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COGNITIVE BELIEFS

AND

PREMENSTRUAL CHANGE

by

DABBY FONG

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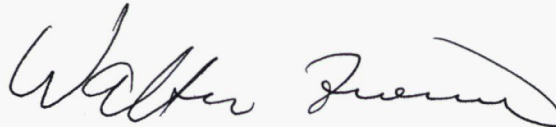
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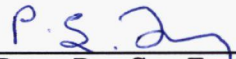
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THE UNIVERSITY OF CALGARY

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to
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Dr. W. W. Zwirner, Supervisor
Dept. of Educational Psychology

Dr. P. S. Fry
Dept. of Educational Psychology

Dr. S. Ramcharan
Dept. of Community Health Science

Date: July 18, 89.

ABSTRACT

This preliminary research study investigated the relationship between cognitions, beliefs and premenstrual changes among 37 menstruating women across four assessments over a two menstrual cycle period. Initial assessment on the Premenstrual Assessment Form (PAF) and the Millon Behavioral Health Inventory (MBHI) showed the group mean scores to reflect a normal population. The women were compared on the PRISM Calendar, the Cognitive Style Test (CST), the Rational Behavior Inventory (RBI), the Dysfunctional Attitude Scale (DAS), the Multiple Affect Adjective Check List (MAACL), the Derogatis Stress Profile (DSP), and the Life Experiences Survey (LES). A two way factor analysis of variance with repeated measures design was used as an exploratory data analysis technique.

Analyses of the data demonstrated partial support for a positive relationship for this sample of women between dysfunctional cognitions and premenstrual change.

Women who believed they had PMS reported significantly more physiological and psychological symptom changes than nonbelievers on the PAF and CST measures.

Women who obtained high scores on the DAS (greater dysfunctional attitudes) indicated more symptoms on the PRISM Calendar than the women who obtained low scores on the DAS.

The high DAS scorers also exhibited more anxiety on the two dependent measures, the MAACL and the DSP, than the low DAS scorers. Hostility and depression was also found to occur with greater frequency in the high DAS score group than the low DAS score group but only on the DSP measure.

The women who obtained low RBI scores (greater degree of irrational beliefs) demonstrated a higher level of anxiety than the high RBI scorers on both the MAACL and the DSP measures. The low RBI scorers also demonstrated more hostility and depression than the high RBI scorers when measured on the DSP.

The group of women who obtained high CST scores (greater degree of cognitive distortions) exhibited a greater frequency of anxiety than the low CST scorers on the MAACL and the DSP measures. The high CST scorers were also found to show more hostility and depression than the low CST scorers on the DSP measure.

Life experiences as assessed by the LES did not appear to be a differentiating factor between the high and low score groups (DAS, RBI or CST). Perceived stress as measured by the DSP was significantly different between the high and low score groups; that is, the women in each of the high distortion groups reported more stress than the women in the low distortion groups throughout the cycle phase. The findings provide tentative support for the view of cognitions as a mediating factor in the experience of premenstrual change.

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INTRODUCTION

From a cultural and historical perspective menstruation has been viewed with awe, disgust and mostly fear since the earliest of time in many cultures. The treatment of and attitude towards menstruating women is well documented (Rubinow, Hoban, Roy-Byrne, Grover & Post, 1985; Abraham, 1981; Barker-Benfield, 1976; Ehrenreich & English, 1978; Golub, 1985; Shuttle & Redgrove, 1986; Chesler, 1983; Showalter, 1985; Kerstner, 1986; de Bouvier, 1974). These authors indicate that historically the view of menstruation has been far from positive.

Historical annals are replete with descriptions of the affective/behavioral changes of the woman preceding her menstrual flow or during the menstrual flow. In 1835, Pritchard observed that in:

> "Some females, at the period of catamenia, undergo a considerable degree of nervous excitement: morbid dispositions of mind are displayed by them at these times, a wayward and capricious temper, excitability in the feelings, moroseness in disposition, and a proneness to quarrel with their dearest relatives, and sometimes a dejection of mind approaching to melancholia."

(Rubinow, et al, 1985, p.27).

In 1890 Icard composed a list of mood and behavioral disorders which occurred during menstrual flow such as kleptomania,

pyromania, dipsomania, homicidal mania, suicidal mania, erotomania, nymphomania, delirous insanity, impulsive insanity, morbid jealousy, lying, calumny, illusions, hallucinations and melancholia (Rubinow, et al, 1985).

Premenstrual changes, of course, have occurred for as long as women have had the experience of menses. The phenomenon of changes occurring premenstrually has been recorded as far back as the Greeks but only in the last fifty years have there been any scientific studies. Much of the research in this area has focused primarily on finding a bio-medical etiology for PMS. Some of the proposed bio-medical sources for the etiology of PMS include the following:

1) Hormonal - estrogen/progesterone ratio
      - progesterone withdrawal
      - prolactin
      - androgens/androgenic steroids

2) Mineralocorticoid
      - aldosterone

3) Monoamine Neurotransmitters
      - catecholamine
      - serotonin

4) Endogenous opiates

Examination of past and present investigations show findings that are inconclusive (Reid, 1985; Reid & Yen, 1982; Keye, 1985; Freeman, Sondheimer, Rickels & Weinbaum, 1985; Chihal, 1987). The past ten years have seen an increase in investigations which have attempted to analyse why the bio-medical model is incomplete. These suggest that perhaps psycho-social concomitants have been sorely neglected. This

does not detract from the research done to date in the bio-medical sphere, but what information has been collected may be better understood when studied along with the psycho-social concomitants.

Psycho-social factors such as cognitions, beliefs, perception, attitudes and external stressors (such as life events) may have a significant effect on premenstrual change. Thus, how a woman perceives herself and her environment may be as equally impinging on the bodily experience of menses as the actual physical change itself. Current interest in this area has resulted in a plethora of research exploring the relationship(s) between the psycho-social realm and that of the menstrual cycle, particularly the premenstrual phase.

A major symptom often found in the premenstrual phase is affective change which is usually dysphoric in nature (Rubinow, Roy-Byrne, Hoban, Grover, Stambler & Post, 1986). Although there are quite clear biochemical and physiological concomitants of menstruation which may be causative, there is increasing speculation that cognitive distortions and dysfunctional beliefs are equally important in the development of negative affective states. Some authors would agree that an interactional model is appropriate in the development of negative affective states (Beck, Rush, Shaw, & Emery, 1979; Sommer, 1983; Vila & Beech, 1980; Rea, 1988; Goudsmit, 1988; Morse & Dennerstein, 1988; Asso, 1983). This view recognizes the importance of reciprocal interactions between factors such

as cognition, attitudes and biomedical status (Abraham, 1981; Clare, 1985a, 1985b; DeJong, Rubinow, Roy-Byrne, Hoban, Grover & Post, 1985; Halbreich & Endicott, 1985).

Recently, researchers have indicated that the severity of depression and other negative emotions appears to vary with the frequency of negative cognitive distortions and the presence of negative schemas or beliefs which may be activated by physiological mechanisms (Beck, 1976; Koeske & Koeske, 1975; Abramson, Seligman & Teasdale, 1978; Beck & Greenberg, 1974; Morse & Dennerstein, 1986). If this is the case for premenstrual changes it would be important to assess the relevance of negative beliefs and concomitant distortions of thought to the severity of depressive symptomatology prior to and during the premenstrual phase. Differences in women experiencing or not experiencing premenstrual distress might be attributable to their cognitive status. While some researchers have noted the impact of life events (Siegal, Johnson & Sarason, 1979), this is in no way antagonistic to the aforementioned view since the negativity of these life events would be modulated by the negative schemas already in place.

Before proceeding with a review of the literature it will assist the reader to be aware of some of the definitions and terminology used by various researchers in the study of premenstrual change. The following is a brief highlight of some of the more commonly used definitions and terms found in

the literature.

DEFINITIONS

In the past fifty years numerous definitions and terms
have been used by researchers to describe the changes which
occur in some women prior to the onset of menstrual bleeding.
Frank (1931) first coined the term PREMENSTRUAL TENSION (PMT)
to describe what he observed as "a worsening of a group of
symptoms or the symptoms appeared prior to the onset of
menses" (Haskett, Steiner, Osmun & Carroll, 1980). The
predominant symptoms were described as being tension or
tension related. Greene and Dalton (1953) introduced the term
PREMENSTRUAL SYNDROME (PMS) for what they felt to be a single
premenstrual condition with a variety of symptoms including
premenstrual tension (Dalton, 1983). According to Dalton
"Premenstrual Syndrome is the recurrence of symptoms in the
premenstruum with complete absence of symptoms in the
postmenstruum." (Dalton, 1985, p.14). This definition also
requires that the symptoms recur for at least three cycles,
that the symptoms are present in the premenstruum and that
there is a complete absence of symptoms in the period
following menses in the follicular phase.

Moos (1968) suggested that the plural 'syndromes' might
more aptly reflect what he felt to be several separate
complexes found in the typology. This concept was followed

up by Abraham (1981), using the term PREMENSTRUAL TENSION
SYNDROMES, or PMTS. Abraham noted that most of the symptoms
manifested were not commonly shared, that is not all symptoms
were experienced by most women, and that as such represent an
"exacerbation of a preexisting condition." (Abraham, 1981,
p.11). When he excluded those women experiencing mild
symptomatology he found that he was able to categorize
premenstrual sufferers according to four subgroups based on
the predominant symptoms experienced (See Table 1).

To qualify into one of the four groups, PMT-A, PMT-C,
PMT-D, or PMT-H, the symptoms experienced must be moderate to
severe during the luteal phase (week preceding the onset of
menses) and absent or mild during the follicular phase (week
following the cessation of menses). Abraham also proposed that
in the pathophysiology of PMT, stress plays a significant role
in the etiology of PMT.

Steiner, Haskett and Carroll (1980) argued that
premenstrual tension syndrome (PMTS) as a research focus
suffered from a lack of consensus as to what criteria to use.
To adequately delineate PMTS from other pathophysiology they
used a strict inclusion criteria to devise what they
considered to be a valid research diagnostic criteria for the
evaluation of PMTS (see Table 2). Essentially the criteria
involves only the most severe cases of PMT and excludes those
who suffer mild to moderate symptoms.

Table 1. Premenstrual Tension Syndromes

PMT-A   Chief complaint is of anxiety,irritability, and
nervous tension. Begins as early as mid cycle,
becomes progressively worse during luteal phase and
improves with onset of menses. Sometimes mild to
moderate depression occurs during the luteal phase.
This is the most common subgroup of PMT.

PMT-H   Premenstrual sensation of weight gain abdominal
bloating and tenderness, breast congestion and
mastalgia, and occasionally edema of the face and
extremities are characteristic of this subgroup. The
weight which is gained is not completely lost with
menses, this is in relation to age. Second most
common subgroup.

PMT-C   Predominant to this subgroup is premenstrual
increased appetite, craving for sweets, with
subsequent ingestion of large amounts of refined
sugar, followed later by fainting spells, fatigue,
palpitation and headache. Cravings appear to occur
during stressful or at least perceived stressful
situations.

PMT-D   This subgroup occurs the least frequently.
Symptoms include premenstrual depression,
withdrawal, thoughts of suicide followed by attempt
at suicide, lethargy, difficulty verbalizing,
confusion, incoherence. This subgroup generally does
not seek aid or attention but are brought for help
by concerned relatives or friends. Psychiatric
consultation is advised.

(summarized from Abraham,1981)

Another difficulty with such a rigid criteria is that a large proportion of women are overlooked, mainly those who experience the physiological changes as more problematic. Its uses as indicated in the criteria are limited to a psychiatric population.

Table 2.   Criteria for PMTS

_____

PRIMARY RECURRENT PREMENSTRUAL TENSION DISORDER

This category is applied to female subjects in their fertile years who do not currently meet the criteria for any other psychiatric disorder.

The psychological and behavioral symptoms included in this disorder frequently occur in association with physical premenstrual symptoms, e.g. painful or tender breasts, headaches, swelling of abdomen, breasts or ankles, with water retention, weight gain, etc. These are not necessary for the psychiatric diagnosis.

(A through D are required).

A.   At least 5 of the following are required for definite and 4 for probable as part of a current   episode.

1.   Irritable, hostile, angry, short-fused.
2.   Tense, restless, jittery, upset, high-strung, unable to relax.
3.   Decreased efficiency, fatigue.
4.   Dysphoric, marked spontaneous emotional lability, crying.
5.   Lowered motor coordination, clumsy, prone to accidents (cut finger, break dish, etc.)
6.   Distractable, confused, forgetful, difficulty in concentration, lowered judgement.
7.   Change in eating habits (cravings, overeating, etc.)
8.   Marked change in libido.

B.   Overall disturbance is so severe that at least one of the following is present:

1.   Serious impairment socially, with family, at home, at school, or work.
2.   Sought or was referred for help from someone or took medication (especially tranquilizers and/or diuretics) at least once during a premenstrual period.

C.   Premenstrual dysphoric symptoms for at least the six preceding menstrual periods.

D.   Symptoms only during the premenstrual period with relief soon after onset of menses.

(continue...)

SECONDARY RECURRENT PREMENSTRUAL TENSION DISORDER

This category is applied for subjects who meet the criteria A through D for Primary Recurrent Premenstrual Tension Disorder but at the same time meet the criteria for another psychiatric disorder.

N.B. Some women previously given the diagnosis Intermittent Depressive Disorder, Minor Depressive Disorder and/or Labile Personality may now be more accurately classified as having Primary Recurrent Premenstrual Tension Disorder.

(reprinted from Steiner, et al, 1980, p.185)

Halbreich, Endicott, Schacht and Nee (1982) utilize the term PREMENSTRUAL CHANGES or PMC to reflect the variability of dimensions of premenstrual syndromes as opposed to a single entity. To differentiate premenstrual changes from chronic symptoms these authors stipulate that the symptoms or changes occur during the premenstrual period, that the symptom(s) does not exist in the same form or level of severity immediately prior to the premenstrual period, and that the symptom(s) disappears or returns to the usual state or level with the onset of menses.

This brief review by no means covers the gamut of terms used in investigating or diagnosing the changes that occur premenstrually as indicated by the literature (Sampson, 1988; O'Brien, 1987).

For the purpose of this research premenstrual change constitutes those changes which occur during the premenstruum,

occur cyclically, and cease or diminish in severity with the onset of menses. The use of this phrase acknowledges that not every women is severely incapacitated during this phase of the menstrual cycle but that the levels of change are still impinging upon each individual. Thus, the term does not necessarily denote a pathological condition but rather reflects the psycho-physiological fluctuation(s) which are cyclical. In this regard the change may be positive (Logue, Moos, 1988) as well as negative (although it is usually described as negative). The use of the term premenstrual change does not constitute a diagnosis within the framework of this study.

TERMINOLOGY

The following are some of the more commonly used terms in reference to the menstrual cycle. The diagram in Figure 1 will hopefully assist the reader in understanding the time frame with regards to the terms used.

Mense(s) - the event of menstrual blood flow. Also referred to as menstruation. The onset of menstrual flow is generally demarcated as day 1 of the menstrual cycle (and is of 4-7 days duration).*

Follicular Phase - this phase of the menstrual cyle occurs each cycle after the cessation of the menstrual flow (days 6 to 12)* and ends approximately midcycle.

- also is commonly regarded as 'symptom free' phase.

Ovulatory Phase - this phase generally occurs midcycle, (between days 13 and 17)* following the follicular phase and prior to the luteal phase.

Luteal Phase - this phase of the cycle occurs about day 14 or following the ovulatory phase (and generally of 4 to 6 days duration)*.

Late Luteal Phase - this phase of the cycle occurs prior to the onset of menses (and generally of 3 to 7 days duration)*.

Intermenstrual Phase - this phase of the menstrual cycle has been used by researchers to denote 1) the time about 2 weeks after the onset of menses, starting on the 15th day of the cycle (Golub, 1976), 2) the time about 5-6 days after the cessation of menses (Dickson-Parnell & Zeichner, 1988) and 3) the remainder of the cycle which did not include the menstrual week or the week preceding menses, days 8 to 21 (Moos, 1968).

Premenstrual Phase - also referred to as premenstruum, luteal phase and late luteal phase. This phase of the cycle occurs (about 1 to 7 days)* before the onset of menses. Usually demarcated as from days 21 on until the onset of menses.

Perimenstrual Phase - term used to indicate (the 5-7 days)* before the onset of menses and (the 5-7 days)* following the onset of menses. Thus this phrase is used to include the premenstrual and menstrual days of the cycle.

The diagram as shown in Figure 1 is based on an idealized 28 day cycle, thus, the reader should be aware that the duration of each phase may be longer or shorter for each particular women. Also women may experience shorter cycle lengths (21 days duration) to longer cycle lengths (40 days duration); thus, the diagram is merely to depict the chronology of the cycle phase and offer an idealized time frame in order to facilitate the investigation of this study.

The diagram does not suggest that women who differ in terms of cycle phase duration or cycle length are 'abnormal', nor is it suggested that all women should be within the limitations of the idealized framework.

FIGURE 1

Menstrual Cycle Phases

CYCLE DAYS	MENSES	FOLLICULAR	OVULATORY	LUTEAL	LATE LUTEAL	MENSES
	1	7	14	21	28	35
	MENSES	INTERMENSTRUUM			PREMENSTRUUM	MENSES
					PERIMENSTRUUM	

* The days given are based on an idealized average 28 day menstrual cycle.

The focus of this study will be to explore the interactions between cognitive beliefs and premenstrual changes. Specifically the cognitions, affect and life events in relation to premenstrual changes.

Chapter Two of this thesis is the literature review which will provide an over-view of the psycho-social factors investigated in this study. The purpose and rationale of the study along with the hypotheses conclude Chapter Two. Chapter Three outlines the methodology section. Included is information pertaining to the subjects, procedure, the experimental design, and the various questionnaires to be used. Chapter Four will present the results of the research investigation. The relevant data will be in tables and identified according to the hypothesis tested. Chapter Five will discuss the results obtained in this study as well as explore some of the implications for future research and treatment.

CHAPTER TWO

REVIEW OF THE LITERATURE

AFFECTIVE CHANGES AND PERSONALITY

The symptoms associated with premenstrual change continues to expand with every investigation. Since the initial investigations of Frank (1931), symptomotology has increased to well over 150 symptoms in both the physiological and psychological spheres (Dalton, 1985; Debrovner, 1982; Moos, 1968; Steiner, Haskett, Carroll,1980; Halbreich, Endicott, Schacht, Nee,1982). A partial listing of some of the symptoms combined from the review is available in Appendix A. Despite the presentation of both physiological and psychological factor(s), affective or mood symptoms have been noted by many researchers as most reported and often the most dominant (Perr, 1958; Kinch, Robinson, 1985; Ivey, Bardwick, 1968; Coppen, Kessel, 1963; Rees, 1953). This is hardly surprising since the affect encompasses all emotion, feeling and moods which by and large contribute to behavior. Behaviors manifested in relation to premenstrual changes are well documented in the literature and are briefly reviewed here to provide better understanding of the ramifications of affective change.

In 1956 MacKinnon and MacKinnon reported that female

deaths from suicide or accident were much more frequent in the premenstrual phase than other times. Criminal acts, and/or acts of violence have also been related to the premenstruum (Dalton, 1980, 1985). Glass, Heninger, Lansky and Talan in 1971 investigated the relationship of menstrual phase with women presenting for psychiatric emergency service. They report that twice the expected frequency presented during the premenstrual phase compared to other phases. Also reported was that hostile-suicidal ideation and actual suicide attempts occurred at three times the expected rate premenstrually.

Research of this nature has not gone unchallenged. For example, Clare (1985) in reviewing, highlights many of the methodological problems which have biased much of the past research. Furthermore, he declared that to date there has been no consistent finding(s) linking affective, physical or behavioral changes and subsequent adverse behavior to any particular menstrual phase. He does nevertheless acknowledge that a small number of women may experience a biological vulnerability. However Clare points out that perceived 'changes' are distinct from 'symptoms' and possibly "the extent to which a woman experiences various premenstrual changes as complaint or illness may depend "more on her basic personality and the circumstances in which she experiences the cyclical changes than on the underlying cyclical mechanism" (Clare,1985a). This view would certainly be consistent with that of this study, specifically that underlying cognitive

schemas and associated negative self talk influence the perception of circumstances and experiences and if continued unchallenged become part of the 'basic personality'.

PERSONALITY

Personality concomitants have been investigated by various authors. Rees (1953) found that PMS occurred more frequently in neurotic subjects as opposed to 'normal' subjects and that a correlation existed between intensity of PMS and neurotic predisposition. However, he also noted that some of the 'neurotic' women who improved affectively with psychotherapy did not show improvement in their physical symptomatology. This finding would provide support for the view that beliefs and negative self talk rather than neurotic disposition were correlated with mood changes. That is, psychotherapy would assist in reducing cognitive distortions (negative self talk) and eventually challenge underlying negative schemas with subsequent improvement in the affective (emotional or feeling) state. Coppen and Kessel (1963) in their research on menstruation found that some psychological symptoms were worse premenstrually, correlating significantly with the neuroticism scale used. However, they cautioned that a high neuroticism score need not necessarily imply a direct relationship to PMS.

Gruba and Rohrbaugh (1975) administered the MMPI and

Moos' Menstrual Distress Questionnaire (MDQ) to a group of 60 undergraduate women. The results, consistent with Coppen and Kessel, suggested that negative affect (tension, irritability, depression) correlated with several MMPI indices of neuroticism for symptoms experienced before but not during the menstrual flow. As well they found the correlation between MMPI variables and pain symptoms to be higher premenstrually than menstrually. However they also report that the correlation between the same MMPI indices and menstrual pain also approached significance thus reducing any differentiation between menstrual and premenstrual.

Chuong, Colligan, Coulam, Bergstralh (1988) attempted to evaluate the psychological status of PMS women with non-PMS women using the MMPI and the MDQ. Both the MMPI and the MDQ were administered twice, once during the follicular phase and once during the luteal phase. The clinical findings indicated that the PMS group differed in feelings of interpersonal oversensitivity and the increased likelihood of having one's feelings hurt by others (in follicular phase). The mean profile of the PMS group was also significantly different from the non-PMS group in the luteal phase in two ways. For some of the PMS women the profiles indicated an exacerbation of the symptoms they reported in the follicular phase, while for the other PMS women symptoms emerged during the luteal phase which were absent in the follicular. The mean profile of the PMS group during the luteal phase was depicted by " significant

feelings of overall stress, tension, depression, anxiety, nervousness, oversensitivity, and social discomfort" (Chuong, et,al.1988). Thus the study found two subgroups within the larger PMS group. The first group showed insignificant MMPI values during the follicular phase but with dysfunctional levels during the luteal phase. The second of the subgroups had psychological stress and dysfunction throughout the cycle with exacerbation during the luteal phase. The findings from this study are very suggestive of concommitant factors in premenstrual affective change, especially the role of cognitions.

Dimitriou and Didangelos (1980) investigated premenstrual tension (PMT) and personality and found that subjects with severe PMT symptomatology reported significantly higher scores on the Eysenck Personality Questionnaire (EPQ) neuroticism scale. However their results indicated that while 76% showed PMT symptomatology, 52% reported they had PMT, thus, some of the subjects did not report PMT even though they were assessed as having the symptoms. Such a finding raises the question of the influence of mediating factors such as beliefs and cognitive distortions rather than support a relationship between neuroticism and PMS personality profile.

Marriot and Faragher (1986) investigated symptoms in relation to the menstrual cycle using a group of women without pre-existing menstrual complaint. Subjects were informed that the study concerned the menstrual cycle and no reference was

made to PMT or PMS; 32 copies of the MDQ were distributed to each subject, one completed for each day to be mailed back upon completion. The results indicated that women who have not reported pre-existing menstrual complaints nonetheless report an increase in both physiological and psychological symptoms using concurrent daily measures of state. The reported changes occurred in the week prior to menstruation and the same changes returned to 'normal' levels three to five days after the onset of menstruation. This is consistent with the view that premenstrual changes occur to all women who experience menstruation, and that perhaps the final diagnosis of PMS is dependent upon the impact and severity the symptoms have for the particular woman to seek treatment.

Van Den Akker and Steptoe (1985) performed a study similar to that of Marriot and Farragher using 100 volunteers and having them complete the MDQ for 35 days. Unlike the above study, the purpose of this study was disguised from the participants. Their results indicated that significantly more symptoms were reported in the premenstrual and menstrual phases than during the follicular phase, a finding which is consistent with the preceding study. In addition, they found symptom reporting to be higher in all phases of the cycle in women with high trait anxiety, as indexed by the General Health Questionnare thus supporting their hypothesis that premenstrual sufferers experience a "tonically elevated level of symptomatology" (Van Den Akker, Steptoe, 1985). These

authors seem to imply that premenstrual sufferers report/experience more symptoms because of their higher level of trait anxiety. This implication is unsatisfactory since it does not suggest how anxiety influences the experience of 'more' symptoms, and as Goudsmit (1983) pointed out in her research, the concept of trait as a stable personality variable was not found, rather trait anxiety was found to alter throughout the cycle phase.

Stout and Steege (1985) undertook a psychological evaluation of 100 women who were seeking evaluation for PMS. Included in the evaluation was use of the Minnesota Multiphasic Inventory (MMPI), Beck Depression Inventory (BDI), and Short Marital Adjustment Scale (MAS) during the follicular phase of the menstrual cycle. The BDI was repeated in the luteal phase of the menstrual cycle. The results of the MMPI did not lend support to any theory of 'personality type', rather the majority of the group had normal MMPIs. When considering the number of premenstrual physical changes and MMPI items pertaining to somatic complaints, they found only 3% of the women could be described as individuals who were somatizers. The results of the BDI indicated that the majority of the women had scores below criteria (not clinically depressed) for both phases of the cycle. However 26 women who scored below significance in the follicular phase responded at a level during luteal phase indicative of warranting treatment. Thus the authors suggest that a subgroup of women

had clinically significant continuous depression regardless of the superimposed premenstrual changes. This explanation is inadequate especially in view of the fact that these 26 women were asessed to be not clinically depressed during the follicular phase. It would seem that in fact cognitive distortions were present and correlate with premenstrual changes simply by the changed (from not depressed to depressed) BDI scores in the luteal phase.

The purpose of the brief review of personality and premenstrual changes was to illustrate the possibility of underlying mediating processes in the experience of premenstrual change. This by no means covers the extent of psychological interpretation as indicated in 1931 by Karen Horney who postulated that repressed sexual desire and power was the underlying mechanism for PMS (Goudsmit, 1988; Clare, 1985) and by Peskin (1968) who interpreted the somatization of the menses in terms of ego psychology. The reader is referred to the above authors for further elaboration as this is beyond the scope the present thesis. What is noted here is that none of the studies were able to provide empirical evidence for a "personality" profile common to all premenstrual sufferers. Thus, it is suggested that personality alone cannot explain premenstrual changes. What was shared by the studies was that a subgroup of women exist who experience an exacerbation of symptoms premenstrually.

AFFECTIVE CHANGE

Depression and the accompanying adjectives used to describe this state are frequently referred to in the literature. Dysphoria (generalized ill-feeling) is commonly associated with the premenstrual state in studies of the premenstruum and affect. As depression and dysphoria are not unfamiliar to psychiatric morbidity, the investigation of this realm holds much interest as the wealth of often contrary investigations reveals.

Haskett, Steiner, Osmun, and Carroll (1980) studied a group of women who were severely affected by changes in the premenstruum, and who were free of physical or psychological pathology at all other times. Using the strict inclusion criteria, outlined previously in Table 2, they selected 42 women from 254 volunteers. The criteria confirmed that all the women involved suffered from a severe premenstrual dysphoria and that the disturbance was clearly a time limited phenomenon. Using a battery of questionnaires, Menstrual Distress Questionnaire (MDQ), Multiple Affect Adjective Check List (MAACL), Visual Analogue Scale, State-Trait Anxiety Inventory (STAI), Hamilton Depression Scale and the Carroll Depression Scale, the authors attempted to assess changes between the follicular and the luteal phases of the menstrual cycle.

The scores of the MDQ in the follicular phase indicated a group of women with much higher results than obtained

originally by Moos (1968) in his development of the MDQ. This was expected since these authors used a much more strict inclusion criteria suggesting the severity of this particular group of women. The MAACL indicated a change between the follicular and the luteal phase in the dimensions of anxiety, depression and hostility however there was no predominance of any one of these dimensions. Despite the severe inclusion criteria this study also found a subgroup of women who scored high on the MDQ (follicular) whose changes were more weighted towards physical discomfort and incapacity with associated depression. The authors referred to this group as "manifesting subclinical characterological, neurotic, or reactive disturbance" which may promote the belief that depression was characteristic of PMTS (Haskett, et el, 1980) and they further concluded that the nonspecific problems of this subgroup are exacerbated during the premenstruum and subsequently blended with the more specific symptoms of PMTS.

Although the authors attempt to delineate the group of severe premenstrual sufferers, even with the inclusion criteria there exists the subgroup of women who experienced a premenstrual worsening of pre-existing symptoms. This is consistent with the other studies reviewed. These authors conclude that PMTS is not typically a syndrome of anxiety or depression in the usual diagnostic (clinically evaluated) sense nor is this syndrome a clinical model of the recurrent affective disorders. What is suggestive is that the subgroup

of women may have had a higher frequency of cognitive distortion, relative to the high degree of physical discomfort reported in the follicular phase.

Halbreich and Endicott (1985) hold a contrary view in that they do suspect an association between dysphoric premenstrual changes (PMC) and depressive disorders. In the course of their investigation they found that some subtypes of depressive PMC resemble some subtypes of affective disorders (Halbreich, Endicott, Schacht, Nee, 1982; Halbreich, Endicott, Nee, 1983). Specifically they argue that women rarely experience premenstrual endogenous depression. However, the premenstrual dysphoric changes resemble other subtypes of a depressive disorder, principally atypical depression (hypersomnia, increased appetite, rapid mood changes), anxious-agitated depression (anxious, jittery, restless) and hostile depression (irritability, anger, impatience). The manifestations are exhibited at levels of severity and impairment usually lower than that for a diagnosed 'disorder' but the characteristics are still clearly recognizable for a relatively brief period of time in the follicular phase.

Using the Schedule for Affective Disorders and Schizophrenia (SADS), the Research Diagnostic Criteria (RDC), Premenstrual Assessment Form (PAF) and Daily Ratings Form (DRF) on a total of 170 women they found several associations. First, they found that women with a life-time diagnosis of

Major Depressive Disorder (MDD) also met the PAF criteria for premenstrual depression. Secondly, only a few of the women who were never mentally ill reported having depressive syndrome on the PAF. Thus, they found an association existed between premenstrual depression and major depressive disorder in 84% of the women. In conclusion they suggest that the association between premenstrual dysphoric changes and life-time diagnosis of Major Depressive Disorder is such that PMC may be a risk factor for the development of a major depressive disorder in the future.

This contention is supported by Rubinow, Roy-Byrne and Hoban (1985) in their review of menstrually-related mood disorders. They suggest that even though premenstrual syndromes and psychiatric illness are clearly separable, there is considerable overlap between the two. The frequent concurrence of affective disorders and PMS suggests that the menstrually-related mood changes may interact with or serve as a model for affective disorders (Rubinow, et al, 1985, p.35). One possible interaction may be that of serving as a sensitizing stimulus. Cited as an example was an experiment by Post and Ballenger (1981) which demonstrated that the repetitive administration of electrical stimulus or a subictal chemical produced (over time) effects and profound long term changes in brain activity and behaviour. The authors (Rubinow, et al, 1985) postulated that the repetitive experience of premenstrual dysphoria might, in some who are biologically

vulnerable, allow for the gradual development or expression of an affective illness based on these sensitizing-stimuli mechanisms. If this postulation holds merit, one could hypothetically extend this view towards the cognitive schema which an individual acquires, especially regarding the concept of helplessness/hopelessness (Seligman, 1981).

Malikian (1986) investigated premenstrual changes in depressive mood, behavior and somatic functioning in patients with depressive disorders using the PAF and daily self-reporting. The results of this study indicated that the subjects generally manifested significant premenstrual intensification of depressive mood, suicidal ideation, social withdrawal, hostility/anger, and somatic functioning. Data obtained from the daily self-ratings showed the most significant difference pre- and post-menstrually. This was generally not found from the retrospective PAF reports. Thus the author concluded that a positive association existed between premenstrual changes and depressive disorders. This was consistent with other authors reporting on the premenstruum and psychiatric morbidity (Parvathi & Venkoba, 1972; Diamond, Rubinstein, Dunner & Fieve, 1976; Janowsky, Gorney, Castelnuovo-Tedesco & Stone, 1969; Kashiwagi, McClure & Wetzel, 1976; Mandell & Mandell, 1967).

Ivey and Bardwick (1967) investigated affective (emotional) fluctuation within the menstrual cycle. Several findings resulted from using the Verbal Anxiety Scale (VAS).

Anxiety was significantly higher premenstrually than at ovulation (14 to 16 days following the onset of menses). Also, consistent themes of hostility, depression and noncoping were manifested in the verbal material (VAS) during the premenstrual phase. The contrary was present during testing at ovulation, that is, anxiety was decreased, self satisfaction over success and perceived ability to cope with a situation were predominant themes. The authors concluded that significant and predictable affective fluctuations occur during the menstrual cycle. In assessing for themes the authors inadvertently also obtained numerous examples of cognitive distortions in their samples. Although this point will be elaborated upon later on, what is emphasized is the evidence that cognitive distortions are present, and occuring concommitantly with affective changes.

Abraham, Mira, McNeil, Vizzard, Fraser and Llewellyn-Jones (1985) conducted an investigation into mood and physical changes during the menstrual cycle. One group of women believed they suffered from premenstrual tension and the other group of women did not feel they suffered from premenstrual tension. Daily self-report forms were used for 105 days. They found that the group who believed they suffered from premenstrual tension were more likely than the non-believer group to show repeatable variations in mood symptoms either premenstrually or perimenstrually. There was no significant difference between believers and non-believers in regards to

consistent changes in mood during the premenstruum. What this finding suggests is that perhaps for the believers, the maladaptive cognition may reflect an exacerbation of underlying cognitive schemas which filter and interprets everyday experiences. This would give rise to the variations observed both premenstrually and perimenstrually. Unfortunately measures of cognition were not employed in this study.

The review thus far has attempted to present various studies which have investigated the affective changes which have commonly been reported in relation to the premenstrual phase. The findings are far from conclusive and often contradictory. However, most of the studies have the commonality of finding a subgroup or group within the larger group which did not follow the criteria of premenstrual syndrome no matter how stringent the criteria (Steiner, et al, 1980) or measurement of personality (Chuong, et al, 1988; Stout & Steege, 1985; Rees, 1953; Coppen & Kessel, 1963). This group appeared to have some characterological or tonically manifested symptoms throughout the cycle when diagnosed as PMS and when they believed they suffered PMS. Such a trend would indicate that cognitive processes may well play an integral role in the experience of premenstrual changes. Before we can extrapolate further on the cognition and premenstrual changes, one needs to explore the possible influence of environmental

factors, such as life events and stress, upon premenstrual changes.

ENVIRONMENTAL FACTORS (LIFE EVENTS AND STRESS)

To date an abundance of literature exists postulating the etiology of premenstrual tension; however, no single biological hypothesis can empirically account for the multi-faceted symptoms experienced premenstrually (Reid, 1985; Reid & Yen, 1982). Subsequently, investigations into environmentally influential factors have increased information suggesting that situational factors can enable one to predict a person's behavior often more accurately than some tests of personality traits (Bandura, 1969; Mischel, 1968). This could certainly then imply that environmental factors which impinge upon the person may subsequently influence mood and behavior to the degree that in some individuals the effect would be more significant than normal biological functioning or even alter the biological functioning (Sturgis, 1982). The influence of bio-chemical environmental factors (pollutants, toxins, etc.) will not be addressed in this present thesis; instead, the reader is referred to a comprehensive overview provided by Rea (1988). The following section will review environmental factors such as stress and life event changes upon premenstrual symptomatology.

Wilcoxen, Schrader and Sherif (1976) performed a study

investigating the relationship between the menstrual cycle and the experience of stressful events and pleasant activities. Three groups, two of women (one group used contraceptives, one group did not) and one male group were used. The subjects were informed that the research was about mood and body awareness. The Menstrual Distress Questionnaire was retitled to read "Body Awareness Questionnaire". All subjects completed daily questionnaires for 35 days. Analysis of data resulted in some interesting findings. The male group was consistently lower than the two female groups (mean scores) in premenstrual and intermenstrual phases (method of random selection of cycle phase for the males was not reported) for factors of mood and physical symptoms. Obviously, this would be expected since males are not known to undergo the same menstrual cycle hormonal fluctuations which seem to contribute to most of these symptoms and moods. The post-hoc analysis found that stress contributed significantly more to the total variance in the factor, Negative Affect, than did cycle and interaction effects combined. The negative mood factors (Negative Affect, Impaired Concentration, Happy-Sad, and Anxiety-Dysphoria) each showed significantly greater association with stressful events than with cycle phase. Thus experience of stressful events appeared to account for more of the variance than did cycle phase for negative mood but not for pain and water retention (again these latter two variables are directly related to bio-chemical changes). This is consistent with studies in the

literature linking life changes (i.e. life stress) to physiological and psychological problems (Dohrenwend and Dohrenwend,1978).

Essentially the conclusions of this particular study suggest that individual differences among women in both groups were significantly striking to suggest the involvement of both physiological variables and environmental events. The increased variances on measures of negative affect and environmental stress, especially during the premenstrual phase would suggest the possibility of the diverse modes of dealing and interacting with the environment. These modes might include such factors as socio-cultural beliefs, perceptions and cognitions which then contribute to individual responsivity. Curiously enough, women not taking contraceptives peaked on measures of negative affect mood during the menstrual phase while women who took contraceptives peaked during the premenstruum and dropped during the menstruum. Two questions are raised from this finding. If the individual differences in the latter group reflected differential hormonal reactions to cessation of the pill, one would presume that the reported somatic symptoms should have increased more than what was obtained, therefore, what would account for the non-reporting of symptoms? Secondly, it is conceivable that women taking contraceptives would be more aware of the oncoming menstrual flow and if this is the case then could anticipatory cognitions influence the experience?

Certainly in the first group, women not taking contraceptives, the women are presumably less aware of the impending blood flow until its ultimate arrival at which point awareness would influence the experience. This view is consistent with that of Vinoker and Selzer (1975) who suggest that the contribution of life events to psychological impairment is mediated by stress that is perceived as undesirable rather than by the change per se.

Siegal, Johnson and Sarason (1979) addressed the relationship between life changes and menstrual discomfort using female college students. Initially using the Life Experience Survey (LES) and a menstruation questionnaire (which was not identified) the authors found that positive life changes and negative life changes (as measured by the LES) were both positively correlated with the number of reported symptoms of menstrual discomfort. However, when comparing the number of symptoms of discomfort reported by subjects above and below the median of both positive and negative life changes, the authors found significantly more reports of symptom discomfort by the subjects above the median on negative life change than below the median. There was no significant difference between the subjects in the reporting of discomfort when separated by median on the positive life change. This latter finding would not be unusual considering that one does not generally associate positive change with discomfort. In conclusion, Siegal, Johnson, and Sarason (1979)

suggest that although the results indicate that negative life change significantly predict menstrual distress in this study, that there are also other variables associated which need to be as yet identified.

Woods, Dery, and Most (1982) examined whether the effects of life events on perimenstrual symptoms were due to operational confounding of the instruments used to measure the dependent and independent variables. This was also a criticism of the previous two studies where differences in parity, age and other demographic characteristics were not assessed since variables such as age and parity have been reported as influencing the incidence of PMS (Dalton, 1985; Norris & Sullivan, 1983). Woods, et al (1982) postulated that perhaps exposure to a stressful context may exacerbate menstrual symptoms. A heterogenous community group of women were given revised versions of the Menstrual Distress Questionnaire (MDQ) and the Schedule of Recent Events (SRE).

Data analysis indicated that several demographic variables were related to both stressful life events and perimenstrual symptoms. High income, being married, and being older were associated with a lower SRE score. The variables age, income, education, having been pregnant, and contraceptive use were found to be negatively associated with perimenstrual symptomatology. Consistent with the two previous studies, this latter investigation found a relationship between life stress and symptoms of premenstrual

and menstrual negative affect, menstrual water retention and menstrual performance impairment. When the health related events were accounted for, the non-health life events scores did demonstrate an effect on premenstrual negative affect, menstrual water retention, and menstrual performance impairment. Furthermore, the relationship between life events and perimenstrual symptoms diminished when the health related components of the total SRE score were controlled for. Their conclusion that stressful life events are related to perimenstrual symptoms is qualified by the particular influence of health related life events (personal injury or illness).

Schmidt, Hoban, and Rubinow (1987) investigated the pattern of reporting of life events in relation to the menstrual cycle. Two groups of women were examined using the Schedule of Life Events (SLE) during the follicular phase and the luteal phase of the menstrual cycle. Results indicated that the prospectively diagnosed PMS group showed a significant increase in negative life events as compared with the control group of asymptomatic women. Furthermore, the PMS group showed significantly more distress associated with events occurring premenstruallly. They conclude that premenstrual syndrome may be interpreted as a model for state dependent perceptual and affective changes, a postulation which implicates the schemata.

Kerstner (1986) investigated career traditionality,

gender role orientation, and life stress contributions to premenstrual symptomatology in a group of professional women. Instruments used were the Bem Sexual Role Inventory (BSRI), Hassles Scale (HS) and the Menstrual Distress Questionnaire (MDQ).

Several results were derived from this investigation. First for all the professional women in the study masculine role (not defined by author) and life stress were significant. That is, the more masculine the gender role, the fewer reported premenstrual symptoms, and the higher their stress, the more reported premenstrual symptoms. Secondly, in the non-traditional career group only, it appeared that increased masculine gender-role orientation and decreased life stress predicted decreased premenstrual symptoms. Third, for the traditional career group only, life stress was a positive predictor of premenstrual symptom reporting while feminine gender-role (culturally defined female behavior) orientation was not. Fourthly, life stress was shown to be positively related to premenstrual symptomatology, but was not related to feminine gender-role orientation.

What the findings suggest is that perhaps a cognitive interactive style is more appropriately involved. This would account for the finding that femininity was not related to reporting of premenstrual symptoms in the traditional career women and also supports the finding that life stress was predictive of premenstrual symptom reporting. Furthermore this

would also contribute to the explanation of why life stress also affected the group of non-traditional career women reporting premenstrual symptomatology.

Pepitone-Arreola-Rockwell, Sommer, Sassenrath, Rozee-Koker, and Stringer-Moore (1981) also investigated the impact of stress and life events in relation to menstrual symptomatology. The subjects were 173 women employed in university (non-faculty) positions. The two groups matched for age were either in high paying positions (HPP) or were in low-paying positions (LPP). The questionnaire devised for this study comprised three sections. The first assessed subjective level of job responsibility, job success and job stress. The second part was health oriented asking about menstrual status and other non-menstrual symptoms. The third and last part, asked the respondents to rate their degree of satisfaction on an eight item life satisfaction list. A second questionnaire, the Recent Life Changes Questionnaire (RLCQ) was also used.

These authors were unable to find a relationship between either objective job stress (based on the assumption that higher paying jobs had potential for greater stress) or subjective job stress (based on how respondents' indicated they felt their jobs to be), nor with the two in combination to reported menstrual dysfunction. There was a trend for the women experiencing moderate subjective stress in both the HPP and LPP group to reporting the largest number of symptoms.

There was a negative correlation between RLCQ scores and the rated life satisfaction, however neither one showed any reliable correlation with menstrual symptomatology. There was an indication that perceived or subjective stress was related to the non-menstrual symptoms, a greater number of symptoms being reported by the women who indicated more subjective stress in both groups. Women who had experienced the greater amount of life change during the past two years indicated more illness, however, despite this difference in life experiences the groups did not differ significantly in their perception of job stress. The results essentially indicated that objective and subjective (job) stress was not sufficient to account for the reported menstrual symptoms. One would propose that the perception of stress and subsequent mechanisms are important in that the women who perceived the most stress (in both groups) also reported the most symptoms, menstrually and non-menstrually.

The concept that perception of stress (life change, event, or job stress) is significant in the development of somatic problems is also supported by the findings from a study by Dickson-Parnell and Zeichner (1988). The authors postulated that "individuals predisposed to the development of chronic back pain and/or who utilize maladaptive coping techniques may respond to these stressors with elevated low back muscle activity" (p.162). The authors studied three groups of women: PMS and severe premenstrual low back pain

(group 1), PMS with moderate premenstrual low back pain (group 2), and a non-PMS group without premenstrually occuring back pain (group 3). The Menstrual Distress Questionnaire was given after each session to evaluate the validity of self-reported premenstrual back pain.

Essentially they found that women with PMS and severe premenstrual low back pain exhibited greater changes in muscle activity in response to personally relevant stressors during the premenstrual phase and that this reactivity was significantly greater than that of the women not reporting back pain regardless of the severity of the premenstrual symptoms. Both groups 1 and 2 (PMS women) reported higher levels of stress than did group 3. They found little correlation between stress, tension and pain, a factor which they acknowledge may be due to the insensitivity of the procedure. That is, subjects may have had variable concepts of what constituted tension, stress or pain. Nonetheless, the findings show that higher EMG changes occurred in the presence of personnally relevant stressors during the premenstruum for all three groups.

The results of this study would suggest that personally relevant stressors seem to influence reactivity, especially EMG activity, but moreover, these particular stressors appear to exacerbate the pre-existing symptom of low back pain. If this is the case, then one would consider that it is the perception of stress (whether life event, job, task, etc.)

rather than the event itself which contributes to the experience. Furthermore, the non-PMS women (group 3) showed lower EMG records on the emotional (E) and premenstrual symptom (P) tasks than the cognitive (C) tasks, which was contrary to groups 1 and 2. Assuming that perception of stress may be a determinant in 'exacerbating' pre-existing symptoms (of PMS) one would postulate that the cognitive schema and related perceptions of the women in group 3 were also different from that of the other two groups.

One study which attempted to examine the role of interactions between personality characteristics and life events was by Robins and Block (1988). These authors postulated that depression arises when a particular type of events or set of events occurs to those who are specifically sensitive or vulnerable to that particular class of events, personality dimensions being sociotrophy and autonomy. Thus, for example, those individuals for whom these dimensions are salient will be more sensitive to perceived lossess or threats of loss within that domain. The highly sociotrophic individual may develop depression in response to perceived loss or rejection in social relationships, whereas the highly autonomous individual may develop depression in response to perceived achievement failure or lack of control over the environment. If this was the case then support exists for the view that the predictive value of social cognitive schemata may depend on the extent to which they have been primed by

stressful events.

Their findings support, at least in part, that some patterns of interactions occur between person and event, specifically that highly sociotrophic individuals display a proclivity towards symptom of depression when faced with increased frequency of negative social events and to some degree with negative autonomous achievement events. In this regard the authors suggest that sociotrophy may be a general vulnerability factor for any type of negative event.

Some implications arise from this study. Although the Autonomy scale did not correlate positively with the BDI as hyposthesized, it did show an inverse or negative correlation with the BDI with regards to the number of negative social events reported for the highly autonomous individuals. If sociotrophy and autonomy were inversely related this would be expected; however, the researchers found no significant relation between the two scales. One explanation would be that the cognitive schema of the high autonomous individual is different from that of the average autonomous or sociotrophic individual. Unfortunately this was not examined for and may be considered for future research. The consideration here is that if a difference of cognitive schema exists (in this group of females and males combined) then it is just as likely for difference to exist within the subgroup of just females. Such a contention may explain the similarity of findings (albeit not investigated) in the previously

mentioned studies of women and the premenstrual phase in relation to job stress, career traditionality, and life events towards the reporting of symptomatology. Certainly one does not state that differential cognitive schema is causal to the experience of premenstrual symptomatology. It is however feasible to contemplate the possibility that cognitive schema are important interacting variables in the experience of premenstrual symptomatology (DeLongis, Lazarus & Folkman, 1988; Brown & Siegel, 1988; Cohen, Towbes & Flocco, 1988; Watson, 1988).

The previous section has attempted to examine some of the environmental factors (stress, negative events, job, life events) which may impinge upon premenstrual symptomatology. Some of the studies have supported the view that environment does impact upon the reporting of symtomatology, while others have indicated that the environmental factors per se are not the major influence but rather that the perception of the event is influential in the reporting of premenstrual symptomatology. Thus, the remainder of the literature review will concentrate on studies which investigate the relationship between perception, attitude and beliefs and their influence upon the menstrual cycle.

PERCEPTIONS, ATTITUDES AND BELIEFS

Subsequent to the often contrary findings on premenstrual research a number of researchers have speculated that attitudes and beliefs may have contributed to the disparate findings (Clare, 1983; Parlee, 1974, 1982; Ruble, Brooks-Gunn, 1982; Koeske, Koeske, 1975). Ruble and Brooks-Gunn (1979) noted that young girls expected to feel more menstrual pain than actually experienced, suggesting that beliefs about menstruation and premenstrual discomfort are acquired early, perhaps before menarche. This is consistent with the findings in a review by Golub (1983). One of the studies she cites is that by Williams (1983) which explored numerous beliefs held by young boys and girls. The girls with the more positive atitudes were premenarchal (ages 9 to 12) and generally equated menstruation with growing up and normal. However one third of these same girls also believed menstruation to be embarassing, 28% thought it a nuisance, 27% found it disgusting and 23% disliked the idea that it was not controllable. About half the girls thought that a girl should not swim when menstruating, 22% believed they should not engage in sports when menstruating. 85% thought that a girl should not talk about menstruation to boys and just as striking was that 40% did not think it was alright to discuss menstruation with their fathers. Given that the social climate has remained relatively stable since the study, one might

speculate that the findings may still hold true for the premenarchal and menarchal group today.

Parlee (1974) undertook to study stereotypic beliefs about menstruation by comparing responses of females and males on the Menstrual Distress Questionnaire (MDQ). The sample of women and men were asked to report what they believed women to experience during the menstrual cycle. Rating results showed that females indicated greater 'symptom severity' in the menstrual phase than in the intermenstrual phase for five of the eight categories. The females also indicated greater 'symptom severity' in the premenstrual than intermenstrual phase for three of the categories. The males showed greater 'symptom severity' in the menstrual than intermenstrual phase for the same five categories as the women and also reported impaired concentration and control, suggesting that the males perceived such impairment occurs during menstruation. The males further indicated greater 'symptom severity' in four of the categories during the premenstrual phase than the intermenstrual. In terms of 'changes' these findings are not dissimilar to the original sample used by Moos to construct the MDQ (1968). However, Parlee further examined the absolute value of the ratings (as opposed to the measures of symptom changes) themselves and found that the males' scores were higher than the females' scores in 23 of the 24 cases (eight symptom scales or categories at each of the three phases of the menstrual cycle). In 11 of the cases the difference

between the two groups were significant, and in these cases the male group ratings indicated greater 'symptom severity' than did the female group. With respect to the females in this study, the values of the ratings were higher in 21 of the 24 cases as compared to the original sample of women tested by Moos (1968).

Parlee reported that while the men and women expected virtually identical patterns of symptoms and changes, the men attributed greater symptom severity to women than the women themselves on three of the scales for the premenstruum and on six of the scales during the menstrual phase. Considering that the subjects were asked to indicate their knowledge about, or experience of symptom and mood changes associated with the menstrual cycle, these findings raise several questions. The most glaring question is that of the high correlation between the two groups. It is taken for granted that men do not experience a menstrual cycle firsthand, therefore information about the menstrual cycle is learned through a myriad of social sources. Two explanations come to mind. First, this group of men may constitute an unrepresentative sample of the male population, or secondly, stereotypic beliefs concerning the menstruum and premenstruum are reflected in the Menstrual Distress Questionnaire. If the latter is possible, then Parlee points out that women may also be responding to stereotypic conceptions in the assessment measures and in this regard she reports "there seems to be no strong reason to suppose that

a woman's responses on the MDQ do in fact represent reports of her direct personal experience of psychological changes throughout the menstrual cycle" (Parlee, 1974, p.239).

To examine this further, Ruble and Boggiano (1982), carried out a study in which college men and women were asked to imagine a specific scenario in which a woman behaves very irritably and then gives one of several excuses for the behavior, two of which were menstrually related. The participants evaluated the excuse in terms of degree of annoyance, blameworthiness, and internality versus externality. As well the participants completed a Menstrual Attitude Questionnaire (MAQ) in a later contact. Results showed that the males tended to see menstrual-related excuses as less blameworthy and more external than did females. As well results from the MAQ (Brooks-Gunn, Ruble,1980) indicated that general atitudes regarding the debilitating effects of menstruation predicted greater tolerance toward the use of menstrual excuses.

Ruble (1977) in another study convinced a group of female college students (who were all in the premenstrual phase) that they were either in the premenstrual phase or in the intermenstrual phase. The results indicated that the 'premenstrual' group recorded significantly higher scores than the 'intermenstrual' group on items for water retention, pain, change in eating habits and sexual arousal (suggestive of the influence of beliefs on the menstrual cycle). However, there

were no significant differences between the groups on scores for negative affect, concentration, behavior change, autonomic reactions and arousal. Therefore, even though stereotypic beliefs may have some influence, the lack of significant difference on these latter categories would suggest this explanation is not encompassing. Although one might argue that of course the 'premenstrual' group would show higher scores simply because the women were in actual fact in the premenstrual phase of their menstrual cycle, it is important to note that the 'intermenstrual' group scored much less, even though they were in fact also in the premenstrual phase. This alone strongly suggests cognitive processes; in effect, that what one believes influences the experience.

The possibility that demand characteristics and expectancies may have influenced the reporting of cycle related symptoms in studies such as Ruble's was investigated by AuBuchon and Calhoun (1985). These latter authors informed one group of females that the focus of the study was menstrual symptomatology, the other group of females and a group of men were not advised of the focus. The group of women informed of the interest in menstrual symptomatology reported significantly more negative psychologic and somatic symptoms at the premenstruum and menstrual phases than the other two groups. Therefore although stereotypic beliefs have a major impact, it seems that social expectancies and experimental demand characteristics (mediated by cognitive processes) also

have an influence on reporting of premenstrual and menstrual symptomatology.

Chernovetz, Jones and Hansson (1979) postulated that perhaps the variable may involve perception of control since the presence of cues that reduce uncertainty may mediate the event even more than actual control of the event. The subjects were informed they were participating in menstrual research and completed a battery of questionnaires, the Bem Sex Role Inventory (BSRI), and the Menstrual Distress Questionnaire (MDQ). The results reportedly supported the influence of cultural beliefs in that the more 'feminine' subjects reported more severe distress on the MDQ than the 'masculine' subjects (which was inversely related to inhibition). What these authors also found was that the women who have more cues to the onset of menstruation had more positive feelings about menstruation despite greater discomfort, suggesting that the reduction of uncertainty was a greater determinate of one's feeling toward menstruation than the actual amount of discomfort experienced. These findings also lend support towards a cognitive component in the experience of premenstrual symptomatology.

In a second study by these authors, the findings corroborate those of Stout and Steege (1985), mentioned earlier, in that there was no support for the view that women who complain of severe distress were complainers or somatizers. Men and women were placed into two groups, one

group being informed the questionnaire (MDQ in random order) listed symptoms associated with menstruation, and the other group being informed that the symptoms were frequent occurences for college students. The results from the men did not show a significant difference from that reported by the female groups. It did however indicate that the MDQ scores were related to ratings of general health when the subject was not aware that the symptoms were associated with the menstrual cycle. The women who knew that the symptoms were associated with menstruation did not show a correlation between their ratings on the MDQ and general health. In keeping with their earlier contention (previously reviewed study) the impact of cultural beliefs is supported by the similar ratings obtained by the men in the study. What is contrary to other studies is that the women in this study reported less incidence of symptomatology when aware of the association with menstruation and in fact indicated greater incidence of symptoms in relation to general health.

Ruble and Brooks-Gunn (1979) interpreted findings such as the above in terms of social cognition using an information-processing model. They suggest that symptom associations may be viewed, in part, as reflecting a set of beliefs; the associations may originate and be maintained by means of biases in the processing of information about menstruation, and mechanisms which contribute to the maintenance of such bias include distortion, autonomy, and

category accessibility of the evidence. This position is summarized as follows.

First, in the cognitive acquisition of beliefs, an individual need not actively experience in order to associate characteristics to an event. The concept/phenomenon of menstruation has universal connotations of negativity (Chesler, 1983; Shuttle & Redgrove, 1986; Koeske, 1983; Golub, 1983) and as such is often used to explain negative changes (Koeske & Koeske, 1975). Thus both men and women are susceptible to such connotation (as well as researchers) without having the actual experience (men) or severity of change (women).

Secondly, increasing the salience of information increases the perception of its importance as a cause or explanation, thus when an event (somatic or behavioral change) occurs requiring an explanation, menstruation, if present or expected, is perceived as the likely cause. This was the case in the Koeske and Koeske (1975) study where the negative moods of a hypothetical female student were primarily attributed to premenstruation, even when it was the environment that was described as being unpleasant.

Third, studies have indicated that individuals may distort the evidence in order to be consistent with their own implicit beliefs, that is supporting information may be given more weight while less valid or unreliable evidence (according to the individual) may be ignored or disregarded (Ross, 1977;

Koeske & Koeske, 1975). This would be consistent with the Wilcoxen, et al (1976) study in that pill-taking women (more aware of cycle phase via cessation of pill) reported more changes in the premenstrual phase than the non-pill-takers (aware only at the onset of menstruation) who reported more changes in the menstrual phase. In this manner, the authors intimate that it is plausible that cognitive distortions, such as "exaggerating the intensity of naturally fluctuating bodily states to be consistent with perceived phase, may partially account for the differences between the groups" (Ruble & Brooks-Gunn, 1979, p.187).

The research thus far would seem to indicate that each of the variables (life events, stress, personality) explored are not sufficient in and of themselves to explain the diversity of changes reported. If what Ruble and Brooks-Gunn proposes is feasible, then greater understanding is imminently forthcoming by way of understanding the cognitive domain.

COGNITIVE THEORY

Cognitive theory (Beck, 1976) is composed of three essential components. The first consists of automatic thoughts (the first thoughts that come to mind, are not the results of direct thinking and are accepted unchallenged by it's owner) which are characterised by the cognitive triad, that is, a negative perception of the world, the self, and the future.

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The second component is that of cognitive distortions in thinking (arbitrary inference, overgeneralization, magnification and minimization, personalization, dichotomous thinking, selective abstraction, etc.). The third component is that of the schemata. The schemata holds the core beliefs or assumptions about the world and represents the way the individual organizes past experiences and is the structure which screens and codes incoming information about the world. It is these schema which largely dictate the degree of negativity and frequency of distortions in individual experience. According to Beck (1976), affect and cognition are intimately related, that is, between an event and an emotional reaction to it lies a cognition or automatic thought which dictates the resultant affect. Furthermore the affect has the potential for reinforcing the initial cognition. Subsequently an association is linked to a more generalized cognitive schemata.

COGNITIONS AND PREMENSTRUAL CHANGE

Beck and Greenberg (1974) have argued that women by virtue of their sex role definitions face a routine (daily and otherwise) which is inherently depressing, more so than that of male counterparts. Beck and Greenberg (1974), in concordance with other researchers, encourage the notion that women (generally) have a culturally induced tendency to 'see

themselves as powerless' hence the index of depressed affect and dysphoria may reflect the amount of perceived helplessness and hopelessness. The result is that the more the individual persists in interpreting events in terms of one's own helplessness or powerlessness, then the more persistent and lasting will be the corresponding affect.

Speculating further, Beck and Greenberg (1974) relate this to the effects of learned helplessness in dogs and reactive depression as researched by Seligman (1981). The authors note that in Seligman's experiments "it was not the trauma per se that produced failure to escape, but having learned that no response at all can control trauma" (Beck and Greenberg, 1974). Thus, they intimate that female children are taught that personal worth and survival depend not on effective responding but on beauty and appeal, hence they have no direct control over their lives. As adolescents and women, the female is subjected to parental, institutional and societal supervision which both restricts their alternatives and shelters them from the consequences of any disapproved alternatives chosen.

The relevance of the implications are consonant with that of Ruble and Brooks-Gunn (1979). It would appear that cognitions may be the intervening variable between many of the diverse findings on premenstrual changes.

Returning to the Ivey and Bardwick study (1967) mentioned much earlier on, the study investigated the patterns of

affective fluctuation in the menstrual cycle, and found that significant and predictable affective fluctuations correlated with endocrine changes, implying a physiological impact upon the premenstrual and menstrual affective changes. This was however one of the few studies found which used verbatim material which demonstrated the presence of cognitive distortions, a component the researching authors were not actively studying. For example, the authors used two samples of the same female, one from the ovulatory phase and one from the premenstrual phase to demonstrate two different affective themes:

Ovulatory

....so I was elected chairman./ I had to establish with them the fact/ that I knew/ what I was doing./ I remember one particularly problematic meeting,/ and afterwards,L. came up to me and said/"you really handled the meeting well."/ In the end it came out the sort of thing/ that really bolstered my confidence in myself./

Premenstrually

....They had to teach me how to water ski./ I was so clumsy/ it was really embarrassing/ 'cause it was kind of like saying to yourself/ you can't do it/ and the people were about to lose patience with me./

(Ivey & Bardwick, 1979,p.341)

If what Beck and Greenberg (1974) contend is plausible, then perhaps what Ivey and Bardwick (1967) found were cognitive distortions which mediated the affective themes rather than the endocrine changes. Also what this would suggest is that perception and cognitions may change along with the menstrual cycle, that the interaction mediates subsequent reactions and perceptions. Unfortunately none of the other articles reviewed utilized verbal measures such as the above to allow for inspection of cognitive dialogue.

One study which did attempt to examine this relationship was Goudsmit (1983). The study used three groups of women, one with PMS, one group with menstrual distress (symptoms throughout the cycle) and a non-symptomatic control group. This investigation found that the PMS group scores consistently rose from day 18 as the cycle progressed. The menstrual distress group showed an interesting relationship in that following day 18 the scores would show a consistent decline. The control group remained relatively stable over time. These results were consistent with their hypotheses, however they did discover as well a finding on the trait scale which did not conform with their hypotheses. Theoretically trait refers to a personality characteristic, and as such, the scores should have remained fairly stable throughout the cycle. As it were, they found that the PMS group showed significant increase on the trait anxiety scores after day 18, while the menstrual distress group showed a significant

decline in trait anxiety scores after the 18th day. This would suggest that some of the women may have changed the way in which they perceived themselves as they experienced more discomfort. It is important to emphasize that changes had occurred at a level which was presumably pre-established in a 'characterologic' sense. Thus trait anxiety may very well be influenced by the schema in place.

Morse and Dennerstein (1986) propose a cognitive model for interpreting the role of cognitions in PMS. The model is presented in Figure 1. In this framework the activating event is the cluster of premenstrual changes which take place and which are experienced as additional strain or stress with or without concurrent life stresses. Over time the premenstrual changes trigger stereotypic cognitions at the beliefs level which in turn create or heighten levels of affect which in turn result in behaviors that typify the affective states. The behaviors subsequently influence secondary and/or tertiary levels of distress such as guilt for 'being out of character', and low self-esteem, to name a few.

Thus a feedback loop exists between emotions and cognitions so that affective states trigger further cognitive distortions or 'irrational beliefs'. The cognitive distortions then feed back to an activating event (e.g. premenstrual phase) which is labeled as a negative experience. Once labelled the individual anticipates negative behavioral consequences which adversely affects subsequent performance and ability since

anticipation that one will be less competent often becomes a self-fulfilling prophecy. As a result the woman finds herself behaving in ways which contravene her own 'personal standards', coping strategies are compromised over time and a sense of helplessness and hopelessness is generated, leading to secondary levels of depressive states and lowered self-esteem.

FIGURE 2

Proposed Cognitive Model for PMS

A COGNITIVE MODEL OF PREMENSTRUAL SYNDROME (A = ACTIVATING EVENTS; B = BELIEFS,COGNITIONS; C_B = BEHAVIORAL CONSEQUENCES; C_E = EMOTIONAL CONSEQUENCES)
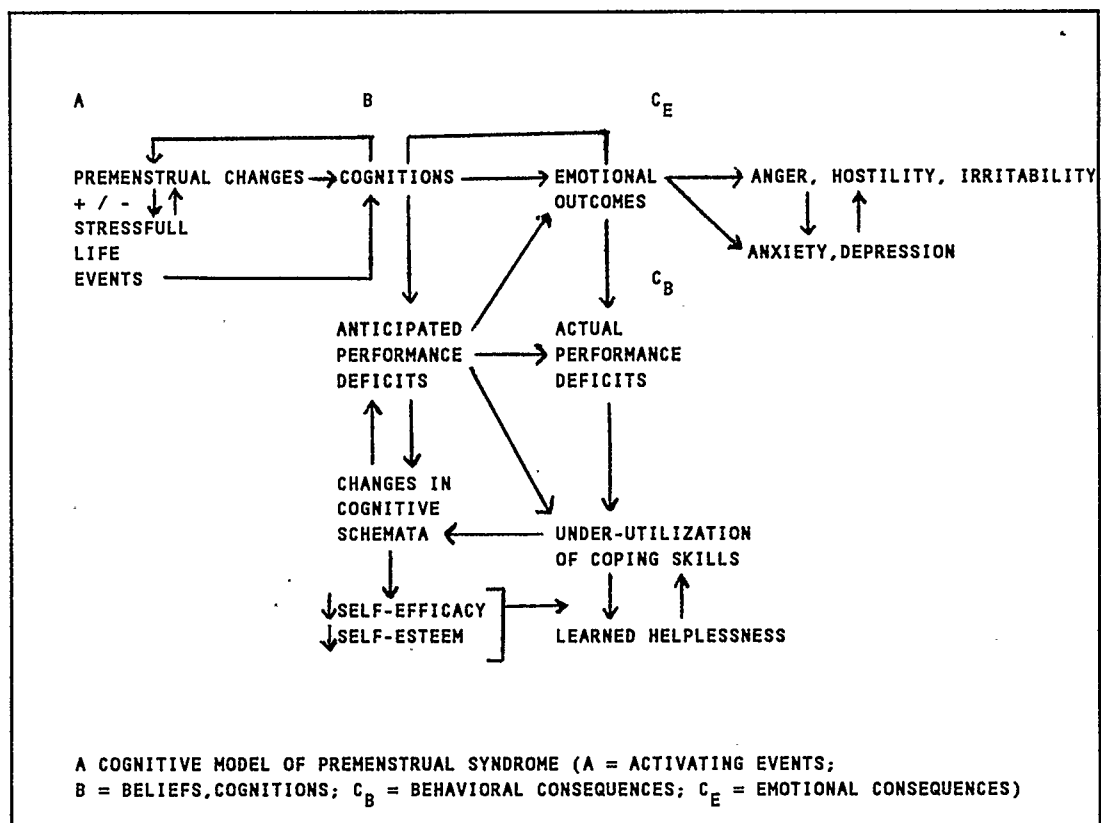
(reprinted from Morse and Dennerstein, 1986)

With the onset of menses the cognitive attributions change. The onset of menstruation is a visible sign of an underlying 'just' cause or explanation for the emotional and behavioral changes which have occurred, thus removing most of the personal responsibility for the recent (albeit cyclic) changes. Subsequently each approach of the menstrual cycle is tacitly bound by the cognitive processes unique to that individual.

The literature review as presented here has attempted to demonstrate that a complex array of symptoms purporting to indicate PMS arise from an interaction of psychological and social concomitants. The bio-physiological concomitants are also integral; however, as noted in the beginning of this thesis, investigation of this area is beyond the scope of this research and the reader is referred to reviews by Reid (1985) and Reid and Yen (1981). The premise of this thesis is that premenstrual changes occur within an interactional model. Therefore, despite the inconsistency in findings, researchers have demonstrated that premenstrual changes do in fact occur. The degree or severity of changes appear to be associated with the beliefs held.

Even though psychological distress is often the predominant complaint, few investigations have focused on the cognitive organization as a target area. Thus the bulk of past research has focused on treatment of the manifest symptom

(ie. anxiety, depression, etc.) rather than the origin of the problem. Perhaps this reflects the milieu of the society. Women have been socialized not to express anger or other active-type response directly. When these emotions occur then some women may deny them or alternately utilize a more socially acceptable passive expression, namely depression. Those who do act out this anger subsequently feel guilt for doing so. The following two narratives illustrate the psychological distress and the inherent cognitive distortions often expressed by some women.

Nancy's Story:

Let's say I have errands to run. I ask my family: "Please have the kitchen cleaned up before I get back."

It sounds reasonable enough. But when I get back, the dishes aren't done, and everyone's watching TV. No one bothers to offer an excuse. The scene is set for World War III to start.

"I can't believe the dishes aren't done!" I say.

Then my voice goes up a couple of notches. "I can't believe that you're all just sitting around watching TV. No one ever does anything they say they're going to do! I'm sick of this!"

At this point, I become very much aware of myself. I think to myself: "I shouldn't be getting so angry."

It seems like I'm outside myself, watching myself. It's strange. I wish I could stop. But I can't. Actually, I just keep getting angrier.

"Get up this instant! I'm sick and tired of doing all the work around here. Get in there and do the dishes. Clean up your mess in the bathroom, too!" By now, I'm yelling.

I'll continue in this vein, getting angrier and angrier, louder and louder, until I run out of energy. I may add something else like, "I'm sick of doing everything. You never help me."

This last line is delivered with near-explosive force, as I glare at my husband and run out the back door - slamming it of course.

Once I'm outside, I break down crying, and I can't stop. I cry until I can't cry anymore - until I'm mentally and

physically exhausted. Then I start to feel guilty about what I've just done.

After getting in the car and driving around for a while or sitting in a kind of daze, I finally get it together again and go back to my family. I say something like, "Iprobably shouldn't have exploded. I'm sorry."

My family is relieved that I'm back and speaking to them again. But I don't feel any better. I go over everything again and again in my mind: "Why did I do that? Why did I say that?"

Then I think: "I'm a failure as a mother. I'm a lousy wife. My family would be better off without me."

Mary's Story:

Sometimes I am unable to do the simplest things. I frantically run around accomplishing absolutely nothing. I am a complete mess. One thing after another goes wrong. It's as if my nerves are stretched almost to the breaking point. I feel useless, worthless, and out of control. I am in a state of confusion. Making any kind of decision is out of the question. My mind doesn't seem to function properly. My thoughts rage between good and bad, right and wrong. I want to snap at someone and let all those built-up emotions erupt.

I know that's not the real me, so I sit fighting the anger within me. I want to be left alone with my madness so that later I won't regret something I said or did.

Then I become depressed. I cry without reason. I feel I have nothing to live for, I feel totally worthless. No positive thoughts pass through my mind. Everything seems negative. I try to think of the good times, but even those feel sad.

I feel ugly and become self-conscious. My body feels oily and dirty and I can't seem to wash clean. My stomach and body swell, and my face breaks out, especially my chin. I become irritable and restless. I eat until I'm stuffed, and then I eat more. I become so tired that I can sleep sitting or even standing. I feel like a completely different person, like someone who is unpredictable. I don't know who I really am.

But when the blues fade away and I regain control of myself, I feel like I can tackle the world. I want to do everything at once because I feel so good, and I know these feelings won't last long.

(reprinted from DeGraff-Bender & Kelleher, 1986, pp. 39, 49)

As outlined in the beginning of the thesis, the socialization of the woman's roles and contributions towards pathophysiology is profound and as such is beyond the scope of this research. What is intended is an initial investigation into the relationship of maladaptive cognitions and premenstrual change. Further, if a relationship exists, then implications for a more integrative treatment modality would be forthcoming.

FORMULATION OF HYPOTHESES

The purpose of this study will be to examine the cognitive process of the woman in relation to her menstrual cycle. According to the research (Beck & Greenberg, 1974; Ruble & Brooks-Gunn,1979; Abramson, Seligman & Teasdale, 1978;. Peterson & Seligman, 1987; Dobson & Block, 1988; Dryden & Ellis, 1988; Krause, 1985; Kovacs & Beck, 1978), negative affective states are preceded by cognitive schema which is biased towards negativity. If this is the case then the hypothesis is that women who believe they have PMS will demonstrate an exacerbation of cognitive distortions during the premenstruum (luteal phase) as opposed to the intermenstruum phase (follicular). Differences in the women experiencing or not experiencing affective distress and physical symptoms might be predictable from their cognitive status. The influence of life events would then be modulated

by the cognitive schemas already in place, via the perception of stress (Kuiper, Olinger, Lyons, 1986).

What the subjects believe at the conscious level may not necessarily reflect the core belief held within the schemata. Similarly, expressing the belief that one might have PMS does not necessarily imply that the individual has cognitive distortions or vice versa. Thus, in the formulation of the hypotheses, what may appear as an overlap is not so. The first two hypotheses investigate the relationship between what the individual is consciously aware of (believe that they have PMS or believe that they do not have PMS) with symptom severity and degree of cognitive dysfunction. The degree of cognitive dysfunction is not generally available to the individual at the conscious level, rather, this reflects the schema held by the individual. The remaining three hypotheses investigate the relationship between the degree of cognitive dysfunction with physical and psychological symptoms, with affective changes and with life changes and stress.

It is important to note at this point that because of the volunteer character of the sample all hypotheses are treated as pertaining only to the sample observed and not to a larger target population.

As much as this study would anticipate obtaining a large subject sample, it would be unrealistic to rule out the possibility that only a small subject sample will be used in the final analysis. This is a valid consideration since a

small subject sample often leads to the possibility of accepting the null hypothesis inappropriately. Consequently, a level of significance in statistical testing of .05 will be used in this study. While this leads to the risk of a 5% chance for a Type I error, this is felt to be acceptable for a preliminary study. The assumptions of normality, homogeneity of variance have to be made and seem reasonable in light of other studies. The inferential indicator (the F statistic) is used as a measure of relative difference more along the lines of descriptive statistics which allow for the generation of further hypotheses and verification that some of the questions being raised are worthy of further study, or seem to support or contradict other research.

HYPOTHESES

The following hypotheses were investigated by the present study:

I)   Women who believe they have PMS will report more psycho-physiological symptom changes than women who do not believe they have PMS. Further, the women who believe they have PMS will report an increase in symptoms during the premenstruum as opposed to the intermenstruum.

II)   Women who believe they have PMS will demonstrate more significant negative schemas and consequent cognitive distortions than women who do not believe they have PMS. Subsequently, those women who believe they have PMS will report more life changes than those women who do not believe they have PMS.

III)   Women who exhibit more maladaptive cognitions will report a greater degree of physiological and psychological symptoms than those women with fewer maladaptive cognitions. Further, women who exhibit greater degree of cognitive distortion will show a premenstrual exacerbation of symptoms.

IV)   Women who exhibit more maladaptive cognitions will report more affective change than those women with fewer maladaptive cognitions. Further, the higher distortion group will demonstrate a premenstrual exacerbation of affective change as compared to the intermenstruum phase.

V)   Women who exhibit greater degree of cognitive dysfunction will report more life changes (life events and stress) than those women with lesser degree of cognitive dysfunctions.

CHAPTER THREE

METHODOLOGY

SUBJECTS

One hundred and five women expressed interest in the study. Subjects for the study were recruited in various ways. First, a number of women responded to poster advertisements placed in doctors' offices requesting volunteers for menstrual research (see Appendix B-1). Second, the author attended various seminars after which the audience were informed that a study on the menstrual cycle needed volunteers. The same information sheet was distributed as in the doctors'offices. Third, a group of women diagnosed as having PMS was obtained from the office of a well established medical specialist. Fourth, a number of women responded after hearing about the 'menstrual research' through friends.

The criteria for inclusion into the study were as follows:

1) between the ages of 20 and 45

2) have menstruated the preceding three cycles

3) not have 'irregular' cycles:
   cycle length must be between 20 - 30 days

4) no current psychiatric illness

5)   no current medical illness

6)   no current menstrual related problems, i.e.

dysmenorrhea, menstrual distress, endometriosis, or

pelvic inflammatory disease (PID)

PROCEDURE

All the women were advised that the purpose of the study
was to examine physical and psychological change(s) with
respect to the menstrual cycle. All of the women completed a
Millon Behavioral Health Inventory (MBHI), a Premenstrual
Assessment Form (PAF) and a questionnaire (RHHF) devised for
this study to obtain medical, social and demographic
information as part of the screening procedure. Following
this the women were required to complete a daily self-report
on the PRISM Calender for two consecutive menstrual cycles.
Participation and recording of data began with the onset of
menstrual flow in the following cycle.

A battery of questionnaires were completed during the
follicular phase (days 9,10,11) and during the premenstrual
phase (days 24,25,26). The women were instructed to continue
recording on the calender until the onset of the next
menstrual flow at which time they would commence recording on
the second PRISM calender in exactly the same way as the first
calender. This served to reduce the variability between women

and over cycles.

The women completed the questionnaires individually in the author's University office and when this was not possible or inconvenient, the author delivered the questionnaires to the individual's home to be completed. All delivered questionnaires included self-addressed envelopes for the return of the material to the author at the University of Calgary. All participants signed consent forms (see Appendix B-2) during the initial contact and all ethical standards were maintained as outlined in Appendix B-3.

QUASI-EXPERIMENTAL DESIGN

Due to the exploratory nature of the investigation, the study has to be classified as an observational-correlational study which used volunteer subjects classified into categories. which led to a two factor repeated measures design. The independent measures were the phases of the menstrual cycle, four levels were used. The first follicular phase (T_1), the first premenstrual phase (T_2), the second follicular phase (T_3), and the second premenstrual phase (T_4).

For the purpose of investigating Hypothesis I and Hypothesis II, the dependent measures used were the obtained scores on the PRISM, CST, RBI, DAS, DSP (total stress score) and LES. The independent variable was whether the subject believed she had PMS or not.

To investigate Hypotheses III, IV, and V, the score obtained on the CST, RBI, and DAS at T_1 (first follicular phase) served as the baseline independent variable. The highest 30% and the lowest 30% (obtained scores) on each of these three measures provided the two comparison groups. Thus individuals may be included in each of the three measures. Six groups were used, high CST scorers, low CST scorers, high RBI scorers, low RBI scorers, high DAS scorers, and low DAS scorers. For Hypothesis III the dependent measure was the frequency of reported symptoms on the PRISM. For Hypothesis IV the dependent measure was the obtained score on the MAACL and the DSP for the anxiety, hostility and depression scales. For Hypothesis V the dependent measure was the obtained score on the LES and the DSP(total stress score).

Each analysis was tested at the .05 level of significance, this statistical measure was used as an indication of the lack of likelihood of occurrence given the assumptions made in the hypotheses.

The SPSSX statistical package was used for initial raw data entry and organization. Calculation of scores were also performed on this system.

Group mean scores and two way analysis of variance with repeated measures was performed using the STATVIEW 512+, a statistical analysis program available on the Mackintosh SE computer system in the Department of Educational Psychology.

SCREENING MEASURES

1). Millon Behavioral Health Inventory (MBHI)

This is a 150 item (true or false) questionnaire which assess 20 dimensions and classifies these dimensions into four basic scales: basic personality style, psychogenic attitudes, psychosomatic and prognostic. This measure was used as a prescreening device. The scales on this measure have shown to be correlated with various scales on the MMPI, Beck Depression Inventory, Life Events Scale, and various other inventories. The purpose of this measure was to screen for any profiles which may be at risk for participating in the study as well as to provide a profile of the women. This also allowed for the sample of women to be relatively homogenous with regards to norm for attitudes concerning physical health. Further information concerning reliability and scale comparisons can be found in Millon, Green and Meagher, (1982).

2). Premenstrual Assessment Form (PAF)

This is a 95 item self-rating questionnaire descriptive of mood, behavior and physical condition. Items are rated on a six point scale of severity of change from the usual condition. Questions about the menstrual history is also included. The PAF was used for several reasons. First, it allowed for individuals to rate their experience according to their perception of change or experience rather than just

indicating the presence or absence of an item. Second, the changes could be summarized along a bipolar continua to denote positive changes as well as negative changes. Third, the summary categories allowed for comparison of different syndromes of mood and behavior without necessarily having the level of severity or duration to meet criteria for a disorder. For the purposes of this study, the PAF was specifically used to separate the group of women into those who report severe premenstrual changes and those who report no severe premenstrual changes. Further information on the development and use of the PAF may be found in reviews by Halbreich, Endicott, Schacht, and Nee (1982), Malikian (1987), Endicott, Nee, Cohen, and Halbreich (1986) and Logue and Moos (1986).

3). PRISM Calendar

The Prospective Record of the Impact and Severity of Menstrual Symptomatology consists of a 49 day one page calender listing 24 commonly occuring symptoms, 11 lifestyle impact items and 4 items related to life events. The symptoms can be rated one to three depending on perceived severity or left blank if not occurring. The lifestyle impact and life events items are simply marked with an X for occurrence or not. Instructions on how to complete the calendar are included on the bottom of the page. The days for completing the questionnaires are shaded in at the top of the calendar. Thus this calendar served the purpose of identifying the menstrual

markers (onset of bleeding, cessation of bleeding) for each subject so that the timing of the battery of questionnaires was the same across subjects in relation to phase of the menstrual cycle. This calendar also served to record the individual's percieved changes on a daily basis. Further information on this calendar could be obtained from Reid (1985).

4). Research Health and History Form (RHHF)

This 14 item form was devised for this study to seek information about the individual's medical history, medications and immediate social sphere.

BATTERY OF QUESTIONNAIRES

1). The Cognitive Style Test (CST)

This scale consists of 30 short descriptions of every day events. The events are classified in Beck's cognitive triad of the self, the world, and the future. Fifteen of the items represented pleasant/rewarding situations and the other items represented unpleasant/punishing situations. Response chosen represents the degree of depressed distortion. Cognitive distortions have been found to correlate highly with depressed moods (Kovacs and Beck, 1978; Wilkinson and Blackburn, 1981; Williams, 1984). Therefore in regards to this thesis the cognitive distortions

would be expected to correlate with mood changes occurring during the menstrual cycle, furthermore distortions would be predictive of mood changes in the premenstruum. This would be consistent with the findings of BlackBurn, Whalley, Christie, Sherig, Foggo, Bennie, Farrer, Watts, Wilson, and Fink (1987) that "negative cognitive style predicted changes in both mood measure and feeling unwell predicted changes in negative automatic thoughts." (Blackburn, et al, 1987, p.31).

2). Dysfunctional Attitude Scale (DAS) (See Appendix B-9)

This 40 item scale measures depressogenic schemata (depressive beliefs). Items are rated on a scale of 1 (totally agree) to 7 (totally disagree). Two forms exist, the DAS-A and the DAS-B. The later form was used for this study, both forms have equal reliability. Those individuals with elevated scores during the premenstruum would continue to score high even during the follicular phase (least expected mood changes). This occurrence is due to the schemata being relatively stable. The elevation that will occur would support the view for an exacerbation of a pre-existing condition (Miranda, Persons, 1988). Further information can be found in reviews by Segal (1988) and Weissman (1979).

3). Rational Behavior Inventory (RBI)

This 37 item questionnaire yields an index of "rationality" in which the greater rationality is indicated

by higher scores. Items are rated on a scale of 1 (strongly agree) to 5 (strongly disagree). Eleven factor scales (catastrophising, guilt, perfectionism, need for approval, caring and helping, blame and punishment, inertia and avoidance, independence, self-downing, projected misfortune, and control of emotions) produce the index score. The factor scales should demonstrate change between the two phases of the menstrual cycle in relation to the cognitive distortions associated with premenstrual changes. Scoring and validity information can be found in Himle, Thyer, and Papsdorf (1982) and Ray and Bak (1980).

4). Life Experience Survey (LES)

This 54 item self-report scale monitors perception of life events and the degree of distress or pleasure associated with the individual events during the prior week. Ten items were dropped from the original as they pertained exclusively to a young student population and/or pertained to men only. Thus the 44 items used in this study were from the original form. Unlike other measures for life event the LES allows the individual to rate according to whether the event had a positive or negative impact thus items were rated -3 (extremely negative) to +3 (extremely positive). Consonant with the research, subjects with high negative scores would not only record more symptomatology but the perceived negative life impact scores should also correlate with higher cognitive

distortions. Sarason, Johnson and Siegel (1978) provide a comprehensive review and rationale for the development of this scale.

5). Derogatis Stress Profile (DSP)

This 77 item scale was designed to measure three components of stress: environmental events, personality mediators, and emotional responses. Eleven factor scores (time pressure, driven behavior, attitude posture, relaxation potential, role definition, vocational satisfaction, domestic satisfaction, health posture, hostility, anxiety, and depression) were summarized to obtain a total stress score. This study was particularly interested in the hostility, anxiety and depression scores as well as the total stress score as these are commonly attributed to premenstrual changes. If cognitive distortions correlate with premenstrual changes these four factor scores should also change. The items are rated 0 (not at all true of me) to 4 (extremely true of me), and require about five to ten minutes to complete (Derogatis, 1984).

6). Multiple Affect Adjective Check List (MAACL)

This scale consists of 132 adjectives which measure the dimensions of anxiety, depression and hostility. The information describes the affective state as opposed to trait. This scale was included for the assessment of the three

negative affects also tapped for in the DSP above. However to provide a more valid measure this checklist was completed once for each of the designated three days (days 9,10,11 and days 24, 25 26) over the four testing periods (two follicular and two luteal phases) for a total of twelve completed forms and averaged for each of the four periods (Bloom and Brady, 1968). This should take less than five minutes to complete. Validation of this measure has been undertaken by several authors (Pankratz, Glaudin, and Goodmonson, 1972; Zuckerman, Lubin, Robins, 1965; Zuckerman, Lubin, 1965).

The battery of questionnaires were completed twice for the follicular phase and twice for the premenstrual days. These were the premarked days on the PRISM Calendars (days 9,10,11, and 24,25,26). The women completed each battery in one sitting with the exception of the MAACL. The women were asked to complete one MAACL for each of the three premarked days whereas the battery was completed on only one of the three designated days for each phase. The battery of questionnaires required approximately one hour of time and the women were instructed not to ponder too long on any of the questions.

CHAPTER FOUR

RESULTS

One hundred and five women expressed interest in the study. Eight decided not to participate due to the lack of remuneration, four were excluded due to the age criteria. Two of the women decided to proceed with surgery (hysterectomy) midway into the research. Fifteen were excluded due to incompletion of forms of one or more of the cycle phases. A further thirty-nine dropped out at various phases of the research, most reported lack of time as reason for discontinuing. Twelve women were referred by a medical specialist with a diagnosis of PMS. Of this latter group, three consented to participation when contacted. A total of thirty-seven women completed the study.

PRELIMINARY ANALYSIS

The mean age of the sample of women was 33.5 years with a range from 23 years to 45 years. Six of the women have never been pregnant, six of the women have been pregnant but no live children while 25 of the women have children. Twenty-six of the women in the study were currently married, eight were single, one was living with a significant other and two were separated from their marital partners. Contraceptive use

was varied. Eleven women were not using any form of contraceptive device, four used birth control pills (BCP), two of the women used over the counter contraceptives (ie. condom/foam) while twenty of the women reported having had tubal ligations. Twenty-six of the women reported that they believed they had PMS while eleven of the women did not believe they experienced PMS. The pertinent demographic information for both groups are summarized in Table 3.

Table 3

Demographic Information

	Believers	Nonbelievers
N	26	11
Age (Mean)	33.15	34.55
(Range)	23 - 45	29 - 45
Status		
(Single)	6*	4
(Married)	20**	7
Parity		
(Para)	24	7
(Gravida)	19	6
Contraceptive		
(None)	6	5
(BCP)	2	2
(Over the counter meds)	2	0
(Tubal)	15	5

* Two of the women were separated
** One of the women was living with a partner

The following statistical descriptions are supplied to allow for the possibility of replication studies, the sample thus is used to give a clear picture of the 'sampled population'.

Premenstrual Assessment Form (PAF)

The Premenstrual Assessment Form scores ranged between 103 and 388, the overall mean score was 227, standard deviation of 87.4. The lowest possible score would be 95 (none to mild change) and the highest score obtainable is 570 (extreme change). Thus the mean for this particular sample of women was below the mean by 8 points assuming that the midpoint of 235 would be the mean in a normal population. Further analysis was performed using the PAF as the independent measure with the PRISM, CST, RBI and DAS.

The sample of women were sorted into two groups based on their PAF total score (high scorers N=13 and low scorers N=13) and compared on the PRISM data. A two way analysis of variance with repeated measures was performed (Winer, 1971, pp. 518-519). There were statistically significant differences found between the two groups, $F(1,24)=7.25$, $p <$ .05 and over the two menstrual cycles, $F(3,72)=6.35$, $p < .001$.

A two way analysis of variance was performed on the three cognitive measures, the CST, DAS, and the RBI using the PAF high scorers and PAF low scorers grouping. The P values are summarized in Table 5.

high scorers and PAF low scorers grouping. The P values are summarized in Table 4.

TABLE 4

High vs Low PAF on RBI, CST, DAS

QUESTIONNAIRE	GROUP EFFECT (P VALUE)	PHASE EFFECT (P VALUE)	GROUP X PHASE (P VALUE)
DAS	.3424	.0989	.8432
CST	.0551	.1515	.0937
RBI	.0708	.1846	.2219

There were no statistically significant differences found between the PAF high and low scorers on either the CST, the DAS or the RBI. It is worthy to note however that the CST fell just short of significance at the .05 level of significance for group difference.

Millon Behavioral Health Inventory (MBHI)

The overall mean scores from the Millon Behavioral Health Inventory reflected a healthy coping and attitude style for all of the women in regards to physical illness. The six psychogenic attitude scales (chronic tension, recent stress, premorbid pessimism, future despair, social alienation and somatic anxiety) which are of particular relevance here also revealed a profile which was within norms for the test. Eighty-four percent of the women reported mild to moderate

stress (chronic tension) within the normal range. This suggests that these women are not disposed towards suffering physical ailments. Eighty-six percent of the women indicated they were not susceptible to illness (recent stress), ninety-three percent were not characterologically pessimistic, ninety-five percent had a productive future outlook and ninety-one percent did not indicate a tendency to withdraw from others. Further, ninety-eight percent were not indicative of somatizers, that is, the women were not hypochondriacal nor were these women susceptible to complaints of minor illness.

Although the overall means of all the scales were all within the normal limits for the combined groups of women, there were some sharp differences when comparing the PAF high scorers and the PAF low scorers. Specifically the two groups were compared on the psychogenic scale of the MBHI. The analysis showed statistical significance in four out of the six scales. That is, chronic tension $F(1,24)=4.99$, $p < .05$, recent stress $F(1,24)=5.76$, $p < .05$, premorbid pessimism $F(1,24)=4.82$, $p < .05$ and future despair $F(1,24)=4.66$, $p < .05$. There were no differences found between the groups on the social alienation and the somatic anxiety scale.

The findings from the comparison of the believer versus nonbeliever groups on the MBHI psychogenic scales indicated no difference between the two groups when the mean scores were visually inspected. A one way analysis of variance performed

on the data also showed no statistical difference between the
two groups.

The remainder of this section will report the findings
of the present research as pertaining to the outlined
hypotheses. For ease of reader recall, the hypotheses are
restated followed by visual presentation of the group mean
scores and the conclusions which may be extracted from the
analysis performed.

PRIMARY ANALYSIS

HYPOTHESIS I

Women who believe they have PMS will report more psycho-
physiological symptom changes than women who do not believe
they have PMS. Further, the group of women who believe they
have PMS will report an increase in symptoms during the
premenstruum as opposed to the intermenstruum.

In order to assess the above hypothesis the two groups
of women (believers vs nonbelievers) were compared on the
Premenstrual Assessment Form (PAF), the PRISM Calender and
the Derogatis Stress Profile (DSP).

Believers vs Nonbelievers on the PAF

Mean scores and standard deviations for the PAF are presented in Table 5.

Table 5

Believers vs Nonbelievers on PAF

Group	Count	Mean	Std.Dev.	Std.Error
Non-believers	11	183.82	85.36	25.73
Believers	26	245.27	83.18	16.31

Visual inspection of Table 5 indicates that the believers group reported more symptoms than nonbelievers as measured by the PAF group mean score. In order to assess whether the difference between the two groups was statistically significant, a one way analysis of variance was performed on this data. The results of the analysis indicate a significant effect between believers and nonbelievers, $F(1,35) = 4.16$, $p < .05$. The finding suggests that retrospective memory is a factor in differentiating the two groups. Further, since memory is selective, one might speculate that the believers remember themselves as worse and if this is the case then cognitive distortions might mediate this selective recall.

Believers vs Nonbelievers on PRISM.

Visual inspection of Table 6 suggests that believers recorded more symptom changes than the non believers over both menstrual cycles. The results of the means table also suggest that both groups of women recorded more symptom changes premenstrually (T_2 and T_4) than intermenstrually (T_1 and T_3). In order to assess whether these observed results were statistically significant, a two way analysis of variance with repeated measures was performed.

Table 6

Believers vs Nonbelievers on the Prism

Group	T_1	T_2	T_3	T_4	Totals
believers	4.6	9.32	4.28	10.52	7.18
nonbelievers	2.18	6.27	3.64	6.36	4.61
Totals	3.86	8.39	4.08	9.25	6.40

The analysis performed indicated nonsignificant group effect; however, the trials effect was statistically significant $F_{(3,102)}=8.22$, $p < .01$. Results of Scheffe' contrasts indicate a significant increase in symptoms for both

groups from T_1 to T_2 with $F(1,71)=3.58$, $p < .05$ and from T_3 to $T4$, $F(1,71)=4.66$, $p < .05$.

Believers vs Nonbelievers on the DSP

Visual inspection of Table 7 showed that the believer group consistently reported more symptoms than the nonbeliever group on the hostility, anxiety, depression and total stress score scales of the DSP. The three affective scales, hostility, anxiety and depression did not appear to have a cycle phase effect however there appeared to be a cycle phase effect for the total stress score. Thus a two way analysis of variance with repeated measures was performed.

Results of the two way analysis showed that the believers group differentiated from the nonbelievers on the hostility and anxiety scale, $F(1,27) = 4.78$, $p <.05$ and $F(1,27) = 6.41$, $p < .05$, respectively. There were no significant cycle phase effects for either scales. The depression scale did not differentiate the two groups, nor was there a cycle phase effect. The total stress score fell just short of significance, there was however a cycle phase effect $F(3,81) = 3.86$, $p < .05$ for the believer group.

Table 7

Believers vs Nonbelievers group means on the DSP

SCALE GROUP	T_1	T_2	T_3	T_4	TOTALS
HOSTILITY					
BELIEVERS	12.23	11.91	11.32	12.73	12.04
NON-B	9.86	8.71	8.0	8.14	8.68
TOTALS	11.65	11.14	10.52	11.62	11.23
ANXIETY					
BELIEVERS	14.04	13.91	14.54	14.54	14.26
NON-B	10.29	10.29	8.57	8.86	9.5
TOTALS	13.14	13.03	13.10	13.17	13.11
DEPRESSION					
BELIEVERS	8.73	9.82	9.54	10.04	9.53
NON-B	7.29	6.29	6.57	6.14	6.57
TOTALS	8.38	8.97	8.83	9.10	8.82
TOTAL STRESS					
BELIEVERS	133.23	136.04	136.82	143.95	137.51
NON-B	113.14	113.00	107.86	114.14	112.04
TOTALS	128.38	130.48	129.83	136.76	131.36

Conclusion to Hypothesis I

The present results indicate that when a retrospective report of symptomatology (PAF) is used believers report significantly more symptoms than nonbelievers. However, when a prospective measuring device is used (PRISM) no significant differences emerged between the two groups. As expected both

groups demonstrated an exacerbation of symptoms during the premenstruum as measured on the PRISM. The believer group was significantly different from the nonbeliever group in the reporting of hostility and anxiety when compared on the DSP. This was not the case for depression or the total stress score. The total stress score was found to show a cycle phase effect whereas none of the three affect scales showed this.

HYPOTHESIS II

Women who believe they have PMS will demonstrate more significant negative schemas and consequent cognitive distortion than women who do not believe they have PMS. Subsequently, those women who believe they have PMS will report more life changes than those women who do not believe they have PMS.

Thus the two groups were compared on the CST, the RBI and the DAS over the two menstrual cycles. The findings are summarized in Table 8.

Visual inspection of Table 8 indicates that the believers group demonstrated more distortions that the nonbelievers group on all three cognitive measures, the RBI, the DAS and the CST. There did not appear to be any major change between cycle phases for either of the groups on the three cognitive measures.

Table 8

Believers vs Nonbelievers on the RBI, the DAS and CST

MEASURE GROUP	T_1	T_2	T_3	T_4	TOTALS
RBI NON-B	22.91	24.18	26.73	28.18	25.50
BELIEVERS	24.03	22.50	23.08	22.35	22.99
TOTALS	23.70	23.00	24.16	24.08	23.74
DAS NON-B	113.00	109.36	111.00	113.36	111.68
BELIEVERS	129.17	133.17	121.83	127.37	127.88
TOTALS	124.09	125.69	118.43	122.97	122.79
CST NON-B	41.36	40.73	39.73	41.27	40.77
BELIEVERS	47.19	48.47	48.04	48.88	48.21
TOTALS	45.46	46.35	45.57	46.62	46.00

Two way analysis of variance was performed on the data from the two groups. Statistically significant difference was found between believers and nonbelievers on the CST, $F_{(1,35)}$ = 6.90, p < .05. No other main effects were significant on this measure. The RBI did not show any significant group effect however there was an interaction effect noted, F (3,105) = 7.02, p < .001. Further analysis using Scheffe contrasts indicate that the nonbelievers show a difference between T_1-T_3, T_1-T_4 and at T_2-T_4, at the .05 level of significance. The DAS did not show any of the main effects.

Believers vs Nonbelievers on the LES

In view of these findings it would seem plausible that a difference might also exist between the groups in their perception of life events. Distortions might negatively influence the perception of these events. The mean scores over trials for the two groups are presented in Table 9.

Table 9

Believers vs Nonbelievers mean scores on LES

Group	T_1	T_2	T_3	T_4
Believers	1.88	1.96	2.27	1.23
Nonbelievers	1.18	.64	.18	1.64

Visual inspection of Table 9 appears to indicate that the believer group reported more life event changes than the nonbeliever group. In order to test this a two way analysis of variance with repeated measures was performed on this data. None of the main effects were found to be statistically significant.

Conclusion to Hypothesis II

The hypothesis was partially supported. Analysis indicated that believers and nonbelievers were significantly different on the CST in the degree of distortions presented. None of the measures showed a cycle phase effect. The RBI however demonstrated an interaction effect for the nonbeliever group. Subsequent analysis did not indicate that believers and nonbelievers perceive life events differently.

HYPOTHESIS III

Women who exhibit more maladaptive cognitions will report a greater degree of physiological and psychological symptom changes than those women with fewer maladaptive cognitions. Further, women who exhibit greater cognitive distortion will show a premenstrual exacerbation of symptoms.

In order to assess the above hypothesis the sample of women were grouped into high and low scorers on each measure (CST, DAS, RBI) and compared on the Prism.

Inspection of Table 10 suggest that high CST scorers reported more symptoms than low CST scorers as recorded on the PRISM. In order to assess whether the difference between the two groups was statistically significant, a two way analysis of variance with repeated measures was performed on the data.

TABLE 10

High vs low distortion on PRISM mean scores

MEASURE	GROUP	T_1	T_2	T3	T_4	TOTALS
CST	LOW	1.69	4.85	2.46	7.69	4.17
	HIGH	6.15	11.38	5.77	9.46	8.19
	TOTALS	3.92	8.11	4.11	8.58	6.18
RBI	LOW	5.58	10.5	5.25	10.25	7.90
	HIGH	1.83	6.17	3.08	10.08	5.29
	TOTALS	3.71	8.33	4.17	10.17	6.59
DAS	LOW	1.09	4.82	1.91	8.27	4.02
	HIGH	7.00	13.27	6.36	12.09	9.68
	TOTALS	4.05	9.05	4.14	10.18	6.85

Results of the analysis indicate that the difference between the two groups fell just short of statistical significance, $F(1,24)=3.877$, $p =.0606$. However, the trials effect was statistically significant, $F(3,72)=4.26$, $p < .01$. Further analysis using Scheffe' contrasts found that the high CST scorers changed significantly between T_1 and T_2, $F(1,24)=3.497$, $p<.05$, and between T_2 and T_3, $F(1,24)=4.031$, $p < .05$.

Visual inspection of Table 10 suggests that low RBI scorers (greater irrational beliefs) reported more symptoms than the high RBI scorers as measured by the PRISM. Two way analysis of variance with repeated measures was performed on this data. The results of the analysis indicate that only the

trials effect was statistically significant, $F_{(3,66)} = 5.802$, $p < .01$. Further analysis using Scheffe' contrasts indicated statistically significant differences between T_1 and T_4, $F_{(1,46)} = 4.121$, $p < .05$ and between T_3 and T_4, $F_{(1,47)} = 3.557$, $p < .05$.

Visual inspection of Table 10 also suggests that high DAS scorers reported more symptoms than low DAS scorers as measured by PRISM. In order to assess whether the difference between the two groups was statistically significant, a two way analysis of variance with repeated measure was performed on this data. The findings from this analysis indicate that individuals with higher dysfunctional attitudes reported more symptoms than individuals with lower dysfunctional attitudes. Thus, the difference between groups was found to be statistically significant, $F_{(1,20)} = 6.091$, $p < .05$ as was the cycle phase effect, $F_{(3,60)} = 4.853$, $p < .01$. Further analysis using Scheffe contrasts indicated significant change in symptoms for both groups between T_1 and T_4, $F_{(1,43)} = 3.006$, $p < .05$ and between T_3 and T_4 $F_{(1,43)} = 2.917$, $p < .05$.

Conclusion to Hypothesis III

The hypothesis was partially supported in that the DAS was successful in differentiating between the two groups in terms of predicting the degree of symptoms. While the RBI did not show a statistically significant difference between

groups, the CST fell just short of the .05 level of significance. All the measures, RBI, CST, and DAS showed trial effects which were statistically significant at the .01 level of significance. Thus, the hypothesis is supported by the DAS in that high DAS scores did predict higher symptoms on the PRISM.

The previous analysis suggest the trend that dysfunctional attitudes/cognitive distortions were predictive of the degree of symptoms reported. Therefore, if cognitive dysfunction predicts reported symptomatology, then one could conclude that cognitive dysfunction would predict affective change commonly reported (anxiety, hostility, depression). Thus, high cognitive distortions would predict increased affective changes in the premenstruum.

HYPOTHESIS IV

Women who exhibit more maladaptive cognitions will report more affective change than those women with fewer maladaptive cognitions. Further, the high distortion group will demonstrate a premenstrual exacerbation of affective change as compared to the intermenstruum.

Subsequently, the two groups (high and low scorers) from the CST, DAS, and RBI were compared on the MAACL and the DSP over the two menstrual cycles.

High vs Low CST on the MAACL

Visual inspection of Table 11 suggests that the high CST scorers reported more anxiety than the low CST scorers on the MAACL. A two way analysis of variance with repeated measures performed on this data showed a statistically significant difference between the groups, $F(1,22)=7.362$, $p < .05$. There were no other significant main effects for this scale.

TABLE 11

High vs Low CST scorers on the MAACL

SCALE GROUP	T_1	T_2	T_3	T_4	TOTAL
Anxiety					
LOW CST	6.87	7.24	7.03	7.47	7.15
HIGH CST	9.57	10.02	9.67	9.31	9.64
TOTAL	8.22	8.63	8.35	8.39	8.40
Hostility					
LOW CST	10.85	11.46	10.97	11.85	11.28
HIGH CST	11.97	12.95	11.38	12.98	12.30
TOTAL	11.41	12.20	11.14	12.42	11.79
Depression					
LOW CST	14.62	16.07	15.61	16.20	15.63
HIGH CST	17.47	19.92	17.10	19.06	18.39
TOTALS	16.05	18.00	16.35	17.63	17.01

Visual inspection of Table 11 found the two groups to be different in the degree of hostility and depression reported. However, two way analysis of variance with repeated measures performed on the data proved to be nonsignificant for any main effects for either hostility or depression on the MAACL.

High vs Low CST on the DSP

Means scores over trials for anxiety, hostility and depression for the two groups on the DSP are presented in Table 12.

TABLE 12

High vs Low CST groups on DSP means scores

SCALE GROUP	T_1	T_2	T_3	T_4	TOTAL
ANXIETY					
LOW CST	11.25	11.33	10.5	9.83	10.73
HIGH CST	15.58	15.92	16.33	16.33	16.04
TOTAL	13.42	13.62	13.42	13.08	13.85
HOSTILITY					
LOW CST	9.67	10.75	8.75	10.08	9.81
HIGH CST	13.92	12.75	13.25	13.17	13.27
TOTAL	11.79	11.75	11.00	11.62	11.54
DEPRESSION					
LOW CST	7.58	6.50	7.00	6.42	6.87
HIGH CST	9.83	11.5	11.42	12.25	11.25
TOTAL	8.71	9.00	9.21	9.33	9.06

Visual inspection of Table 12 indicated that high CST scorers reported more anxiety, hostility and depression than the low CST scorers. To assess for statistically significant difference between the groups on these three affect scales, a two way analysis of variance with repeated measures was performed on the respective data. Results from the analysis showed that high CST scorers were different from the low CST scorers. The findings were statistically significant for anxiety $F(1,23)=9.867$, $p < .01$, hostility $F(1,23)=6.192$, $p< .05$, and for depression $F(1,23)=6.462$, $p < .05$. There were no trial or interaction effects.

Summary of CST (high vs low scorers) on the MAACL and DSP

The findings show that the CST was successful in differentiating between the two groups for anxiety on the MAACL but not for hostility or depression. There were no other main effects found using the CST high and low scorers on the MAACL. The findings on the DSP measure found that the difference between the two groups were statistically significant on all three affect variables (anxiety, hostility, and depression). The measures were nonsignificant for trial or interaction effects. Thus the hypothesis was partially supported, that is, the CST was capable of predicting anxiety in the MAACL and the DSP, and also was able to predict hostility and depression on the DSP.

High vs Low RBI scorers on the MAACL

Tabulated means scores over trials for anxiety, hostility, and depression for the high RBI scorers (higher rationality) and the low RBI scorers (lower rationality) on the MAACL measure are presented in Table 13.

TABLE 13

High vs Low RBI scorers on the MAACL

SCALE GROUP	T_1	T_2	T_3	T_4	TOTALS
ANXIETY					
LOW RBI	9.19	10.25	9.45	9.45	9.58
HIGH RBI	7.10	7.77	6.81	8.18	7.46
TOTALS	8.15	9.01	8.13	8.82	8.52
HOSTILITY					
LOW RBI	12.03	13.28	12.12	13.53	12.74
HIGH RBI	10.92	11.27	10.95	12.68	11.46
TOTALS	11.48	12.27	11.53	13.11	12.10
DEPRESSION					
LOW RBI	17.20	19.58	18.57	19.33	18.67
HIGH RBI	15.12	16.96	15.01	18.70	16.45
TOTALS	16.16	18.27	16.79	19.02	17.56

Visual inspection of the group mean scores indicate that the low RBI scorers (greater irrational beliefs) reported more anxiety, hostility and depression than the high RBI scorers. There also appeared to be an increase in reported change for all three affects between T_1 and T_2 and between T_3 and T_4.

Two way analysis of variance with repeated measures was performed on all three affect scales. Results show that the anxiety variable was statistically different between the two groups, $F(1,22)=4.915$, $p < .05$. There were no trial or interaction main effects. The hostility variable of the MAACL did not show a statistically significant difference between the two groups. However, there was a significant trial effect on this variable, $\underline{F}(3,66)=2.795$, $\underline{p} < .05$. The depression scale of the MAACL did not show a statistical difference between the two groups. There was a trial effect, $\underline{F}(3,66) = 3.466$, $\underline{p} < .05$. Analysis using Scheffe' contrasts showed a significant change between T_1 and T_4, $F(1,47)=2.76$, $p < .05$.

High vs Low RBI scorers on the DSP

Visual inspection of the group mean scores in Table 14 suggest that low RBI scorers reported more anxiety than the high RBI scorers overall and over trials. Inspection of the means for the hostility scale found that low RBI scorers reported more hostility than the high RBI scorers. Visual inspection of the mean scores for the two groups on the depression scale suggest that the low RBI scorers report more depression than the high RBI scorers.

TABLE 14

High vs Low RBI groups on DSP means scores

SCALE GROUP	T_1	T_2	T_3	T_4	TOTALS
ANXIETY					
LOW RBI	16.08	16.58	15.83	15.17	15.92
HIGH RBI	11.25	10.75	11.17	11.08	11.06
TOTALS	13.67	13.67	13.5	13.12	13.49
HOSTILITY					
LOW RBI	14.25	13.25	12.75	13.75	13.5
HIGH RBI	10.00	10.00	8.67	10.08	9.69
TOTALS	12.12	11.62	10.71	11.92	11.59
DEPRESSSION					
LOW RBI	10.50	10.50	11.17	11.08	10.81
HIGH RBI	7.50	7.42	6.75	7.17	7.21
TOTALS	9.00	8.96	8.96	9.12	9.01

Two way analysis of variance with repeated measures was performed on all three affective scales. Anxiety was found to be statistically different between the two groups, $F(1,22) = 6.649$, $p < .05$. There were no other main effects for anxiety. The groups were found to be statistically different on the hostility scale, $F(1,22)=7.096$, $p < .05$. There were no trial or interaction main effects. The results of the depression scale analysis indicate that there was statistical difference between the two groups on this affect measure, $F(1,22)=4.492$, $p < .05$. There were no trial or interaction main effects.

Summary of RBI (high vs low group) on MAACL and DSP

The findings show that the RBI was capable of predicting anxiety between the two groups on the MAACL but not for hostility or depression between the two groups. However the hostility and depression scale of the MAACL showed significant trial effect.

The results of the analysis performed on the DSP indicated statistically significant differences between the groups on all three affect scales (anxiety, hostility and depression). There were no other main effect for any of the three affect scales.

Thus, the hypothesis was partially supported by the results of this analysis. That is, women with greater irrational beliefs tend to report (and perhaps experience) more affective distress, specifically anxiety, hostility and depression as measured on the DSP. This was not demonstrated by the MAACL except on the anxiety scale.

High vs Low DAS scorers on the MAACL

The two groups of women used in the following analyses were those who scored high on the DAS and those who scored low on the DAS at T_1. These two groups were compared over the two menstrual cycles on the MAACL measure.

Visual inspection of Table 15 suggest that high DAS scorers reported more anxiety than the low DAS scorers. However there did not appear to be any significant change between trials based on observation of the means. The high DAS scorers recorded more hostility than the low DAS scorers. There did not appear to be significant change between trials for either of the groups on the hostility scale. Further, the high DAS scorers reported more depression than the low DAS scorers. Also the low DAS scorers would appear to demonstrate more change between the trials than the high DAS scorers on the depression scale.

TABLE 15

High vs Low DAS groups on the MAACL

SCALE GROUP	T_1	T_2	T_3	T_4	TOTALS
ANXIETY					
LOW DAS	6.01	7.38	5.85	7.32	6.64
HIGH DAS	9.9	9.82	10.25	9.16	9.78
TOTALS	7.95	8.6	8.05	8.24	8.21
HOSTILITY					
LOW DAS	9.62	11.22	10.08	11.87	10.7
HIGH DAS	12.73	12.65	12.12	12.71	12.55
TOTALS	11.17	11.94	11.1	12.29	11.62
DEPRESSION					
LOW DAS	12.28	15.99	13.35	16.36	14.50
HIGH DAS	19.13	20.16	18.63	19.05	19.24
TOTALS	15.70	18.08	15.99	17.70	16.87

Two way analysis of variance with repeated measure was performed on the three affect scales. The difference between the two groups for anxiety was found to be statistically different, $F(1,20) = 16.677$, $p < .01$. There were no other main effects found for this scale. On the hostility scale the difference between the two groups fell just short of statistical significance. Trial and interaction main effects were nonsignificant. On the depression scale the difference between the two groups was found to be statistically significant, $F(1,20)=10.508$, $p < .01$. Trial and interaction effects were nonsignificant for depression.

High vs Low DAS groups on the DSP

The high and low DAS scorers were compared on the affect scales (anxiety, hostility and depression) in the DSP. Mean group scores for both groups over the four trials are presented for each of the affects in Table 16.

Visual inspection of Table 16 indicate that the high DAS scorers reported significantly more anxiety than the low DAS scorers. There did not appear to be much change between trials for either of the two groups. The high DAS scorers also reported significantly more hostility than the low DAS scorers. Neither of the groups exhibited much change between trials for hostility. Further, the high DAS group scored significantly higher on the depression scale than the low DAS

group. There were no observed increase over trials for either of the groups.

TABLE 16

High vs Low DAS groups on the DSP

SCALE GROUP	T_1	T_2	T_3	T_4	TOTALS
ANXIETY					
LOW DAS	9.00	9.10	8.20	9.20	8.87
HIGH DAS	15.58	15.75	16.33	16.25	15.98
TOTALS	12.59	12.73	12.64	13.04	12.75
HOSTILITY					
LOW DAS	9.00	9.40	8.10	8.50	8.75
HIGH DAS	13.42	12.17	12.25	13.17	12.75
TOTALS	11.41	10.91	10.36	11.04	10.93
DEPRESSION					
LOW DAS	5.50	5.80	5.10	5.70	5.52
HIGH DAS	10.00	12.25	12.25	12.33	11.71
TOTALS	7.95	9.32	9.00	9.32	8.90

Two way analysis of variance with repeated measures was performed on the data. The difference between the two groups was found to be statistically significant, $F(1,20) = 22.07$, $p < .01$ for anxiety. There were no trial or interaction effects for the anxiety scale. The difference between the two groups on the hostility scale was statistically significant, $F(1,20) = 8.007$, $p < .05$. Trial and interaction main effects were nonsignificant for hostility. The difference between the groups on the depression scale was found to be statistically

significant at $F(1,20)=18.87$, $p < .01$. There were no trial or interaction effects as expected from the observation of the means in Table 16.

Summary of DAS (high vs low) on the MAACL and DSP

Individuals with a high level of dysfunctional attitude (high DAS score) showed greater anxiety and depression over trials as measured by the MAACL then those with low levels of dysfunctional attitudes. This finding did not extend to the measure of hostility on the MAACL.

When assessed on the DSP, all three affective states showed statistically significant differences between the two groups.

Conclusion to Hypothesis 1V

The CST was successful in predicting anxiety on both the MAACL and the DSP. The CST also predicted hostility and depression on the DSP but not on the MAACL.

The RBI was successful in predicting anxiety on the MAACL and the DSP. Hostility and depression were predicted on the DSP but not on the MAACL by the RBI.

The DAS was successful in predicting anxiety and depression on both the MAACL and the DSP. Hostility was predicted on the DSP and fell just short of significance on

the MAACL.

HYPOTHESIS V

Women who exhibit a greater degree of cognitive dysfunction will report more life changes (life events and stress) than those women with less cognitive dysfunctions.

The overall findings suggest that cognitive distortions and dysfunctional attitudes do predict worse symptoms and affect states. In view of these findings it would be reasonable and important to assess whether life events are then perceived differently by high and low distortion groups. Thus the following analysis investigates the high and low scorers of the CST, RBI, and the DAS in relation to the LES.

CST, RBI and DAS (high vs low groups) on the LES.

Mean scores for the high CST scorers and low CST scorers were obtained for the LES. Visual inspection of the group mean scores from Table 17 did not suggest any difference between the groups. Mean scores for the high DAS scorers and the low DAS scorers did not suggest that there was any difference in their reporting life changes. Mean scores for the high RBI scorers and the low RBI scorers also did not indicate any difference between the two groups. Curiously enough, for both the CST and RBI peak scores were indicated

on T_1 and were virtually the same across phases. This was not observed for the DAS groups, instead the means scores would suggest that an inverse relationship existed. That is, low DAS subjects reported more life changes at T_1 and T_2 than at T_2 and T_3, this was opposite to that for the high DAS subjects.

TABLE 17

High vs low distortion groups on the LES

MEASURE GROUP	T_1	T_2	T_3	T_4	TOTALS
CST					
LOW	2.42	1.58	1.08	1.67	1.69
HIGH	2.42	.67	1.75	1.42	1.56
TOTALS	2.42	1.12	1.42	1.54	1.62
RBI					
LOW	2.33	1.58	1.08	1.67	1.67
HIGH	2.25	.58	1.83	1.58	1.56
TOTALS	2.29	1.08	1.46	1.62	1.61
DAS					
LOW	1.64	.73	.18	1.45	1.0
HIGH	.73	2.91	2.27	.09	1.5
TOTALS	1.18	1.82	1.23	.77	1.25

Two way analysis of variance with repeated measure was performed on the data for the three measure. All three measures failed to show any statistically significant differences between the groups.

CST, RBI AND DAS (high vs low groups) on the DSP

Visual inspection of Table 18 indicated that the women in the high cognitive distortion group (CST) reported more overall stress than the low cognitive distortion group. Also there appeared to be a premenstrual increase for both groups (T_2 and T_4) on the overall total stress score.

TABLE 18

High vs low distortion groups on the DSP

MEASURE GROUP	T_1	T_2	T_3	T_4	TOTALS
CST					
LOW	110.84	110.25	110.17	113.83	111.27
HIGH	139.92	146.75	144.25	151.67	145.65
TOTAL	125.37	146.75	144.25	151.67	145.65
RBI					
LOW	140.42	140.92	139.83	143.00	141.04
HIGH	114.50	113.83	114.67	121.17	116.04
TOTALS	127.46	127.37	127.25	132.08	128.54
DAS					
LOW	98.9	99.8	96.8	103.4	99.7
HIGH	148.67	155.58	154.0	163.33	155.40
TOTALS	126.0	130.23	128.0	136.09	130.08

A two way analysis of variance with repeated measures was performed with the high CST and low CST scorers. The difference between the two groups was found to be statistically significant, $F_{(1,22)} = 8.92$, $p < .05$. There

were no other main effects found for the total stress score. Thus the group of women with the higher cognitive distortions reported more stress than the group with the lower cognitive distortions throughout the cycle phases.

The mean group scores found in Table 18 suggest that the Low RBI scorers (greater irrational beliefs, thus more cognitive distortions) reported more overall stress than the high RBI scorers. There did not appear to be any clear premenstrual phase increase in stress based on the RBI grouping.

Thus, two way analysis of variance with repeated measures was performed on the high and low RBI groups with the total stress score means on the DSP. The overall total stress score was found to be statistically different between the two groups, F (1,22) = 4.85, p < .05. There was no cycle phase effect.

Visual inspection of Table 18 also indicated that the high dysfunctional attitudes (DAS) group reported more stress than the low dysfunctional attitudes group on the total stress scale of the DSP. There also appeared to be a cycle phase effect with higher stress reported in the premenstruum for both groups.

Two way analysis of variance with repeated measures performed on the high and low DAS groups indicated several findings. The total stress score proved to be highly statistically different between the two groups, F (1,20) =

45.83, $p < .001$. There was also a cycle phase effect, F $(1,20)$ = 3.99, $p < .05$.

Conclusion to Hypothesis V

There was no difference found between the high and low distortion groups (CST, RBI, DAS) on the LES. Results of the total stress score on the DSP provided the support for the hypothesis. Thus this investigation was unable to support the hypothesis that a higher degree of distortions influence perceptions of life events more than a lower degree of distortions. However the results indicated that individuals with a higher degree of distortions reported more total stress than the individuals with a lower degree of distortions on the CST, RBI and DAS measures. As well the DAS comparison showed a cycle phase effect.

Ancillary analysis

As the previous findings suggest stress to be strongly associated with cognitive distortions it would seem appropriate to assess if stress were also correlated with the incidence of reported symptomatology. The sample of women were grouped into those who demonstrated high stress and low stress as measured on the DSP and compared on the PRISM in Table 19.

Table 19

High vs low DSP groups on the PRISM

GROUP	T_1	T_2	T_3	T_4	TOTALS
LOW DSP	2.45	4.91	3.0	3.64	3.59
HIGH DSP	7.0	12.73	6.36	12.64	9.68
TOTALS	4.73	8.82	4.68	8.14	6.59

Visual inspection of the mean scores in Table 19 suggests a large difference between the two groups. The high stress group reported significantly more symptoms than the low stress group. There also appeared to be a cycle phase effect for both groups of women. A two way analysis of variance with repeated measures was performed on this data. Analysis showed that the two groups were statistically different, F (1,20) = 8.60, p < .01, as well there was a statistically significant cycle phase effect, F (3,60) = 5.38, p < .01.

Thus the ancillary analysis indicated that perceived stress was highly associated with the incidence of reported premenstrual symptomatology.

Summary of Results

The investigation into the relationship of cognitive

beliefs and premenstrual change was partially supported in all phases of the analyses.

The group of women who believed they had PMS reported more symptoms on the PAF measure but this was not confirmed when assessed by the incidence of symptoms recorded on the daily measure, the PRISM. The PRISM did, however, confirm a cycle phase effect for both groups of women. The group of women who believed they had PMS was also found to show a higher frequency of cognitive distortions than the group of women who did not believe they had PMS as measured by the Cognitive Style Test (CST). This was not confirmed by the RBI or DAS measures. Thus, women who believed they had PMS reported more symptoms on the PAF and demonstrated a higher degree of cognitive distortions on the CST than the women who did not believe they had PMS, providing partial support for Hypotheses I and II.

The group of women who exhibited more maladaptive cognitions on the RBI and the CST, were not significantly different from the group of women demonstrating fewer maladaptive cognitions in the incidence of reported symptoms on the PRISM measure. There was, however, a statistically significant difference between the high DAS (more depressogenic schemata) group and the low DAS (less depressogenic schemata) group with regard to the level of reported symtoms. The findings also indicate that all three of the cognitive measures showed there was a cycle phase

effect in the incidence of reported symptomatology. Thus, Hypothesis III was partially supported in that the women who exhibited more maladaptive cognitions (on the DAS) recorded a higher incidence of symptoms than the women who exhibited fewer maladptive cognitions. Premenstrual exacerbation of symptom(s) was not limited to the groups with the higher level of cognitive dysfunctions. Rather, both the high and low distortion groups of women showed statistical differences in the degree of reported symptoms between the premenstruum and the intermenstruum phases of the menstrual cycle.

The predictability of affective change from the level of maladaptive cognition was partially supported in the analysis. Anxiety was consistently predicted on both of the dependent measures, the MAACL and the DSP, from the level of distortion on the independent measures (RBI, CST, and DAS). The affect scale, hostility, was not predictable on the MAACL but was confirmed on the DSP for all three cognitive measures. The affect, depression, was predictable on the MAACL but only from the DAS measure groupings, whereas the depression scale of the DSP was predictable from all three cognitive measures. Thus affective change (anxiety, hostility and depression) was predictable on the DSP from the level of cognitive distortion on all three of the independent measures. This was only partially supported using the MAACL.

The analyses indicated that the level of cognitive distortion did not appear to influence the reporting of life

changes as recorded by the LES. There was however a significant correlation between maladaptive cognitions (CST, RBI and DAS) and total stress as reported on the DSP. The CST and RBI groups showed a consistent level of perceived stress across the cycle phase. This was not so on the DAS groups, rather, there was a significant cycle phase effect between the premenstruum and the intermenstruum.

The overall findings from the investigation indicate that cognitions, specifically maladaptive cognitions, are involved in the experience of premenstrual and menstrual symptomatology. These findings support the view for an interactional explanation for premenstrual changes. Such a conclusion is, of course, tempered by the fact that the subject sample used was small and more importantly restricted by the fact that it was a volunteer sample. Thus, the findings are considered tentative.

Readers interested in viewing the two factor repeated measures tables obtained in this research are encouraged to contact the researcher.

CHAPTER FIVE

DISCUSSION

The preceding research was intended to assess the relationship between cognitions and premenstrual symptomatology. Perceived beliefs and psychometric measures of cognitive dysfunction were assessed and then compared with measures of premenstrual change. The analysis performed on the data were partially supportive of the hypotheses presented. The following section will discuss the findings of the analyses and explore possible implications for future research and treatment.

Limitations

Several limitations were present in this study. First, the size and character of the sample used restricted any interpretation beyond that of the 37 volunteers in the sample. The volunteers were drawn from the community and therefore did not represent a formally diagnosed PMS group. As assessed on the MBHI and on the three cognitive measures (CST, RBI, DAS), the volunteers as a whole were not observed to be clinically dysfunctional. Also the sample used was not controlled for socio-economic status, parity, marital status, education or employment.

Another limitation was that the study was restricted to only two phases of the menstrual cycle. Further investigation might benefit from a comparison of the ovulatory phase and during menses.

The study was also limited by the fact that only two menstrual cycles were investigated. It would have been useful to have sampled more than two cycles.

A further concern stemmed from the fact that the women completed the study at various times of the year. High stress times such as Christmas or summer holidays might be expected to influence the personal experience of the individual.

One problem with much of this area of research is the frequent lack of a control group. Several authors (Cumming, 1987; AuBuchon & Calhoun, 1985; Koeske, 1985) have suggested the need for an adequate control group in PMS research though few researchers have convincingly overcome this problem.

It is possible that the subjects may have 'learned' what responses were expected and socially desirable because they had to complete the questionnaires four times; however, there was no evidence supportive of this view.

A final limitation was that this exploratory study only attempted to assess the frequency of symptoms; this may not reflect the severity of the symptoms reported. In a similar vein, scores used in this study reflected a total score; thus, there were no comparisons between frequency of positive versus negative changes which might have provided some enlightening

information.

Perceptions of Premenstrual Change

It is commonly reported in the literature that one's perception of the world influences the experiences that one encounters in life (Beck, Rush, Shaw & Emery, 1979; Lazarus & Folkman, 1984; Dobson & Block, 1988; Watson, 1988; Dryden & Ellis, 1988; Segal, 1988; Peterson & Seligman, 1987; Mikulincer, 1988; Kuiper, Olinger & Lyons, 1986; Krause, 1985; Crocker, Alloy & Kayne, 1988; Brown & Siegel, 1988). This view has also extended into the realm of menstrual and premenstrual research (Schmidt, Hoban & Rubinow, 1987; Ruble & Brooks-Gunn, 1979; Parlee,1982; Olasov & Jackson, 1987; Koeske & Koeske, 1975). The findings from this research support such a view. It was found that women who believed they experienced premenstrual change reported more symptoms on the PAF than the group of women who did not believe they experienced premenstrual changes. This finding was in contrast to the results obtained using the PRISM measure which did not demonstrate a difference between the groups in the amount of reported symptoms.

One possible explanation for this discrepancy is that the PAF is a retrospective measure and as such is more likely to be influenced by memory recall. The PRISM calender on the other hand is a prospective measure and not as susceptible to

recall bias. This view is supported by Rubinow, Roy-Byrne, et al, (1984) and Rubinow and Roy-Byrne (1984). They consider the use of retrospective measures as inaccurate because of the tendency to overestimate the symptoms experienced. Parlee (1973, 1974, 1982) has been an outspoken critic of retrospective forms reflecting stereotypic beliefs. Some researchers have suggested that in studies that rely on retrospective measures, as much as 50% of the women may not have premenstrual changes when assessed with prospective measure (Schnurr, 1988; Endicott & Halbreich, 1982; Rubinow, Roy-Byrne, Hoban, Gold & Post, 1984; Endicott, Nee, Cohen & Halbreich, 1986; Graham & Sherwin, 1987).

A second explanation lies with the inter-cycle variability of each woman. The discrepancy obtained may be due to the fact that a one or two cycle sample of data from each woman may not accurately reflect her usual experience (considering a women experiences approximately 400 menstrual cycles in a life time). Several researchers share the view that the monthly fluctuation in symptom changes may account for the discrepancies between retrospective and prospective measures (Vila & Beech, 1980; Hamilton, Parry, Alagna, Blumenthal & Herz, 1984; Markum, 1976). Further support was found by Hart, Coleman and Russell (1987) in their study which found the retrospective measure to be relatively predictive of subsequent menstrual symptoms. Thus, there is evidence that the PAF and PRISM cannot be used interchangeably. However,

what is important in this thesis is that negatively biased cognitions are involved in the reporting of and perhaps the experience of premenstrual changes, especially retrospectively.

This was supported by the finding that the frequency and severity of cognitive distortions (CST) did differentiate the two groups. Thus, there was evidence the believers were characterized by significantly more negatively biased cognitive. However, psychometric measures of negative cognitive schemas or beliefs (RBI and DAS) did not differentiate between the two groups. This is somewhat surprising since cognitive distortions typically correlate highly with such measures.

One possible explanation for this inconsistency may lie in the structure of the measures used. Thus, the DAS and RBI appear to measure schemas which reflect different affective states. For example, the beliefs measured by the RBI are more typically correlated with anxiety while the beliefs measured by the DAS are more typically correlated with depression. There is considerable evidence to indicate that the affective state which characterizes the premenstruum shows marked variability between individuals (McFarlane, et al, 1988). As a consequence some individuals might experience significant anxiety while others may experience a significant depressive state. If this were the case then there might not always be a correlation between the RBI and the DAS. However both might

be significantly associated with increased cognitive distortion.

It is interesting to speculate why women who believe they have PMS (believers) demonstrate a more dysfunctional cognitive structure. First, it is possible that believers might be differentiated from nonbelievers on the basis of their proclivity for a negative affective state. Recent research appears to indicate this possibility. Numerous researchers have reported a significant association between premenstrual symptom and affective state in believers (Cummings, 1987; Halbreich & Endicott, 1985; Rubinow & Schmidt, 1987; Wetzel, Reich, McClure & Wald, 1975; DeJong, Rubinow, Roy-Byrne, Hoban, Grover & Post, 1985; Endicott, Nee, Cohen & Halbreich, 1986). Thus, it may be that believers have a tendency towards a negative affective state and consequently perceive their symptoms in a substantially more negative way than nonbelievers.

Although the results were somewhat equivocal the evidence indicated that believers experienced significantly more hostility and anxiety throughout all phases. The results did not indicate any significant difference in depressive or dysphoric mood. However, the absence of the latter might reflect the fact that the group as a whole tended to report low levels of depression, or that some individuals somatized their depression into physical symptoms. Even though depression per se did not characterize the believers group,

this finding is still largely consistent with Beck's cognitive model. Thus, he hypothesizes that individuals with dysfunctional attitudes and consequent cognitive distortions tend to focus their attention on negative events. This selective interpretation of the environment prompts negative affect. Although Beck's work is normally linked to depression, there is no reason why it should be limited to depression alone. Thus, these selective perceptions would be likely to prompt anxiety and hostility. If this is the case for premenstrual changes, then every cyclical recurrence of menses may be viewed as potential grounds for reinforcing the idiosyncratic schema and accompanying affect.

Further support for the importance of cognitive dysfunction in premenstrual change came when the data were analyszed in a different way. Thus, there was some evidence, albeit tentative, that measures of cognitive distortion could predict prospectively the incidence of premenstrual symptoms. For example, when subjects were separated into those characterized by a high incidence of negative schemas and those characterized by low negative schemas (DAS), differences were evident between the two groups in the incidence of symptoms reported on the PRISM. Thus there was some support for the contention that cognitive structure and distortion predict symptomatology.

It was interesting to note that both negative schemas and associated distortions were elevated irrespective of the cycle

phase. This suggests that psychological distress may be manifested throughout the menstrual cycle.

At the very least the above findings suggests that there may be a quantitative and possibly qualitative difference between high and low symptom groups in terms of their respective cognitions. This finding is consistent with recent research by Morse and Dennerstein (1988b). These authors found that women with PMS report predominately psychological distress symptoms during the follicular phase, a time frame which the literature has characterized as being symptom free. Further, the authors suggest that the "psychological distress may permeate through the cycle and interact with natural-occurring premenstrual changes to result in premenstrual reports of distressing symptoms that have become magnified in intensity" (Morse and Dennerstein, 1988b, p. 96).

The results of this thesis supports the Morse and Dennerstein (1988) conclusions in other ways. Thus the sample of women characterized by negative schemas and associated distortions did indeed show a phase effect on the PRISM. This would also account for the finding that the high distortion groups all showed significantly high group differences on the stress measure (DSP) across all phases of the menstrual cycle. If cognitions mediate psychological distress it would then follow that the degree of psychological distress or perceived stress would predict the incidence of reported symptoms and show an exacerbation in the premenstruum. This was found to

be the case. The DSP measure of perceived stress was highly predictive of differences in reported symptoms between groups and over phases. Thus high perception of stress appears to exacerbate premenstrual symptoms.

This position is well documented elsewhere (Lazarus & Folkman, 1984; Wickramasekra, 1986; Clark & Watson, 1988; Watson, 1988).

Considerable evidence also indicate that individuals with high premenstrual symptomatology tend to report a high incidence of external stressors (Kuiper, Olinger & Lyons, 1986; Krause, 1985; Hanson, 1986; Dickson-Parnell & Zeichner, 1988). This was not supported in the present experiment. There were no differences evident between high and low symptom groups on life event changes as measured by the LES. However, this finding is not necessarily antagonistic towards the premise of the present thesis. There are two reasons for this.

First, it might be that major life events did not influence the subjects in this study. Very few individuals reported more than one or two significant events. Second, it is likely that it is not major life events per se which are crucial. Several authors have proposed that it is the minor hassles of life which prompt stressful reactions (Hanson, 1986; Rowlison & Felner, 1988; DeLongis, Lazarus & Folkman, 1988). Thus, stress is characterized in the following quote by Lazarus and Folkman:

" A second assumption is that life events must be major, that is, have profound adaptational consequences or produce profound losses, in order to create stress of sufficient magnitude to impair health. Although this thinking seems reasonable, it is incomplete in important ways. Simply knowing that life events have occurred does not permit us to grasp their individual meanings - what they do to the person-environment relationship - and how they are responded to in the present on a day-to-day basis. What is major or minor is, in effect, often an individual matter. In this sense, life events are psychologically distal. What is missing are the more proximal, diverse psychological and behavioral activities generated by these events in people who vary in beliefs, commitmensts, and other personal agendas on which the significance of events is predicated."

(Lazarus & Folkman, 1984, p.309-310)

This view is entirely consistent with the idea that it is percieved stress mediated by idiosyncratic beliefs and distortions which is a prime consideration.

Beck (1984) describes a model of stress which is made up of a triad of the cognitive constellation, the behavioral inclination and the affect. In this model Beck suggests that environmental events are cognitively processed (by the controlling cognitive constellation) which then determines the appropriate action-arousing system (behavioral inclination). The affect-arousing system (affect) may also be concommitantly activated by the cognitive constellation. Thus the cognitive constellation is comprised of relatively stable cognitive schemas which constantly and successively appraise, evaluate and assign meaning to the external world. The behavioral

inclinations and the affective responses are also cognitive schemas. Within this model of stress the cognitive constellation activates the relevant behavioral inclination. However the feedback to the cognitive schemas then elicits a alternate response, namely, control or inhibition. Subsequently the individual is mobilized for action but is prevented from carrying out the actions due to the newly triggered signals or controls.

Beck emphasizes that the new signal does not deactivate the mobilization for action or the concomitant affect. Both of the latter systems persist until some modification in the controlling cognitive constellation occurs. Prolonged or intense mobilization then result in distress, cognitive dysfunctions and frequently physiological disturbances in appetite and sleep. Of course these then reinforce what becomes idiosyncratic cognitive schemas. Thus the chain of events becomes not only additive but more selective as well.

It is interesting to speculate how the aforementioned concept might fit into a psychological model for PMS. It appears as if individuals who experience high symptom levels are characterized by pervasive dysfunctional attitudes and distortions. This may be a function of the hopelessness and/or helplessness engendered by premenstrual problems (Hamilton, et al, 1984; Harrison, 1984; Norris & Sullivan, 1986; Chernovetz, et al, 1979; Golub, 1985; DeGraff-Bender & Kelleher, 1986) or it may reflect a specific personality

constellation of which negative schemas or distortions may be secondary.

Evidence although inconclusive, suggests the possibility of specific personality characteristics (Coppen & Kessel, 1963; Robins & Block, 1988; Peskin, 1968; Chuong, et al, 1988; Gruba & Rohrbaugh, 1975; Stout & Steege, 1985). It is also possible that it may reflect an underlying hormonal abnormality over all phases of the cycle (Morse & Dennerstein, 1988b). Of course, there is no reason that a combination of these factors might not account for increased cognitive dysfunction across all phases of the menstrual cycle. This is quite consistent with Beck's cognitive model of stress.

Whatever the cause of these dysfunctions, their effect on stress reactivity would be profound. Thus, psychological stress similar to that reported by Morse and Dennerstein (1988) would be mediated by these cognitive anomalies. The quality of affect would be prompted by the idiosyncratic schemas characteristic of the individual. Thus, hostility, anxiety or depression would be triggered by the arousal of hyperactive schemas with an idiosyncratic content specific to that particular cognitive constellation. These schemas would be most likely to be triggered around the premenstruum. Since schemas often prompt maladaptive behavior which in turn precipitates more stress a vicious cycle might be encouraged which might eventually permeate throughout the cycle. To illustrate this let us assume that someone with PMS has a set

of schemas which dictate 'I should always be in control' and 'I should always be nice'. These schemas might prompt psychological distress during all phases of the cycle; however, they might be especially encouraged by the onset of the premenstruum, a phase when control might be difficult to achieve especially with hormonal changes. Behaviors instigated at this stage might conceivably prompt interpersonal distress which might in turn encourage further activation of schemas throughout the cycle. The two women's narratives previously presented in the literature review would seem to support this. Obviously this is speculative and awaits empirical validation. However, should this sort of model be validated, the treatment implications would be significant.

IMPLICATIONS FOR FUTURE RESEARCH AND TREATMENT

Most of the past research have stressed the importance of the biophysical factors and as such have focused on biochemical and/or invasive surgical methods of treatment. The results have been far from successful for most women. In fact, several reviews indicate that a large and highly significant placebo effect is associated with all treatment modalities (Abplanalp, 1983; Andersch & Hahn, 1985; Dennerstein, Morse, Gotts, Brown, Smith, Oats & Burrows, 1986). Even the investigations into personality variables such as increased neurosis, hypochondriasis, etc., have failed to show

conclusive evidence for any specific trait or characteristic to be found in women diagnosed with PMS, nor are any means of treatment forthcoming from labelling as such. In each of the studies reported earlier in the literature review it is highly likely that cognitive and ideational distortion was the missing factor which could explain the often variable findings. Thus, cognitions may well be the mediating link between the physiological and external factors and the subsequent behavior(s) exhibited.

Future research would benefit from several considerations. As mentioned earlier, the investigation of maladaptive beliefs with a clinically diagnosed PMS sample of women would provide more concise information about the relationship between some of the beliefs held and severe premenstrual changes. This is particularly directed to the fact that as much as 5-10% of menstruating women are severely incapacitated by premenstrual changes, about 30% suffer moderate premenstrual changes and a further 50% experience mild premenstrual changes (Reid, 1985). To investigate the relationship between cognitions and premenstrual changes would seem implicitly warranted.

A second consideration is an examination of the specific items which are contained in the measures (Morse & Dennerstein, 1988b). That is, item analysis of the measures used may indicate the kinds of cognitive distortions commonly held. This is particularly important in that perceived stress

is highly related to reported premenstrual symptomatology. If the type of distortion could be identified, this would be a valuable assistance towards modifying perceptions of premenstrual change as well as other stressors. Beck's cognitive model of stress is extremely relevant as he outlines several stress syndromes (eg. hostility, depression). Thus treatment might be directed at modifying the specific types of cognitive distortions unique to that particular woman.

Third, use of a cognitive model holds several inherent benefits. First, this treatment modality is not intrusive on the biology of the individual. This is not to say that more traditional methods are without merit, certainly there are some women who may require bio-medical intervention. What is emphasized is that cognitive treatment might be considered as an initial step. Various authors have reported on the incidence of women who have continued to experience the same PMS symptoms even after surgical procedures to remove the presumed causative organs (Morgan, 1985; Payer, 1987; Lauersen & Stukane, 1983). Thorough clinical evaluation may find the concomitant use of cognitive therapy with traditional methods of benefit. A second benefit of cognitive therapy would be to assist the women in regaining the loss of control or learned helplessness which has been acquired through socialization and cultural stereotyping (Hamilton, et al, 1984; DeGraff-Bender & Kelleher,1986; Golub, 1976, 1983; Koeske, 1985; Chesler, 1983). .

A fourth consideration is that of the changes which do occur during the premenstruum. This study has focused on some of the primary negative symptoms which occur premenstrually. Recent investigations have indicated the presence of positive changes that occur (Hamilton, et al, 1984; Logue & Moos, 1988; Shuttle & Redgrove, 1986; Asso, 1983). Further investigations into this area may find that the cognitive schema of the women who exhibit positive changes to be immensely important for several reasons. First, to facilitate scientific understanding and subsequent teaching to those women who experience less than positive changes. Second, is the promotion of beliefs that premenstrual changes need not always be negative (Ingram & Wisnicki, 1988). Certainly this would be a step towards reducing the negative cultural beliefs currently held towards premenstrual and even menstrual changes.

CONCLUDING REMARKS

The findings from this thesis research are highly suggestive of a cogitive component in the experience of premenstrual change. Cognitive dysfunction was found to be associated with the incidence of reported symptomatology, physiologically and psychologically. Stress was found to be significantly related with cognitive distortions and incidence of reported symptomatology.

Implications for future research include identifying specific cognitive distortions relevant to the individual women. Treatment as such would not only alleviate premenstrual symptomatology but also assist the woman in acquiring the control back into her life; control which is lost between personal beliefs, cultural beliefs, and the overwhelming implications of social and political bias.

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APPENDIX A

*Partial listing of some of the symptoms occurring premenstrually

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sadness	anxiety	anger
irritability	labile mood	headache
indecision	paranoia	syncope
chest pains	insomnia	psychosis
suicidal ideation	breast tenderness	e d e m a
hypersomnia	anorexia	hay fever
craving (food)	fatigue	o l i g u r i a
lethargy	agitation	numbness
nausea	diarrhea	palpitations
sweating	clumsiness	seizures
dizziness	vertigo	parasthesia
tremors	bloating	weight gain
nightmares	libido change	acne
withdrawal	poor impulse control	aggression
crying spells	elation	asthma
constipation	sensitive	tremors
hay fever	eye problems	a c h e s
energetic	creative	

urinary problems
decreased concentration
assault/criminal act(s)
decreased self-esteem
increased arousal
guilt/self-blame
increased alcohol consumption
joint/muscle aches
feeling of suffocation
improved performance

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*list is incomplete as individuals may experience one, several or other symptom(s) and changes not listed.

APPENDIX B

RESEARCH INFORMATION SHEET (B-1)

The purpose of this study will be to examine physical and psychological change(s) with respect to the menstrual cycle. The nature of your involvement, as a participant, will be to complete a battery of questionnaires. These questionnaires will require approximately 3/4 to one hour of your time to complete. There will be a total of 4 sessions (excluding the initial contact) over an interval of 8 weeks in which to complete the questionnaires. The sessions will be held approximately every second week.

The researcher will be contacting you by telephone within 4 weeks after the consent form has been signed in the initial contact. The telephone contact will inform you of the time and date(s) you will be completing the questionnaires. If there is any conflict with times, arrangement can be made for you to complete the questionnaires at your convenience at home.

The questionnaires will ask you about your health, your mood, how you feel about yourself, your menstrual cycle, events in your life and what you think about the events in your life. There will be 6 different questionnaires, all of which can be completed within an hour. One of the questionnaires will be completed over three consecutive days. This particular questionnaire will take less than 5 minutes. For all of the questionnaires you will be asked to fill in as many of the blanks as you can, however you are free to omit any question which may not be applicable to you or that you may not wish to answer.

The information given will be pooled with that of all the other participants, thus precluding identification of any individual. The strictest of confidence will be accorded to each individual's record forms. Any participant who wishes to see their own record forms and/or the final report may do so by contacting the researcher.

If you have any further questions regarding the study or your participation in the study please contact the researcher at the following numbers:

DABBY FONG: 220-5282 (UNIVERSITY)

270-8720 (ANSWERING SERVICE)

CONSENT FORM (B-2)

<u>Title of Research</u>:   Cognitive Belief and Premenstrual Change
<u>Researcher</u>: Author

     This is to certify that I, _____,
hereby agree to participate as a volunteer in a scientific
study as an authorized part of the education and research
program of the University of Calgary under the supervision of
Dr. Zwirner.

     I have read the information sheet provided and understand
what will be expected of me as a participant.

     The investigation and my part in the investigation have
been   defined   and   fully   explained   to   me   by
_____,and I understand her explanation.

     I have been given an opportunity to ask whatever
questions I may have had and all such questions and inquiries
have been answered to my satisfaction.

     I understand that any data or answers to questions will
remain confidential with regard to my identity.

     I certify that to the best of my knowledge and belief,
I have no physical or mental illness or weakness that would
increase the risk to me of participation in this
investigation.

     I am aware that I may request to see my own data when the
study is over by contacting the researcher. As well, access
to the final report will be made available by contacting the
researcher.

     I FURTHER UNDERSTAND THAT I AM FREE TO WITHDRAW MY
CONSENT AND TERMINATE MY PARTICIPATION <u>AT ANY TIME</u>, INCLUDING
THE OMISSION OF ANY OF THE QUESTIONS I DO NOT WISH TO ANSWER.

_____   _____
Date   Participant's Signature

     I, the undersigned, have defined and fully explained the
investigation to the above subject.

_____   _____
Date   Researcher's Signature

ETHICAL CONSIDERATIONS (B-3)

In keeping with the standards and policies of ethical procedures the following will be upheld:

1) All participants will be informed of the nature of the study and their involvement in the study.

2) Informed consent will be obtained prior to each individual's participation.

3) Information obtained will be held in strictest confidence assuring anonymity.

4) Information will be used for research purposes and may be presented for scientific meetings only.

5) All documents and records are the sole responsibility of the author.

6) No one except the author shall have access to documents.

7) Should any unforeseen risk arise, the participant shall be advised of same risk by the researcher and/or the individual's physician shall be notified to arrange for appropriate follow-up.

8) There shall be no influence exerted upon participants whatsoever. Participants shall be free to drop out of the research at any time they wish, as well the author shall have the right to terminate/limit participation in the study.