3 X 3 Latin Square arrangement. One three-digit random number was assigned to each of the 99 trials used in the study.

A further three groups of 11 trials of words and three-digit numbers were created in a similar manner partway through data collection in order to accommodate those subjects who required extra testing sessions (see page 65).

3. Cognitive distortion measure.

This is a simple three-item measure (Performance Questionnaire, Appendix A) which was developed for use in the present study and was administered in tandem with the cognitive efficiency measure. Immediately following administration of the memory tasks, subjects were asked to rate their performance with respect to: a) how they judged others would do; b) how well they thought they would normally be capable of doing; and c) how well

they felt they had done on the previous testing occasion. The first two questions only were asked after the first administration of the cognitive efficiency measure. Ratings were made on a 10-point scale ranging from 0 (worse) through 5 (about the same) to 10 (better).

Each subject was also asked: a) what score out of 24 she felt others would achieve on average; (Estimated Other) b) what score out of 24 she felt she would normally achieve; (Estimated Usual) and c) what score out of 24 she felt she would be capable of achieving during the premenstruum (Estimated Premenstrual).

4. Nowlis Mood Adjective Check List (NMACL; Nowlis, 1965).

This measure, consisting of a list of 49 adjectives which describe feelings or moods, was developed as a measure of mood change. Subjects were asked to rate the degree of experience of each mood or feeling over the previous 24 hour period on a six-point scale ranging from 1 (definitely no experience of this feeling) to 6 (extreme experience of this feeling). Intermediate points on the scale were described as 2 - minimal experience of this feeling; 3 - mild experience of this feeling; 4 - moderate experience of this feeling; and 5 - extreme experience of this feeling.

Individual ratings on each item of the NMACL were combined to give scores on 12 mood factors as defined by Nowlis (1965): aggression, anxiety, surgency, elation, concentration, fatigue, social affection, sadness, skepticism, egotism, vigour or

general activation, and nonchalance or general deactivation. Specific items for each factor are included in Appendix B.

5. Physical and behavioural checklist. (Appendix A)

This measure is a checklist of physical and behavioural symptoms which was adapted for use in this study from the pain, autonomic reactions, water retention, and arousal scales of Moos' (1968) Menstrual Distress Questionnare. Each item was rated on a scale of 1 (no experience of symptom) to 6 (acute or partially disabling) with respect to the experience of each symptom over the previous 24 hours.

In addition, two questions were included to ascertain the extent of any weight gain over the previous 48 hours and the subject's perception of her body image at the time of testing.

6. Beck Depression Inventory (BDI; Beck,Ward, Mendelson, Mock, & Erbaugh., 1961).

The BDI is a clinically derived self-report measure which consists of 21 items relating to affective, cognitive, motivational, and physiological symptoms of depression.

Subjects were asked to check the responses which best described the way they had been feeling during the previous 24 hours. Response options carry a score from 0 to 3 and a total score reflecting depth of depression is obtained by summation of individual item scores. The range of possible summated scores extends from 0 to 63 with scores of 0 to 9 being categorized as

not depressed, 10 to 15 as mildly depressed, 16 to 23 as moderately depressed, and 24 to 63 as severely depressed.

Procedure

Each subject was screened for eligibility to be in the study and was then requested to read the Premenstrual Symptoms Study document (Appendix A) and, if agreeable, to sign the Consent Form (Appendix A) indicating that she agreed to participate in the study and that she understood she may withdraw from the study at any time.

Subjects were informed that the study was designed to investigate premenstrual symptoms and that testing would be carried out on nine separate occasions over three consecutive menstrual cycles[1] All subjects were regularly tested either in the Department of Psychology at Simon Fraser University or in their homes. Four women were tested throughout the study by telephone and, on occasion, others were tested by telephone when they were absent from Vancouver on the date of scheduled testing.

Due to the nature of subject selection for this study all women were aware that the subject of the investigation was premenstrual syndrome and all were similarly aware of their group membership in the study.

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[1]The present document addresses analyses conducted on data collected from only two menstrual cycles. Further analyses will be conducted on data from three cycles at a later date.

Subjects were contacted on 10 occasions in total. At the first session each woman was required to complete the Background Information questionnaire (Appendix A) which described details of her menstrual history. At that time the Premenstrual Assessment Form (Menstrual Symptoms Questionnaire: Form A), describing the degree of change from normal experienced over the past three premenstrual phases, was also completed. Testing sessions were then scheduled to coincide with the next relevant phase of the menstrual cycle (premenstrual: within the four[2] days prior to menstruation; menstrual: within the first four days of menstruation; intermenstrual: within the four days at the midpoint of the cycle) that occurred for each woman. Each testing session thereafter included administration of the cognitive efficiency measure, the cognitive distortion measure, the NMACL, the physical and behavioural checklist, the PAF (Menstrual Symptoms Questionnaire: Form B), and the BDI. For each of the latter four measures subjects were asked to reflect their experiences during the 24 hours prior to testing.

In addition, at each intermenstrual phase, following a premenstrual testing session, subjects were required to complete the PAF (Menstrual Symptoms Questionnaire: Form C) describing the degree of change from normal experienced during the previous

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[2]The premenstrual phase has been variously defined as spanning the two, three, four, five, seven and 10 days before onset. For the purposes of this study the premenstrual phase was defined as the four days prior to onset of menstruation. However, if menstruation occurred within seven days of premenstrual testing, the subject was considered to be premenstrual at the time of testing.

premenstruum.

During each testing session subjects were first administered the cognitive efficiency measure (short-term memory tasks). The procedure was described on the first testing occasion as follows:

> I will be giving you a series of tasks which are designed to measure sort-term memory for simple, well-known nouns. There will be 11 separate trials. The first trial is a practice one so that you can get used to the task. The words are printed on the cards I have here, along with a three-digit number. As soon as I turn a card over I want you to read the words printed on the card out loud, then read the three digits out loud.[3] I will then take the card away and I want you to count backwards by three's from the three-digit number as fast as you can but try not to make errors.[4] If you make a mistake just continue from the last number that you said. When I say "stop"[5] I want you to stop counting backwards by three's and recall the three words that were on the card. Then, when I turn up the next card we will repeat the procedure for the next trial. For example: I turn up the card and you say "home, people, list, one, four, two" at about that speed. Then when I take the card away you say "139, 136, 133, 130, 127, etc" as fast you can. Remember, if you make a mistake while counting backwards, for example, you say "139, 136, 133, 130, 128" then just continue counting backwards by three's from 128 i.e. 125, 122, 119, etc. Then I will say "stop" and you say "home, people, list". You don't have to recall the words in the same order - any order will do. Do you have any questions? Then we'll begin with the first trial - remember, the first trial is for practice.

Thereafter, each subject was asked at the beginning of the session if she remembered the instructions and a brief summary

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[3]The experimenter began timing subjects as soon as the three-digit number was read.

[4]All subjects counted in English with the exception of two women: one counted in Punjabi and the other counted in French.

[5]After a timed period of 18 seconds.

was given by the experimenter when necessary.

In order to maximize uniformity in testing the experimenter did not look at subjects while they were reading the words, counting backwards, or recalling. Instead, attention was directed toward the experimenter's stopwatch and scoring sheet. Subjects were also informed that they would receive no feedback with respect to their performance on the memory tasks and all words recalled (correctly or incorrectly) were immediately transcribed onto the scoring sheet. If subjects considered that they had made an error and offered a fourth word they were asked to indicate which of their original three words was to be replaced.

Immediately upon completion of the short-term memory tasks the subject was asked to complete the performance questionnaire. All other questionnaires were required to be completed on the same day that testing took place. Subjects were asked not to consult any records they may have kept regarding their menstrual cycle symptoms when completing questionnaires. Furthermore, all women were discouraged (although not forbidden) from monitoring their symptoms throughout the menstrual cycle in any systematic way.

In all cases an attempt was made to collect complete data over three consecutive menstrual cycles. However, in some instances this was not possible. Despite attempts to include only women with regular menstrual cycles in this study, several women had one or more unusually long or unusually short cycles.

On several occasions women began menstruating before the premenstrual testing date. In such cases the missing premenstrual data was obtained during the next menstrual cycle. In other instances, subjects were retested for premenstrual data when they failed to begin menstruation within the nominated seven-day period after premenstrual testing. Thus, while complete data on all women comprised three premenstrual, three menstrual, and three intermenstrual testing sessions, these were not necessarily obtained over consecutive menstrual cycles.

Each subject who completed the study (or who was required to withdraw from the study involuntarily) received $5.00 on completion.

Statistical Analyses

A series of analyses of variance for repeated measures with nested (subjects) and crossed (group, menstrual phase, month) factors were performed to test interphase differences in symptomology for each group. Fixed (group, menstrual phase) and random (subjects, month) effects were also considered in analysis procedures.

Between-group differences in symptomology were assessed by a series of two-tailed t-tests.

Familywise Correction of Significance Level

The statistical analyses used to test hypotheses 1 and 2 involved six multiple comparisons (hypothesis 1) and three

t-tests (hypothesis 2) for each variable. For the purposes of analysis, the set of nine statements about each variable was considered to be one family of comparisons. In order to make the required familywise correction of the acceptable significance level, the multistage Bonferroni procedure, as described by Larzelere and Muliak (1977) was employed. This procedure involves using a series of significance levels which are determined according to the number of tests of the null hypothesis that are considered at each stage of the procedure.

In the first stage, the significance level is determined according to the usual Bonferroni procedure for a family of m tests and each test of the null hypothesis is performed with that significance level. If none of the tests are significant then the procedure ends. If, however, the null hypothesis is rejected for k of the tests, then the second stage of the procedure involves examining the remaining tests using $(m-k)$ in the calculation of the significance level. This procedure is repeated until a point is reached at which no further null hypotheses can be rejected.

Missing Data

Considering the amount of data collected from each subject the proportion of missing data points was minimal. For all missing data, estimates were calculated by pro-rating: the mean of all other data points included in the subscale or factor to which the missing item belonged was substituted for the missing

value. Missing data points for items which were not included in subscale scores (i.e. some items of the PAF) were estimated to be the mean of all other items included in that measure.

C. Results

Differences between groups and interphase differences within groups for all measures are illustrated in Figures 1 to 9 which are included at the end of the results section.

Menstrual History

Symptomatic and control subjects did not differ significantly with respect to age, menstrual history characteristics or contraceptive use (Tables 1 and 1a).

Interphase Differences in Symptomology Within Groups

Symptomatic Group

Results of all possible comparisons across phases are reported in Tables 2, 3 and 4.

1. Premenstrual Assessment Form (Menstrual Symptoms Questionnaire: Form B)

On all subscales of this measure, and on the total score, women in the symptomatic group indicated a greater change from normal during the premenstrual phase than during either of the menstrual or intermenstrual phases (Table 2). Higher scores were also observed in the menstrual phase when compared with those in the intermenstrual phase. However, with the exception of the physical symptoms and behavioural symptoms subscales, none of

TABLE 1: Demographic and menstrual history characteristics

Characteristic	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	df	t	p
Age (years)	30.5	6.50	30.0	5.26	33	0.22	0.8269
Number of pregnancies	1.2	1.40	0.8	0.94	33	1.08	0.2900
Age at menarche	12.8	1.72	12.3	1.16	33	1.07	0.2937
Length of menstrual cycle (days)	27.7	3.04	28.7	1.46	33	-1.30	0.2017
Length of menstrual flow (days)	4.9	1.14	4.9	1.15	33	0.08	0.9355

TABLE 1a: Contraceptive use

Contraceptive	Group: Symptomatic Number	Control Number	X^2	df	p
Oral contraceptives					
Past users	8	16			
Nonusers	3	8	0.129	1	0.7199
Intra-uterine device					
Past users	2	10			
Current users	1	3			
Nonusers	8	11	2.295	2	0.3174

TABLE 2: Interphase comparisons - Symptomatic group (Premenstrual Assessment Form and Cognitive Efficiency Measure)

Measure	Phase Mean PM	M	IM	F-value for comparison PM/M	PM/IM	M/IM
Premenstrual Assessment Form:						
Affective	52.32	43.73	37.00	3.7069	11.7854*	2.2730
Cognitive	33.64	28.36	20.64	2.5708	15.6269**	5.5213
Behavioural	61.23	48.95	42.69	8.0694	18.4262**	2.1080
Physical	78.10	69.82	53.55	2.3194	20.4185**	8.9743*
Total	270.50	227.91	183.23	4.4679	18.7599**	4.9174
Cognitive Efficiency Measure	16.09	17.55	16.68	2.1959	0.3624	0.7724

PM = Premenstrual; M = Menstrual; IM = Intermenstrual

df(1,66) for all comparisons

* $p<.005$

** $p<.001$

the differences observed between premenstrual and menstrual subscale scores or those between menstrual and intermenstrual subscale scores were statistically significant. The degree of reported change from normal in physical symptoms was significantly greater at the menstrual phase when compared with the intermenstrual phase ($p<.005$). Reported change in behavioural symptoms was significantly greater at the premenstrual phase ($p<.01$) than during the menstrual phase.

Differences for all subscale comparisons between the premenstrual and intermenstrual phases did, however, reach statistical significance. Specifically, symptomatic women reported a greater change from normal during the premenstruum for affective ($p<.005$), cognitive ($p<.001$), (physical ($p<.001$), and behavioural ($p<.001$) symptoms. Total scores on this measure were also significantly higher ($p<.001$) during the premenstruum than during the intermenstruum.

2. Cognitive Efficiency Measure.

No significant differences were observed across phases in scores obtained on the short-term memory tests ($p>.25$) for women in the symptomatic group (Table 2).

3. Nowlis Mood Adjective Check List.

Subjects in the symptomatic group reported higher levels of aggression, anxiety, concentration, fatigue, sadness, and skepticism during the premenstruum with a decrease in scores on

these factors through the menstrual phase to the intermenstrual phase (Table 3). Scores on the elation, social affection, vigour, and nonchalance factors increased from the premenstruum to the menstrual phase with the highest scores observed in the intermenstrual phase. On both the egotism and surgency factors the lowest scores were observed during the menstrual phase with greatest surgency appearing in the intermenstruum and highest levels of egotism reported during the premenstruum. These differences did not, however, reach statisitical significance except with respect to the premenstrual/intermenstrual differences on the anxiety ($p<.005$), aggression ($p<.001$), and social affection ($p<.005$) factors.

4. Physical and Behavioural Check List.

Increases in water retention and autonomic reactivity were reported at the premenstrual phase with decreasing scores on these measures through the menstrual and intermenstrual phases (Table 4). The greatest pain was reported by the symptomatic group during the menstrual phase with lowest pain levels reported at the intermenstrual phase.

Water retention was significantly more severe during the premenstrual phase than during the intermenstruum ($p<.005$). No other interphase differences reached statistical significance.

TABLE 3: Interphase comparisons - Symptomatic group (Nowlis Mood Adjective Check List)

Measure	Phase Mean			F-value for comparison		
	PM	M	IM	PM/M	PM/IM	M/IM
Aggression	19.91	15.86	13.00	4.4036	12.8445**	2.2065
Anxiety	9.68	7.68	6.77	4.2023	8.8907*	4.2023
Surgency	12.09	11.95	16.91	0.0063	7.8526	8.3033
Elation	7.32	9.05	11.95	1.1143	8.0285	3.1608
Concentration	25.27	24.59	23.23	0.1340	1.2060	0.5360
Fatigue	14.91	14.64	10.41	0.0204	5.5540	4.9011
Social Affection	10.45	12.09	14.00	2.2529	10.5761*	3.0665
Sadness	8.23	8.09	6.41	0.0147	2.6128	2.2356
Egotism	9.27	8.82	8.23	0.2843	1.5041	0.4805
Vigour	7.36	7.59	9.5	0.0240	2.1173	1.6908
Nonchalance	4.50	4.77	5.14	0.1327	0.7226	0.2360

PM = Premenstrual; M = Menstrual; IM = Intermenstrual

df(1,66) for all comparisons

*p<.005

**p<.001

TABLE 4: Interphase comparisons - Symptomatic group (Physical and Behavioural Check List and Beck Depression Inventory)

Measure	Phase Mean PM	M	IM	F-value for comparison PM/M	PM/IM	M/IM
Physical and Behavioural Check List:						
Pain	18.68	19.95	13.09	0.4390	8.4718	13.o740**
Autonomic Reactions	8.41	7.50	6.86	1.1413	3.2976	0.5591
Water Retention	12.05	10.77	7.23	0.7773	11.1409*	6.0325
Beck Depression Inventory	15.64	12.27	8.64	1.9977	8.6517*	2.3348

PM = Premenstrual; M = Menstrual; IM = Intermenstrual

df(1,66) for all comparisons

*p<.005

**p<.001

5. Beck Depression Inventory.

Although a decrease in symptoms of depression was observed across the menstrual cycle from the premenstruum to the intermenstruum (Table 4), the only significant interphase difference was that between the premenstrual and intermenstrual phases ($p<.005$).

Control Group

Results of all possible comparisons across phases are summarized in Tables 5, 6 and 7.

1. Premenstrual Assessment Form. (Menstrual Symptoms Questionnaire: Form B)

In contrast to the symptomatic group, where highest levels of change were observed during the premenstruum, women in the control group reported higher levels of change from normal on all subscales and on the total score during the menstrual phase (Table 5). The least degree of change from normal was evident at the intermenstrual phase. With the exception of a significant increase in reported change in physical symptoms at the menstrual phase ($p<.005$) when compared to the intermenstrual phase, no significant interphase differences were observed.

2. Cognitive Efficiency Measure.

No interphase differences in performance on short-term memory tasks were observed for the control subjects ($p>.25$)

TABLE 5: Interphase comparisons - Control group (premenstrual Assessment Form and Cognitive Efficiency Measure)

Measure	Phase Mean PM	M	IM	F-value for comparison PM/M	PM/IM	M/IM
Premenstrual Assessment Form:						
Affective	29.21	30.77	25.29	0.2675	1.68105	3.2898
Cognitive	16.23	16.83	13.88	0.0736	1.1181	3.2898
Behavioural	32.31	32.44	28.94	0.0018	1.3315	1.4319
Physical	44.23	46.27	34.79	0.3082	6.5859	9.7436*
Total	146.60	151.02	122.19	0.1048	3.2038	4.4677
Cognitive Efficiency Measure	20.40	20.44	20.15	0.0039	0.1415	0.1926

PM = Premenstrual; M = Menstrual; IM = Intermenstrual

df(1,66) for all comparisons

* $p<.005$

(Table 5).

3. Nowlis Mood Adjective Check List.

Again, in contrast to the symptomatic group, women in the control group reported highest levels of anxiety and fatigue and lowest levels of surgency, concentration, social affection, egotism, and vigour during the menstrual phase (Table 6). However, like the symptomatic group, these subjects reported more aggression, sadness and skepticism during the premenstruum with decreasing levels of these symptoms across the menstrual cycle. Similarly, elation and nonchalance were least evident during the premenstrual phase and increased through the menstrual and intermenstrual phases. However, none of these interphase differences reached statistical significance.

4. Physical and Behavioural Check List.

Subjects in the control group reported greater pain and autonomic reactivity during the menstrual phase than at other times in the menstrual cycle but they experienced the greatest degree of water retention at the premenstrual phase (Table 7). Severity of pain was significantly greater during the menstrual phase when compared with the intermenstrual phase ($p<.005$). No other significant interphase differences were observed.

TABLE 6: Interphase comparisons - Control group (Nowlis Mood Adjective Check List)

Measure	Phase Mean			F-value for comparison		
	PM	M	IM	PM/M	PM/IM	M/IM
Aggression	12.52	11.73	10.27	0.3679	2.9721	1.2486
Anxiety	5.79	5.96	4.90	0.0637	1.8395	2.5876
Surgency	11.77	11.10	13.63	0.3280	2.5373	4.6898
Elation	7.98	8.13	9.88	0.0173	2.9289	2.4956
Concentration	21.44	20.85	21.60	0.2140	0.0175	0.3537
Fatigue	9.42	10.04	7.50	0.2338	2.1983	3.8657
Social Affection	10.56	10.04	11.88	0.4980	3.1623	6.1697
Sadness	6.58	6.06	5.21	0.4678	3.2603	1.2582
Skepticism	5.42	5.31	4.85	0.0236	0.6889	0.4574
Egotism	7.21	6.81	7.04	0.4704	0.0834	0.1577
Vigour	7.38	6.83	8.94	0.2970	2.4710	4.4813
Nonchalance	3.98	4.00	4.60	0.0017	1.5209	1.4212

PM = Premenstrual; M = Menstrual; IM = Intermenstrual

df(1,66) for all comparisons

TABLE 7: Interphase comparisons - Control group (Physical and Behavioural Check List and Beck Depression Inventory)

Measure	Phase Mean			F-value for comparison		
	PM	M	IM	PM/M	PM/IM	M/IM
Physical and Behavioural Check List:						
Pain	11.27	13.98	9.73	4.3374	1.4054	10.6808*
Autonimic Reactions	4.75	4.98	4.46	0.1582	0.2563	0.8172
Water Retention	7.94	7.38	5.13	0.3313	8.2824	5.3008
Beck Depression Inventory	5.65	5.60	3.06	0.0007	2.5709	2.4886

PM = Premenstrual; M = Menstrual; IM = Intermenstrual

df(1,66) for all comparisons

* $p < .005$

5. Beck Depression Inventory.

Although scores on this measure were slightly more elevated at the premenstrual and menstrual phases when compared to the intermenstrual score, there were no significant differences between phases for the control group (Table 7).

Group Differences in Menstrual Phase Symptomology

Results of comparisons between groups are reported in Tables 8 to 14.

Retrospective Premenstrual Symptomology

Compared to control subjects, women in the symptomatic group retrospectively reported significantly greater degrees of change from normal level of functioning in affective ($p<.001$), cognitive ($p<.001$), behavioural ($p<.001$), and physical ($p<.001$) symptoms as measured by the PAF (Menstrual Symptoms Questionnaire: Form A) during the previous three premenstrual phases of the menstrual cycle (Table 8). Total scores on the PAF were also significantly higher for the symptomatic group than for the control group ($p<.001$).

TABLE 8: Retrospective premenstrual symptomology

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Premenstrual Assessment Form:							
Affective	63.73	19.34	33.96	14.97	4.98	33	0.00
Cognitive	38.27	14.03	17.46	7.86	5.64	33	0.00
Behavioural	67.82	21.75	33.54	12.92	5.84	33	0.00
Physical	89.00	27.05	49.58	14.71	5.61	33	0.00
Total	313.64	90.53	161.21	60.24	5.91	33	0.00

Concurrent Premenstrual Symptomology

1. Affective Symptoms.

Group differences in premenstrual affective symptomology are reported in Table 9.

Symptomatic women reported significantly greater changes from normal than the control group in affective symptoms ($p<.001$) during the premenstruum as measured by the Premenstrual Assessment Form (PAF; Menstrual Symptoms Questionnaire: Form B). Similarly, a significantly higher level of depression ($p<.001$) was evident in the symptomatic group as measured by the Beck Depression Inventory (BDI) when compared to scores obtained by control subjects.

Although higher levels of aggression, anxiety, surgency, concentration, fatigue, sadness, skepticism, egotism and nonchalance were endorsed on the Nowlis Mood Adjective Check List (NMACL) by symptomatic subjects premenstrually, differences between groups were statistically significant for aggression ($p<.001$), anxiety ($p<.001$), fatigue ($p<.001$), and skepticism ($p<.002$) only. All other differences remain insignificant even when the more stringent familywise correction for statistical significance is ignored.

Lower scores on the elation, social affection and vigour factors of the NMACL were observed for symptomatic women when compared to the control group, however, these differences do not

TABLE 9: Concurrent premenstrual symptomology: Affective symptoms

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Premenstrual Assessment Form:							
Affective	52.32	17.53	29.21	8.73	5.25	33	0.0000
Beck Depression Inventory	15.64	9.53	5.65	4.97	4.10	33	0.0003
Nowlis Mood Adjective Check List:							
Aggression	19.90	7.16	12.52	4.83	3.85	33	0.0005
Anxiety	9.68	2.76	5.79	2.21	4.48	33	0.0001
Surgency	12.09	4.24	11.77	3.86	0.22	33	0.8264
Elation	7.32	2.83	7.98	3.42	-0.56	33	0.5804
Concentration	25.27	7.49	21.44	6.22	1.59	33	0.1219
Fatigue	14.91	3.00	9.42	3.98	4.06	33	0.0003
Social Affection	10.45	3.24	10.56	2.61	-0.11	33	0.9167
Sadness	8.23	2.64	6.58	3.15	1.50	33	0.1422
Skepticism	8.45	2.77	5.42	2.30	3.40	33	0.0018
Egotism	9.27	4.09	7.21	2.71	1.78	33	0.0849
Vigour	7.36	3.29	7.38	3.52	-0.01	33	0.9929
Nonchalance	4.50	2.11	3.98	1.76	0.76	33	0.4504

reach statistical significance even when the family-wise correction for significance is ignored.

2. Cognitive Symptoms.

A significant difference in reported levels of change from normal in cognitive symptoms as measured by the PAF was observed between groups with the symptomatic subjects reporting greater change than control subjects ($p<.001$). A similar difference in cognitive abilities was observed with respect to performance on short-term memory tasks completed premenstrually. Women in the symptomatic group correctly recalled significantly fewer words on memory tasks ($p<.002$) than the control group (Table 10).

3. Physical Symptoms.

Scores on the PAF physical symptoms subscale were significantly higher ($p<.001$) for symptomatic women than for their control group counterparts. A similar difference was observed in reported pain ($p<.001$), autonomic reactivity ($p<.001$), and water retention ($p<.004$) as measured by the physical and behavioural check list (Table 10).

4. Behavioural Symptoms.

Symptomatic women reported significantly greater levels of change from normal in behavioural symptoms premenstrually ($p<.001$) on the PAF than women in the control group (Table 10).

TABLE 10: Concurrent premenstrual symptomology: Cognitive, physical and behavioural symptoms

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Premenstrual Assessment Form:							
Cognitive	33.64	12.35	16.23	5.59	5.80	33	0.0000
Cognitive Efficiency Measure	16.09	4.54	20.37	2.84	-3.42	33	0.0017
Premenstrual Assessment Form:							
Physical	78.09	31.65	44.23	11.66	4.66	33	0.0001
Physical and Behavioural Check List:							
Pain	18.68	5.90	11.27	3.29	4.78	33	0.0000
Autonomic Reactions	8.41	4.44	4.75	1.50	3.66	33	0.0009
Water Retention	12.05	4.21	7.94	3.31	3.13	33	0.0036
Premenstrual Assessment Form:							
Behavioural	61.28	22.47	32.31	8.07	5.64	33	0.0000

Concurrent Menstrual Symptomology

1. Affective Symptoms.

Group differences in menstrual affective symptomology are reported in Table 11.

Although symptomatic subjects reported greater levels of change from normal than control subjects in affective symptomology as measured by the PAF, this difference was not statistically significant. If, however, the familywise correction for significance is ignored, this difference reaches significance at the .02 level.

Significantly higher scores were evident for symptomatic women on the BDI ($p<.005$) during the menstrual phase when compared to those of the control subjects.

Scores on all factors of the NMACL for the symptomatic group during the menstrual phase were higher than those reported by control subjects. However, with the family-wise alpha correction observed, the only significant difference between groups occurred on the fatigue factor ($p<.004$). When the family-wise correction is disregarded, group differences in scores on the aggression ($p<.04$), skepticism ($p<.04$), and egotism ($p<.03$) factors reach statistical significance.

2. Cognitive Symptoms.

The reported degree of change from normal level of cognitive functioning as measured by the PAF was significantly

TABLE 11: Concurrent Menstrual symptomology: Affective symptoms

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Premestrual Assessment Form:							
Affective	43.73	17.58	30.77	10.68	2.70	33	0.0107
Beck Depression Inventory	12.27	9.17	5.60	4.24	2.97	33	0.0055
Nowlis Mood Adjective Check List:							
Aggression	15.86	4.90	11.73	4.90	2.32	33	0.0269
Anxiety	7.68	2.05	5.96	2.66	1.90	33	0.0661
Surgency	11.95	3.69	11.10	3.52	0.65	33	0.5176
Elation	9.05	3.24	8.13	2.77	0.87	33	0.3929
Concentration	24.59	6.05	20.85	6.12	1.68	33	0.1021
Fatigue	14.64	3.60	10.04	4.12	3.18	33	0.0032
Social Affection	12.09	3.27	10.04	2.92	1.86	33	0.0719
Sadness	8.09	2.63	6.06	2.97	1.94	33	0.0609
Skepticism	7.50	2.86	5.31	2.39	2.37	33	0.0240
Egotism	8.82	2.53	6.81	2.10	2.46	33	0.0195
Vigour	7.59	2.38	6.83	2.66	0.81	33	0.4248
Nonchalance	4.77	2.06	4.00	1.66	1.19	33	0.2441

greater ($p<.001$) during the menstrual phase for symptomatic women than for women in the control group. However, the higher scores achieved on short-term memory tasks by the control subjects during this phase can be considered significantly different from those achieved by the symptomatic group only in the absence of the familywise correction for significance level ($p<.03$) (Table 12).

3. Physical Symptoms.

On all subscales of the physical and behavioural check list (pain ($p<.007$), autonomic reactions ($p<.008$), and water retention ($p<.02$)) symptomatic subjects reported more severe symptomology menstrually. However, with the exception of the difference in reported pain, these differences are statistically significant only if the family-wise alpha correction is ignored.

In contrast, the degree of change from normal in physical symptoms reported by symptomatic women on the PAF was significantly greater ($p<.003$) than that reported by control subjects even when the family-wise correction of alpha is observed (Table 12).

4. Behavioural Symptoms.

Women in the symptomatic group reported a significantly greater degree of change from normal in behavioural symptoms ($p<.003$) on the PAF than the control subjects (Table 12).

TABLE 12: Concurrent menstrual symptomology: Cognitive, physical and behavioural symptoms

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Premenstrual Assessment Form:							
Cognitive	28.36	12.10	16.83	5.88	3.83	33	0.0005
Cognitive Efficiency Measure	17.55	4.06	20.44	3.01	-2.36	33	0.0242
Premenstrual Assessment Form:							
Physical	69.82	30.29	46.27	13.36	3.23	33	0.0028
Physical and Behavioural Check List:							
Pain	19.95	6.49	13.98	5.32	2.88	33	0.0069
Autonomic Reactions	7.5	4.15	4.98	1,06	2.83	33	0.0079
Water Retention	10.77	4.71	7.38	3.23	2.50	33	0.0177
Premenstrual Assessment Form:							
Behavioural	48.95	19.96	32.44	9.54	3.34	33	0.0021

Concurrent Intermenstrual Symptomology

1. Affective Symptoms.

Group differences in intermenstrual affective symptomology are reported in Table 13. Symptomatic women achieved higher scores intermenstrually on both the affective subscale of the PAF ($p<.009$) and the BDI ($p<.02$) than women in the control group. However, differences in scores for both measures can be regarded as statistically significant only in the absence of the familywise correction for significance.

Subjects in the symptomatic group indicated higher levels of all factors on the NMACL during the intermenstrual phase than their control group counterparts. However, with the exception of the anxiety ($p<.03$), surgency ($p<.03$), fatigue ($p<.03$), and social affection ($p<.03$) scores, which are significant only when the family-wise alpha correction is ignored, none of these differences are statistically significant.

2. Cognitive Symptoms.

A greater degree of change from normal in cognitive symptomology was reported on the PAF by symptomatic women during the intermenstruum when compared to control subjects. This difference between groups is significant only when the family-wise correction for alpha is disregarded ($p<.02$).

The observed difference between groups in intermenstrual performance on short-term memory tasks was statistically

TABLE 13: Concurrent intermenstrual symptomology: Affective symptoms

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Premenstrual Assessment Form:							
Affective	37.00	18.04	25.29	6.76	2.82	33	0.0082
Beck Depression Inventory	8.64	10.04	3.06	2.59	2.58	33	0.0146
Nowlis Mood Adjective Check List:							
Aggression	13.00	5.25	10.27	4.07	1.68	33	0.1023
Anxiety	6.77	2.51	4.90	2.13	2.29	33	0.0285
Surgency	16.91	5.38	13,63	2.90	2.36	33	0.0246
Elation	11,95	4.63	9.88	3.07	1.58	33	0.1233
Concentration	23.23	5.80	21.60	5.66	0.78	33	0.4400
Fatigue	10.41	4.32	7.50	3.10	2.27	33	0.0298
Social Affection	14.00	3.33	11.88	2.08	2.31	33	0.0271
Sadness	6.41	2.68	5.21	2.35	1.34	33	0.1889
Skepticism	5.77	2.50	4.85	2.25	1.08	33	0.2871
Egotism	8.23	2.25	7.04	2.24	1.45	33	0.1562
Vigour	9.50	3.26	8.94	2.33	0.58	33	0.5630
Nonchalance	5.14	1.52	4.60	1.59	0.93	33	0.3577

significant ($p<.004$) with control subjects recalling more words correctly than symptomatic subjects (Table 14).

3. Physical Symptoms.

Symptomatic women received higher intermenstrual scores than control subjects on all subscales of the physical and behavioural check list and on the physical subscale of the PAF. With the familywise adjustment of significance level observed, the difference between groups in scores on the physical subscale is statistically significant ($p<.008$). If the family-wise alpha correction is ignored then the difference observed on the water retention subscale of the physical and behavioural check list ($p<.03$) also reaches significance (Table 14). No other group differences are statistically significant.

4. Behavioural Symptoms.

Significant between-group differences were evident for reported change from normal on behavioural symptoms ($p<.003$) on the PAF with symptomatic women reporting a greater degree of change than women in the control group (Table 14).

Concordance Between Retrospective and Concurrent Reports of Premenstrual Symptomology

Concurrent responses on the PAF completed premenstrually (Menstrual Symptoms Questionnaire: Form B) were compared to retrospective responses given on the same measure (Menstrual

TABLE 14: Concurrent intermenstrual symptomology: Cognitive, physical and behavioural symptoms

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Premenstrual Assessment Form:							
Cognitive	20.64	11.33	13.88	3.97	2.63	33	0.0129
Cognitive Efficiency Measure	16.68	4.14	20.15	2.42	-3.12	33	0.0037
Premenstrual Assessment Form:							
Physical	53.55	29.95	34.79	8.64	2.86	33	0.0072
Physical and Behavioural Check List:							
Pain	13.09	7.64	9.73	3.91	1.73	33	0.0923
Autonomic Reactions	6.86	5.94	4.46	0.72	1.99	33	0.0552
Water Retention	7.23	3.89	5.13	1.48	2.33	33	0.0258
Premenstrual Assessment Form:							
Behavioural	42.68	18.68	28.94	6.30	3.29	33	0.0025

Symptoms Questionnaire: Form C) with respect to the same time period but completed during the following intermenstrual phase.

No significant differences were revealed for either group between concurrent and retrospective accounts of symptomology experienced during the premenstruum for any of the subscales (affective, cognitive, behavioural, and physical symptoms) or for the total PAF score.

However, when retrospective accounts of symptomology experienced over the previous three premenstrual phases (Menstrual Symptoms Questionnaire: Form A) are compared with concurrent accounts of premenstrual symptomology, some differences are apparent. Symptomatic women reported a significantly greater change from normal in affective symptoms ($p<.02$) retrospectively than concurrently while the control group reported a significantly greater change from normal in physical symptoms ($p<.04$) retrospectively than concurrently (Table 15).

Differences in Judgement of Performance on Short-Term Memory Tasks

Analyses of subjective evaluations of performance on short-term memory tasks revealed no significant interphase differences for either group. These findings apply to subjects' ratings of their performance with respect to "how others would do" and "what you are normally capable of". However, between-group differences were evident (Table 16), with

TABLE 15: Matched-pair comparisons of retrospective (3 months) and concurrent reports of premenstrual symptomology

Symptoms	Mean Difference Score	SD	t	df	p
Symptomatic group:					
Affective	11.41	12.68	2.98	10	0.0137
Cognitive	4.64	9.04	1.70	10	0.1197
Behavioural	6.59	13.50	1.62	10	0.1364
Physical	10.91	20.52	1.76	10	0.1083
Control group:					
Affective	4.75	13.46	1.73	23	0.0972
Cognitive	1.23	6.08	0.99	23	0.3321
Behavioural	1.23	9.74	0.62	23	0.5423
Physical	5.35	8.17	3.21	23	0.0039

TABLE 16: Subjective evaluation of performance on short-term memory tasks

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Comparison of self to others:							
Premenstrual	4.14	1.60	5.44	1.60	-2.24	33	0.0322
Menstrual	4.86	1.32	5.38	1.39	-1.03	33	0.3117
Intermenstrual	4.36	1.00	5.44	1.18	-2.61	33	0.0136
Comparison of self to usual:							
Premenstrual	3.95	1.15	5.13	1.13	-2.54	33	0.0160
Menstrual	4.91	1.58	4.90	1.11	0.03	33	0.9773
Intermenstrual	4.45	0.98	5.06	1.14	-1.53	33	0.1359

symptomatic subjects evaluating their performance, compared to how others would do, more negatively than control subjects at both the premenstrual ($p<.04$) and intermenstrual ($p<.02$) phases. Symptomatic women also evaluated their performance, compared to what they are normally capable of, significantly more negatively ($p<.02$) than control subjects during the premenstruum. No other observed differences in evaluation of performance were statistically significant.

Between-group comparisons of estimated scores with respect to "What score out of 24 you feel others would achieve" on the short-term memory tasks (Estimated Other), "what score out of 24 you feel you would normally achieve" (Estimated Usual), and "what score out of 24 you feel you would achieve during the premenstruum" (Estimated Premenstrual) revealed no significant differences between groups (Table 17). However, it is interesting to note that, while group means for Estimated Other (17.82 and 18.17 for symptomatic and control groups respectively) and Estimated Usual (18.55 and 19.67) were not dissimilar, the group difference between mean Estimated Premenstrual scores (15.09 and 18.21) approaches statistical significance ($p<.06$). Thus, while symptomatic subjects' estimates of their usual scores and of others' usual scores were only slightly lower than the equivalent estimates by control subjects, the symptomatic group's estimates of premenstrual performance were considerably lower than those of the control group.

TABLE 17: Estimates of performance on short-term memory tasks for Others, Usual Self and Premenstrual Self

Measure	Group: Symptomatic Mean	Symptomatic SD	Control Mean	Control SD	t	df	p
Estimated Others	17.82	1.25	18.17	2.26	-0.48	33	0.6367
Estimated Usual	18.55	3.80	19.67	2.35	-1.07	33	0.29135
Estimated Premenstrual	15.09	5.39	18.21	3.75	-1.98	33	0.0557

Premenstrual Assessment Form Typological Categories

Both symptomatic and control group subjects were categorized according to the typology used by Halbreich et al. (1983) from retrospective data relating to the previous three premenstrual phases (Menstrual Symptoms Questionnaire: Form A).

Table 18 summarizes the frequencies with which subjects were included in each category.

TABLE 18: Frequency of inclusion in Premenstrual Assessment Form typological categories

Category	Group: Symptomatic N	Symptomatic %	Control N	Control %
1. Change in mood and behaviour:				
Major depressive syndrome	11	100	8	33.3
Minor depressive syndrome	0	0	5	20.8
Subtypes of depressive syndrome:				
Endogenous features	0	0	0	0
Atypical features	11	100	8	33.3
Hysteroid features	6	54.5	2	8.3
Agitated-anxious features	7	63.6	3	12.5
Hostile features	8	72.7	6	25
Withdrawn features	6	54.5	6	25
Anxious syndrome (not depressed)	0	0	0	0
Irritable syndrome (not depressed)	0	0	0	0
Impulsive syndrome	11	100	4	16.6
Increased well-being syndrome	5	45.4	1	4.2
2. Change in physical condition:				
General discomfort syndrome	10	90.9	15	62.5
Water retention syndrome	10	90.9	12	50
Fatigue syndrome	8	72.7	5	20.8
Autonomic physical syndrome	6	54.5	4	16.6
3. Changes in functioning:				
Impaired social functioning	11	100	7	29.2
"Organic" mental features	6	54.5	2	8.3
4. No significant changes	0	0	0	0
5. No suitable PAF subtype	0	0	5	20.8

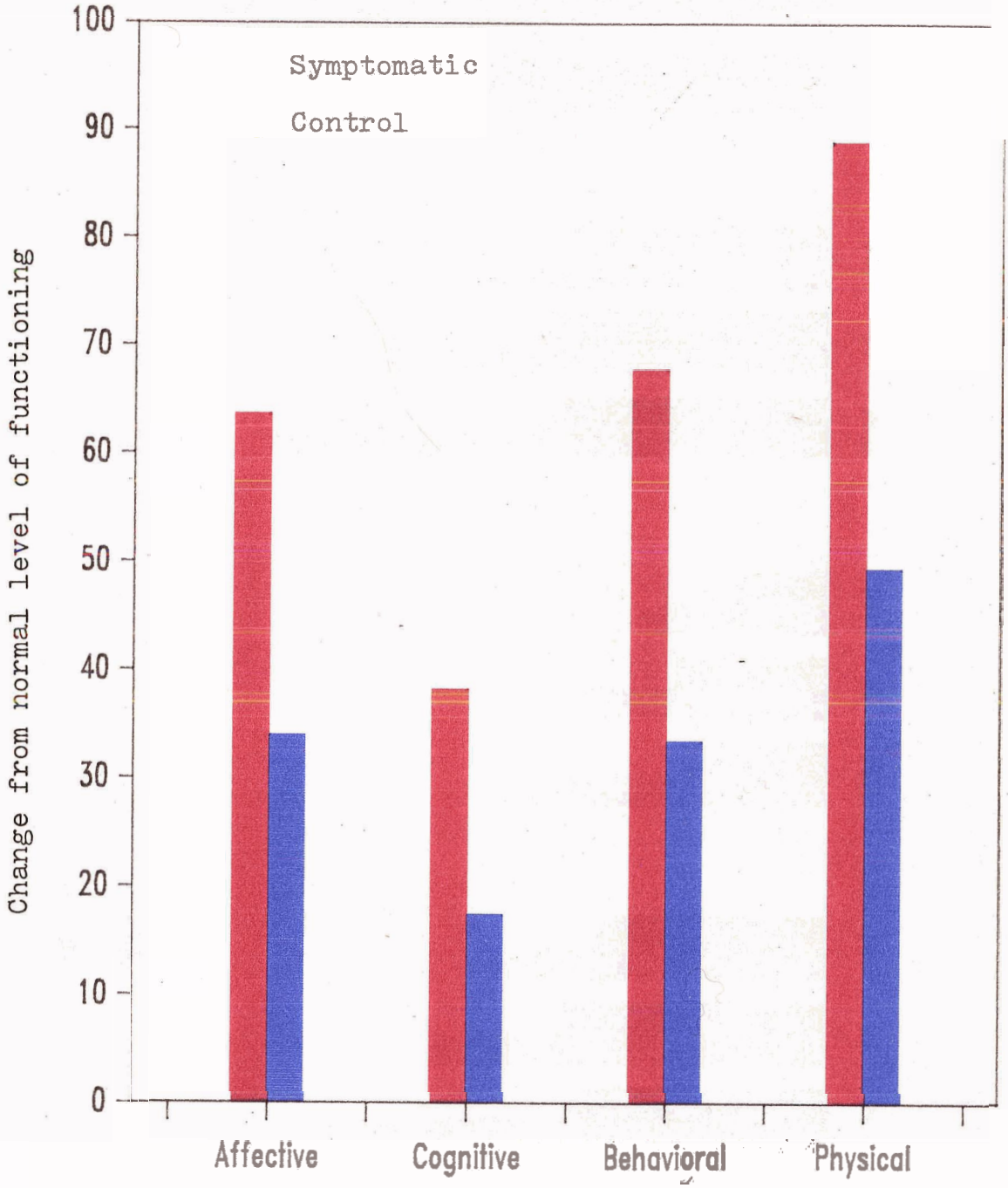

FIGURE 1: Retrospective symptomology over previous three premenstrual phases (Premenstrual Assessment Form)

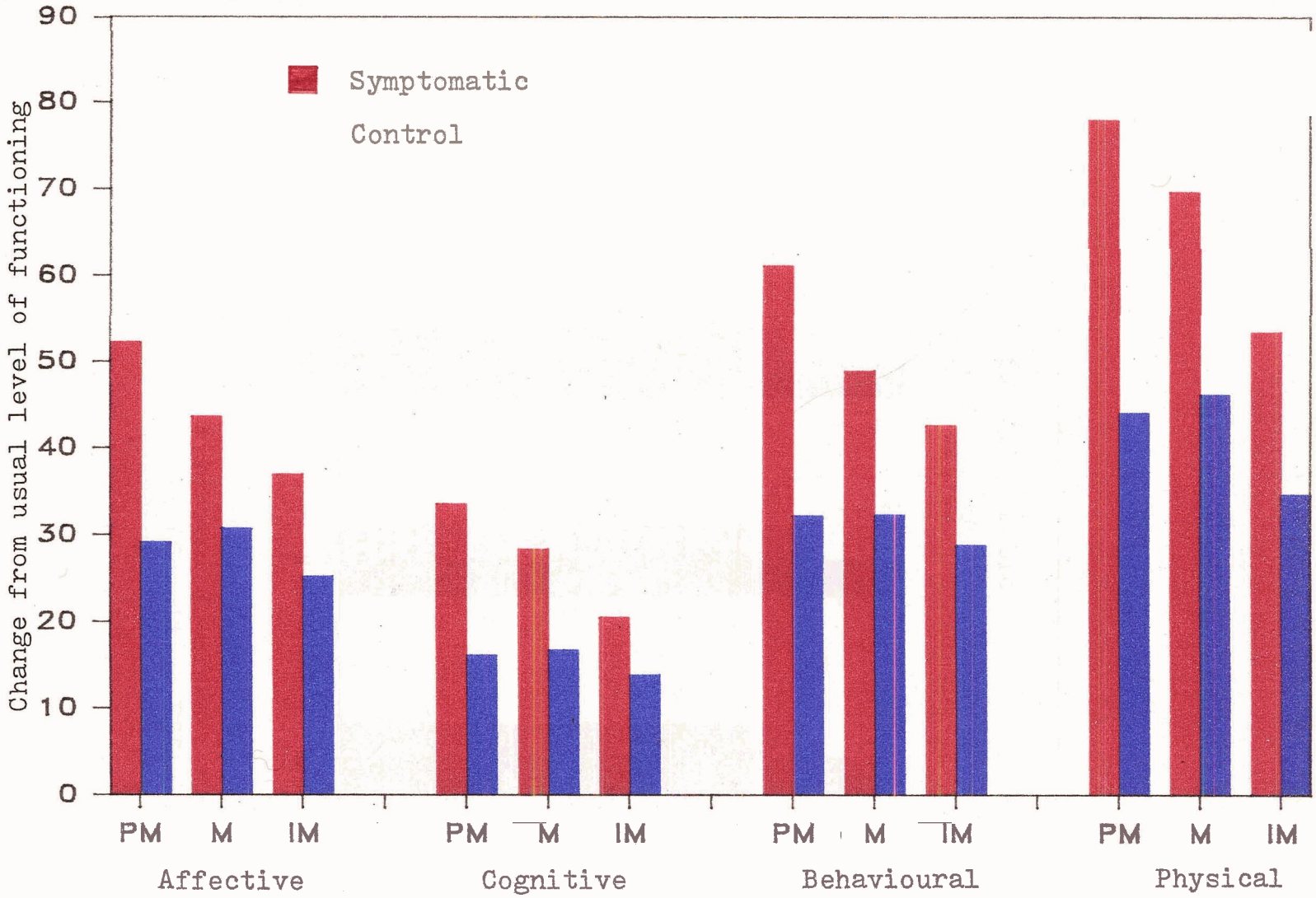

FIGURE 2: Concurrent symptomology (Premenstrual Assessment Form)

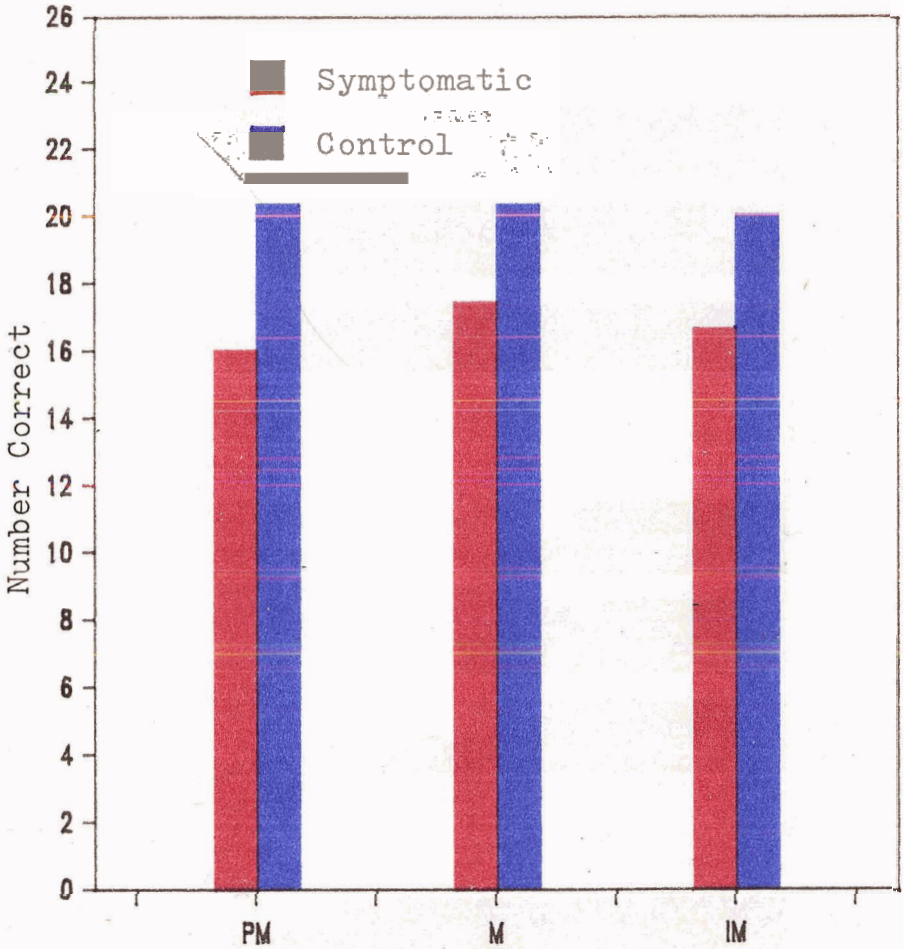

FIGURE 3: Performance on short-term memory tasks (Cognitive Efficiency Measure)

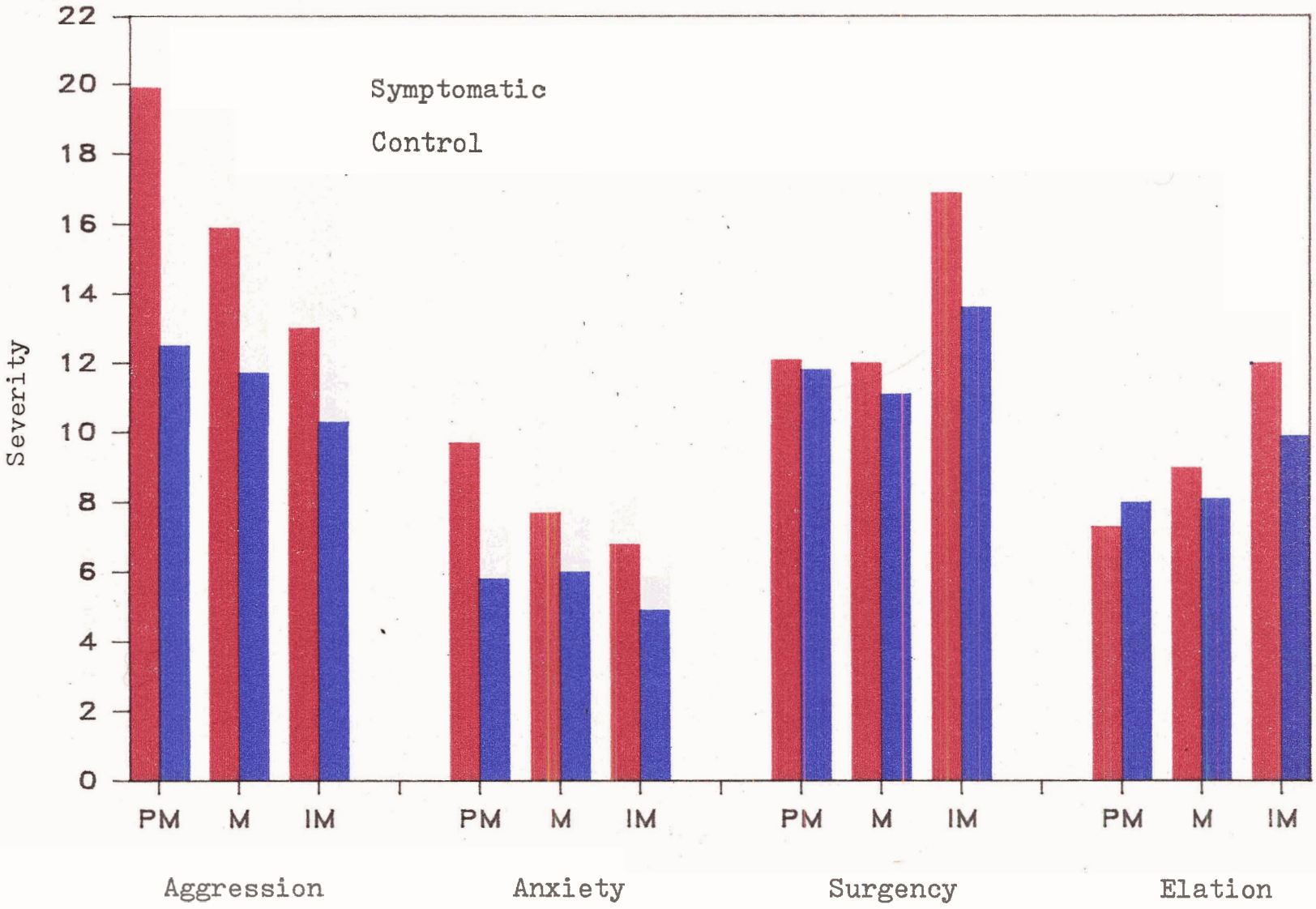

FIGURE 4: Concurrent symptomology (Nowlis Mood Adjective Check List)

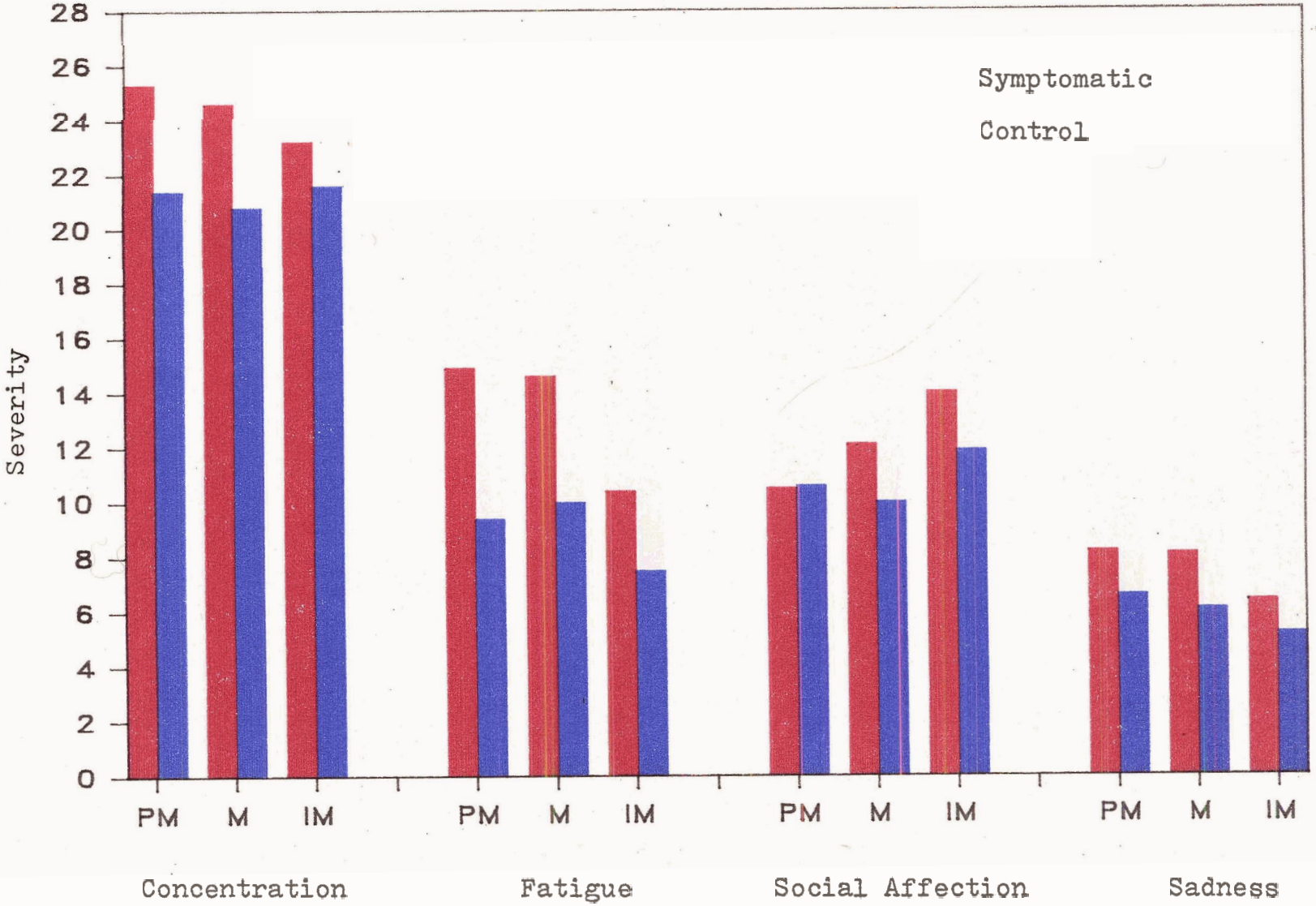

FIGURE 5: Concurrent symptomology (Nowlis Mood Adjective Check List)

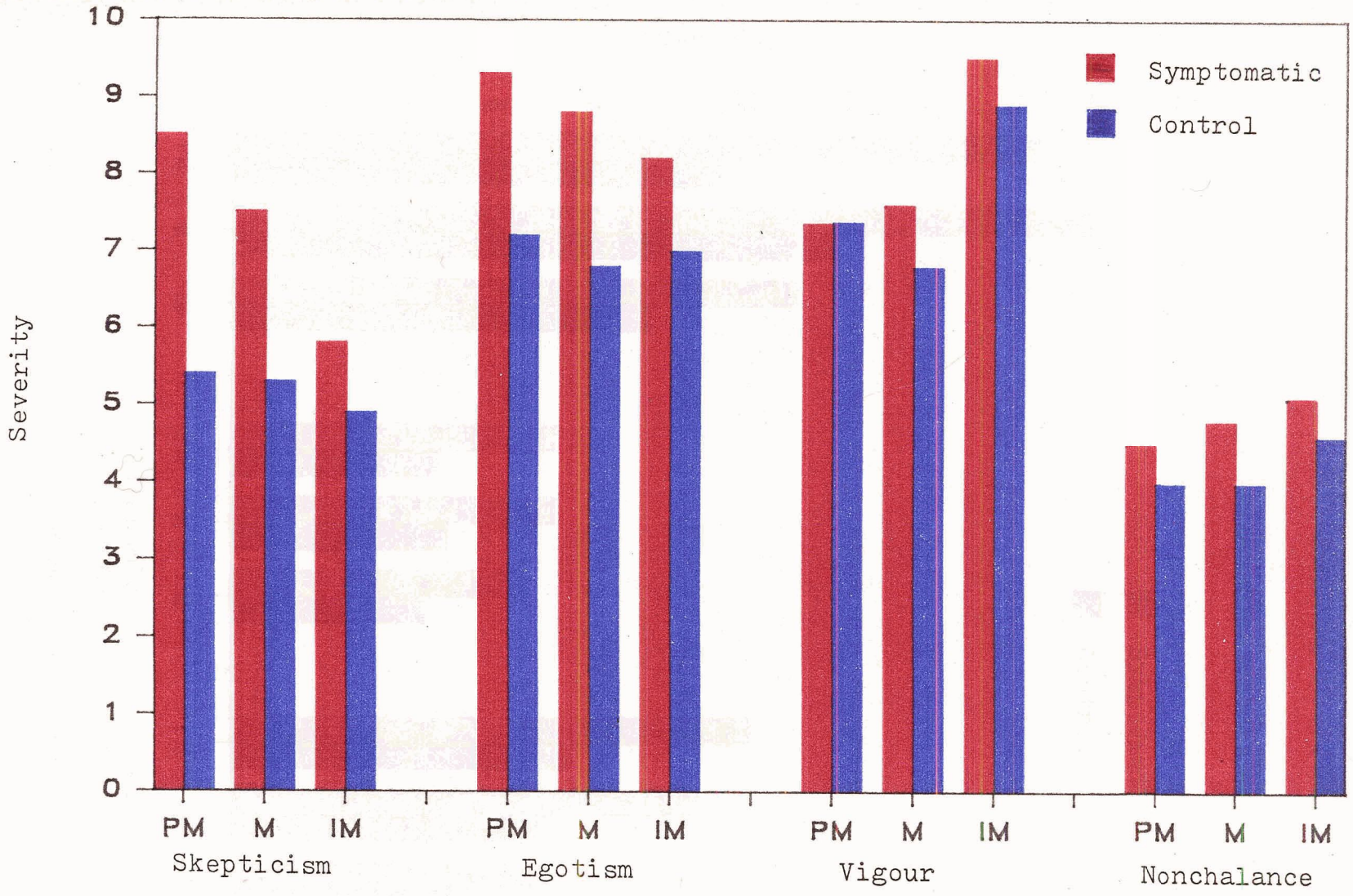

FIGURE 6: Concurrent symptomology (Nowlis Mood Adjective Check List)

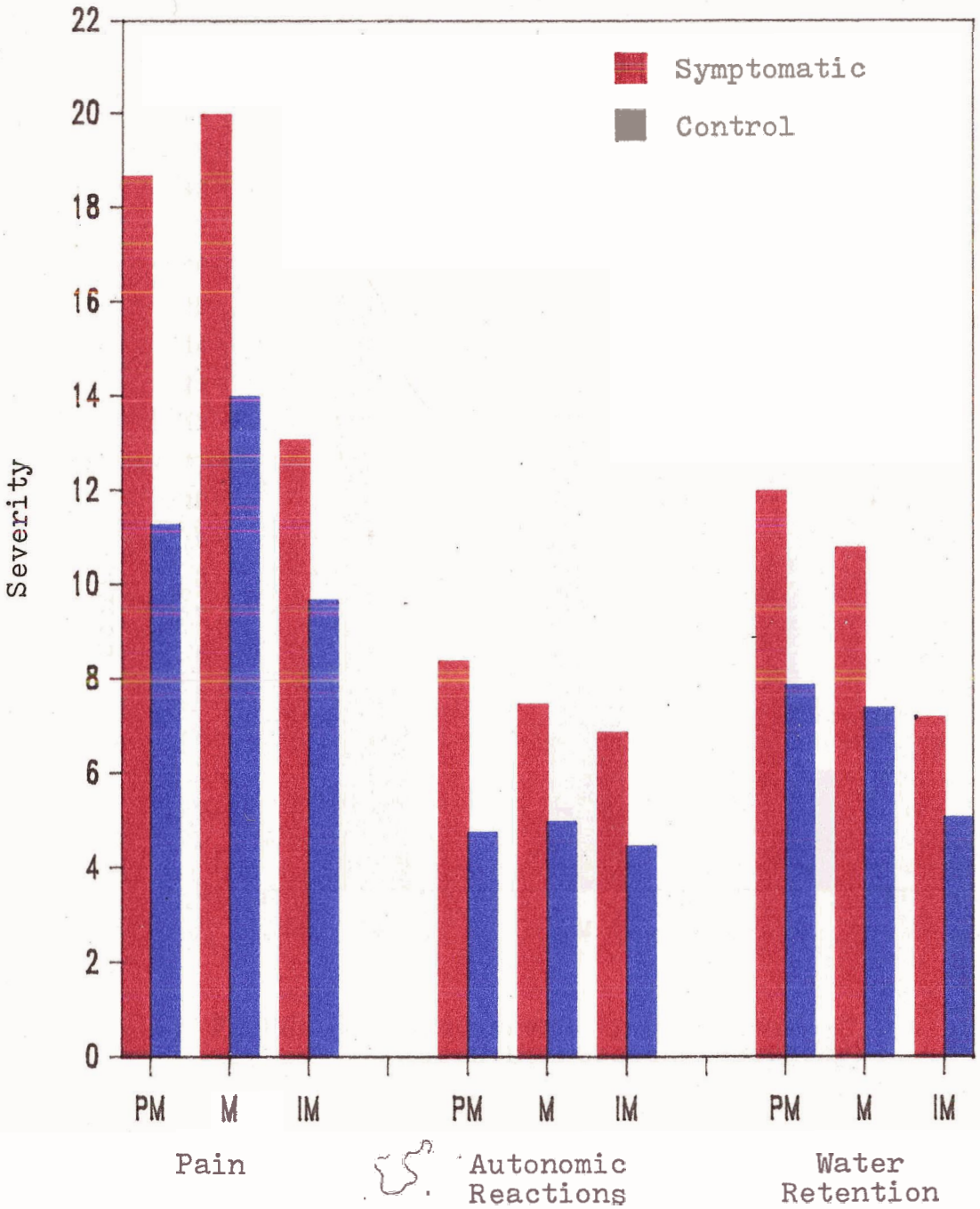

FIGURE 7: Concurrent symptomology (Physical and Behavioural Check List)

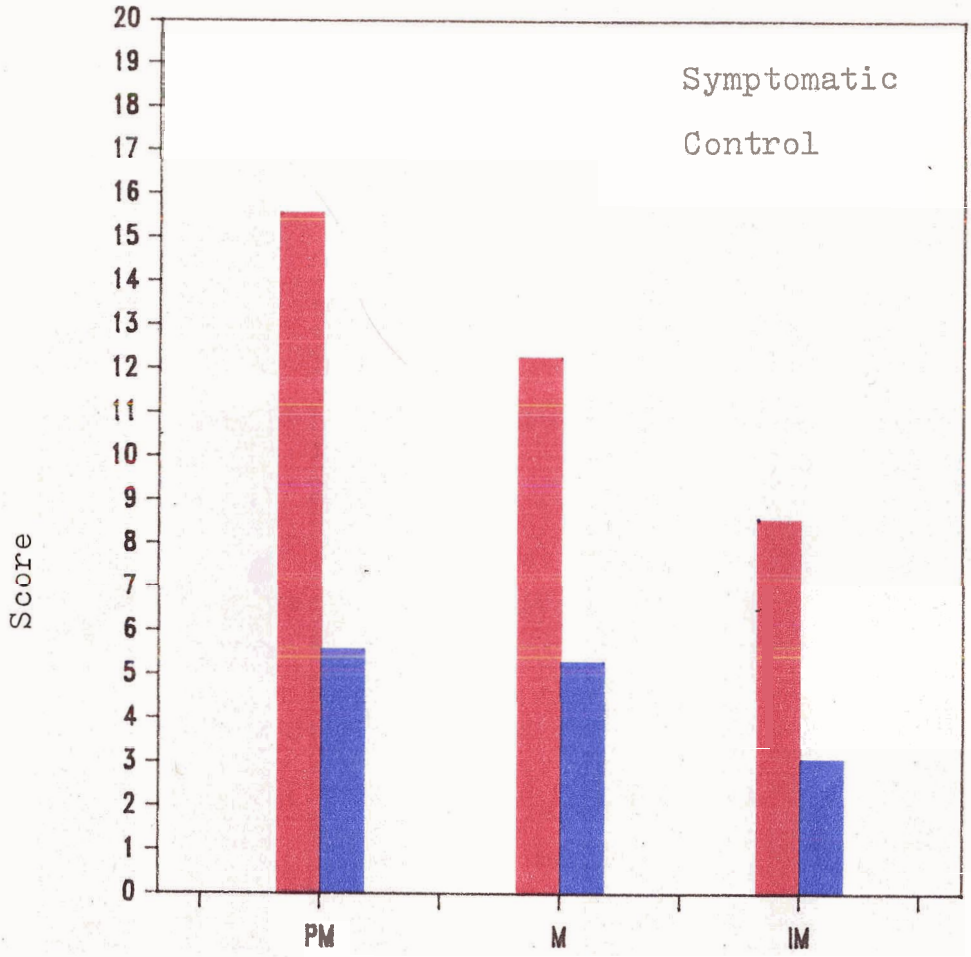

FIGURE 8: Concurrent Symptomology
(Beck Depression Inventory)

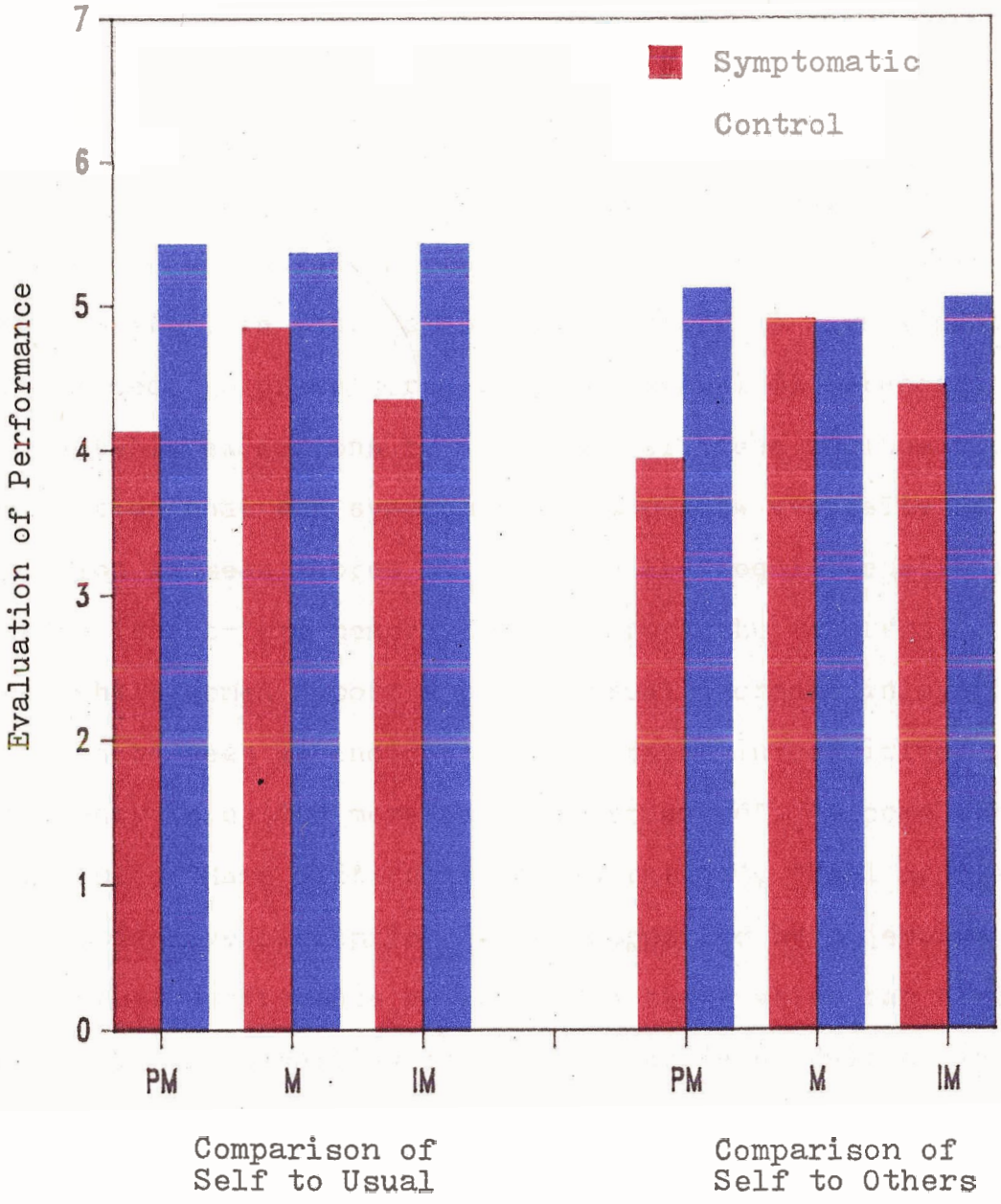

FIGURE 9: Subjective evaluation of performance on short-term memory tasks

D. Discussion

Results will be discussed with reference to the hypotheses investigated.

Interphase Differences in Symptomology Within Groups

As hypothesized, symptomatic women do, indeed, show increased symptomology premenstrually on almost all measures used, however, in most cases this increase is significant only with respect to premenstrual/intermenstrual differences.

Notable exceptions to this general trend include the observation that the symptomatic group show virtually no variation in mean scores obtained on the cognitive efficiency measure (short-term memory tasks) across the menstrual cycle. Thus, while women report a premenstrual increase in symptoms that can be seen as indicating a decrease in cognitive efficiency (e.g. "Be more easily distracted", "Become more forgetful", "Have difficulty concentrating", "Feel confused"), this subjective perception is not supported by objective data from actual performance on cognitive tasks which tap similar phenomena. While earlier investigations (e.g. Dalton, 1960a, 1968) supported an hypothesized decrement in cognitive abilities premenstrually, later research has indicated that no such decrement occurs (Bernstein, 1977; Golub, 1976a; Sommer, 1972; Walsh et al., 1981). The findings from the current study are consistent with these latter results.

A further exception to the generally observed premenstrual increase in symptomology is seen in reports of physical symptoms. In terms of both change from usual level of physical symptoms and reported severity of pain experienced, symptomatic women show significant menstrual/intermenstrual differences. It is possible that this observed increase in menstrual phase physical symptomology, relative to intermenstrual levels, is due, in part, to the confounding effect of physical distress (i.e. dysmenorrhea and other physical discomfort) experienced during menstruation, particularly since this difference is seen in the absence of other menstrual/intermenstrual symptom area differences.

Clearly then, while the hypothesized differences in both premenstrual/menstrual and premenstrual/intermenstrual symptomology were not evident, there is evidence to suggest that, with respect to the intermenstruum, self-defined symptomatic women do experience significantly increased symptomology premenstrually.

It is also evident that premenstrually symptomatic women do not tend to experience a dramatic alleviation of symptoms with the onset of menstruation as suggested by early investigators (e.g. Frank, 1931; Israel 1938). Rather, a definition which recognizes a gradual change in intensity of symptoms with the onset of menses, as reported by Blume (1983), would appear to be more reflective of actual experience. Furthermore, it is important (although difficult) to distinguish symptomology at

the menstrual phase which is a continuation of the premenstrual experience from that which is attributable to menstrual distress.

As expected, women in the control group reported little variation in symptomology across the menstrual cycle. Interphase differences which were significant can be attributed with some confidence to changes in symptomology experienced due to menstrual distress: in comparison to intermenstrual levels, the experience of physical symptoms (change from normal in general physical symptoms and pain) was greater during the menstrual phase. However, in the absence of similarly significant differences between the premenstrual and menstrual levels of physical symptomology, the attribution of differential symptomology to menstrual distress alone remains somewhat speculative.

Between-group Differences in Symptomology

Both retrospective and concurrent reports indicate, as hypothesized, that self-defined symptomatic women differ significantly from the control group during the premenstruum. On all subscales of all measures, with the exception of the NMACL, symptomatic women reported higher levels of symptomology than their control group counterparts. Data obtained from the NMACL indicate that symptomatic women also experience more feelings of aggression, anxiety, fatigue and skepticism premenstrually than do women in the control group. These findings are consistent

with the research hypothesis.

Group differences at both the menstrual and intermenstrual phases are, however, not as clearly delineated although the hypothesized lack of difference between groups is not clearly supported either. If the familywise correction of statistical significance is maintained then symptomatic women differ from control subjects during the menstrual phase only with respect to the experience of cognitive, affective, behavioural and physical changes from normal, the severity of pain and fatigue experienced and the degree of depression as measured by the BDI. However, if the familywise correction for significance is ignored then a pattern of differences between groups emerges which is similar to that seen during the premenstruum. Specifically, symptomatic women appear to experience a greater degree of change from normal or greater intensity of symptoms on all subscales of the PAF and the physical and behavioural check list and on the BDI. Furthermore, more feelings of aggression, skepticism and egotism are reported, and symptomatic women also show evidence of impaired cognitive abilities, as measured by short-term memory tasks, when compared to asymptomatic women.

Similarly, during the intermenstruum, with the familywise correction of alpha observed, significant differences between groups are limited to performance on short-term memory tasks and reported physical symptoms. However, with the more stringent correction for significance disregarded, these differences extend to all subscales of the PAF, the pain subscale of the

physical and behavioural check list, symptoms of depression as measured by the BDI, and severity of feelings of anxiety, surgency, fatigue and social affection.

Thus, the hypothesis that symptomatic women would differ from asymptomatic women only during the premenstruum is not unambiguously supported when the familywise adjustment of alpha is applied and is clearly not supported when the more stringent correction for significance is disregarded. A number of robust between-group differences are observed both menstrually and intermenstrually in this sample of women and, with the familywise significance correction discounted, there are indications that, at all phases of the menstrual cycle, symptomatic women may experience substantially more symptoms of a "premenstrual" nature than asymptomatic women.

Concordance Between Concurrent and Retrospective Self-reports

A further objective of this study was to investigate the degree of concordance between retrospective and concurrent reports of premenstrual symptoms in both symptomatic and asymptomatic women. Contrary to expectation, no significant differences were observed for either group between reports of premenstrual symptoms completed concurrently and retrospectively with respect to the same time period. This suggests then, that women do not exaggerate their perceptions of premenstrual symptoms when viewed retrospectively.

These results must be interpreted with caution since one cannot discount the possible effects of using the same measure for both concurrent and retrospective reporting. Women were reporting (retrospectively) on experiences relating to a period of time in which they were required to focus on their symptomology and they may have recalled and repeated their previous responses. However, the strength of this finding is increased by the observation that retrospective reports of symptomology experienced during the three premenstrual phases prior to participation in this study did not differ significantly from concurrent premenstrual responses obtained during the period of study for either group with the following exceptions. Symptomatic women reported significantly more affective symptoms retrospectively than concurrently while the control group reported significantly more physical symptoms retrospectively than concurrently. If one assumes some consistency of symptomology over a five-month period then this suggests that most retrospective reports of premenstrual symptoms are not exaggerated (or minimized) when compared to concurrent reports. However, one cannot ignore the suggestion that symptomatic women do retrospectively exaggerate affective symptomology while asymptomatic women retrospectively exaggerate physical symptomology. It is possible, in the latter case, that increased physical discomfort experienced during menstruation (which is evident from concurrent data) is retrospectively associated with premenstrual symptomology.

Cognitive Distortion of Performance on Short-term Memory Tasks

Finally, it was hypothesized that symptomatic women would show more distorted premenstrual evaluations of their performance on short-term memory tasks when compared to nonpremenstrual testing sessions while asymptomatic women would show no such variation across the menstrual cycle. For both groups, no interphase differences were apparent in actual scores on the memory tasks and, similarly, no interphase differences were evident in subjective evaluations of performance when compared to how others would perform or when compared to what the individual is normally capable of. This suggests that, for both groups, subjective evaluation of performance is consistent across the menstrual cycle.

However, symptomatic women evaluated their performance, in comparison to how others perform, more negatively than the control group during both the premenstruum and intermenstruum. Symptomatic women also evaluated their premenstrual performance, in comparison to their usual performance, significantly more negatively than did asymptomatic women. Furthermore, the difference in estimated premenstrual score between groups approached significance with symptomatic women providing lower estimates than the control group.

These findings suggest, then, that while symptomatic women tend to predict more impaired premenstrual cognitive ability and evaluate their premenstrual performance more negatively than

asymptomatic women, they do not show a significantly more negative evaluation of their performance premenstrually when compared to their own evaluations at other phases. Thus, contrary to expectations, symptomatic women do not show more distorted evaluations of their performance on memory tests premenstrually when compared to nonpremenstrual testing sessions.

Categorization of Women into PAF Typologies

All women in the current study were categorized, on the basis of retrospective data, according to Halbreich et al.'s (1983) PAF typologies. Although no explicit hypotheses were outlined for this data, one would expect that the majority of symptomatic women would meet the criteria for at least one category while few, if any, asymptomatic women would do so. However, while this expectation was borne out for premenstrually symptomatic women, 19 (79.2%) of the asymptomatic women were also able to be included in at least one category. Perhaps most notable, is the observation that eight (33.3%) of the asymptomatic group met the criteria for PAF Major Depressive Syndrome while a further five (20.8%) were categorized as PAF Minor Depressive Syndrome. If one is to interpret these results in accordance with Halbreich et al.'s (1983) typology, then, of the present group of 24 self-defined asymptomatic women, 19 must be classified as premenstrually symptomatic with 13 of them included within depressive syndrome categories.

It is possible that, among the group of self-defined asymptomatic women, there is a subset of women who, at least retrospectively, report premenstrual symptomology which is of a similar magnitude to that reported by self-defined premenstrually symptomatic women but who simultaneously do not self-define as symptomatic.

Alternatively, the rather stringent criterion for inclusion in the symptomatic group (having considered seeking treatment for premenstrual symptoms) may have excluded women from that group who would otherwise have self-selected as premenstrually symptomatic. Certainly the magnitude of variability in scores obtained on all measures in this study would suggest that the asymptomatic group was not homogeneous with respect to symptoms experienced.

Finally, it is possible that the diagnostic criteria employed by Halbreich et al. (1983) may fail to distinguish between severely premenstrually symptomatic women and those who experience a number of premenstrual symptoms but perceive them to be minimally disruptive.

Some Tentative Conclusions

The major objective of this study was to empirically investigate the validity of premenstrual syndrome as a diagnostic entity. The results obtained confirm the existence of differences in menstrual cycle symptomology between self-defined symptomatic and asymptomatic women, however, there is not as

clear an emergence of the premenstrual syndrome profile in self-defined symptomatic women as previous researchers would suggest.

There appears to be strong evidence, in this sample of self-defined symptomatic and asymptomatic women, that differences exist at the premenstrual phase in symptomology experienced. When considered in tandem with the observed premenstrual/intermenstrual differences in symptomology for symptomatic women and the lack of interphase differences for asymptomatic women these results point to the existence of premenstrual syndrome as a valid diagnostic entity.

However, results of the current study also suggest the presence of both menstrual and intermenstrual group differences on a large percentage of measures used. Therefore, a closer investigation of the implications of these differences is warranted.

Despite the lack of consensus in the literature with respect to a concise definition of premenstrual syndrome there does appear to be general agreement that premenstrually symptomatic women differ significantly from asymptomatic women during the premenstruum with a return to "normal" at least by the intermenstruum. This hypothesis is implicit in the term "premenstrual syndrome". Therefore, as suggested earlier in this document, in the absence of associated pathology, the concept of premenstrual syndrome implies that symptomatic women should differ from asymptomatic women only during the premenstruum. The

current study reveals evidence of group differences during the menstrual phase which may be explained if one assumes that alleviation of symptoms after the onset of menstruation is a gradual process that spans the menstrual phase. However, observed group differences during the intermenstrual phase, when neither premenstrual symptomology nor menstrual distress can be regarded as confounding elements, are more difficult to explain within the premenstrual syndrome paradigm.

It is possible that the overall differences observed (which are evident only in the absence of the familywise adjustment of significance level) are specific to this sample and not generalizable to the population of premenstrually symptomatic women. Further research, designed to investigate this phenomenon specifically, is necessary for confirmation.

However, should this pattern of observed differences be repeated, then it is possible that premenstrual syndrome is a valid construct and the observed menstrual and intermenstrual phase differences between symptomatic and asymptomatic women are attributable to other differences between groups. For example, symptomatic women may experience greater menstrual distress and more disruptive symptoms at the time of ovulation (e.g. Mittelschmerz) than asymptomatic women.

An alternative hypothesis, however, is that some women who define themselves as premenstrually symptomatic are more aptly included within other diagnostic categories. There is some evidence to suggest that the affective symptomology manifested

premenstrually is not dissimilar to that seen in the affective disorders (e.g. McClure et al., 1971; Kashiwagi et al., 1976; Schuckit et al., 1975; Wetzel Reich & McClure, 1971; Wetzel et al., 1975). There is also evidence of characteristics of neuroticism in premenstrually symptomatic women. Coppen and Kessel (1963) noted that:

> It appears that a women who complains of premenstrual irritability is more likely to be irritable at other times as well, and it therefore seems as though premenstrual symptoms are an exacerbation of personality traits which in turn are related to neuroticism. (p. 718)

Furthermore, Gruba and Rohrbaugh (1975) discovered high correlations between premenstrual negative affect (irritability, tension, depression) and Minnesota Multiphasic Personality Inventory (MMPI) indices of neuroticism (Hysteria and Hypochondriasis scales). If the trend toward between-group differences at all phases of the menstrual cycle is, indeed, more than an artifact of the current study, one must question the validity of a diagnosis of premenstrual syndrome for women who manifest differences at all phases of the cycle and consider alternate diagnoses.

There is also evidence in this study to suggest that some women who self-define as premenstrually asymptomatic may, objectively, be included within the diagnostic category of premenstrual syndrome. Thus, it is possible that, with respect to premenstrual syndrome, there are in fact four groups of women: a) those who self-define as asymptomatic and report little premenstrual symptomology; b) those who self-define as

asymptomatic but report symptomology of a similar magnitude to those who self-define as symptomatic; c) those who self-define as premenstrually symptomatic and manifest increased symptomology only during the premenstruum; and d) those who self-define as premenstrually symptomatic but present differential symptomology, in comparison to asymptomatic women, at all phases of the menstrual cycle. In view of the frequency of inclusion of "asymptomatic" women in the PAF categories of premenstrual syndrome one must consider the likelihood that some self-defined asymptomatic women should be in the symptomatic group. Similarly, those who self-define as symptomatic but present differential symptomology at all phases of the menstrual cycle may be mistakenly included in the premenstrually symptomatic group. Certainly, anecdotal reports would support this hypothesis. While some women in the symptomatic group allowed that their symptoms were restricted to "a few days" or "the week" before the onset of menstruation, others attested to the fact that they experienced "only a few symptom-free days during each month". All, however, were self-defined as premenstrual syndrome sufferers.

A further objective of this study was to investigate the extent to which symptomatic women may distort their premenstrual evaluation of cognitive abilities in the absence of any actual decrement in abilities. Results of this study indicate that symptomatic women do not tend to evaluate their performance more negatively during the premenstruum when compared to other

phases. However, it is evident that, when compared to the asymptomatic group, symptomatic women both predict a greater premenstrual decrement in their abilities and evaluate their premenstrual performance more negatively. There is also evidence to suggest that while symptomatic women report a premenstrual change from normal in symptoms that indicate a decrease in cognitive efficiency they do not show a premenstrual decrement in cognitive efficiency as measured by short-term memory tasks.

It is apparent, then, that symptomatic women do not experience a premenstrual decrement in cognitive abilities and, furthermore, they are able to accurately evaluate premenstrual performance on specific tasks. However, it is likely that these women may perceive, more globally, that they do experience a general premenstrual decrement in cognitive abilities.

Finally, in contrast to suggestions in previous literature, it is apparent that the women in the current study did not exaggerate their premenstrual symptomology with the notable exceptions of affective symptoms in symptomatic women and physical symptoms in the control group.

Limitations of the Current Study

Interpretations of the results of this study should be made in the light of several considerations. Firstly, the sample size of groups (particularly the symptomatic group) is considerably smaller than desired for reaching strong conclusions. With respect to the symptomatic group this small sample size reflects

the difficulty of locating women who are experiencing premenstrual symptoms which are severe and disruptive enough to have at least considered seeking treatment yet who are simultaneously not undergoing any form of medical treatment.

Secondly, the results presented in the current document are derived from data collected over only two menstrual cycles. Obviously, the strength of conclusions drawn would be enhanced by a longer data collection period during which any reactivity effects of monitoring menstrual cycle symptomology would be reduced.

Thirdly, in both groups, although particularly in the symptomatic group, the within-group variability in scores is quite substantial on most measures. Thus, it is apparent that more heterogeneity of symptomology is present in both groups than would ideally be desired.

Directions for Future Research

It is evident that the results of the current study can neither confirm nor refute the validity of premenstrual syndrome as a diagnostic category. Certainly, they have served to raise questions beyond those that were investigated.

Perhaps the most interesting of these questions concerns the extent to which self-defined premenstrually symptomatic women may be included, more appropriately, in other diagnostic categories. Further research, involving both self-definition of subjects as premenstrually symptomatic or asymptomatic and the

inclusion of a psychiatric interview and measures of personality characteristics in a longitudinal study of concurrent symptomology, is necessary to answer this question.

Similarly, further research is warranted to investigate possible differences between self-defined premenstrually symptomatic women and those who self-define as asymptomatic while reporting premenstrual symptoms of a similar magnitude.

Finally, in view of the difficulty encountered in predicting the exact date of the onset of menses even in women with "regular" menstrual cycles, it is imperative that future investigations of a similar nature employ daily self-report measures from which premenstrual, menstrual and intermenstrual data can be taken.

APPENDIX A

I. Menstrual Symptoms Questionnaire: Form A

MENSTRUAL SYMPTOMS QUESTIONNAIRE

FORM A

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

INSTRUCTIONS FOR RATINGS:

Please focus on the physical, behavioral and mood changes which have taken place during your past three premenstrual periods, even if the changes did not last throughout the entire premenstrual period. The premenstrual period consists of the 4 days before the onset of menstrual flow.

Consider each item and decide whether it describes a new condition or change which usually has occurred during your last three premenstrual periods. Circle the appropriate number to indicate the severity of change from your usual self.

For example: you may become anxious premenstrually OR, if you are mildly anxious most of the time, the anxiety may become more severe during the premenstrual period. Either type of change should be noted.

DEFINITIONS OF THE RATINGS OF SEVERITY OF CHANGE FROM USUAL STATE:

1 - Not applicable, not present at all, or no change from usual level

2 - Minimal change (only slightly apparent to you, others would probably not be aware of change)

3 - Mild change (definitely apparent to you and perhaps to others who know you well)

4 - Moderate change (clearly apparent to you and/or others who know you well)

5 - Severe change (very apparent to you and/or others who know you well)

6 - Extreme change (the degree of change in severity is so different from your usual state that it is very apparent to you OR even people who do not know you well might notice)

.....2/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 2 Identification Number.....

1 - not applicable, not present at all, or no change from usual state

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

.....

Changes present during last 3 premenstrual periods	Level of change from usual state
1. Have rapid changes in mood (e.g. laughing, crying, angry, happy, etc.).....	1 2 3 4 5 6
2. Have decreased energy or tend to fatigue easily.....	1 2 3 4 5 6
3. Have decreased ability to coordinate fine movements, poor motor coordination or clumsiness.....	1 2 3 4 5 6
4. Feel anxious or more anxious.....	1 2 3 4 5 6
5. Sleep too much or have difficulty getting up in the morning or from naps.....	1 2 3 4 5 6
6. Have a feeling of malaise (i.e. general, non-specific bad feeling or vague sense of mental or physical ill-health).....	1 2 3 4 5 6
7. Feel jittery or restless.....	1 2 3 4 5 6
8. Have loss of appetite.....	1 2 3 4 5 6
9. Have pain, tenderness, enlargement, or swelling of breasts.....	1 2 3 4 5 6
10. Have headaches or migraines.....	1 2 3 4 5 6
11. Be more easily distracted (i.e. attention shifts easily and rapidly).....	1 2 3 4 5 6
12. Tend to have accidents, fall, cut self, or break things unintentionally.....	1 2 3 4 5 6
13. Have nausea or vomiting.....	1 2 3 4 5 6
14. Show physical agitation (e.g. fidgeting, hand wringing, pacing, can't sit still).....	1 2 3 4 5 6
15. Have feelings of weakness.....	1 2 3 4 5 6
16. Feel that you just "can't cope" or are overwhelmed by ordinary demands.....	1 2 3 4 5 6
17. Feel insecure.....	1 2 3 4 5 6
18. Have "flare-ups" of allergy, breathing difficulties, stuffy feeling, or watery discharge from the nose (Specify.....).....	1 2 3 4 5 6

.....3/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 3 Identification Number.....

1 - not applicable, not present at all, or no change from usual state

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

Changes present during last 3 premenstrual periods	Level of change from usual state
19. Feel depressed.....	1 2 3 4 5 6
20. Have periods of dizziness, faintness, vertigo (room spinning), ringing in the ears, numbness, tingling of skin, trembling, lightheadedness (Specify.....)..	1 2 3 4 5 6
21. Tend to "nag" or quarrel over unimportant issues.....	1 2 3 4 5 6
22. Think of what it would be like to do something to self, like crash the car, wish to go to sleep and not wake up, or have thoughts of death or suicide.....	1 2 3 4 5 6
23. Feel less desire to talk or move about (it takes an effort to do so).....	1 2 3 4 5 6
24. Become more forgetful.....	1 2 3 4 5 6
25. Feel disaatisfied with personal appearance.....	1 2 3 4 5 6
26. Become violent with people or things (e.g. deliberately break things, hit someone).....	1 2 3 4 5 6
27. Take naps during the day or have an overwhelming desire to do so.....	1 2 3 4 5 6
28. Feel sense of unreality, like in a dream, unreal, etc...	1 2 3 4 5 6
29. Feel pounding of heart or have rapid heartbeat.....	1 2 3 4 5 6
30. Get more enjoyment or excitement out of little things...	1 2 3 4 5 6
31. Have difficulty concentrating.....	1 2 3 4 5 6
32. Feel confused.....	1 2 3 4 5 6
33. Have lowered judgement (i.e. realize judgement was less good than usual when looking back on decisions made during premenstrual period).....	1 2 3 4 5 6
34. Feel passive, want others to make decisions, to take charge, etc.....	1 2 3 4 5 6
35. Have an increased feeling of well being.....	1 2 3 4 5 6
36. Have a lack of self control.....	1 2 3 4 5 6
37. Tend to become more childlike.....	1 2 3 4 5 6
38. Tend to feel or be tearful, weep, or cry.....	1 2 3 4 5 6

.....4/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 4 Identification Number.....

1 - not applicable, not present at all, or no change from usual state

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

Changes present during last 3 premenstrual periods	Level of change from usual state
39. Feel need to urinate more frequently or have an increased amount of urine	1 2 3 4 5 6
40. Become constipated	1 2 3 4 5 6
41. Tend to be self-indulgent in use of time, spending money, eating, etc	1 2 3 4 5 6
42. Have episodes of impulsive behavior	1 2 3 4 5 6
43. Tend to smoke more, drink more alcohol or use "drugs of abuse" (e.g. "pot", "speed" etc.)	1 2 3 4 5 6
44. Feel under stress	1 2 3 4 5 6
45. Pick at, bite or scratch skin, or bite fingernails	1 2 3 4 5 6
46. Have mood swings from high to low or low to high	1 2 3 4 5 6
47. Tend to become "hysterical" if something upsets you	1 2 3 4 5 6
48. Have guilt feelings	1 2 3 4 5 6
49. Feel "empty"	1 2 3 4 5 6
50. Have outbursts of "irritability" or bad temper	1 2 3 4 5 6
51. Feel sad or blue	1 2 3 4 5 6
52. Have tired legs (weak, sore, tremble)	1 2 3 4 5 6
53. Tend to have backaches, joint and muscle pains or stiffness	1 2 3 4 5 6
54. Family or friends know "she is in one of her moods today"	1 2 3 4 5 6
55. Feel "at war" on awakening or have complaints or outbursts about old irritants	1 2 3 4 5 6
56. Act spiteful	1 2 3 4 5 6
57. Feel lonely	1 2 3 4 5 6
58. Urinate less frequently or in lesser amounts	1 2 3 4 5 6
59. Have weight gain	1 2 3 4 5 6
60. Tend to be intolerant or impatient or lose the ability to respond to or understand the faults, needs or errors of others	1 2 3 4 5 6

.....5/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 5 Identification Number.....

1 - not applicable, not present at all, or no change from usual state

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

Changes present during last 3 premenstrual periods	Level of change from usual state
61. Tend to be overtalkative.....	1 2 3 4 5 6
62. Have relatively steady abdominal heaviness, discomfort or pain.....	1 2 3 4 5 6
63. Have increased sexual activity or interest (fantasy, with self, with others).....	1 2 3 4 5 6
64. Have trouble sleeping.....	1 2 3 4 5 6
Check, if wake early in the morning and can't get back to sleep.....	.....
65. Have intermittent pain or cramps in the abdomen.....	1 2 3 4 5 6
66. Have a decrease in self-esteem (i.e. don't feel good about self or feel a failure).....	1 2 3 4 5 6
67. Tend to blame others for problems (personal, at home, work, school, etc).....	1 2 3 4 5 6
68. Have increase in activity, organization, efficiency, or involvement socially, at home or work.....	1 2 3 4 5 6
69. Tend to brood over unpleasant events.....	1 2 3 4 5 6
70. Have skin problems such as acne, pimples, etc.....	1 2 3 4 5 6
71. Have edema, swelling, puffiness, or "water retention"...	1 2 3 4 5 6
72. Stay at home more.....	1 2 3 4 5 6
73. Have less sexual interest (fantasy, self, others).....	1 2 3 4 5 6
74. Tend to avoid social activities.....	1 2 3 4 5 6
75. Feel bloated.....	1 2 3 4 5 6
76. Have lowered performance, output, efficiency or ease, in tasks at work, at home, or with hobbies, etc.....	1 2 3 4 5 6
77. Miss time at work because of premenstrual changes.....	1 2 3 4 5 6
78. Want to be alone.....	1 2 3 4 5 6
79. Feel a lack of inspiration and creativity.....	1 2 3 4 5 6
80. Crave specific foods (sweets, bread, chocolate, pickles, etc.).....	1 2 3 4 5 6

.....6/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 6 Identification Number.....

1 - not applicable, not present at all, or no change from usual state
2 - minimal change
3 - mild change
4 - moderate change
5 - severe change
6 - extreme change

Changes present during last 3 premenstrual periods	Level of change from usual state
81. Have an increase in appetite or tend to eat more.....	1 2 3 4 5 6
82. Feel worse in morning.....	1 2 3 4 5 6
83. Pay less attention to physical appearance.....	1 2 3 4 5 6
84. Feel cold and/or more sensitive to temperature change...	1 2 3 4 5 6
85. Have bursts of energy or feel more energetic.....	1 2 3 4 5 6
86. Become more sensitive to or intolerant of personal rejection of self or one's work.....	1 2 3 4 5 6
87. Feel more affectionate.....	1 2 3 4 5 6
88. Tend to seek advice more often, or about simple matters.	1 2 3 4 5 6
89. Have pessimistic outlook.....	1 2 3 4 5 6
90. Drink more coffee, tea, or cold drinks with caffeine (cola, rootbeer, etc.).....	1 2 3 4 5 6
91. Feel pain or discomfort during intercourse.....	1 2 3 4 5 6
92. Do less housework (cleaning, care of clothes, etc.).....	1 2 3 4 5 6
93. Spend less time at leisure activities (hobbies, TV, reading).....	1 2 3 4 5 6
94. Have "flare up" or appearance of cold sores, diarrhea, belching, spontaneous bruises, varicose veins, chest pain, hemorrhoids, numbing, tingling, epilepsy ("fits"), sensitivity of skin to sun (Specify.....)	1 2 3 4 5 6
95. Have an increase in eye problems or changes in vision (e.g. sty, redness, watering, mistiness, discomfort, sensitivity to light) (Specify.....)	1 2 3 4 5 6

Please describe any unusual situations that you feel may have contributed to any marked changes indicated above (e.g. illness, medication, stressful or upsetting events).....
.....
.....
.....
.....

II. Menstrual Symptoms Questionnaire: Form B

MENSTRUAL SYMPTOMS QUESTIONNAIRE

FORM B

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

INSTRUCTIONS FOR RATINGS:

In making the ratings, think about the changes you may have experienced in the past 24 hours.

Consider each item and decide whether it describes a new condition or change from your usual level of functioning or your usual state.

Circle the appropriate number to indicate the severity of change from your usual state.

DEFINITIONS OF THE RATINGS OF SEVERITY OF CHANGE FROM USUAL STATE:

1 - Not applicable, not present at all, or no change from usual level

2 - Minimal change (only slightly apparent to you, others would probably not be aware of change)

3 - Mild change (definitely apparent to you and perhaps to others who know you well)

4 - Moderate change (clearly apparent to you and/or others who know you well)

5 - Severe change (very apparent to you and/or others who know you well)

6 - Extreme change (the degree of change in severity is so different from your usual state that it is very apparent to you OR even people who do not know you well might notice)

.....2/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 2 Identification Number.....

1 - not applicable, not present at all, or no change from usual

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

Changes present during past 24 hours	Level of change from usual state
1. Have rapid changes in mood (e.g. laughing, crying, angry, happy, etc.) all within the same day.....	1 2 3 4 5 6
2. Have decreased energy or tend to fatigue easily.....	1 2 3 4 5 6
3. Have decreased ability to coordinate fine movements, poor motor coordination or clumsiness.....	1 2 3 4 5 6
4. Feel anxious or more anxious.....	1 2 3 4 5 6
5. Sleep too much or have difficulty getting up in the morning or from naps.....	1 2 3 4 5 6
6. Have a feeling of malaise (i.e. general, non-specific bad feeling or vague sense of mental or physical ill-health).....	1 2 3 4 5 6
7. Feel jittery or restless.....	1 2 3 4 5 6
8. Have loss of appetite.....	1 2 3 4 5 6
9. Have pain, tenderness, enlargement, or swelling of breasts.....	1 2 3 4 5 6
10. Have headaches or migraines.....	1 2 3 4 5 6
11. Be more easily distracted (i.e. attention shifts easily and rapidly).....	1 2 3 4 5 6
12. Tend to have accidents, fall, cut self, or break things unintentionally.....	1 2 3 4 5 6
13. Have nausea or vomiting.....	1 2 3 4 5 6
14. Show physical agitation (e.g. fidgeting, hand wringing, pacing, can't sit still).....	1 2 3 4 5 6
15. Have feelings of weakness.....	1 2 3 4 5 6
16. Feel that you just "can't cope" or are overwhelmed by ordinary demands.....	1 2 3 4 5 6
17. Feel insecure.....	1 2 3 4 5 6
18. Have "flare-ups" of allergy, breathing difficulties, stuffy feeling, or watery discharge from the nose(Specify.....)	1 2 3 4 5 6

.....3/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 3 Identification Number.....

1 - not applicable, not present at all, or no change from usual

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

Changes present during past 24 hours	Level of change from usual state
19. Feel depressed	1 2 3 4 5 6
20. Have periods of dizziness, faintness, vertigo (room spinning), ringing in the ears, numbness, tingling of skin, trembling, lightheadedness(Specify)	1 2 3 4 5 6
21. Tend to "nag" or quarrel over unimportant issues	1 2 3 4 5 6
22. Think of what it would be like to do something to self, like crash the car, wish to go to sleep and not wake up, or have thoughts of death or suicide	1 2 3 4 5 6
23. Feel less desire to talk or move about (it takes an effort to do so)	1 2 3 4 5 6
24. Become more forgetful	1 2 3 4 5 6
25. Feel dissatisfied with personal appearance	1 2 3 4 5 6
26. Become violent with people or things (e.g. deliberately break things, hit someone)	1 2 3 4 5 6
27. Take naps during the day or have an overwhelming desire to do so	1 2 3 4 5 6
28. Feel sense of unreality, like in a dream, unreal, etc	1 2 3 4 5 6
29. Feel pounding of heart or have rapid heartbeat	1 2 3 4 5 6
30. Get more enjoyment or excitement out of little things	1 2 3 4 5 6
31. Have difficulty concentrating	1 2 3 4 5 6
32. Feel confused	1 2 3 4 5 6
33. Have lowered judgement (i.e. realize judgement is less good than usual when looking back on decisions made at this time)	1 2 3 4 5 6
34. Feel passive, want others to make decisions, to take charge, etc	1 2 3 4 5 6
35. Have an increased feeling of well being	1 2 3 4 5 6
36. Have a lack of self control	1 2 3 4 5 6
37. Tend to become more childlike	1 2 3 4 5 6
38. Tend to feel or be tearful, weep, or cry	1 2 3 4 5 6

.....4/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 4 Identification Number.....

1 - not applicable, not present at all, or no change from usual

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

Changes present during past 24 hours	Level of change from usual state
39. Feel need to urinate more frequently or have an increased amount of urine.....	1 2 3 4 5 6
40. Become constipated.....	1 2 3 4 5 6
41. Tend to be self-indulgent in use of time, spending money, eating, etc.....	1 2 3 4 5 6
42. Have episodes of impulsive behavior.....	1 2 3 4 5 6
43. Tend to smoke more, drink more alcohol or use "drugs of abuse" (e.g. "pot", "speed", etc.).....	1 2 3 4 5 6
44. Feel under stress.....	1 2 3 4 5 6
45. Pick at, bite or scratch skin, or bite fingernails.....	1 2 3 4 5 6
46. Have mood swings from high to low or low to high.....	1 2 3 4 5 6
47. Tend to become "hysterical" if something upsets you.....	1 2 3 4 5 6
48. Have guilt feelings.....	1 2 3 4 5 6
49. Feel "empty".....	1 2 3 4 5 6
50. Have outbursts of "irritability" or bad temper.....	1 2 3 4 5 6
51. Feel sad or blue.....	1 2 3 4 5 6
52. Have tired legs (weak, sore, tremble).....	1 2 3 4 5 6
53. Tend to have backaches, joint and muscle pains or stiffness.....	1 2 3 4 5 6
54. Family or friends know "she is in one of her moods today".....	1 2 3 4 5 6
55. Feel "at war" on awakening or have complaints or outbursts about old irritants.....	1 2 3 4 5 6
56. Act spiteful.....	1 2 3 4 5 6
57. Feel lonely.....	1 2 3 4 5 6
58. Urinate less frequently or in lesser amounts.....	1 2 3 4 5 6
59. Have weight gain.....	1 2 3 4 5 6
60. Tend to be intolerant or impatient or to lose the ability to respond to or understand the faults, needs, or errors of others.....	1 2 3 4 5 6

.....5/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 5 Identification Number.....

1 - not applicable, not present at all, or no change from usual
2 - minimal change
3 - mild change
4 - moderate change
5 - severe change
6 - extreme change

Changes present during past 24 hours	Level of change from usual state
61. Tend to be overtalkative.....	1 2 3 4 5 6
62. Have relatively steady abdominal heaviness, discomfort or pain.....	1 2 3 4 5 6
63. Have increased sexual activity or interest (fantasy, with self, with others).....	1 2 3 4 5 6
64. Have trouble sleeping.....	1 2 3 4 5 6
Check, if wake early in morning and can't get back to sleep.....	.....
65. Have intermittent pain or cramps in the abdomen.....	1 2 3 4 5 6
66. Have a decrease in self-esteem (i.e. don't feel good about self or feel a failure).....	1 2 3 4 5 6
67. Tend to blame others for problems (personal, at home, work, school, etc.).....	1 2 3 4 5 6
68. Have increase in activity, organization, efficiency, or involvement socially, at home or work.....	1 2 3 4 5 6
69. Tend to brood over unpleasant events.....	1 2 3 4 5 6
70. Have skin problems such as acne, pimples, etc.....	1 2 3 4 5 6
71. Have edema, swelling, puffiness, or "water retention"...	1 2 3 4 5 6
72. Stay at home more.....	1 2 3 4 5 6
73. Have less sexual interest or activity (fantasy, self, others).....	1 2 3 4 5 6
74. Tend to avoid social activities.....	1 2 3 4 5 6
75. Feel bloated.....	1 2 3 4 5 6
76. Have lowered performance, output, efficiency or ease, in tasks at work, at home, or with hobbies, etc.....	1 2 3 4 5 6
77. Miss time at work because of changes from usual state...	1 2 3 4 5 6
78. Want to be alone.....	1 2 3 4 5 6
79. Feel a lack of inspiration and creativity.....	1 2 3 4 5 6

.....6/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 6 Identification Number.....

1 - not applicable, not present at all, or no change from usual
2 - minimal change
3 - mild change
4 - moderate change
5 - severe change
6 - extreme change

.....

Changes present during past 24 hours	Level of change from usual state
80. Crave specific foods (sweets, bread, chocolate, pickles).....	1 2 3 4 5 6
81. Have an increase in appetite or tend to eat more.....	1 2 3 4 5 6
82. Feel worse in morning.....	1 2 3 4 5 6
83. Pay less attention to physical appearance.....	1 2 3 4 5 6
84. Feel cold and/or more sensitive to temperature change...	1 2 3 4 5 6
85. Have bursts of energy or feel more energetic.....	1 2 3 4 5 6
86. Become more sensitive to or intolerant of personal rejection of self or one's work.....	1 2 3 4 5 6
87. Feel more affectionate.....	1 2 3 4 5 6
88. Tend to seek advice more often or about simple matters..	1 2 3 4 5 6
89. Have pessimistic outlook.....	1 2 3 4 5 6
90. Drink more coffee, tea, or cold drinks with caffeine (cola, rootbeer, etc.).....	1 2 3 4 5 6
91. Feel pain or discomfort during intercourse.....	1 2 3 4 5 6
92. Do less housework (cleaning,care of clothes, etc.).....	1 2 3 4 5 6
93. Spend less time at leisure activities (hobbies, TV, reading).....	1 2 3 4 5 6
94. Have "flare up" or appearance of cold sores, diarrhea, belching, spontaneous bruises, varicose veins, chest pain, hemorrhoids, numbing, tingling, epilepsy ("fits"), sensitivity of skin to sun (Specify.....).	1 2 3 4 5 6
95. Have an increase in eye problems or changes in vision (e.g. sty, redness, watering, mistiness, discomfort, sensitivity to light) (Specify.....)	1 2 3 4 5 6

Please describe any unusual situation that you feel may have contributed to any marked changes indicated above (e.g. illness, medication, stressful or upsetting event).....
.....
.....

III. Menstrual Symptoms Questionnaire: Form C

MENSTRUAL SYMPTOMS QUESTIONNAIRE

FORM C

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

INSTRUCTIONS FOR RATINGS:

Please focus on the physical, behavioural and mood changes that took place during your last premenstrual phase even if the changes did not last throughout the entire premenstrual phase. The premenstrual phase consists of the 4 days before the onset of menstrual flow.

Consider each item and decide whether it describes a new condition or change which occurred during your last premenstrual phase.

Circle the appropriate number to indicate the severity of change from your usual (non-premenstrual) self.

For example: you may have become anxious premenstrually, OR, if you are mildly anxious most of the time, the anxiety may have become more severe during the premenstrual phase. Either type of change should be noted.

DEFINITIONS OF THE RATINGS OF SEVERITY OF CHANGE FROM USUAL STATE:

1 - Not applicable, not present at all, or no change from usual level

2 - Minimal change (only slightly apparent to you, others would probably not be aware of change)

3 - Mild change (definitely apparent to you and perhaps to others who know you well)

4 - Moderate change (clearly apparent to you and/or others who know you well)

5 - Severe change (very apparent to you and/or others who know you well)

6 - Extreme change (the degree of change in severity is so different from your usual state that it is very apparent to you OR even people who do not know you well might notice)

.....2/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 2 Identification Number.....

1 - not applicable, not present at all, or no change from usual state

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

.....

Changes present during last premenstrual phase	Level of change from usual state
1. Have rapid changes in mood (e.g. laughing, crying, angry, happy, etc.).....	1 2 3 4 5 6
2. Have decreased energy or tend to fatigue easily.....	1 2 3 4 5 6
3. Have decreased ability to coordinate fine movements, poor motor coordination or clumsiness.....	1 2 3 4 5 6
4. Feel anxious or more anxious.....	1 2 3 4 5 6
5. Sleep too much or have difficulty getting up in the morning or from naps.....	1 2 3 4 5 6
6. Have a feeling of malaise (i.e. general, non-specific bad feeling or vague sense of mental or physical ill-health).....	1 2 3 4 5 6
7. Feel jittery or restless.....	1 2 3 4 5 6
8. Have loss of appetite.....	1 2 3 4 5 6
9. Have pain, tenderness, enlargement, or swelling of breasts.....	1 2 3 4 5 6
10. Have headaches or migraines.....	1 2 3 4 5 6
11. Be more easily distracted (i.e. attention shifts easily and rapidly).....	1 2 3 4 5 6
12. Tend to have accidents, fall, cut self, or break things unintentionally.....	1 2 3 4 5 6
13. Have nausea or vomiting.....	1 2 3 4 5 6
14. Show physical agitation (e.g. fidgeting, hand wringing, pacing, can't sit still).....	1 2 3 4 5 6
15. Have feelings of weakness.....	1 2 3 4 5 6
16. Feel that you just "can't cope" or are overwhelmed by ordinary demands.....	1 2 3 4 5 6
17. Feel insecure.....	1 2 3 4 5 6
18. Have "flare-ups" of allergy, breathing difficulties, stuffy feeling, or watery discharge from the nose (Specify.....).....	1 2 3 4 5 6

.....3/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 3 Identification Number.....

1 - not applicable, not present at all, or no change from usual state

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

Changes present during last premenstrual phase	Level of change from usual state
19. Feel depressed.....	1 2 3 4 5 6
20. Have periods of dizziness, faintness, vertigo (room spinning), ringing in the ears, numbness, tingling of skin, trembling, lightheadedness (Specify.....)	1 2 3 4 5 6
21. Tend to "nag" or quarrel over unimportant issues.....	1 2 3 4 5 6
22. Think of what it would be like to do something to self, like crash the car, wish to go to sleep and not wake up, or have thoughts of death or suicide.....	1 2 3 4 5 6
23. Feel less desire to talk or move about (it takes an effort to do so).....	1 2 3 4 5 6
24. Become more forgetful.....	1 2 3 4 5 6
25. Feel dissatisfied with personal appearance.....	1 2 3 4 5 6
26. Become violent with people or things (e.g. deliberately break things, hit someone).....	1 2 3 4 5 6
27. Take naps during the day or have an overwhelming desire to do so.....	1 2 3 4 5 6
28. Feel sense of unreality, like in a dream, unreal, etc....	1 2 3 4 5 6
29. Feel pounding of heart or have rapid heartbeat.....	1 2 3 4 5 6
30. Get more enjoyment or excitement out of little things....	1 2 3 4 5 6
31. Have difficulty concentrating.....	1 2 3 4 5 6
32. Feel confused.....	1 2 3 4 5 6
33. Have lowered judgement (i.e. realize judgement was less good than usual when looking back on decisions made during premenstrual phase).....	1 2 3 4 5 6
34. Feel passive, want others to make decisions, to take charge etc.....	1 2 3 4 5 6
35. Have an increased feeling of well being.....	1 2 3 4 5 6
36. Have a lack of self control.....	1 2 3 4 5 6
37. Tend to become more childlike.....	1 2 3 4 5 6
38. Tend to feel or be tearful, weep, or cry.....	1 2 3 4 5 6

.....4/

1 - not applicable, not present at all, or no change from usual state
2 - minimal change
3 - mild change
4 - moderate change
5 - severe change
6 - extreme change

Changes present during last premenstrual phase	Level of change from usual state
39. Feel need to urinate more frequently or have an increased amount of urine	1 2 3 4 5 6
40. Become constipated	1 2 3 4 5 6
41. Tend to be self-indulgent in use of time, spending money, eating, etc	1 2 3 4 5 6
42. Have episodes of implusive behavior	1 2 3 4 5 6
43. Tend to smoke more, drink more alcohol or use "drugs of abuse" (e.g. "pot", "speed", etc.)	1 2 3 4 5 6
44. Feel under stress	1 2 3 4 5 6
45. Pick at, bite or scratch skin, or bite fingernails	1 2 3 4 5 6
46. Have mood swings from high to low or low to high	1 2 3 4 5 6
47. Tend to become "hysterical" if something upsets you	1 2 3 4 5 6
48. Have guilt feelings	1 2 3 4 5 6
49. Feel "empty"	1 2 3 4 5 6
50. Have outbursts of"irritability" or bad temper	1 2 3 4 5 6
51. Feel sad or blue	1 2 3 4 5 6
52. Have tired legs (weak, sore, tremble)	1 2 3 4 5 6
53. Tend to have backaches, joint and muscle pains or stiffness	1 2 3 4 5 6
54. Family or friends know "she is in one of her moods today"	1 2 3 4 5 6
55. Feel "at war" on awakening or have complaints or outbursts about old irritants	1 2 3 4 5 6
56. Act spiteful	1 2 3 4 5 6
57. Feel lonely	1 2 3 4 5 6
58. Urinate less frequently or in lesser amounts	1 2 3 4 5 6
59. Have weight gain	1 2 3 4 5 6
60. Tend to be intolerant or impatient or lose the ability to respond to or understand the faults, needs or errors of others	1 2 3 4 5 6

.....5/

MENSTRUAL SYMPTOMS QUESTIONNAIRE: Page 5 Identification Number.....

1 - not applicable, not present at all, or no change from usual state

2 - minimal change

3 - mild change

4 - moderate change

5 - severe change

6 - extreme change

Changes present during last premenstrual phase	Level of change from usual state
61. Tend to be overtalkative	1 2 3 4 5 6
62. Have relatively steady abdominal heaviness, discomfort or pain	1 2 3 4 5 6
63. Have increased sexual activity or interest (fantasy, with self, with others)	1 2 3 4 5 6
64. Have trouble sleeping	1 2 3 4 5 6
Check, if wake early in the morning and can't get back to sleep	.....
65. Have intermittent pain or cramps in the abdomen	1 2 3 4 5 6
66. Have a decrease in self-esteem (i.e. don't feel good about self or feel a failure)	1 2 3 4 5 6
67. Tend to blame others for problems (personal, at home, work, school, etc)	1 2 3 4 5 6
68. Have increase in activity, organization, efficiency, or involvement socially, at home or work	1 2 3 4 5 6
69. Tend to brood over unpleasant events	1 2 3 4 5 6
70. Have skin problems such as acne, pimple, etc	1 2 3 4 5 6
71. Have edema, swelling, puffiness, or "water retention"	1 2 3 4 5 6
72. Stay at home more	1 2 3 4 5 6
73. Have less sexual interest (fantasy, self, others)	1 2 3 4 5 6
74. Tend to avoid social activities	1 2 3 4 5 6
75. Feel bloated	1 2 3 4 5 6
76. Have lowered performance, output, efficiency or ease, in tasks at work, at home, or with hobbies, etc	1 2 3 4 5 6
77. Miss time at work because of premenstrual changes	1 2 3 4 5 6
78. Want to be alone	1 2 3 4 5 6
79. Feel a lack of inspiration and creativity	1 2 3 4 5 6
80. Crave specific foods (sweets, bread, chocolate, pickles, etc.)	1 2 3 4 5 6
	.....6/

1 - not applicable, not present at all, or no change from usual state
2 - minimal change
3 - mild change
4 - moderate change
5 - severe change
6 - extreme change

Changes present during last premenstrual phase	Level of change from usual state
81. Have an increase in appetite or tend to eat more.....	1 2 3 4 5 6
82. Feel worse in morning.....	1 2 3 4 5 6
83. Pay less attention to physical appearance.....	1 2 3 4 5 6
84. Feel cold and/or more sensitive to temperature change.....	1 2 3 4 5 6
85. Have bursts of energy or feel more energetic.....	1 2 3 4 5 6
86. Become more sensitive to or intolerant of personal rejection of self or one's work.....	1 2 3 4 5 6
87. Feel more affectionate.....	1 2 3 4 5 6
88. Tend to seek advice more often, or about simple matters...	1 2 3 4 5 6
89. Have pessimistic outlook.....	1 2 3 4 5 6
90. Drink more coffee, tea, or cold drinks with caffeine (cola, rootbeer, etc.).....	1 2 3 4 5 6
91. Feel pain or discomfort during intercourse.....	1 2 3 4 5 6
92. Do less housework (cleaning, care of clothes, etc.).....	1 2 3 4 5 6
93. Spend less time at leisure activities (hobbies, TV, reading, etc.).....	1 2 3 4 5 6
94. Have "flare-up" or appearance of cold sores, diarrhea, belching, spontaneous bruises, varicose veins, chest pain, hemorrhoids, numbing, tingling, epilepsy ("fits"), sensitivity of skin to sun (Specify.....)	1 2 3 4 5 6
95. Have an increase in eye problems or changes in vision (e.g. sty, redness, watering, mistiness, discomfort, sensitivity to light) (Specify.....)	1 2 3 4 5 6

Please describe any unusual situations that you feel may have contributed to any marked changes indicated above (e.g. illness, medication, stressful or upsetting events).....
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.....
.....
.....

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 1 (BLOCK 1: GROUP A)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 1: A

1	ICE	BEACH	MACHINE	113
2	SAILOR	COW	STEAM	969
3	YACHT	SHIRT	ISLAND	716
4	SMOKE	FLASH	STRANGER	328
5	ARM	EMPIRE	BOY	148
6	CHAIR	BABY	GRASS	155
7	APPLE	BEE	ROAD	922
8	ROOM	WOMAN	BED	335
9	BAG	TRAIL	ENGINE	844
10	MOUNTAIN	CLERK	NECK	916
11	WIFE	CHICKEN	DAY	783
Number correct (8 trials):	....	....	....	

Total number correct: 24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 2 (BLOCK 1: GROUP B)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 1: B

1	CAT	....	STEP	....	CITY	....	978
2	COAT	....	STOCK	....	ARMY	....	672
3	QUEEN	....	SLAVE	....	CABIN	....	536
4	STUDENT	....	BUSH	....	LAKE	....	529
5	BOWL	....	DAWN	....	MOTHER	....	253
6	EGG	....	COTTON	....	BOOK	....	730
7	PARENT	....	SHELL	....	BIRD	....	317
8	SKIN	....	YARD	....	PAPER	....	477
9	COLLEGE	....	TENT	....	MOON	....	541
10	POUND	....	BUILDING	....	SHOE	....	937
11	MOTOR	....	BEAST	....	TOP	....	816

Number correct
(8 trials): ....

Total number correct: ....
24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 3 (BLOCK 1: GROUP C)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 1: C

1	STONE	....	HARBOR	....	KNEE	....	797
2	GOLD	....	LOG	....	HERO	....	921
3	MAID	....	FIRE	....	PALACE	....	875
4	VILLAGE	....	BEAR	....	SHORE	....	375
5	GOAT	....	HANDLE	....	TRACK	....	959
6	BOTTLE	....	CHECK	....	MAN	....	346
7	STAND	....	BOARD	....	CASTLE	....	504
8	LIP	....	CURTAIN	....	BOX	....	533
9	IRON	....	WALL	....	FATHER	....	163
10	SERVANT	....	BRANCH	....	SHEEP	....	963
11	SEA	....	BLOOD	....	COVER	....	385

Number correct (8 trials): ....

Total number correct: .... /24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 4 (BLOCK 2: GROUP D)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 2: D

1	RING	....	WAVE	....	SUGAR	 459
2	ROUTE	....	CROWD	....	TOWER	 597
3	PRINCE	....	HALL	....	SOLDIER	 212
4	MONEY	....	FLESH	....	SCALE	 937
5	RANK	....	SHADOW	....	GRAIN	 155
6	PATTERN	....	TIP	....	KNIGHT	 127
7	NAIL	....	GAS	....	BREAKFAST	 890
8	CELL	....	FLOWER	....	PIPE	 624
9	BRIDGE	....	GIANT	....	MEMBER	 458
10	THROAT	....	CLOTH	....	SENATE	 845
11	ROCK	....	FINGER	....	LION	 452

Number correct
(8 trials): ....

Total number correct: ....
24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 5 (BLOCK 2: GROUP E)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 2: E

1	PORT	....	SHIN	....	POCKET	 680
2	MEAT	....	COURT	....	BOULDER	 132
3	SHOP	....	DINNER	....	GROUND	 663
4	SOIL	....	OCEAN	....	FENCE	 563
5	CIRCLE	....	PLANT	....	WIND	 192
6	BANK	....	GLASS	....	QUARTER	 199
7	ORANGE	....	SHEET	....	KISS	 477
8	READER	....	LIGHT	....	HILL	 959
9	SEAT	....	GROUP	....	BUTTER	 727
10	HAND	....	TAX	....	STANDARD	 562
11	LETTER	....	OAK	....	MILK	 143

Number correct (8trials): ....

Total number correct: 24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 6 (BLOCK 2: GROUP F)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 2: F

1	ROOF	....	STRING	....	HOTEL	....	412
2	TRIBE	....	CUP	....	DOLLAR	....	935
3	SISTER	....	TRACE	....	HOUSE	....	556
4	FACE	....	OIL	....	MARKET	....	424
5	SAINT	....	TOWN	....	PRISON	....	637
6	POLE	....	KITCHEN	....	ROW	....	551
7	DOCTOR	....	SALT	....	RANGE	....	594
8	WOOL	....	BASKET	....	LAUGH	....	761
9	MILL	....	BAR	....	TABLE	....	397
10	BAY	....	PLACE	....	WAGON	....	443
11	PAINT	....	CLOUD	....	PUPIL	....	522

Number correct (8 trials): ....

Total number correct: 24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 7 (BLOCK 3: GROUP G)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 3: G

1	BELL	....	FUR	....	SUPPER	 227
2	CLOCK	....	SEED	....	DIAMOND	 708
3	CENT	....	TEA	....	JOURNAL	 998
4	WINTER	....	BILL	....	CAKE	 513
5	LAND	....	MEAL	....	POLICE	 612
6	PATIENT	....	HEEL	....	TEETH	 281
7	BLOCK	....	POST	....	TEMPLE	 483
8	WOOD	....	FLY	....	LEATHER	 966
9	CAPTAIN	....	NIGHT	....	GIFT	 853
10	SHOULDER	....	FLAME	....	CHIEF	 310
11	WALK	....	CHAMBER	....	SHIP	 737

Number correct
(8 trials): ....

Total number correct: ....
24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 8 (BLOCK 3: GROUP H)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 3: H

1	BALL	....	CATTLE	....	FLOOD	 640
2	GARDEN	....	HORSE	....	RAY	 986
3	FLAG	....	BOAT	....	CORNER	 890
4	RAIN	....	WHEAT	....	PRODUCT	 237
5	STEEL	....	RIVER	....	LOAD	 141
6	TEACHER	....	STREET	....	WOODS	 536
7	DEVIL	....	PLATE	....	COIN	 601
8	KING	....	LAD	....	STATION	 766
9	GIRL	....	CHURCH	....	WITNESS	 333
10	VALLEY	....	EAR	....	THING	 534
11	STAR	....	CARD	....	UNCLE	 569

Number correct
(8 trials): ....

Total number correct: ....
24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 9 (BLOCK 3: GROUP I)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

BLOCK 3: I

1	WINDOWS	....	FIRM	....	WINE	....	681
2	SUIT	....	GUEST	....	BODY	....	242
3	TICKET	....	COOK	....	DESK	....	583
4	HONEY	....	PACK	....	FLOOR	....	990
5	CLOTHING	....	SCHOOL	....	CORN	....	922
6	COAL	....	STORM	....	PERSON	....	314
7	TREE	....	FEET	....	PICTURE	....	509
8	MAP	....	TAIL	....	COFFEE	....	317
9	JUDGE	....	WATER	....	HAT	....	338
10	SAND	....	CHAIN	....	FOREST	....	162
11	CAMP	....	PORCH	....	RAILROAD	....	530

Number correct (8 trials): ....

Total number correct: ....
24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 10 (ADDS # 1)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

ADDS # 1:

1	.	LOCKER	.....	PATH	.....	FOOT	....
2		GATE	....	CLUB	....	LEMON	....
3		CAR	....	NUT	....	BEGGAR	....
4		TRAIN	....	STAMP	....	ANKLE	....
5		DOG	....	HAMMER	....	DUKE	....
6		FISH	....	CANDY	....	BAGPIPE	....
7		PENCIL	....	STAIR	....	LEG	....
8		DUST	....	TONGUE	....	BEAVER	....
9		COAST	....	OVEN	....	SAIL	....
10		WOLF	....	CHEEK	....	PUDDING	....
11		SINK	....	BLISTER	....	CROP	....

Number correct
(8 trials) ....

Total number correct 24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 11 (ADDS # 2)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

ADDS # 2:

1	.	CRADLE	....	FRIEND	....	BREAD	....
2		ELBOW	....	SUN	....	TEAM	....
3		COTTAGE	....	FOOD	....	SONG	....
4		SINK	....	BULLET	....	PARK	....
5		WATCH	....	HAIR	....	REPTILE	....
6		SALAD	....	HEART	....	EYE	....
7		BRAIN	....	RATE	....	METAL	....
8		MOUTH	....	FIELD	....	ARROW	....
9		MEADOW	....	PEN	....	FLOUR	....
10		EAST	....	DECK	....	SHADOW	....
11		SWORD	....	DOOR	....	MAMMAL	....
Number correct (8 trials)			....		....		....

Total number correct 24

COGNITIVE EFFICIENCY MEASURE

SCORING CHART NUMBER 12 (ADDS # 3)

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

ADDS # 3:

1 .	STREAM	WORLD	POEM	
2	ARTIST	FRUIT	EARTH	
3	FOREHEAD	LAMP	FLEET	
4	HEADLIGHT	CHILD	HOLE	
5	TROOPS	LOBSTER	ROOT	
6	GUN	EDGE	LEOPARD	
7	DISK	INFANT	POINT	
8	PEPPER	STICK	BREAST	
9	KETTLE	CREAM	NOSE	
10	FARM	PAPER	DANCE	
11	DRESS	BROOK	HILLSIDE	

Number correct
(8 trials) ....

Total number correct 24

V. Performance Questionnaire

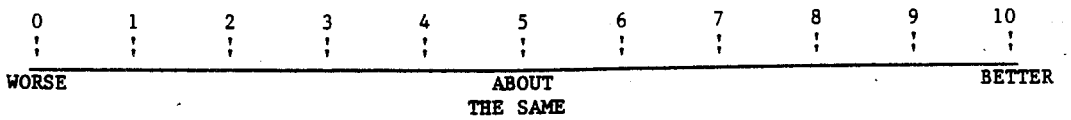
PERFORMANCE QUESTIONNAIRE

Identification Number.....

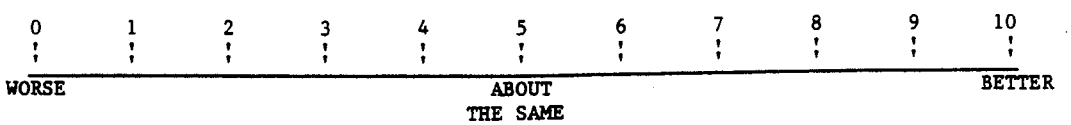
Date.....

Number of days since beginning of last menstrual flow.....

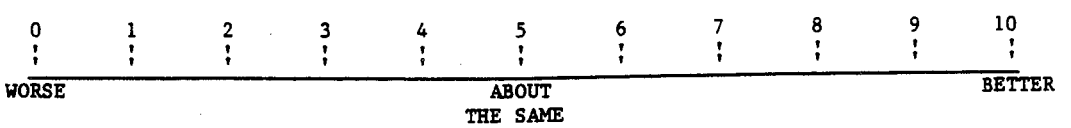
1. How well do you think you did on this test compared to how others would do? (Please indicate on scale below)



2. How well do you think you did on this test compared to what you are normally capable of? (Please indicate on scale below)



3. How well do you think you did on this test compared to the last time you completed it? (Please indicate on scale below)



VI. Physical and Behavioural Check List

PHYSICAL AND BEHAVIOURAL CHECKLIST

Identification Number.....

Date.....

Number of days since beginning of last menstrual flow.....

The following is a list of physical and behavioural symptoms which some women experience.

Please indicate, using the descriptive categories outlined below, your experience of each of these symptoms during the past 24 hours. Consider each item and circle the number which best describes your experience of that symptom.

DESCRIPTIVE CATEGORIES: 1 - no experience of symptom
2 - barely noticeable
3 - present, mild
4 - present, moderate
5 - present, strong
6 - acute or partially disabling

	Symptom	Severity of symptom
1.	Muscle stiffness	1 2 3 4 5 6
2.	Headache	1 2 3 4 5 6
3.	Cramps	1 2 3 4 5 6
4.	Backache	1 2 3 4 5 6
5.	Fatigue	1 2 3 4 5 6
6.	General aches and pains	1 2 3 4 5 6
7.	Dizziness or faintness	1 2 3 4 5 6
8.	Cold sweats	1 2 3 4 5 6
9.	Nausea or vomiting	1 2 3 4 5 6
10.	Hot flashes	1 2 3 4 5 6
11.	Weight gain	1 2 3 4 5 6
12.	Skin disorders	1 2 3 4 5 6
13.	Painful breasts	1 2 3 4 5 6
14.	Swelling	1 2 3 4 5 6
15.	Affectionate feelings	1 2 3 4 5 6
16.	Orderliness	1 2 3 4 5 6
17.	Excitement	1 2 3 4 5 6
18.	Feelings of wellbeing	1 2 3 4 5 6
19.	Bursts of energy or activity	1 2 3 4 5 6

.....2/

PHYSICAL AND BEHAVIOURAL CHECKLIST: Page 2 Identification Number.....

20. If you have gained weight in the past 48 hours please indicate how much

.....lbs

21. Whether you have gained weight in the past 48 hours or not please indicate your degree of satisfaction at this time with your physical body image. (Check one):

a) entirely satisfied and comfortable with my body image....._____

b) satisfied with my body image but not as comfortable as I usually feel....._____

c) definitely less satisfied with my body image than I usually feel....._____

d) not satisfied with my body image but no more dissatisfied than usual....._____

VII. Premenstrual Symptoms Study document

PREMENSTRUAL SYMPTOMS STUDY

The study in which you are being asked to participate is investigating the phenomenon of Premenstrual Syndrome.

If you agree to participate in this study you will be required to monitor various aspects of your behaviour, physical health, and moods over three consecutive menstrual cycles and to complete simple memory tests at intervals throughout the three months.

Specifically: a) at the beginning of the study you will be required to complete a Menstrual Symptoms Questionnaire and an information sheet giving details about your menstrual history

b) at three points in each cycle you will be required to complete the Menstrual Symptoms Questionnaire, a checklist describing your feelings and moods, a checklist describing any physical and behavioural symptoms experienced, and a short test involving simple memory tasks (N.B.: This is not an intelligence test)

Your participation in this study is voluntary and you may withdraw from the study at any time. Your name will not be used on data collected from this study and confidentiality is assured. The data collected from this study will be used only by the researcher.

This study has been approved by the Ethics Committee of Simon Fraser University and is being conducted under the supervision of Dr. Richard Freeman of the Psychology Department, Simon Fraser University.

On completion of your participation in this study you will be paid the sum of $5 by the researcher in appreciation of your assistance in this research.

VIII. Consent Form

CONSENT FORM

I have read the procedures of this study as specified in the document entitled "Premenstrual Symptoms Study".

I understand the procedures to be used in this study and I also understand that I may withdraw from this study at any time.

My signature below certifies that I consent to participate in this study.

NAME.....

SIGNATURE.....

DATE.....

IX. Background Information questionnaire

BACKGROUND INFORMATION

Identification Number.....

Date.....

1. Date of birth..... Age .....

2. Please indicate the date of the first day of your last menstrual flow (or approximate date if not known exactly):

   .....

3. Number of pregnancies (whether carried full term or not):.....

4. Age at onset of first menstrual period:.....

5. Average number of days of menstrual cycle, that is, from the beginning of one menstrual flow to the beginning of the next:

   .....

6. If irregular, that is, the number of days varies greatly, what is the range?

   Ranges from ..... to ..... days

7. Average duration of menstrual flow:

   .....days

8. Are you currently using, or have you ever used oral contraceptives?

   Yes.....

   Never used.....

   If you answered "yes" please indicate dates and duration of all periods of use including current use.....
   .....
   .....
   .....

9. Are you currently using, or have you ever used an intra-uterine device (IUD)?

   Yes.....

   Never used.....

   If you answered "yes" please indicate dates and duration of all periods of use including current use.....
   .....
   .....
   .....

.....2/

10. Are you currently using any medication?

Yes.....

No.....

If you answered "yes" please indicate type of medication and reason taken

.....

.....

.....

11. Have you ever been hospitalized or received any other form of treatment for depression?

Yes.....

No.....

If you answered "yes" please specify when and what type of treatment received

.....

.....

.....

12. Has any member of your family been hospitalized or received any other form of treatment for depression?

Yes.....

No.....

If you answered "yes" please indicate your relationship to this person

.....

APPENDIX B

X. Subscales of Premenstrual Assessment Form

Affective Subscale

1. Have rapid changes in mood (e.g. laughing,crying, angry, happy, etc.).
2. Feel anxious or more anxious.
3. Feel insecure.
4. Feel depressed.
5. Get more enjoyment or excitement out of little things.
6. Feel passive, want others to make decisions, to take charge etc.
7. Have an increased feeling of well being.
8. Tend to feel or be tearful, weep, or cry.
9. Have mood swings from high to low or low to high.
10. Tend to become "hysterical" if something upsets you.
11. Have guilt feelings.
12. Feel "empty".
13. Feel sad or blue.
14. Feel lonely.
15. Have a decrease in self-esteem (i.e. don't feel good about self or feel a failure).
16. Feel worse in morning.
17. Become more sensitive to or intolerant of personal rejection of self or one's work.
18. Feel more affectionate.

Cognitive Subscale

1. Be more easily distracted (i.e. attention shifts easily and rapidly).
2. Feel that you just "can't cope" or are overwhelmed by ordinary demands.
3. Become more forgetful.
4. Feel sense of unreality, like in a dream, unreal, etc.
5. Have difficulty concentrating.
6. Feel confused.
7. Have lowered judgement (i.e. realize judgement was less good than usual when looking back on decisions made during this time).
8. Have a lack of self control.
9. Tend to blame others for problems (personal, at home, work, school, etc).
10. Feel a lack of inspiration or creativity.
11. Have pessimistic outlook.

Behavioural Subscale

1. Tend to have accidents, fall, cut self, or break things unintentionally.
2. Show physical agitation (e.g. fidgeting, hand wringing, pacing, can't sit still).
3. Tend to "nag" or quarrel over unimportant issues.
4. Become violent with people or things (e.g. deliberately break things, hit someone).
5. Tend to become more childlike.

6. Tend to be self-indulgent in use of time, spending money, eating, etc.
7. Have episodes of impulsive behavior.
8. Tend to smoke more, drink more alcohol or use "drugs of abuse" (e.g. "pot", "speed", etc.).
9. Pick at, bite or scratch skin, or bite fingernails.
10. Have outbursts of "irritability" or bad temper.
11. Family or friends know "she is in one of her moods today".
12. Act spiteful.
13. Tend to be overtalkative.
14. Have increased sexual activity or interest (fantasy, with self, with others).
15. Have increase in activity, organization, efficiency, or involvement socially, at home or work.
16. Stay at home more.
17. Tend to avoid social activities.
18. Have lowered performance, output, efficiency or ease, in tasks at work, at home, or with hobbies, etc.
19. Miss time at work because of premenstrual changes.
20. Pay less attention to physical appearance.
21. Drink more coffee, tea, or cold drinks with caffeine (cola, rootbeer, etc.).
22. Do less housework (cleaning, care of clothes, etc.).
23. Spend less time at leisure activities (hobbies, TV, reading, etc.).

Physical Subscale

1. Have decreased energy or tend to fatigue easily.
2. Sleep too much or have difficulty getting up in the morning or from naps.
3. Have loss of appetite.
4. Have pain, tenderness, enlargement, or swelling of breasts.
5. Have headaches or migraines.
6. Have nausea or vomiting.
7. Have feelings of weakness.
8. Have "flare-ups" of allergy, breathing difficulties, stuffy feeling, or watery discharge from the nose.
9. Have periods of dizziness, faintness, vertigo (room spinning), ringing in the ears, numbness, tingling of skin, trembling, lightheadedness.
10. Feel pounding of heart or have rapid heartbeat.
11. Feel need to urinate more frequently or have an increased amount of urine.
12. Become constipated.
13. Have tired legs (weak, sore, tremble).
14. Tend to have backaches, joint and muscle pains or stiffness.
15. Urinate less frequently or in lesser amounts.
16. Have weight gain.
17. Have relatively steady abdominal heaviness, discomfort or pain.
18. Have trouble sleeping.
19. Have intermittent pains or cramps in the abdomen.

20. Have skin problems such as acne, pimples, etc.
21. Have edema, swelling, puffiness, or "water retention".
22. Feel bloated.
23. Have an increase in appetite or tend to eat more.
24. Feel cold and/or more sensitive to temperature change.
25. Have bursts of energy or feel more energetic.
26. Feel pain or discomfort during intercourse.
27. Have "flare up" or appearance of cold sores, diarrhea, belching, spontaneous bruises, varicose veins, chest pain, hemorrhoids, numbing, tingling, epilepsy ("fits"), sensitivity of skin to sun.
28. Have an increase in eye problems or changes in vision (e.g. sty, redness, watering, mistiness, discomfort, sensitivity to light).

Items on PAF not included in subscales:

1. Have decreased ability to coordinate fine movements, poor motor coordination or clumsiness.
2. Have a feeling of malaise (i.e. general, non-specific bad feeling or vague sense of mental or physical ill-health).
3. Feel jittery or restless.
4. Think of what it would be like to do something to self, like crash the car, wish to go to sleep and not wake up, or have thoughts of death or suicide.
5. Feel less desire to talk or move about (it takes an effort

to do so).

6. Feel dissatisfied with personal appearance.
7. Take naps during the day or have an overwhelming desire to do so.
8. Feel under stress.
9. Feel "at war" on awakening or have complaints or outbursts about old irritants.
10. Tend to be intolerant or impatient or lose the ability to respond to or understand the faults, needs or errors of others.
11. Tend to brood over unpleasant events.
12. Have less sexual interest (fantasy, self, others).
13. Want to be alone.
14. Crave specific foods (sweets, bread, chocolate, pickles, etc.).
15. Tend to seek advice more often, or about simple matters.

XI. Nowlis Mood Adjective Check List Factor Items

Aggression

Defiant, rebellious, angry, grouchy, annoyed, fed-up.

Anxiety

Clutched up, fearful, jittery.

Surgency

Carefree, playful, witty, lively, talkative.

Elation

Elated, overjoyed, pleased, refreshed.

Concentration

Attentive, earnest, serious, contemplative, concentrating, engaged in thought, intent, introspective.

Fatigue

Drowsy, dull, sluggish, tired.

Social Affection

Affectionate, forgiving, kindly, warm-hearted.

Sadness

Regretful, sad, sorry.

Skepticism

Dubious, skeptical, suspicious.

Egotism

Egotistic, self-centred, aloof, boastful.

Vigour

Active, energetic, vigourous.

Nonchalance

Leisurely, nonchalant.

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