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Are There Cultural Differences in the Self-Report of Symptoms of PMS in Adolescents?: A Comparison Study of Chippewa Native Americans and Caucasian Americans

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ARE THERE CULTURAL DIFFERENCES IN THE SELF-REPORT OF SYMPTOMS OF PMS IN ADOLESCENTS?: A COMPARISON STUDY OF CHIPPEWA NATIVE AMERICANS AND CAUCASIAN AMERICANS

by

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This dissertation submitted by Shelly Marie Peltier in partial fulfillment of the requirements of the for the degree of Doctor of Philosophy from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

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ABSTRACT

Subjects completed a series of questionnaires as a means to obtain symptoms experienced across three phases of the cycle (menstrual, premenstrual, and intermenstrual). The questionnaires completed included the Demographic Data Questionnaire, the Moos' Menstrual Distress Questionnaire, the Depression Adjective Check List (Forms A and D), the State-Trait Anxiety Inventory (Forms Y-1 and Y-2), and Index Cards for two consecutive months. There were ninety-nine (99) subjects: forty-seven (47) Caucasian American adolescents and fifty-two (52) Chippewa Native American adolescents. Two subjects were dropped from this study, one from each group, due to the exclusion criteria established prior to data collection, leaving forty-six (46) and fifty-one (51) subjects per group respectively. Comparisons of the self-reported anxiety, depression, menstrual symptoms, and demographics between the two groups were conducted to determine if differences existed between the two groups. More specifically, comparisons were made to determine if differences during premenstrual phase per se or any other symptoms reported existed between the two groups of adolescents studied. Analyses compared the two groups in terms of demographic data differences and/or symptom

differences. It was hypothesized that no differences would exist in terms of types and severity of symptoms as a function of the phase of cycle for the two groups studied.

Results indicated that, in general, the Chippewa Native American group reported more anxiety, depression, water retention, negative affect, autonomic reaction, control, and behavioral change symptoms with the majority of the symptoms occurring in the intermenstrual phase of the cycle. In terms of demographic data, the Chippewa Native American group was significantly younger, regulated menstrual cycles at a younger age, and were more likely to use condoms as a contraceptive method. The Caucasian American group was more likely to mediate symptoms via non-steroidal anti-inflammatory drugs such as Advil, were more educated about the menstrual cycle via films, more likely to utilize a health professional as a source of information, and had longer cycles than the Chippewa Native American group. Differences between the two groups were also found for self-reported anxiety and depression, with both types of symptoms occurring primarily in the menstrual phase of the cycle. Exploratory regression analyses suggest some significant predictors of symptoms as well. The data overall suggest differences between the two groups in regard to menstrual cycle symptoms. However, the lack of consistency of the same symptoms to be existent across at least two cycles did not appear to meet criteria for PMS.

CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

Premenstrual syndrome (PMS) is a complex and controversial disorder that has challenged researchers, physicians, psychologists, psychiatrists, and the women who suffer from PMS. This area of study will remain a mystery for years to come until someone creates a satisfactory definition that is to be used consistently for research on diagnosis, etiology, symptoms, and treatment of PMS. Until then, one may only be guided by the current research dealing with the above issues. To give the reader an overview of PMS, a brief history will be given followed by definitions, symptoms, causes and sociocultural influences, prevalent theories and hypotheses, research of interest focusing on adolescent women, cross-cultural beliefs and practices, and the proposed comparison study focusing on adolescent women from two ethnic groups: Chippewa Native Americans and Caucasian Americans.

History

Although a specific diagnosis was not given to disorders of a woman's periodic cycle in the past, what we know today as premenstrual syndrome (PMS), has been given considerable attention throughout history. Beliefs about

the regulation of behavior by the menstrual cycle were reported in early writings such as the Talmud and the Bible (Blumenthal & Nadelson, 1988). For example, the Talmud states that a child conceived during menstruation would become a "drunkard, insane, epileptic, or homicidal" (Rubinow, Hoban, Roy-Byrne, Grover, & Post, 1985). Hippocrates stated that cyclic distressful physical and psychological symptoms occur in women and that these 'may be resolved by the onset of menstruation' (Greenblatt, Teran, Barfield, & Bohler, 1987). In Hippocrates' book, Sickness of Virgins, he associated a number of cognitive and behavioral symptoms including delusions, mania, and suicidal ideation with retained menstrual blood (Blumenthal & Nadelson, 1988).

In the sixteenth century, one of the luminaries of Padua University, Giovanni da Monte, drew attention to a possible connection between menstruation and depression (Clare, 1985) and during that same time period, the emotional storms of Queen Elizabeth I were attributed to her monthly cycle. Even William Shakespeare wrote a novel, The Taming of the Shrew, that suggested women were irksome and brawling during their cycles of the month and had an explosive temperament (Greenblatt et al., 1987). Most tribal cultures of Africa and some Native American Indian cultures separated menstruating women from the rest of the population since they were thought to be unclean and

dangerous to the health and safety of the rest of the population (Green & Green, 1986; Rubinow et al., 1985).

In the nineteenth century, PMS was seen as a psychological problem and physicians expressed concern regarding the possible deleterious effects of a woman's 'periodic ordeal' on her general functioning (Clare, 1985; Green & Green, 1986). Indeed, the actions of Lizzie Borden of Fall River who "gave her father 40 whacks" were thought to be provoked by PMS (Benedek, 1988). Henry Maudsley (1873) wrote: 'the monthly activity of the ovaries, which marks the advent of puberty in women, has a notable effect upon the mind and body; wherefore it may become an important cause of mental and physical derangement' (Greenblatt et al., 1987). In 1841, a British doctor, William Goodell, wrote that he had to crusade actively against the tradition that women must not be operated upon during their periods (Montgomery, 1974).

In 1920, Dr. Bela Schick postulated a secretion of a menstrual toxin or "menotoxin" during menstruation. He demonstrated that systemic blood and axillary sweat during menstruation were more toxic than the blood sera of pernicious anemia, leprosy, and trachoma and caused fresh flowers to wilt, and retarded growth of yeast (Montgomery, 1974). This finding was consistent with that from other menstruating females whose discharge yielded similar results. But it was not until eleven years later (1931 to

be exact) that this monthly malady with negative symptoms associated with it, became known as "premenstrual syndrome." This term was coined by Dr. Robert Frank, an American psychologist. Thus, a woman could have a label, or a diagnosis if you will, for monthly symptoms that may have caused her distress and/or physical discomfort. Other names that have been interchanged with PMS include: premenstrual tension (PMT), premenstrual dysphoric disorder (PDD), and late luteal phase dysphoric disorder (LLPDD). Although DSM-III-R uses the term "late luteal phase dysphoric disorder," this document will utilize the term PMS throughout, since this is a more familiar term.

Given the long and often controversial history of PMS, it is no wonder that there are so many negative attitudes, stereotypes, and beliefs that exist concerning PMS. For example, many attribute "crabby" feelings to a woman's periodic cycle and make jokes that it must be "that time of the month" whenever a woman exhibits such feelings and/or behaviors. As if this is not problematic in itself, there are a multitude of symptoms ascribed to PMS which make a definition difficult.

Symptoms of PMS

As mentioned earlier, there are several definitions and names for PMS. Associated with these are numerous symptoms--anywhere from 100-200 (Halbreich, Endicott, &

Lesser, 1985; Greenblatt et al., 1987; Blumenthal & Nadelson, 1988).

Although all the symptoms need not be present, the symptoms that do occur must be concurrent with previous and later menstrual cycles in order to be considered "PMS symptoms." Of all the symptoms that are said to exist, most researchers agree that insomnia or changes in sleep, anxiety, fatigue, irritability, mood, tender breast, and feelings of being bloated are most often associated with PMS (Kinch & Robinson, 1985; Rubinow et al., 1985; Greenblatt et al., 1987; Haskett, 1987; Blumenthal & Nadelson, 1988; Endicott & Halbreich, 1988; McDaniel, 1988; Osofsky et al., 1988; Janiger, Riffenburgh, & Kersh, 1972). Other symptoms that are frequently associated with PMS include: tension, clumsiness, accident-proneness, decreased intellectual and physical performance, decreased efficiency, headache, backache, nausea, weight gain, general aches and pains including muscle and joint cramps (Oswald, 1984), loss of interest and pleasure, changes in appetite or food cravings (Abraham, 1983), anorexia, loss of concentration, irrationality, loss of control, anger, resentment, remorse, nervousness, irascibility, emotional instability, constant frenzy and fretfulness, gastrointestinal upsets, urticaria, dermatosis, aphthous ulcers, antisocial behavior, psychosexual aberrations (Greenblatt et al., 1987), cramps, crying, disturbing thoughts, empty feelings, decreased or

increased energy, lethargy and social isolation, agitation, feeling fat, hallucinations, poor impulse control, increased or decreased sexual interest, suicidal ideations/actions, feelings of unreality, feelings of violence/aggression, vertigo, confusion, and excessive thirst (Osofsky, Keppel, & Kuczmierczyk, 1988). In rare instances, such curiosities as metatarsalgia, halitosis, nymphomania, and labial elephantiasis have been reported (Janiger et al., 1972). As can be seen, this is quite an extensive and diverse list of symptoms.

Operational Definition of PMS

Although several definitions of PMS exist (adding to the complexity of how to operationally define the syndrome) all definitions state that PMS is a constellation of psychological and somatic symptoms that occur regularly before the onset of menses (Greenblatt et al., 1987; Osofsky, Keppel, & Kuczmierczyk, 1988; Blumenthal & Nadelson, 1988; McDaniel, 1988; Rapkin, Chang, & Reading, 1988). Differences in definitions range from establishing when the premenstrual period begins (Rapkin et al., 1988), to including a need for symptoms to become progressively worse, to interfering with familial, social, and work-related activities, and to associating symptoms with age (McDaniel, 1988; Osofsky et al., 1988).

In 1983, the National Institute of Mental Health (NIMH) offered some guidelines regarding the operational diagnosis

of PMS. NIMH recommended that "a diagnosis of premenstrual syndrome (PMS) should be made when symptom intensity changes at least 30% in the premenstrual period (6 days before menses) compared with the intermenstrual period (days 5-10 of the cycle)" for two consecutive months (Anderson, Severino, Hurt, & Williams, 1988, p. 484). Others have added to the NIMH guidelines suggesting that the symptoms must be recurrent, must occur in two out of three successive cycles, and must abate or markedly improve within the follicular phase of the cycle, followed by a worsening of symptoms premenstrually (Osofsky et al., 1988).

More recently, the drafters of DSM-III-R (Diagnostic and Statistical Manual, Revised, 1987) suggested calling PMS "Late Luteal Phase Dysphoric Disorder" (LLPDD) until an accepted operational definition is resolved. As this is the operational criterion to be used here, a detailed description of the DSM-III-R criteria follows.

There are two main requirements for the diagnosis of LLPDD (DSMIII-R, 1987, p. 369): "(1) symptoms must be temporally related to the premenstrual cycle phase; and (2) those premenstrual symptoms must be confirmed in a longitudinal, prospective manner over the course of several menstrual cycles. Inclusion criteria for LLPDD were based on attention to several factors: (a) The particular phase of the premenstrual cycle, recognizing that the disorder can occur in nonmenstruating women who have intact ovaries; for

most menstrual cycles during the past year, symptoms (as described in b) were present during the week prior to menses, and disappeared within a few days of the onset of menses; (b) At least five of the following symptoms must be present for most of the time during each symptomatic premenstrual phase with at least one symptom being either (1), (2), (3), or (4):

(1) marked affective lability (e.g., suddenly sad, tearful, irritable, or angry);

(2) persistent and marked anger or irritability;

(3) feeling extremely tense, keyed up, or on edge;

(4) markedly depressed mood, marked pessimism, or self-deprecating thoughts;

(5) loss of interest in usual activities (e.g., work, friends, hobbies);

(6) easily tired or lack of energy;

(7) subjective sense of difficulty concentrating;

(8) marked change in appetite, overeating, or specific food cravings;

(9) insomnia or hypersomnia;

(10) other physical symptoms such as breast tenderness or swelling, headaches, joint or muscle pain, sensation of bloating, or weight gain;

(c) The disturbance must seriously interfere with work or with usual social activities or relationships; (d) The disturbance must not merely be an exacerbation of the

symptoms of another disorder, such as Major Depression, Panic Disorder, Dysthymic Disorder, or a Personality Disorder; and (e) criteria a, b, c, and d must be confirmed by prospective daily self-ratings of at least two symptomatic cycles."

As can be seen, there are many symptoms as well as operational definitions associated with PMS. This can create confusion when a woman presents herself with a few of the many possible symptoms of PMS which may or may not be listed in DSM-III-R or has a few that are listed but may or may not fit the diagnostic criteria specified for PMS. As if this problem were not enough, there are many suggested etiologies for PMS. Although several hypotheses exist, only the most prevalent ones will be briefly described in the next section.

Etiology of PMS

When one reviews postulated causes of PMS, one may be surprised, if not overwhelmed, by the possibilities that exist. It is almost as if one can draw from a magician's hat, pick out a "magical" explanation for the cause of PMS and come up with the "correct" solution. Well, of course this is not easy, nor is there any one "magical" answer. Rather, it seems that there are any number of possible causes of PMS. One such hypothesis is the "raging hormone hypothesis" which is discussed next.

Biochemical Hypotheses

According to the "raging hormone hypothesis," there is an imbalance of female sexual hormones (estrogen and progesterone) that cause the woman to behave and function in a debilitated manner. This "raging hormone hypothesis" promotes fears of women being fundamentally emotionally unstable and unable to cope or function in society when premenstrual symptoms occur. There is no known evidence of menstrual debilitation in the general population on cognitive tasks, work and academic performance, perceptual-motor tasks, or psychophysiological measures (McDaniel, 1988). However, these data do not speak to the atypical or extreme groups with PMS.

Indeed, this "raging hormone hypothesis" has also infiltrated the legal system through an insanity plea in People v. Santos (1982) (for a complete review, please see Benedek, 1988). In this case, the defendant withdrew all defenses and admitted responsibility for her actions. Since then, several tests have been used in court cases that are said to involve "women suffering from PMS at the time of the crime." These tests include: the Frye test which is used to exclude polygraphic testing and hypnotic testimony from the courtroom; the M'Naghten test which is a cognitive test for insanity and generally requires complete noncomprehension of behavior; the Irresistible Impulse test which has been implied in situations in which a defendant

apparently knew right from wrong but lacked sufficient inhibition as a result of mental disease to refrain from committing an offense; the Durham test which intended to allow a greater latitude in psychiatric testimony on the part of the defendant; and the ALI (American Law Institute) test which has been adopted in some form by 25 states and adopts the Penal Code standard or legal insanity. Despite this considerable activity, the insanity plea due to "raging hormones" has not been an acceptable plea in the United States' courtrooms. The courts assert that premenstrual syndrome is not, in itself, associated with mental disease or defect and as it is defined today, does not fit any current legal tests of insanity (Benedek, 1988). Therefore, at the present time, a woman cannot use PMS as an excuse for her offensive or criminal behavior.

More recent views and hypotheses favor a less radical hormonal imbalance hypothesis in explaining the cause of PMS. The progesterone hypothesis suggests that there is an alleged progesterone deficiency and that emotional symptoms are related to decreasing levels of progesterone. Evidence suggests that negative moods begin in the late luteal phase when levels of progesterone are at their highest and symptoms increase in intensity as this hormone drops to its low premenstrual level (Clare, 1985). A few studies utilizing radio-immunoassay of hormones have supported this hypothesis (Backstrom & Carstensen, 1974; Munday, Brush, &

Taylor, 1981; Dennerstein, Spencer-Gardner, Brown, Smith, & Burrows, 1984). As further support of this theory, depressive symptoms have been provoked by the withdrawal of exogenous progesterone treatment (Hamburg, 1966).

A related hypothesis is the serotonin hypothesis. Research has shown that progesterone increases serotonin uptake and turnover in several areas of the brain. This serotonin uptake by platelets has been lowered in depressed patients. However, once the patient was given the medication Chlorimipramine, serotonin uptake appeared to decrease in the premenstrual phase of the cycle even with variations in uptake across all phases of the cycle (Wirz-Justice & Chappius-Arntt, 1976). Wirz-Justice, Fuhringer, Hole, and Menzi (1975) have found that the pattern of platelet monoamine oxidase (MAO) activity in PMS patients was different from controls. More specifically, as compared to controls who showed either no cyclic changes or a postmenstrual increase in monoamine oxidase activity (MAO), the majority of PMS patients showed an increase in MAO activity premenstrually in addition to an increase in level of anxiety. Thus, Chlorimipramine appears to alter the level of platelet serotonin uptake with levels decreasing premenstrually thereby lessening anxiety and/or depression. Possible interactions between decreases of progesterone and decreased serotonin uptake in depression are still being explored.

An alternative hormone theory implicates excess estrogen as a possible cause of PMS. During the luteal phase, estrogen levels are high but tend to decrease when premenstrual symptoms are severe. This suggests that decreasing levels of estrogen may be related to the onset of PMS symptoms. This further suggests that estrogen withdrawal may be the cause of PMS or at least play a significant role in its etiology (Steiner & Carroll, 1977). Research has shown that estrogen withdrawal has certainly been implicated in cases of menstrual migraine (Somerville, 1972; Magos, Zilkha, & Studd, 1983).

However, the most popular of the hormonal theories deals with the estrogen/progesterone (e/p) ratio which has been identified as a possible cause of PMS since 1938 (Clare, 1985). Levels of estrogen were found to be correlated positively with irritability and anxiety whereas levels of progesterone were not. This view suggests the possibility that both hormones may interact as causative factors of PMS. Green and Dalton (1953) hypothesized a high estrogen/progesterone ratio as a cause of PMS and their study lends support to this view. Nonetheless, it is still unclear whether (a) excessive estrogen, (b) diminished estrogen, or (c) decreasing levels of progesterone are the primary cause for symptoms of PMS (Green & Green, 1986). Future research can focus on these issues to determine if

changing levels of estrogen and progesterone are sufficient to cause or prevent PMS.

There have been several other biochemical or hormonal factors that are thought to play a role in the etiology of PMS. These include: prolactin; insulin; melatonin; adrenoandrogens; noradrenaline; dopamine; mineralocorticoids; gammalinolenic acid (GLA); pyridoxine; vitamin B-6 deficiency; endometrial toxins; nutritional deficiencies; abnormalities in glucose metabolism; alterations in levels of endorphin and other peptide hormones (including vasopressin and melanocyte stimulating hormone); and changes in prostaglandins, central monoamines, and glucocorticoids (Clare, 1985: Green & Green, 1986; Blumenthal & Nadelson, 1988). These hypotheses have scant empirical evidence to support them today and are included for purposes of suggesting other possible biochemical correlates of PMS.

There are also factors other than biochemical that are believed to influence the symptoms of PMS. These include: stereotypes of menstruation, marital disturbance/dissatisfaction, the doctor-patient relationship, social stress, and cultural factors (e.g., ethnic belief systems). Research focusing on each of these factors will be addressed separately. The factor to be addressed first is stereotypes of menstruation.

Stereotypes About Menstruation

Many feel that women's role stereotypes influence their experience of the menstrual cycle. Brook, Ruble, and Clarke (1977) suggested that women are "conditioned" to expect fluid retention, pain, and emotional reactions the week before their period. Given the pressures of traditional socialization for females to be soft, nurturing, and kind, some women may feel that for three weeks a month they are expected to be "good girls," then for one week a month it is acceptable to be angry. In support of this hypothesis, women with PMS were more likely to accept the traditional feminine role according to their responses on the Minnesota Multiphasic Personality Inventory (MMPI) (Stout & Steege, 1985). Furthermore, housewives reported the highest level of symptoms (Friedman & Jaffe, 1985), while assertive, career-oriented women were less likely to report symptoms (Price, Dimarzio, & Gardner, 1986). Others, however, reported the reverse and described the "modern woman" or the woman who rejects the traditional feminine role as more likely to have PMS (Berry & McGuire, 1972; Levitt & Lubin, 1967). Needless to say, more research is needed before any clear-cut conclusions can be made.

Marital Relationship

Still other studies have focused on marital issues as a factor in the symptomatology of PMS. At least two studies have found an association between PMS and marital

satisfaction, independent of the psychiatric status of the woman (Abplanalp, 1983; Siegel, 1986). For example, Siegel (1986) found a strong relationship between degree of premenstrual distress and marital dissatisfaction. Nevertheless, it has not been established as to which one causes the other, or how many women in satisfactory relationships also have symptoms of PMS.

Doctor-Patient Relationship

As for the doctor-patient relationship as a factor in influencing diagnosis of PMS, recent publicity in the mass media suggested that more women may be seeking help from their physicians for this problem. Although this may be a self-selected population of women who seek help, differences emerge as to the symptomatology of PMS presented. One researcher distinguishes between "PMS complainers" and those with "true" PMS (Sampson, 1983), suggesting that the two can be differentiated through prospective charting of the menstrual cycle and the woman's symptomatology (Abraham, 1983). The diagnosis given depends on the woman's self-report. Thus, a woman may be inaccurate when presenting symptoms since she may be selective or add/subtract symptoms she experienced during her menstrual cycle. Again, more research is needed to determine how the doctor-patient relationship may influence the diagnosis of PMS.

Social Stressors

Social stress may also influence the symptomatology of PMS. In general, the literature supports the view that stress may act on the brain to suppress ovulation (Abplanalp, Haskett, & Rose, 1980). Furthermore, social supports may ameliorate or buffer the effect of social stress (Cobb, 1976; Gove, 1978) on health and reduce the liability to illness. The exact interaction between stress and PMS also remains to be described.

Cultural Beliefs

A woman's cultural beliefs and expectations also influence the symptomatology of PMS. Many factors are likely to influence an individual woman's response, including modeling after a mother or sister, secondary gain resulting from the reactions of those in her immediate social system, anxiety due to ignorance of basic physiology, and religious and social teachings (McDaniel, 1988). For example, a cross-cultural study on menstrual cycle-related complaints was conducted by Hasin, Dennerstein, and Cotts (1988). They focused on women from different ethnic groups in Australia (Australian, Greek, Italian, Turkish, and Vietnamese). Although 50.8% of women in the entire sample reported menstrual symptoms (with the majority of the symptoms being somatic complaints), 69% of the sample reported suffering from PMS. The Turkish, Greek, and Vietnamese women reported more somatic symptoms, while the

Australian and Italian womens' complaints were of psychological and behavioral symptoms. These authors suggest that these differences may be due to economic, racial and educational issues as well as stress of migration, acculturation and changing family and social network relations, since ethnic immigrant groups must deal with different problems than the native-born population. Alternatively, social and cultural factors may affect the perception and interpretation of symptoms.

A few other studies have also focused on cross-cultural differences in regard to the symptomatology of menarche (Beumont, Abraham, Argall, & Simson, 1978; Janiger et al., 1972; Logan, 1980). Beumont et al. (1978) found that the primary complaints among Australian females included abdominal pain, abdominal fullness, cramps, backache, breast tenderness and breast swelling occurring menstrually while constipation and dizziness were symptoms that occurred premenstrually. Their sample of subjects were healthy females who did not differ from the normal population on well-established parameters of psychological functioning. These authors conclude that there is a maximal occurrence of minor physical and psychological symptoms in the first days of menstrual flow, preceded by a gradual increase in symptoms during the premenstruum. Therefore, these authors suggest that the term "perimenstrual symptomatology" would be more appropriate than "premenstrual tension."

Logan (1980) included samples from 23 countries with the largest samples among from Japan, Iran, and Venezuela (N = 18, 16, and 16, respectively). The rest of the sample sizes ranged from 1-6 with the majority in the 1-2 subjects per group, thus limiting generalizability of findings. Despite this, findings were quite interesting. For the most part, women reported being inadequately prepared for menarche (e.g., no prior knowledge or information about menarche), with the exception of the Iranian and Western European groups who reported that fathers and other family members were involved in preparing them for menarche. Both foreign and American women were likely to depend on their mother as sources of information when menarche began. In this respect, mothers most commonly responded simply by helping the girl with the use of sanitary products, cleanliness procedures, and subtle methods of concealing the presence of menstruation (Logan, 1980). In addition, both foreign and American women evaluate their menstruation negatively. Many were surprised, embarrassed, and frightened with the exception of the Iranian group who evaluated the process of menstruation as "normal" and reported feelings of being "more grown up." Again, since the sample sizes from each of the 23 countries in this study were small, definite conclusions cannot be made. In addition, the subjects in the sample were in the United States to study English, therefore, more likely from upper

or middle class. Thus, their responses and experiences may have been quite different from the lower class and their native country as a whole.

Janiger et al. (1972) focused on females from Greece, Turkey, Japan, Nigeria, and America. A small sample of Apache Indian women was added later to the study. The symptom that was reported as most distressing was lower abdominal pain among all groups (61% of entire sample). Symptoms associated with premenstrual tension in general were found in all cultures examined. However, there were marked differences among the groups in terms of severity of symptoms. For example, the Japanese reported more breast complaints while Nigerians reported a higher frequency of headaches. In terms of overall premenstrual distress score, the Japanese were reported to have the lowest score, the Americans were intermediate, and the Nigerian and Turkish reported the highest incidence of distress. The general conclusion made by these authors was that principal symptoms of premenstrual syndrome are present in a number of diverse cultural groups, though the frequency and severity of specific symptoms show marked variation among cultural groups. Future research should focus on how this variation influences the reporting of premenstrual symptoms in general. As cultural issues are a focus of this dissertation, we shall return to this issue later.

Other Factors

Other factors that seem to have an influence on the symptomatology of PMS include: negative life changes, mood, death of a spouse, job loss, financial hardship, migration, low social class, age, country of birth, marital status, attitude toward work, smoking and drinking habits, childbearing, sex life, and psychological factors (Clare, 1985; Wood, Larsen, & Williams, 1979). To give an example of the complexity of these relationships, consider the study by Wood et al. (1979). Their sample included women from Australia, Europe and Great Britain ranging in age from 15-59. Results indicated that menstrual pain was most common between the ages of 15-19 and declined in women still menstruating at age 50-59. Menstrual pain was reported more frequently by Europeans followed by Australians and British, respectively. Single, separated and divorced women reported having menstrual pain more often than married women. Women who had children reported less menstrual discomfort than those who did not have children. Level of education had no influence on reports of symptoms. Women who were dissatisfied with work were more likely to report menstrual tension. Non-smokers and ex-smokers had a lower incidence of menstrual pain. While the frequency of drinking per se did not affect symptoms reported, the number of drinks taken in a short period of time (e.g., three drinks/hour) did have an effect (the more the drinks, the more the menstrual

symptoms). Women taking pain relievers also had a tendency to report more menstrual pain. Women taking oral contraceptives reported fewer symptoms than those not taking oral contraceptives or using other birth control methods (e.g., IUD, diaphragm). However, women reporting problems tolerating the pill reported more menstrual tension than women who tolerated the pill well. Women who reported having problems in their sex life also reported more menstrual pain and menstrual tension. Finally, emotional health had an effect on reports of menstrual pain and menstrual tension (e.g., suicidal thoughts, depression, crying, irrational fears).

Rudolph Moos and his colleagues (1967) demonstrated that generalized symptoms of menstrual discomfort are prevalent even in groups of "normal" (i.e., psychologically stable) young women. Women also appear to be more susceptible to viral infections at premenstruum and to bacterial infections during menstruation (Dalton, 1964). Other disorders such as epilepsy and migraines, multiple sclerosis, myasthenia, Grave's disease, angiovascular disorders, rashes, exzemas, and urticaria all worsen with the onset of menarche.

A few recent studies have found that depressive disorders seem to be linked with PMS in women (Endicott & Halbreich, 1988; Trunnell, Keye, & Turner, 1988; Morse, Dennerstein, Varnavides, & Burrows, 1988; Sherry, Notman,

Nadelson, Kanter, & Salt, 1988). There may also be subtypes of depression within PMS: hostile depression, atypical depression, and anxious depression (Rosen, Moghadam, & Endicott, 1988). In any event, these data suggest that depression may be correlated with PMS. Attention should be drawn to this factor since depression, in and of itself, is a serious, but treatable phenomenon.

Although the list of potential causes of PMS symptomatology is rather extensive, as can be seen here, other factors may exist. However, the best summary at present is that the etiology of PMS remains complex. Given the apparent importance of beliefs and attitudes on the expression of PMS, it is interesting that most studies have been on adult women. As adolescence is the time of both onset of menarche and a formulative time in the development of associated attitudes, let us now turn to the literature focusing on this critical time.

Studies of PMS in Adolescents

Very little research focuses upon PMS in adolescent women. The reason for the limited research on adolescents with PMS is unknown. Golub and Harrington (1981) had female adolescents (all subjects were from an urban parochial school and ethnicity was not specified) aged 15 to 16 years old complete the MDQ, the Depression Adjective Check List (DACL) and the State-Trait Anxiety Inventory (STAI). The females were compared to a male control group that completed

the DACL and STAI. Their purpose was to assess the magnitude of anxiety and depression of female adolescents who were within four days preceding the onset of menstruation as compared to female adolescents who were tested during the first four days of menstruation. These two groups served as the premenstrual group and menstrual group, respectively. Counterbalancing for test session effects occurred naturally: about half of each female group was tested first when premenstrual or menstrual and second when intermenstrual.

There was no significant difference between groups (male or female) in self-reported anxiety or depression. However, the females complained of menstrual distress on the MDQ. Significant differences attributable to cycle phase (menstrual, premenstrual, and intermenstrual) were found on all subscales except the arousal and control subscales of the MDQ. Complaints were found to be greatest during the menstrual phase with pain reported as the most troublesome symptom. Negative affect scores were higher during the menstrual phase than both the premenstrual and intermenstrual scores.

Furthermore, adolescent women appear to manifest different patterns of depression and anxiety from women over 30 who report significantly increased state anxiety and depression during the premenstrual phase of the menstrual cycle (Golub & Harrington, 1981). More specifically, young

females were as prone, or even more prone, to changes in mood than adult females over 30 since the anxiety scores on the STAI were higher. This also suggests that adolescent females are not better adjusted than adult females in regards to mood changes during the menstrual cycle. However, young females were also more likely to report distress during the menstrual phase of the cycle. These findings suggest that age may influence the incidence of premenstrual and menstrual complaints. Furthermore, these findings are based on two separate studies comparing adult (Golub, 1976) to adolescent females (Golub & Harrington, 1981). This is in keeping with Moos' (1969) observations that women under the age of 21 describe greater symptoms in the menstrual phase whereas older women tend to complain more about symptoms in the premenstrual phase.

Halas (1987) hypothesized that many adolescents may suffer from PMS, even two years before their menstrual cycle begins, since cyclical hormonal activity is present at that time. Even before the onset of the first menstruum, cyclical mood swings may occur. Cyclical mood swings may even occur during a missed menstruation. These mood swings may transform a happy schoolgirl into a "lazy" bad-tempered, selfish individual whose academic work and behavior deteriorate even before menstruation is established (Dalton, 1979). If accurate, this hypothesis can account for much

misunderstanding and inaccurate diagnosis of puzzling behavior and psychological changes in adolescent females.

Furthermore, when PMS strikes in adolescence, its effects are believed to be particularly severe. Some adolescent women react with lethargy and depression, withdrawing from family and friends, refusing to go to school or to engage in normal activities, sexually acting out, and sometimes attempting suicide because of the sudden onset of depression (Halas, 1987; Dalton, 1979). This last issue raises a very important clinical implication since it suggests that a subgroup of adolescents who suffer from PMS may be suicidal and therefore more precise diagnosis may aid utilization of intervention techniques to reduce the risk of suicide in the group of adolescents.

Additionally, cross-cultural research may be a rich source of information regarding the effect of attitudes based on rearing differences in areas of symptomatology, prevalence and severity of PMS within adolescent populations. For example, if the adolescent female is told to expect cramps, bloatedness, and moodiness (some of the negative symptoms associated with the menstrual cycle), she may develop a more negative attitude towards the menstrual cycle in general. On the other hand, if an adolescent female is told that the entire menstrual cycle is a "normal process" that every female goes through, she may develop a more positive attitude toward her menstrual cycle. In

either case, it is presumed that whatever attitude she develops will have a direct impact on symptoms, if any, that are experienced. If symptoms are severe (e.g., cramps, depression), this may require immediate attention and possibly medication to help relieve symptoms. Thus, the need for better treatment regimens for the specific symptoms experienced by each ethnic group may need to be developed for the specific symptoms experienced.

It is hypothesized that there are differences between the various ethnic groups in regards to attitudes and symptoms developed during the menstrual cycle. For example, those cultures (e.g., African tribes, some Native American tribes such as the Navajo, Sioux, and Chippewa) who developed puberty rituals to help prepare the adolescent female for her adult role may have a more positive impact on attitudes developed toward the menstrual cycle whereas the lack of such a ritual in Caucasian American culture may lead to a more negative attitude towards the menstrual cycle. Again, this has important implications for types of symptoms developed and their treatment regimens. Attitudes/beliefs that are developed, in turn, have an impact on types of taboos that exist in any culture. Perhaps the types of taboos that developed were meant to allow a female privacy, (e.g., isolation in menstrual huts during the menstrual cycle). Taboos found in several cultures are presented next.

Menstrual Taboos Found in Cross-cultural Research

Stephens (1961) examined several societies utilizing menstrual taboos. Societies were rated as to whether or not a taboo existed on a scale from which the taboo was rated as "present" or "absent." He found the following basic taboos: (1) the belief that all women are supposed to spend their menstrual periods in special menstrual huts; (2) the belief that all women during their menstrual periods may not cook for their husbands; (3) the belief that menstrual blood is somehow dangerous to men; and (4) the belief that menstruating women may not indulge in sexual intercourse.

All four of these taboos were present in only six of the 71 tribes studied (Ojibwa, Papago, Sanpoil, Kwakiutl, Cheyenne, and Ashanti). Only one society, the Ojibwa (a Chippewa tribe whose puberty customs are discussed later in this paper), believed that the menstruating woman is dangerous to young children (e.g., causes sickness or injury). He further found that several societies have the belief that the menstruating woman can endanger the whole community by bringing supernatural punishment or by blighting the food supply. For the most part, societies believe that menstruating women pose a danger to men whereas they do not pose a threat to other females.

Stephens postulated that menstrual taboos were motivated by castration anxiety felt by men. Stephen's postulations were greatly influenced by Freudian concepts.

He described three general aggravating conditions from which this castration anxiety may be derived: (1) sexual arousal of the child by the mother; (2) punishment of the child's sexual activity, and (3) the nature and severity of punishment for rivalrous behavior toward the father. Specific mechanisms by which castration anxiety leads to menstrual taboos are not developed. Perhaps men develop phobic reactions to menstruating women just by viewing the blood discharge from the woman's genitals, thus leading to a desire to avoid physical contact during this time.

Castration anxiety may also underlie avoidance of sexual intercourse during a woman's menstruation. Evidence for the existence of this practice has been cited by Stephens (1961) and Bock (1967). In some North American Indian tribes, a hunter would abstain from sexual intercourse a few nights before a hunt to safeguard against contamination of the hunt (e.g., not let menstrual blood drip on hunting utensils since this is believed to be offensive to game animals).

Young and Bacdayan (1965) reviewed the research on societies studied by Stephens (1961). They proposed that there is social rigidity present in those societies that have developed menstrual taboos. Rather than accounting for the development of taboos based on castration anxiety, they hypothesized that these societies required a sharp delineation of roles in order to maintain their productivity

and that menstrual taboos were ways of dramatizing and clarifying the status of women. However, rigidity is too narrowly interpreted since the term rigidity refers to internal cleavage that exists in a society (e.g., male solidarity and customs like menstrual taboos). This suggests that there is little flexibility in any given society. However, even though some form of rigidity may exist in any given society (e.g., the menstruating woman is isolated from the rest of the group, the pheromone hypothesis which suggests that the female secretes substances/odors that affect the male species), there is often flexibility of this practice. For example a woman may choose to go to her usual isolated place to carry on every day activities and not just when she is menstruating. Thus, other factors (e.g., psychological), rather than rigidity, may play a role in these customs.

Although these conceptualizations regarded menstrual taboos as negative, not all view them in this manner. Some researchers have focused on puberty rite ceremonies rather than taboos which are practiced in many societies. Some of these puberty rites focus on the "gift" a woman has at the onset of menstruation--the ability to reproduce. For example, most societies connect the onset of menses with the ability to conceive. In some societies when a young girl began menstruating, she was carefully protected since she was now able to reproduce and give the gift of life. In the

Chippewa Native American society, a girl could choose to marry at this time or wait until she got older. It also appears that menstruation was treated as a normal process. Menstruation, under this view, was treated positively, with the girl gaining respect and a new status among the society--that of a fertile adult. Thus, many societies celebrate puberty and proudly display a woman's puberty in elaborate or quiet rituals. Initiation ceremonies prevalent in some Native American Indian societies are presented next.

Initiation Ceremonies

Initiation ceremonies typically began during puberty when a child entered adolescence. There have been more reported puberty rites for girls than for boys, perhaps because a girl's puberty is primarily marked by menstrual bleeding and is, therefore, more readily apparent (Barry & Schlegel, 1980). At this time, a girl takes on more responsibilities and has more restrictions placed on her due to her reproductive capacity.

Female initiation ceremonies were studied by Brown (1963). She suggested that the ceremonies develop as a means of emphasizing the difference in status and roles between girls and women in societies where women continue to live in the same home where they grew up (matrilocal or biolocal residence). Brown found statistically significant support for the following: (1) the rites are observed in societies in which the girl continues to live in the

household of her parents after marriage; (2) the rites take place in those societies in which women make a considerable contribution to subsistence, and (3) rites are relatively rare that subject the girl to extreme pain and painful rites appear to be a response to a conflict in sexual identity. Barry & Schlegel (1980) suggested that initiation ceremonies expressed and enhanced social cohesiveness and also emphasized sex differentiation, and further asserted that the initiation ceremony mediates continuity between childhood and adult characteristics. These authors suggested that initiation ceremonies and prior socialization techniques emphasized both social solidarity and sex differentiation and these traits were utilized in societies in training their young children. Female puberty rites were more common in simple societies in which gathering, fishing or hunting was the main form of subsistence activity (Barry & Schlegel, 1980).

Kitahara (1984) re-examined Barry and Schlegel's (1980) data and found that initiation ceremonies were individually oriented suggesting more of a personal nature of the ceremony than was previously noted. Differences existed between individual societies in the extent to which there was community involvement or family-only involvement in the female initiates' ceremony. Kitahara hypothesized that groups operating at lower levels of subsistence where gathering, hunting, and fishing are practiced, viewed

feminine physiological phenomena such as menstruation, pregnancy, childbirth, and nursing as undesirable in certain situations (e.g., contributes to lack of productivity, overpopulation, food shortages, etc.). The reasons for this were as follows: (1) pregnant women may not be able to work as efficiently as nonpregnant women or men; (2) if a society had too many infants, the problems that arose were that the infants consumed food without contributing productively to the society and took away time and energy of the adults who tend to their needs who could otherwise engage in productive work; (3) if the society was nomadic, pregnant women and infants were viewed as burdens at times of migration; (4) increases in population lead to food shortages and thus, femininity and pregnancy may have been viewed negatively; and (5) women gave off menstrual odors that animals respond to and this may have been the reason why women were excluded in hunting activities. Given these considerations, Kitahara (1984) concluded that the emphasis on and concern with feminine physiological phenomena as symbolized by menstrual taboos were significantly associated with the celebration of female puberty rites. That is, those societies which emphasize and accentuate female physiology may have been more likely to celebrate puberty rites than those who saw femininity as a burden.

Along with puberty initiation ceremonies goes external marks of social maturity. In some tribes, there was a

change of dress (or ornaments) or some type of mark placed on the girl's body. For example, the Déné and Salish Indians inserted labrets (an ornament worn in a perforation of the lip) into adolescent females as an external mark of social maturity. Some girls were admitted as members to secret societies such as the Kotikili of the Zuñi which was also an external mark of social maturity. Some girls became shamans and assumed their religious and medical functions at puberty. Among the Algonquin Indian tribes, where a girl "designed to become a medicine woman" had been subjected to hard usage, that is, the girl did laborious work to build up her physical dexterity (e.g., chopping wood, hauling water, preparing food) since childhood, the girl took up her profession at the period of puberty (Van Waters, 1913). The Omaha and some of their cognates placed a round mark on the girl's forehead which indicated the achievements of her father, though she herself had to fulfill conditions of chastity, strength and industry before he received the honor which accompanied this ceremony. The design was called "The Mark of Honor," and ensured the girl fertility and a fortunate marriage (Van Waters, 1914). In addition, the Omaha tattooed a four-pointed star on the back and breast which signified life processes and spiritual forces in nature. Many western tribes of North America (e.g., Maida Indians) represented pottery and basket designs showing their relation to women's art and industry. The Chippewa

also tattooed girls during puberty with the belief that this would cure toothaches, depending on how the girl endured the pain. The Seri Indians of the Gulf of California painted the girl's face with designs that were hereditary in the female line. The girl was given a puberty feast, after which she may have chosen whether or not to marry at that time.

Another way a girl underwent puberty rites was by physical restrictions, which was related to the girl's welfare as well as that of society. Among the Assiniboine, there was strict taboo that no menstruating girl step over anyone or see the sick, or approach a medicine bundle, in order to prevent her from menstruating indefinitely (Van Waters, 1913). The same reasoning was used by the Shoshone for restricting the girl to a vegetable diet. The Déné tribes had the girls secluded from one to three years and during this time, the father held a potlatch (gave away gifts) to help him "wash out his shame." This was thought to serve as a role model to ensure a girl's generosity. During this time, a girl's diet was restricted from meat and fish and she could not bathe in a stream or lake during her seclusion. The Maida of California had fewer restrictions on the girl; she was allowed to emerge from her hut at certain times and could mingle freely with guests who attended the puberty festival. She remained in the hut during the day but was allowed to dance, sing and feast at

night. It is interesting to note that a girl's husband must live on the same food she did during menstruation and could not partake in hunting. The Shoshone believed that violations of menstrual taboos resulted in death whereby anyone who saw the girl during seclusion would sicken and died by vomiting. This was one of the extreme forms of beliefs in impurity which was not present in the previously mentioned tribes.

There were also rituals in some tribes that were believed to ensure fertility of the girl. The Mission Indians "roasted" the girl by throwing seeds over her to influence organs of reproduction. The Hopi designed the hair into a coiffure (resembling a mature squash) which was a sign of maturity and designed to promote fertility. The Zuñi took the blood from the first killed rabbit during a sacred rabbit-hunting ceremony, and allowed the blood to trickle down the girl's legs to promote fertility.

There were also pedagogical rituals in some tribes. The following modes of training were common: walking, running, leaping, digging, climbing, and swimming, to obtain tirelessness and lightness of foot (Shuswap, Lillooet, Kafir, etc.); carrying pots of water, that she may be strong; hard labor at the home of her future mother-in-law during the first day of the first menstruation "to promote industry and fertility" (Hopi Indians); and vigils for long periods so that she will not be lazy (Cheyenne Indians) (Van

Waters, 1914). Girls among the North Carolina Indians were formerly secluded in the dark to "harden them." The "roasting" ceremony among the Mission Indians involved features of gift-giving to promote generosity in the girls. The Assiniboine had a similar tradition in which gifts and property were distributed to honor the girl.

There were religious, mystical, and magical beliefs surrounding a girl's puberty. For instance, the Delaware Indians believed that the soul entered the body or became mature, only at puberty. Among the Omaha, the girl underwent a trancelike state (to stand sleeping) and was oblivious to surroundings whereby a vision was sought. After a long fast, the animal and/or plants in the vision were procured and became a trophy; a union with the unseen. Shuswap and Lillooet tribes had a similar practice. The Mission Indians waved branches to keep off evil spirits. The Pima renamed the girl at puberty to deceive the evil spirits; it was taboo to say the girl's name and would cause her to have bad luck should it be spoken. The Shasta Indians took many precautions: there were taboos of food, sleep, sun, moon, fire, and clear water, which were used to ward off evil spirits. Should these fail to keep calamity from happening to the girl, she was burnt as sacrifice. These religious and magical explanations were believed to guard the girl from evil.

Many customs served as forms of purification. The California Wintun tribes gave girls "buckeye" (a drink made from the tree of the horse-chestnut family) to drink as a means of consecration and skillful dancing. Disappearance into the mountains (Thompson Indians), "smoking" the girl over sweet grass and burning coals, giving away of gifts, dieting and purging were means of purification among American tribes (Cheyenne, Mission, Pawnees, etc.) (Van Waters, 1914).

As mentioned previously, a girl was also believed to possess supernatural powers at onset of puberty. With the Tlingit Indians, the girl had the power to influence fishermen, hunters, or gamblers and could turn objects to stone. Among the Siouan Assiniboine, a girl could be a danger to herself and others during menstruation. She was not to go into a house where a medicine bundle is kept or she would continue to menstruate indefinitely. Among the Thompson, Lillooet, and Shuswap Indians, spiritual influences would determine a girl's personal and social life. Among the Algonkian tribes, the girl's training involved obtaining a "manitou" (guardian spirit) to help her ward off evil spiritual influences.

In addition, there may have been discrimination between the sexes in terms of puberty rites. The following tribes were said not to discriminate the sexes at puberty: some Déné tribes, Hopi, Lillooet; Navajo; Omaha and some

cognates; Pawnee; Pima; Shuswap and Thompson, Yuchi; and Zuñi. Discrimination, when it was involved, was not based in what separates the sexes, but rather on that which united them. Therefore, customs relating to an adolescent girl cannot be understood apart from their relation to other social groups and classes. Sex-discrimination served as a means to separate the sexes in regards to sex differences, economic and social conditions, religion, pre-marital status, etc., and occurred primarily at the onset of adolescence. Thus, sex-discrimination may have gone against the girl (e.g., not being able to participate in certain religious ceremonies) or in favor of the girl (e.g., external mark of social maturity enabling the girl to participate in becoming a shaman). Needless to say, being aware of the various customs associated with adolescent girls enables us to understand the roles they play in a given society. Examples of this relation are mentioned next.

The Déné warriors had to undergo the same taboos for the first four campaigns (war parties or similar activities that the male members participated in) during a girl's seclusion. Furthermore, boys had to use scratch sticks (the body could not be touched due to danger) and sinew charms to ward off evil spirits. A similar pattern of using a scratch stick is found among the Creek Indians and this initiation lasted 12 months. However, the Creek Indians used the

scratch stick for tattooing the boys via marking them. The Ojibwa (Chippewa) warriors could not touch their head with their hands during the first three campaigns. The Pima warrior had to undergo seclusion for 16 days after killing an enemy. During this time, he had to fast without food for four days and go without water for two days. He was not allowed to touch his head with his fingers but had to use a scratch stick covered with mud at the tip instead. He must keep absolutely silent, bathe frequently and wait to be served food last. During this time, his wife could not eat any salt. Among the Thompson Indians, the father of a girl who has just arrived at puberty, could not hunt or trap for a month and underwent various restrictions.

There were various factors that may have contributed to discrimination when it was present (Van Waters, 1914). Although social class did not appear to be a factor in discrimination between the sexes among Native American Indian tribes, religion appeared to be a causal factor in reducing discrimination in puberty ceremonies. Among the Zuñis, the supreme life-giving power was bisexual, referred to as He-She, or *Awonawilóna*. This conception dominated the whole of their religion and observance (Van Waters, 1914). The Zuñi had several female deities in their religion: Moon Mother, Earth Mother, Corn Mother, Corn Maidens (of which there were 10); Salt Mother and Mother of Game. There was no discrimination between the sexes at puberty in regards to

entering secret societies and fraternities. The Pawnee Hako ceremony and a ceremony by the Omaha tribes were quite similar to that practiced by the Zuñis. The men in the Yuchi tribes gave honor to the Sun-Mother and utilized scarification which ceremonially represented a menstruating woman. Child-bearing among the Yuchi Indians had direct reference to a physiological relation to menstruation. Their origin was attributed to the sun deity, who was in her period and dropped blood to the ground, whereby a baby sat after this phenomena. The most elaborate puberty ceremony was found among the Shasta Indians of California. The girl was secluded for 10 days and again, was given several responsibilities (e.g., gathering firewood for members of the village). The 10-day ceremony was repeated for the next two periods and only at the end was the girl considered marriageable (please see Van Waters, 1913, for more details). No discrimination existed between the sexes at time of puberty in these tribes.

A factor that could lead to discrimination in some tribes was pre-marital status. The Zuñi and Omaha favored chastity among adolescent girls but were not harsh in the treatment of the unmarried mother. The unwed mother was treated kindly and the child was allowed birth ceremonials. Her conduct was looked upon with regret but her child was given consideration. Among the Omaha, girls and boys were socially in a moral equality; a man was given responsibility

for all his children while blame was equally shared. However, discrimination in this regard existed among the Iroquois. In this case, only the girl was held responsible since her social position was deemed superior to a man's. Therefore, a girl's premarital adult status, that given her upon menstruation, directly influenced the respect and responsibilities she would receive from the rest of the tribe. Again, proper education regarding the menstrual cycle may be enforced to ensure a girl's chastity until marriage.

Van Waters (1914) concluded that three tendencies--periodicity, individuation and symbiosis--underlied these diverse patterns of initiation. Periodicity referred to a cycle of activity and rest. The cycle was marked in numerous ways such as seclusion, restricted diet, freedom from work, release from social activities and other menstrual taboos. The second component of periodicity was psychological. Prior to puberty, the girl may be treated like a child by being washed, fed, cradled, guarded, etc., but when she underwent puberty rites she was treated more like an adult and given adult responsibilities. It appeared that the attitude toward menstruation was one of utmost respect. That is, menstruation was taken seriously, since this allowed an adult status for the girl who was now able to give life. This factor suggested a more positive view of

menstruation which enabled the girl to accept it as a normal way of life.

The next factor was individuation--setting the girl apart to develop her own identity. Some examples of this process include: the girl's isolation from the group, seclusion, living in a separate dwelling, and eating meals alone, all of which helped the girl attain independent status. Other markings of individuation could be ornaments, badges, labrets, and tattoos. The girl was now separated from childhood functions and now served an adult role. Although isolation or separation from a group during menstruation may be viewed negatively, since a girl must not be near or touch sacred objects (e.g., hunting equipment, medicine bundles), this may in fact be more positive. When the girl was placed in a menstrual hut at this time, she was usually educated by a female relative about all the aspects of menstruation in addition to being prepared for her adult role. Again, this enabled the girl to develop a positive attitude towards menstruation since she was separated from the group at this time and was allowed time to accept her new role as an adult as well as being able to absorb what menstruation entailed.

The last factor involved was symbiosis, which is the tendency that united the individual with all elements of the environment as a whole. The girl was now assimilated into her community as well as brought into relation with the

forces of nature. Only then could a girl be in harmony with her surroundings and continue life in her new-found adult role. It should be noted that although Van Waters' articles (1913, 1914) are extremely outdated, she did in fact do a comprehensive research on several ethnic groups. Since the publication of these articles, very little cross-cultural research has been done since then. It was doubtful that her findings could be similar or the same in this era. However, her research does suggest differences amongst the groups studied. Given the fact that the research was eighty-four years old gave impetus to the need for further cross-cultural research.

In all essence, however, a girl's puberty ceremony was a much celebrated event and was often viewed positively as a means of introducing the girl as a mature, fertile adult. It was felt that those tribes who celebrated puberty rites would have a more positive impact on the preparedness for menarche and thereby allowed the girl to view menarche as a normal part of life. This, in turn, could lessen the reporting of negative symptoms of menarche since the girl had been prepared beforehand of all that it entailed. This does not mean that symptoms would not exist, but rather symptoms may have been reported as less severe as a result of this preparedness. With this in mind, a few tribes' ceremonies will be discussed next to illustrate various patterns which may differentially affect attitudes toward

menstruation. These tribes are discussed since detailed accounts were given in the literature reviewed, although puberty ceremonies may exist in other tribes. These tribes include the Apache, Oglala Sioux, Navajo, and Chippewa.

Apache Initiation Ceremony

Driver (1972) has studied the elaborate female initiation ceremonies among the Chiricahua Apache. In fact, he went so far as to say that the four-day girls' puberty rite of the Mescalero and Chiricahua Apache is the most rigidly maintained ceremony and the greatest social gathering of the tribe. This statement brought about criticism from Opler (1972), who also studied the ceremony. Opler (1972, p. 1134) stated that "it is an overstatement to assert that the girl's puberty rites are the most important ideologically and best attended of all public ceremonies and that they dominate all other public rituals in the Athapaskan Southwest." He stated further that the girl's puberty rites placed well behind the holiness rite, the ceremonial relay race, and the masked dancer ceremony of the Jicarilla Apache. Among the Jicarilla Apache, a boy of the same age is paired with a girl during the initiation rite and stays with her during every stage of the ceremony. Opler thus called it "the adolescence rite" rather than girl's puberty rite since boys are given equal status. In Driver's (1972) reply to Opler, he agreed that this was so and was pleased someone had corrected his mistakes. The

following is a description of the puberty rite ceremony among the Chiricahua Apache.

Fathers of the pubescent girl encouraged community-wide assistance with the preparations, which took an entire year and began with efforts to win support from those who would play important ceremonial roles in the menarchial ceremony (Paige & Paige, 1981). In some cases, those who committed themselves to such an ordeal obtained life-long personal responsibility to the young woman and her family. Preparations began a year before the daughter reached puberty. A female personal attendant was sought who would accompany the girl throughout the ceremony. Another important person was the "singer" who played a large part in the supervision and execution of the dramatic rituals in the ceremony. Both the attendant and singer were given several gifts as signs of appreciation of the functions they served.

Meanwhile, while the singer and attendant were away getting prepared for the ceremony, the girl's relatives were busy making a buckskin dress for her to wear. The father also made a public announcement to obtain the help of mask makers who also served an important function. The father promised a big feast to all those who helped.

When the onset of the girl's menstruation arrived, she was secluded in either her parents' house or in a specially built seclusion hut. This seclusion could last from a few

days up to a year. During this time, participants were engaging in feasting, singing, and dancing.

Opler (1972) stated that the elaborateness of the ceremony depended upon the size of the family and extent of resources. He suggested that the role of the masked dancers was to ward off enemies or diseases, and thus, may have influenced the attendance of the ceremony. Initially, the ceremony was done individually for each girl. Today, American authorities have forced the Apache living on the Mescalero Reservation (Mescalero, Chiricahua, Lipan) to combine family resources and efforts and to hold a puberty ceremony once a year for all girls who have reached pubescence during the preceding 12 months (Opler, 1972). This, in essence, has enlarged attendance but individual ceremonies have been lost. Among the Jicarilla, it is possible to have up to 12 unrelated girls and therefore the same number of families sharing the expense. Although this may appear to be more practical in terms of expense, its impact on the "traditional" individual ceremony is unknown. In addition, the Native American Religious Freedom Act would still allow for individual ceremonies.

Oglala Sioux Ceremony

The following is a summary of a girl's puberty rite called The Buffalo Ceremony or *Išnati Awicalowanpi* ("They sing over her [first] menses") (Powers, 1980). The term *Išnati* literally means "to dwell alone" and essentially refers to

the fact that a girl lives in isolation during menstruation. The girl was usually secluded in a small tipi outside the camp circle. Her needs were attended by an older female relative, or a female of the family's choosing, who had an impeccable reputation. During this time, the girl was instructed in her new duties as a wife and mother.

The Buffalo Ceremony was performed to invoke the spirit of the buffalo who brought about virtues most desired in a woman: chastity, fecundity, industry, and hospitality. A medicine man conducted the ceremony for 10 days after the girl's first menstrual period.

The day before the ceremony, the girl's tipi was erected with the doorway facing the east to ward off *Anukite* (double-faced woman) who was supposed to be both white and black, which represents appropriate and inappropriate sexual conduct, respectively. She also had to be protected from *Waziya,* the Wizard, and the evil influences of *Inktomi,* the spider, who was a trickster capable of transforming himself into human or other nonhuman forms. The girl's menstrual bundle was placed in a plum tree to ensure fertility. An altar was erected in the tipi that faced the west and the father put ritual paraphernalia in the lodge: a buffalo skull, a pipe, tobacco, a wooden bowl, sweet grass, sage, an eagle feather, a fire carrier, dried chokecherries, dried meat, a drum, two rattles, a breech clout, and the girl's new dress (Powers, 1980).

The medicine man prayed in the lodge and "smoked" it with sweet grass and sage, thus blessing it. The girl entered the tipi and was instructed to sit cross-legged between the altar and the fireplace (in center of tipi). The medicine man then prayed to nature's forces: the sun, moon, earth, and four winds. He then prayed that the girl would be industrious, fertile, and happy. After this he began to play the part of a buffalo, and blew red smoke in the air, and danced toward the young woman, lowing like a buffalo bull during rutting season. He would sidle up to the girl like a buffalo performing a mating ritual and each time he did this, the girl's mother placed sage under her arms and on her lap. The wooden bowl was filled with chokecherries and water and the medicine man invited the girl to get on her hands and knees and drink like a buffalo with him.

After this, the girl was told to remove her dress and her mother arranged her hair so it fell in front. The shaman painted her forehead red and stated that "red is a sacred color" and represented her menstrual flow which was the sign of life. She was dressed as a buffalo woman and the shaman tied the eagle plume in her hair and gave her a staff made of cherrywood. The girl's mother removed the belt that once held the menstrual bundle and the ceremony was concluded by giveaways and a feast in the girl's honor.

Navajo *Kinaaldá* Ceremony

The Navajo's puberty ceremony was a public ceremony whereby essentially everyone in the community was invited to attend. This celebration was called *Kinaaldá,* which literally means "house sitting" and the Navajos used the term to refer to the girl's first menses. Before this ceremony, prepubescent girls were often prepared by their mothers for the onset of menstruation (usually around the age of 10). She warned of the great power she would possess and the restrictions she had to obey during menstruation to avoid harming others. Some of the restrictions placed on her include: She could not enter a ceremonial hogan; see sand paintings, attend a sing, join in any dancing, go into the fields, have contact with livestock or children, carry water, use the sudatory, urinate in places with which others might have contact, or visit persons who were sick (Frisbie, 1967). If these taboos were violated this would result in injury to others in the form of illnesses, impotency, crippling, or hunchback.

The onset of menstruation was a time for rejoicing. The first two menstruations were not considered dangerous and the danger of menstrual blood increased with age. When the girl began to menstruate, a public announcement was made to the community which began the onset of a four-night ceremony. This was done immediately or soon after menstruation began and the ceremony progressed throughout

her menstruation. Formerly, the girl was considered ready to marry and became a tribal symbol of fecundity. Some girls married within a year after puberty, but today, most girls wait until they are older to marry and not necessarily after having their first menses.

The *Kinaaldá* was considered part of the Blessing Way Ceremony. The purposes of the ceremony were to usher the girl into society, invoked positive blessings on her, insured her health, prosperity and well-being, and protected her from potential misfortune. The *Kinaaldá* originated out of the myth of Creation Story in which changing woman's puberty ceremony took place (please refer to Frisbie, 1967, for more details regarding this myth).

As mentioned earlier, the *Kinaaldá* was a four-day celebration. Most girls underwent two *Kinaaldá* before they were considered adults. However, some chose to go through only one *Kinaaldá*, which was also acceptable.

The first day of a *Kinaaldá* involved the announcement of the event and discussion of the start of the ceremony. Preparations for the girl took place and the girl's hair was elaborately combed by her personal female attendant, who attended to her needs throughout the ceremony. She was then dressed in traditional Navajo garb (shirt and skirt) and was "molded" in the hogan. During "molding" limbs were stretched so she would grow. After this the girl ran to the

east; races were run at dawn, noon, and sunset. On the first day, the number of races depend on the starting time of the ceremony. Each race increased by 5 minutes' duration. When the girl returned, she started grinding corn for the *Kinaaldá* cake, which was called *'alkaan.*

The second day, the girl ran three races which again increased in length and time and ground corn when she returned. She was kept busy so she would be strong and endured the role of an adult woman.

On the third day, the girl ran three races, increasing in time and length and again ground corn upon her return. The pit in which the corn batter was to be baked, was dug by the male and female relatives. A fire was made in it so that it would get hot enough to bake the cake. The ground corn was made into batter for the *'alkaan* which could be sweetened by sugar, honey or syrup and raisins added for variation. After it was smooth, the batter was poured into the pit which had been lined with corn husks. Then the cake was blessed and covered so that it would bake from the remaining heat.

In the evening of the third day, food and other goods were brought into the hogan. The hogan was blessed at that time. The girl then passed out corn pollen to the people present. Corn pollen was sacred to the Navajo and represented fertility. The corn pollen was eaten. This was when the singing began in which 14 chief hogan songs were

sung. After that, the girl left the hogan for a little while and returned. This was when the Blessing Way songs were sung. Corn pollen was given to each person present after each set of songs. The singing went on throughout the night.

On the fourth day, a Dawn Song was sung. The personal female attendant washed the girl's hair and gave her jewelry to wear. During this time, four songs were sung. The girl went for her morning run and while she was away, four more songs were sung, followed by one 12-word song. Again, when she returned, corn pollen was given to the guests. The people all went out of the hogan and uncovered the cake and the girl followed them. The cake was then cut. The center was cut first and given to the medicine man, since this was the sacred part of the cake. Then, all of the guests were given cake which was handed out by the girl. The girl was not allowed to eat the cake and had to give it all away to help teach her generosity. After that, the people were fed a feast to honor the girl. The girl's hair was combed and groomed and two more songs were sung. The girl was then painted with white clay (a sign of purity) and again, two songs were sung. The girl was taken outside to be molded and stretched so that she will grow. Blankets, jewelry, or other goods that were loaned to the girl were returned to their owners. If there was any cake or food left, this was

distributed to the guests (please refer to Frisbie, 1967, for more details on the *Kinaaldá*).

If the girl chose to undergo a second *Kinaaldá*, the events were primarily the same as the first *Kinaaldá*. The main difference was that 25 Talking God Hogan songs were added to the third night. The main singer and personal female attendant should be the same two people as in the first *Kinaaldá*, if possible.

Chippewa Custom of Girl's Puberty Rites

The last puberty ceremony to be described was celebrated by the Chippewa. It appeared that Chippewa (Ojibwa, Ojibway) customs of puberty rites were not as elaborate as the above mentioned ceremonies. Very little literature exists regarding the practices of various Chippewa tribes. Landes (1969) goes into a little detail about youth and girl's puberty rites celebrated among the Ojibwa of western Ontario, Canada. A brief synopsis is given about views of the Chippewa (both Canadian and American tribes) surrounding menstruation in general.

Prior to menstruation, a girl was allowed to "play house" with her brothers and other members of the family in which imitation of adult behavior took place. Sex was never allowed and only "hinted at" during play. Boys were taught to take care of their sisters and sisters were taught to play "wives" for their brothers. In other words, the boy

provided food for the home and protected his sister, while she cleaned all the game he had brought and made clothing for him. Although a closeness existed between both sexes, children were never allowed to become intimate. The closeness between the sexes lessened somewhat when the boy's voice changed and when the girl received her first "menstrual sign." A "shyness" existed between brother and sister at this point and the girl was taught to avoid her brother as well as his important possessions for his safety. These taboos existed for subsequent menstrual cycles. Little of the girl's time was spent with males in the home, and most of the time was spent with females in the home who taught her "womanly chores and standards" (Landes, 1969). They were the ones responsible for preparing the girl for onset of womanhood as the "menstrual sign" indicated.

Prior to the onset of menstruation, a young woman had no knowledge of such a phenomenon and when her first cycle began, she was isolated from the rest of the tribe in a wigwam nearby (Hilger, 1951). This isolation lasted between 4-10 days. During this time, the grandmother explained the phenomena of menstruation and prepared the young woman for adulthood. The grandmother attended to the girl's needs and taught her how to cook, clean, and complete other necessities to prepare her for married life.

The girl went through a ceremonial fast at the time of her first menstruation (Landes, 1969). At this time, a girl

possessed great "power" that invaded every woman during her years of fertility. This "power" reached its high point during the first cycle when the woman was considered "new" and a vision quest was thus desired. Beliefs that a woman was now a menace to herself and others (could contaminate) existed during this time and she was hurried out of the main lodge by her mother or grandmother to a secluded hut in the forest. She was dressed poorly, soot was smeared about her eyes, her gaze was cast downwards and she could not look at any living thing (Landes, 1969). She had to use a scratcher for her body so as not to contaminate herself with her own flesh. The girl could not eat fresh food but had to eat dried foods (e.g., berries, meat) and bread so as not to "blight" the fresh fruits, vegetables, and animals. She sat quietly and meditated and could engage in making moccasins, beadwork, or mending. The only people allowed to talk with her were girls in "her condition," or those past menopause. If she chose to walk about, she had to throw leaves about as a forewarning to men, pregnant women, and babies so no harm would come to them. During this time, she was supposed to seek a vision, although it was not a necessary component during first menses. She could seek a vision during a later cycle and might never actually achieve a vision.

Since onset of menses signaled a girl's eligibility for marriage, she was taught basic sewing skills, the meaning of her sexuality as a woman, and other tasks/expectations in

her adult role. Being a good cook and a skilled seamstress were desirable traits for females who sought marriage.

After discharge had ceased, the girl washed, was dressed in new clothes, and could undergo simple ceremonies conducted by her mother or grandmother that prepared her for introduction as an adult to the other tribal members. When she returned home, a feast awaited her. At the feast, an elder welcomed her saying "you left as a girl; you return as a woman. We sorrowed when you departed, leaving behind a girlhood we had grown to love. We rejoice at your return, new and different. Through you, will the people live and live on" (Johnston, 1976, p. 142). The girl was then embraced by the elder and the other women in the tribe did likewise. The girl did not have to return to her wigwam during subsequent menstrual cycles but usually chose to because it was "taboo" to touch any hunting or spiritual articles in the main wigwam when she was in possession of her special "power" (e.g., ability to give life or have supernatural capabilities) during menses.

It is uncertain the extent to which these practices still exist among the various Chippewa/Ojibwa tribes. In the Turtle Mountain Chippewa tribe (an American group), these practices appeared to have become more "modernized" in the sense that the girl was no longer separated from her home during her menstrual cycle. Also, she usually chose not to get married shortly after her cycle first began.

Beliefs still existed that a woman could not partake in any religious ceremonies (e.g., sweat lodge) or dance in a pow-wow during her menstrual cycle. This was usually a personal choice rather than being dictated by the tribe. It remains to be seen the extent to which other "traditional" beliefs/practices still exist (e.g., being informed by mother, grandmother, or other female member about the menstrual cycle and adult female role) and to what extent a person does not touch or eat "taboo" items. Since the focus of this study was to compare Caucasian Americans with Chippewa Native Americans, the views/beliefs of the former in regard to menstruation are discussed next.

Caucasian Practices in the United States

As reviewed above, in many societies the menarche was recognized as a crucial time in a girl's physiological, psychological, and social development which was openly acknowledged to the public world marking her entry into the adult world (Whisnant & Zegans, 1975). In the white, middle-class American culture, however, little formal recognition had been granted the occurrence of this event. Parents and educators had struggled on the best way that prepared and informed girls about menarche. More often than not, menarche was viewed as a hygienic crisis (Whisnant & Zegans, 1975; Koff, Rierdan, & Jacobson, 1981; Clarke & Ruble, 1978; Havens and Swenson, 1986; Whisnant, Brett, & Zegans, 1975). There was very little research that focused

on the emotional and psychological impact of this significant event in an adolescent's life.

The research that did exist in regards to menstruation among Caucasian American groups focused on the adolescents'/womens' beliefs about menarche timing and preparation for menarche, and sources of information about menarche. Most of the research had focused on comparisons of pre- and post-menarcheal girls to determine how they dealt with and adjusted to this phenomenon. The first area to be addressed is attitudes/beliefs regarding menarche.

Most of the research had suggested that girls were not well-informed about menarche, despite the girl's belief that she was well-educated on the topic. Whisnant and Zegans (1975) showed that many girls had poor conceptions of their bodies or their functioning in addition to poor vocabulary when referring to external genitalia. Although the girls had some idea that a discharge of blood via the vagina was to be expected during menstrual cycles, beliefs/conceptions about this discharge were inaccurate. For example, the girls' ideas about why women menstruated included the following: "it is waste blood from your body," "I have no idea what is going on inside," "periods are stuff to have a baby with that was not used by whatever you call it--comes out with blood and junk," "the egg inside does not get fertilized so it drops down--turns to blood" (Whisnant & Zegans, 1975). Misconceptions also existed in regards to

what the uterus was as well as duration of flow, amount of flow and the nature of the flow.

Differences existed between the pre- and post-menarcheal girls in terms of announcing the first menarche. Pre-menarcheal girls anticipated they would openly announce the onset of menarche to their friends and family while post-menarcheal girls tended to be more secretive and relatively few had in fact told their mothers about the onset of menstruation. In addition, pre-menarcheal girls anticipated that they would start their menstrual cycle at about the same age as their mothers, who, in turn, would be pleased about this (Whisnant & Zegans, 1975). In contrast, post-menarcheal girls who started their cycles either before or later than their mothers and/or friends tended to be private about this phenomenon. Furthermore, girls who started later reported being more hurt or confused by their friends' unwillingness to share their experiences with them despite their prior agreement to discuss this freely.

Girls' reactions to their first menarche have been studied by various researchers (Koff et al., 1981; Havens & Swenson, 1986; Ruble & Brooks-Gunn, 1982; Whisnant & Zegans, 1975). Together, these studies suggested that post-menarcheal girls reported more negative experiences and symptoms than pre-menarcheal girls anticipated. Pre-menarcheal girls reported anticipated negative symptoms, but to a lesser degree than reported by post-menarcheal girls.

Furthermore, pre-menarcheal girls could not articulate the source of the flow or negative feelings toward menstruation. For both groups, the negative symptoms reported included: surprise; fear; feelings that menstruation is a "drag;" disgust; anger; inconvenience; feeling more tired or less energetic; confusion; cramps; feeling bloated; physical discomfort; embarrassment; nausea; shame; feeling ill, strange, or weird; gas pains; upset stomach; and moodiness. On the other hand, both groups also associated some positive feelings with menarche. These included: a sign of maturity or being more "grown up," ability to have children, happiness, pride, identifying more with their mothers, and seeing menstruation as a "normal part of life."

Since both groups of girls had a tendency to differ on self-reported or anticipated symptoms in terms of the extent and severity of symptoms, that is pre-menarcheal girls reported anticipation of less severe symptoms than post-menarcheal girls. Two other factors are thought to play a role on girls' attitudes towards menarche: timing and preparation of the girl for menarche. For the most part, girls were not prepared for the onset of menarche. Although the mother was cited as a prominent resource for information about menarche, discussion appears more after the fact. Rather, most girls received information through educational films, teachers, and nurses, either before or after menstruation had begun. Despite the fact that mothers did

not provide pre-menstrual information, girls viewed their mothers as being supportive and concerned. Education by mothers appeared to be more focused on sanitary products rather than discussion of the psychological and physiological significance of menarche.

For both pre-menarcheal and post-menarcheal girls, fathers were usually not informed about the onset of menarche. Thus, the impact of the fathers' role in this event has not been thoroughly investigated. Interestingly, Havens and Swenson (1986) asked whether or not the girls would want siblings or boys to know about menstruation. Although only 35% of the girls in the study wanted boys and girls together during class discussion, 89% stated that boys needed to be informed about menstruation. These girls believed that education of both sexes would increase their comfort in openly discussing menstruation. They also believed that a mutual understanding between boys and girls could be reached if the boys were educated on the subject. As for informing siblings about menstruation, 38% thought that parents should inform siblings when they started menstruation. Again, the girls gave specific reasons to consider such as whether or not the siblings would understand menstruation and not be afraid of it.

Taken together, these data suggested that timing and preparation of a girl for menarche was viewed as being relatively important. Furthermore, it had been suggested

that girls who were unprepared for menarche generally reported more negative feelings, more symptoms, and a more negative self-image (Ruble & Brooks-Gunn, 1982). Thus, early education about menarche appeared to have long-term implications for the psychological adjustment of women. Therefore, timing and preparation of menarche are areas that need to be addressed further.

Statement of the Problem

As described above, menarche may best be conceptualized as a "puberty rite" or "rite of passage." In many cultures, rituals helped a girl to make the transition from child to adult in some recognizable form, thereby, providing new emotional meanings, and redefining the girls' role and status within the society. This appeared to be important in many ways. First of all, formal rites themselves helped prepare the girl for her newly acquired adult status. Second, formal rites introduced the adulthood of a female to society. Third, formal rites introduced the female as a fertile partner to future beaus or marriage partners, promising the gift of procreation. Fourth, this gift of life ensured ongoing existence of the tribe or group via future offspring of the fertile adult. Fifth, when the girl was isolated during the time of her menarche (as happened in several Native American tribes), she was taught all that she needed to know about menarche by an elderly female in the tribe, which may have helped better prepare her on all

aspects of menarche, including symptoms experienced. And finally, this "preparedness" may have ensured a better adjustment to menarche thereby lessening severity of symptoms or negative attitudes towards menarche.

Whisnant and Zegans (1975) pointed out that today's American culture tended to ignore the affective importance of menarche. Among Caucasian American groups in general, there were no formal customs that marked menarche and therefore, no obvious change in the girls' social status. Again, although a ritual may not be developed for this ethnic group, perhaps properly preparing the girl prior to onset of menarche would lessen the negative impacts it has on her attitudes, reactions, beliefs, and symptoms of menarche.

It seemed intuitively likely that traditional puberty customs would have some impact on views of menstruation which may, in turn, impact the psychological components of PMS. It cannot be stressed enough that how a person views menarche and the severity and types of symptoms experienced have implications on attitudes developed. The lack of studies on this phenomenon was puzzling, given the potential importance that attitudes toward self are so critical to ongoing adjustment. Perhaps a better understanding of cultural differences in terms of symptoms experienced during menstrual cycles could remedy this problem especially if it could be determined that differences exist between various

ethnic groups which have divergent methods of introducing young women to menarche. The purpose of the current research was to explore the possibility of self-reported differences in cycle symptoms between Chippewa Native American adolescents and Caucasian American adolescents.

As several questionnaires existed for measuring menstrual cycle symptoms, a brief overview of the available questionnaires will be given next. The advantages and disadvantages of a few of the more widely used questionnaires will also be discussed. Lastly, an overview of this study including methodology and questionnaires adopted will be discussed.

Tests/Measurements of PMS

Several tests have been established to assess the symptoms and severity of PMS. Two of the most widely used were the Premenstrual Assessment Form (PAF) developed by Halbreich, Endicott, Schact, and Nee (1982) and the Menstrual Distress Questionnaire, developed by Moos and his coworkers (1969). Several studies reviewed have used the PAF to assess PMS (Halbreich et al., 1982; Halbreich et al., 1985; Both-Orthman, Rubinow, Hoban, Malley, & Grover, 1988; Anderson et al., 1988; O'Boyle, Severino, & Hurt, 1988; Trunnell et al., 1988; Severino & Hurt, 1989).

The PAF is a self-rating, retrospective questionnaire which was developed for initial screening and evaluation of premenstrual changes (PMC). In order to be considered a

premenstrual change, a symptom or complaint must fulfill several criteria: (1) cyclic recurrence appearing mostly during the premenstrual period; (2) a significant change in severity compared to the usual state; and (3) return to baseline shortly after the beginning of menstrual flow (Halbreich et al., 1985). In order to allow for evaluation of severity and its change, the items on the PAF were rated in a six point scale of severity of change from usual condition, ranging from "no change" to "extreme change." The PAF is usually applied to a retrospective report of the last three menstrual cycles. The items can be scored and analyzed in at least three different ways: (1) Typological Categories which are based on medical and psychiatric phenomenological thinking including sets of inclusion and exclusion criteria; (2) Unipolar Dimension Scales which represent dimensions of change and provide a quantitative summary score of change in all items belonging to a particular scale; and (3) Dimensional Measures of Bipolar Continua which indicate changes experienced in PMS symptoms in opposite directions including the magnitude of such changes.

Items were paired to express manifestations of opposite poles for seven Bipolar Continua: (1) Psychomotor activity (agitated/retarded), (2) Appetite (increased/decreased), (3) Sleep (increased/decreased), (4) Sexual interest and activity (increased/decreased), (5) Energy

(increased/decreased), (6) Goal oriented activity (increased/decreased), and (7) Mood (depressed/increased well-being) (Halbreich et al., 1982). Thus, a person could have one or the other symptom in a given pair of items.

Alpha coefficients for the Unipolar summary scale have demonstrated a high internal consistency (reliability) on several symptoms. For example, low mood/loss of pleasure and anxiety both have an alpha of 0.91, while hostility/anger and fatigue both have an alpha of 0.87. The lowest alpha coefficient has a value of 0.61 and this is for "endogenous" depressive features (for a more complete alpha coefficient table, please see Halbreich et al., 1982). These same authors conclude that the alpha coefficient may be higher among women with more severe symptoms.

Daily Ratings are also used in the PAF to confirm whether or not PMCs actually exist or are validated. This daily rating includes 21 items that emphasize dysphoric changes as well as major physical changes. However, data indicate that the rate of confirmation of retrospectively reported PMC by Daily Ratings is somewhat less than 50%--the rate of confirmation is related to the severity of reported changes (Halbreich et al., 1985).

The PAF classifies subtypes of dysphoric and physical PMC, especially those that have relevance to evaluation and treatment. These categories include: (1) Full Depressive Syndrome, (2) Impairment in Social Functioning, (3)

"Organic" Mental Syndrome, (4) Impulsive Syndrome, (5) Water Retention Syndrome, (6) General Discomfort Syndrome, and (7) Increased Well-Being Syndrome. Although each of these categories have specific criteria the details are left out here for the sake of brevity. Interested readers should refer to Halbreich et al., (1985) for more detailed descriptions.

The PAF offers a broad coverage of positive as well as negative changes, and the scoring system allows cross variate differentiation of subgroups. It had high internal consistency (e.g., up to a 0.91 alpha coefficient for symptoms) and could be used to describe and define a wide variety of syndromes. However, the PAF had a number of drawbacks: (1) single items describing different negative affective features are clustered together, precluding the differentiation of subgroups with varying dysphoric moods; 2) lack of sufficiently specific coverage needed to describe subtypes of depression; and (3) the PAF is a retrospective assessment and, therefore, symptoms and their severity may not be accurately reported by PMS sufferers.

Another measurement tool for symptoms of PMS was the Menstrual Distress Questionnaire (MDQ) and its various versions, such as Form T (Van den Boogaard & Bijleveld, 1988). The original MDQ consists of 47 items and each question was answered according to a 6-point rating scale from 0 (not experienced at all) to 5 (acute or partially

disabling). The MDQ, in general, had been more widely used than the PAF (Coleman, Hart, & Russell, 1988; Lahmeyer, 1984; Bains & Slade, 1988; Callender, McGregor, Kirk, & Thomas, 1988; Dennerstein, Morse, & Varnavides, 1988; Morse & Dennerstein, 1988; Heilbrun & Renert, 1988; Rausch, Janowsky, Golshan, Kuhn, & Risch, 1988; Lahmeyer, Miller, & DeLeon-Jones, 1982; Prakash & Rao, 1982; Clark & Ruble, 1978; Janiger et al., 1972; Golub & Harrington, 1981). There were eight clusters of symptoms including: pain, concentration, behavioral change, autonomic reactions, water retention, negative affect, arousal, and control. Split half reliability was 0.92, indicating that the test had good internal consistency, and the test-retest reliability as 0.88. The questionnaire also had good face validity as it appeared to be measuring what it was supposed to measure--PMS symptoms (Coleman et al., 1988).

Form T was an extended version of the MDQ and consisted of 53 items. The six items that were added were: gay, emotional, satisfied, comfortable, uncertain, and desire to make love. Van den Boogaard and Bijleveld (1988) studied symptoms of well-being and distress in normal men and women by daily administration of Form T of the MDQ. It was found that items asking about well-being play an important role in describing mood fluctuations during the menstrual cycle and that on the average, men showed less intra-individual

variation than women on abdominal pain and water retention scales.

In addition to the different forms, the MDQ had several other advantages. These included: (1) the MDQ only took approximately five minutes to complete; (2) the MDQ could be given repeatedly either for longitudinal investigations of stability and change in menstrual symptomatology or for cross-sectional studies; (3) the MDQ obtained concrete data about one cycle; (4) the MDQ indicated whether or not the different sets of symptoms are cyclical; (5) the MDQ had a built-in "complainer" or control scale in order to identify women who tended to complain of many different symptoms regardless of whether or not they were usually cyclically associated with the menstrual cycle; and (6) the MDQ showed no effects of memory or of the particular phase a woman was in when filling it out (Moos, 1969). Some of the questions regarding the MDQ include: (1) What is the relationship between premenstrual tension, dysmenorrhea, and personality characteristics?; (2) What are the frequency of occurrence and severity of different types of symptoms?; (3) What is the relation between the symptomatology of menstruation and pregnancy?; and (4) What are the effects of different types of treatment on menstrual symptomatology? These issues needed to be studied in groups of women relatively homogeneous in the types of symptoms about which they complained. It appeared that the advantages of the MDQ

outweigh the disadvantages and therefore it was chosen to be used in the present study.

Other measurement tools (see Table 1) have often been used in conjunction with the MDQ and the PAF or as separate questionnaires to assess PMS symptomology. The purpose of using these assessments in conjunction with the MDQ or PAF was to help rule out other disorders or to obtain a more comprehensive evaluation and/or diagnosis of each woman who took them. For example, the Depression Adjective Check List (DACL), Beck Depression Inventory (BDI), Hamilton Rating Scale for Depression (HRSI), Schedule for Affective Disorders and Schizophrenia (SADS), Schedule for Affective Disorders and Schizophrenia-Lifetime version (SADS-L), and Profile of Mood States (POMS) could be utilized to evaluate if depression symptoms exist and the intensity of these symptoms. The Eysenck Personality Inventory (EPI), Dutch equivalent of the Eysenck Personality Inventory (DEPI), and Minnesota Multiphasic Personality Inventory (MMPI) could be used to evaluate personality characteristics. The State-Trait Anxiety Inventory (STAI) could be used to evaluate anxiety symptoms. The SADS or SADS-L could be used to rule out schizophrenia.

The Menstrual Distress Questionnaire (MDQ), State-Trait Anxiety Inventory (STAI), Forms Y-1 and Y-2, and the Depression Adjective Check List (DACL), Forms A and D, were chosen for the present study conducted on adolescent

females. These instruments appeared to be valid and reliable measures of depression, anxiety, and menstrual cycle symptoms and have been utilized in other studies conducted on adolescent females. The language used in all of the questionnaires requires an eight grade education and since the focus groups were grades 9-12, it was assumed these questionnaires were at an appropriate education level and would make it easier to fill them out.

Table 1

Studies on Menarche and Instruments/Questionnaires used to Collect Data on Symptoms Experienced

Study	Measures
Halbreich, Endicott, Schact, & Nee (1982); Rausch, Janowsky, Golshan, Kuhn, & Risch (1988); Russell, Coleman, & Hart (1988)	Profile of Mood States (POMS)
Stout & Steege (1985); Trunnell, Keye, & Turner (1988)	Minnesota Multiphasic Personality Inventory (MMPI)
Halbreich, Endicott, & Lesser (1985)	Schedule for Affective Disorders and Schizophrenia (SADS)
Both-Orthman, Rubinow, Hoban, Malley, & Grover (1988); Anderson, Severino, Hurt, & Williams (1988); O'Boyle, Severino, & Hurt (1988)	Schedule for Affective Disorders and Schizophrenia-Lifetime Version (SADS-L)
Anderson, Severino, Hurt, & Williams (1988); O'Boyle, Severino, & Hurt	Research and Diagnostic Criteria (RDC)

(1988); Halbreich, Endicott, & Lesser (1985)	
Halbreich, Endicott, & Lesser (1985)	Family History-Research and Diagnostic Criteria (FM-RDC)
Sherry, Notman, Nadelson, Kanter, & Salt (1988); Halbreich, Endicott, & Lesser (1985); Janiger, Riffenburgh, & Kersh (1972)	Demographic Form
Halbreich, Endicott, & Lesser (1985)	Symptom Check List-90 (SCL-90)
Sherry, Notman, Nadelson, Kanter, & Salt (1988)	Zung Self-Rating Depression Scale, Zung Self-Rating anxiety Scale, and Cornell Medical Index Health Questionnaire (CMI)
Deicken (1988)	Premenstrual Tension Syndrome Rating Scales
Lahmeyer (1984)	Global Assessment Scale (GAS)
Giannini, Sullivan, Sarachene, & Loiselle (1988)	Brief Psychiatric Rating Scale (BPRS)
Dennerstein, Morse, & Varnavides (1988)	Rosenberg Self-Esteem Scale
Rausch, Janowsky, Golshan, Kuhn, & Risch (1988)	Hamilton Anxiety Scale (HAS)
Morse & Dennerstein (1988)	Stress Arousal Checklist
Heilbrun & Renert (1988)	Adjective Check List
Koff, Rierdan, & Jacobson (1981)	Incomplete Sentences Blank

Beumont, Abraham, Argall, & Simson (1978)	16-PF -- Form A and Leyton Obsessional Inventory
Malmgren, Collins, & Nilsson (1987)	Behm's (1974) Sex Role Inventory and Karolinsky Scales of Personality (KSP)
Trunnell, Keye, & Turner (1988)	Utah PMS Calendar
Callender, McGregor, Kirk, & Thomas (1988); Rausch, Janowsky, Golshan, Kuhn, & Risch (1988)	Beck Depression Inventory (BDI)
Rausch, Janowsky, Golshan, Kuhn, & Risch (1988)	Self-Rating Scale (SRS) and Hamilton Rating Scale for Depression (HRSI)
Callender, McGregor, Kirk, & Thomas (1988)	Salkind anxiety Inventory
Anderson, Severino, Hurt, & Williams (1988); O'Boyle, Severino, & Hurt (1988)	Daily Rating Form (DRF)
O'Boyle, Severino, & Hurt (1988)	Rotter's Locus of Control (LOC)
Bains & Slade (1988)	Person Perception Questionnaire (PPQ) and Menstrual Attitude Questionnaire (MAQ)
Van der Molen, Merckelbach, & Van den Hout (1988)	Amsterdam Biographical Questionnaire (ABQ) and the Dutch Equivalent of the Eysenck Personality Inventory (DEPI)
Beumont, Abraham, Argall, & Simson (1978); Layton (1988); Dennerstein, Morse, & Varnavides (1988), Sampson, Heathcote,	Eysenck Personality Inventory (EPI)

Wordsworth, Prescott, & Hodgson (1988)	
Layton (1988); Lahmeyer (1984); Dennerstein, Morse, & Varnavides (1988); Golub & Harrington (1981); Lahmeyer, Miller, & DeLeon-Jones (1982)	State-Trait Anxiety Inventory (STAI)
Trunnell, Keye & Turner (1988); Golub & Harrington (1981)	Depression Adjective Check List (DACL)
Wood, Larsen, & Williams (1979); Logan (1980); Janiger, Riffenburgh, & Kersh (1972); Hasin, Dennerstein, & Gotts (1988); Larsen (1961); Havens & Swenson (1986); Dennerstein, Morse, & Varnavides 1988); Sampson, Heathcote, Wordsworth, Prescott, & Hodgson (1988); Koff, Rierdan, & Jacobson (1981); Whisnant & Zegans (1975); Whisnant, Brett, & Zegans (1975); Ruble & Brooks-Gunn (1982)	Clinical Interviews

In summary, both the PAF and MDQ appeared to be useful diagnostic tools for women with PMS. Both of these questionnaires have been used extensively. However, thus far in the literature, both of these questionnaires have been used primarily on adult women. To the author's knowledge, only one study (Golub & Harrington, 1981, as rev.ewed earlier), which utilized the MDQ, focused on

adolescent subjects. Therefore, the MDQ was chosen for the present study to enhance comparability with the earlier study.

Lack of Cross-Cultural Research in Adolescent Menstrual Cycles

Despite the extensive research focusing on PMS, the majority of the studies have focused on adult women (especially upper middle class white women). There have been relatively few studies focusing on adolescent women, which leads one to believe that there were many unanswered questions dealing with the prevalence of PMS in adolescents. As mentioned previously, in the Caucasian American culture, there was little preparation of the girl for the onset of menstruation and no history of viewing menstruation as a "rite of passage", which, in turn, may have affected how she reacted to it. Despite these girls reporting both positive and negative feelings, there appeared to be some "secrecy" in not wanting to share their experiences during menstruation with others. On the other hand, in some Native American cultures (e.g., Chippewa Native Americans), the onset of menstruation was publicly announced via puberty ceremonies. Therefore, one obvious difference between the general white culture and Native American culture was the issue of "secrecy" regarding menstruation. It was hypothesized that attitudes towards menstruation were

different between the two groups since "preparedness" for menstruation was different between the two.

The Chippewa Native American group was chosen for the present study since the author is an enrolled member of this tribe. It was felt that the present study would be more acceptable if conducted by someone of a similar ethnic background since it dealt with a personal matter (menstrual cycle). Thus, those who wanted to participate may have been more comfortable and felt more understood if someone from their ethnic group was conducting the study than if a stranger from a different ethnic group requesting the same information was conducting the study. Also, if traditional practices/beliefs existed in any of the participants, they might feel more at ease sharing that experience with someone who was familiar with the culture than with someone who had no knowledge of it. However, the current practices regarding the menstrual cycle amongst this particular Chippewa Native American group was unknown. It was hypothesized that rigid "traditional" practices were no longer existent (e.g., isolation in puberty huts, announcement of puberty to rest of tribe) but that some beliefs/practices (informed by mother or grandmother) still existed. Thus, the extent to which traditional practices existed amongst the Chippewa Native American group was unknown.

It was assumed that differences in attitudes and practices toward menstruation would exist between the two groups. More specifically, the Chippewa Native American group would be informed about the menstrual cycle via mother/grandmother, whereas the Caucasian American group would be more informed via education/materials since there appeared to be more "secrecy" about such personal matters according to the literature reviewed. In any case, it was hypothesized that the two groups would differ on sources of information of the menstrual cycle, which in turn would influence attitudes/beliefs toward the menstrual cycle.

It was hypothesized that as cultural tradition was likely to have an influence on current attitudes and beliefs, differences in attitudes toward menstruation and self-reported symptoms of PMS may vary as a context of the cultural heritage of a young woman. Furthermore, what the person was told to expect (e.g., symptoms such as cramps, bloating, water retention, etc.) during any phase of the cycle may have also affected not only which symptoms were reported but also the severity of symptoms experienced. It was hypothesized that the Chippewa Native American group would be told to expect menstruation as a normal process with fewer symptoms reported than the Caucasian American group which may have resulted from a "preparedness" perspective. If the Chippewa Native American group was "better prepared" for menarche than the Caucasian American

group, they may have developed more positive attitudes and reported less severe symptoms as a result.

In addition, it was hypothesized that cultural differences would exist in regards to who informed or prepared the girl for menarche. This hypothesis stemmed from the fact that "traditional" Chippewa Native American customs publicly announced a girl's menarche, creating an openness between the girl and her tribe. Furthermore, this hypothesis also stemmed from the fact that the more "traditional" Chippewa Native American view of the menstrual cycle was that this phenomenon was to be explained by the grandmother and prior to this phenomenon, the girl had no knowledge of it (Hilger, 1951). Finally, it was hypothesized that the Chippewa Native American group would be more accepting of the menstrual cycle in a positive way because of this preparedness and openness whereas the Caucasian American group would not have this advantage and therefore report more negative attitudes or severe symptoms as a result.

CHAPTER II

METHOD

Subjects

Ninety seven freshman through senior female high school students served as subjects for this study. Fifty two were volunteers contacted at a rural community high school in Belcourt, North Dakota, and forty seven were contacted in three other rural community high schools in Rolla, Rolette, and Thompson, North Dakota. The adolescents from Belcourt comprised the Chippewa Native American group and the adolescents from Rolla, Rolette and Thompson comprised the Caucasian American group. Subjects were excluded from the study if they were currently pregnant or taking oral contraceptives, since this affects menstrual symptomatology via hormone replacement. Two subjects, one from each group, were dropped from the study since they did not meet criteria for the study (both taking oral contraceptives), leaving 51 Chippewa Native Americans and 46 Caucasian American subjects.

All subjects were told that this was an investigation of the menstrual experience of high school girls and were given the Menstrual Distress Questionnaire (MDQ) (Moos, 1969) by the experimenter. The term "distress" was

eliminated from the heading of the test in an attempt to avoid stereotypically determined responses and to minimize negative attitudes (Golub & Harrington, 1981). Subjects were also asked to report the actual date of onset of their next two menstrual cycles. This was accomplished by having each girl place an index card with menstrual information (i.e., subject number, onset of menstruation, symptoms before, during and after menstruation, and heaviness of flow) in a conveniently located box at the high school nurse's station, or school counselor's office. Subjects were also contacted in person or by telephone, if necessary, to determine the onset of menstruation if the index card was not in the box at about the expected date.

Materials

Menstrual Distress Questionnaire (MDQ). The MDQ (Moos, 1969) assesses menstrual cycle symptoms during the premenstrual, menstrual, and intermenstrual phases of a woman's most recent cycle. The questionnaire consists of 47 items, each describing a symptom, which have been grouped into eight factor-analytically derived scales: pain, concentration, behavioral change, autonomic reactions, water retention, negative affect, arousal, and control. This questionnaire appears in Appendix A.

Depression Adjective Check List (DACL). The DACL (Lubin, 1967) is a brief, reliable, and valid measure of self-reported transient depressive mood. Each list consists

of 32 adjectives connoting varying degrees of depression and elation. Forms A and D with an intercorrelation of 0.90 were used in this study. Form A was administered at the first session and Form D at the second. These questionnaires appear in Appendix A.

State-Trait Anxiety Inventory (STAI). The STAI (Spielberger, Gorsuch, & Lushene, 1970) consists of two separate 20-item self-report rating scales measuring state and trait anxiety. Instructions on the state scale require that the examinee report how she feels at the time of administration, whereas the trait scale instructions ask that she indicate how she generally feels. Only one form of this test is available. This questionnaire appears in Appendix A.

Demographic Data Questionnaire (DDQ). The DDQ was created by the experimenter for the specific purpose of obtaining background information on the different ethnic groups. The purpose of this questionnaire was to determine if there were any cultural/social differences (e.g., what to "expect" during menstruation; symptoms experienced during any phase of the cycle; who informed the young female in regards to menstruation, etc.) in the reporting of PMS symptomatology and its prevalence among female adolescents (please see DDQ in Appendix A to find a copy of questions asked).

Procedure

The MDQ and a demographic data questionnaire (DDQ) (see Appendix A) were administered to both groups of females during the first test session. The stage of the menstrual cycle each subject was in was coded as such during the first and in each subsequent session. The MDQ was administered only once during data collection since it differentiates between the various stages of the menstrual cycle (menstrual, premenstrual, and intermenstrual) and further administrations would not be needed.

Three weeks after the administration of the MDQ and DDQ, the State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1970) and the Depression Adjective Check List (DACL) (Lubin, 1967), Form A, were administered to both groups. Again, these questionnaires were coded for phase of cycle each subject was in. It was assumed that each subject was in a different phase than in the first session for the administration of the MDQ and DDQ. Using this procedure, the girls would be in various stages of the menstrual cycle when filling out the questionnaires. Exactly two weeks later the STAI, and the DACL, Form D, were administered. Again, it was assumed the girls would be in various stages of the menstrual cycle during administration of these questionnaires. The timing of administration of the questionnaires (e.g., three weeks, two weeks) was crucial to ensure that each subject experienced a full menstrual cycle

during data collection to ensure that comparisons of the questionnaires could be made across the phases of the cycle. Table 2 provides a summary of the procedure for the administration of questionnaires.

Table 2

Procedure for Administration of Questionnaires

	Questionnaires
First Administration:	Menstrual Distress Questionnaire (MDQ) Demographic Data Questionnaire (DDQ) April Index Card (handed out only)
Second Administration:	Three weeks after first administration Depression Adjective Check List - Form A (DACLA) State-Trait Anxiety Inventory (STAI) April Index Card - Completed* May Index Card (handed out only)
Third Administration:	Two weeks after second administration Depression Adjective Check List - Form D (DACLD) State-Trait Anxiety Inventory (STAI) May Index Card - Completed*

* If index card was not completed at the time of collection, it was returned at a later time to the experimenter wherein all information was complete on that cycle.

These tests were given to all of the freshman through senior high school students of all four schools who volunteered and provided informed consent (approved by the Institutional Review Board) to participate. The questionnaires were given during class time by the experimenter. The students were told that the experimenter would be comparing their responses with other female high school students of a different ethnic background. Subjects

who participated provided all of the necessary information and did not need to be contacted by phone.

CHAPTER III

RESULTS

Between Group Comparisons on Demographic Data

Appropriate *t*-tests or chi-square tests were used to assess differences in demographic characteristics between the Chippewa Native American group and Caucasian American group. Tables 3 and 4 present summary statistics for demographic variables for each of the types of analysis, respectively. The average grade level for the Chippewa Native American group was 9.82 (SD = .95), while the average grade level for the Caucasian American group was 10.71 (SD = 1.21). This yielded significant results: t (95) = 4.07, p < .001. This suggests that the average subject in the Chippewa Native American group was younger than the average subject in the Caucasian American group. The age distribution of subjects confirms this impression. The average age for the Chippewa Native American group was 15.76 (SD = 1.05), while the average age for the Caucasian American group was 16.65 (SD = 1.37). Again, the results were significant: t (95) = -3.60, p < .001.

The average age of the onset of the menstrual cycle among the Chippewa Native American group was 12.14 (SD = 1.23), while the average of the onset of the menstrual cycle

among the Caucasian American group was 12.41 (SD = 1.07): t (95) = -1.17, $p < .24$. Thus, both groups began their menstrual cycles at about the same age. The average age at which the cycle became regulated among the Chippewa Native American group was 13.29 (SD = 1.36), while the average age at which the cycle became regulated among the Caucasian American group was 13.89 (SD = 1.60): t (95) = -1.99, $p < .05$. Thus, subjects from the Chippewa Native American group were likely to become menstrually regulated at a slightly younger age than subjects from the Caucasian American group.

The average number of days between menstrual cycles for the Chippewa Native American group was 25.29 (SD = 2.96), while the average number of days between menstrual cycles for the Caucasian American group was 27.48 (SD = 5.52): t (95) = -2.46, $p < .02$. Thus, subjects from the Chippewa Native American group had shorter menstrual cycles than the Caucasian American group.

In the Chippewa Native American group 19.6% (10) reported using condoms, while 80.4% (41) reported not using contraceptives. In the Caucasian American group 4.3% (2) reported using condoms, while 95.7% (44) reported not using any type of contraceptive. Chi-square analyses revealed significant results: X^2 (2) = 7.35, $p < .025$. This suggests the subjects from the Chippewa Native American group were more likely to use condoms as a contraceptive method than were subjects from the Caucasian American group.

Table 3

Frequencies, Means, Standard Deviations, and t-Tests of Subject Demographics Comparing Chippewa Native Americans and Caucasian Americans

	Chippewa		Caucasian				
Demographics	M	SD	M	SD	t	df	p
Grade	9.82	.95	10.72	1.21	-4.07	95	.001*
Age	15.76	1.05	16.65	1.37	-3.60	95	.001*
Age Cycle Began	12.14	1.23	12.41	1.07	-1.17	95	.244
Age Regulated	13.29	1.36	13.89	1.60	-1.99	95	.050*
Duration of Flow	4.59	1.37	5.07	1.36	-1.72	95	.089
Days Between Cycles	25.29	2.96	27.48	5.52	-2.46	95	.016*

* $p < .05$

Subjects were asked to respond whether or not they were told prior to menarche whether to "expect" symptoms or other phenomena during their cycle and if so, what were they told to "expect." Please refer to Table 4 for a complete review of the symptoms subjects were told to expect. The Caucasian American group was more likely to be educated on what to expect during the menstrual cycle than the Chippewa Native American group: X^2 (1) = 8.33, $p < .001$. There were no other differences in self-reported prior expectations.

Another question subjects were asked was "from what source were you told to expect symptoms?" Chi-square analysis revealed significant results for use of health professionals as a resource of information: X^2 (1) = 5.45, $p < .020$. As can be seen in Table 4, the Caucasian American group was more likely to utilize health care professionals as a resource for information about the menstrual cycle. Contrary to our expectations, being informed by a relative was similar for both groups (e.g., being informed via mother).

Subjects in the Chippewa Native American group reported fewer symptoms experienced in general (80.4%) than the Caucasian American group (93.5%). The chi-square analysis on symptoms experienced during the menstrual cycle did not reach traditional levels of statistical significance: X^2 (1) = .22, $p < .059$. Thus, both groups were equally as

likely to experience symptoms at any given phase of the menstrual cycle.

Subjects were also asked whether or not medications were taken to relieve symptoms and if so, what kind of medication was used. Results indicated that 41.2% (21) of the subjects from the Chippewa Native American group reported using medications whereas 63.0% (29) of the subjects from the Caucasian American group reported using medications to relieve symptoms: X^2 (1) = 4.63, $p < .031$. Subjects from the Caucasian American group were more likely to use medications than subjects from the Chippewa Native American group to relieve symptoms. The Caucasian American group was more likely to use non-steroidal anti-inflammatory drugs (NSAIDs) for symptom relief than the Chippewa Native American group: X^2 (1) = 4.44, $p < .035$. There was no difference in frequency of use of other analgesics or antacids between the groups.

There was no self-reported difference in heaviness of flow between the groups: X^2 (2) = .08, $p < .963$. Menstrual cycle flow was also reported for two consecutive months (April and May). Subjects were to report whether or not flow was "light, "moderate," or "heavy." The majority of subjects reported "moderate" flows for the two months reported. As may be seen in Table 4, the chi-square analysis on both months' flow revealed that both groups were similar on this variable: X^2 (2) = .20, $p < .905$; and X^2

(2) = 2.50, $p < .287$, for the months of April and May, respectively. The average duration of flow among the Chippewa Native American group was 4.59 days, SD = 1.37, whereas the average duration of flow among the Caucasian American group was 5.07 days, SD = 1.36: t (95) = -1.72, $p < .089$. Thus, both groups appear to be similar in regard to duration and heaviness of flow in general.

Each subject was also asked whether or not she was pregnant in the past or presently. Those currently pregnant could not participate in the study but those pregnant in the past could participate as long as they met other inclusion criteria. In the Chippewa Native American group, two (3.9%) reported a past pregnancy, while one (2.2%) Caucasian American girl reported a past pregnancy: X^2 (1) = .25, $p < .620$. Thus, both groups were similar in regards to past pregnancies.

Finally, questionnaires (administrations of the MDQ/DDQ, DACLA/STAI-1, and DACLD/STAI-2) were coded as to the phase of cycle (menstrual, premenstrual, or intermenstrual) each subject was in when the questionnaires were filled out. The chi-square analysis suggested that the groups were similar in regards to representation of each of the three phases of the cycle when questionnaires were administered: X^2 (2) = .73, $p < .694$; X^2 (2) = .56, $p < .756$; and X^2 (2) = 3.87, $p < .149$, respectively.

Menstrual Distress Questionnaire

The means and standard deviations for the eight scales of the MDQ can be reviewed in Table 5. The table includes the various points in a cycle: premenstrual, menstrual, and intermenstrual. A repeated measures multivariate analysis of variance (MANOVA) was conducted on the eight separate MDQ symptom scales for each of the three phases of the menstrual cycle: premenstrual, menstrual, and intermenstrual, comparing the subjects from the Chippewa Native American and Caucasian American groups. The design used for this analysis was a 2 (group) x 3 (phase) MANOVA. The results appear in Table 6.

The repeated measures MANOVA indicated significant scale main effects across all three phases of the menstrual cycle: $F\ (7, 637) = 94.92$, $p < .00$ for the premenstrual scale symptoms; $F\ (7, 637) = 14.79$, $p < .00$ for the menstrual scale symptoms; and $F\ (7, 637) = 93.30$, $p < .00$ for the intermenstrual scale symptoms. There was also a significant group x phase x scale interaction effect for the premenstrual phase: $F\ (14) = 1.86$, $p < .028$. There were no other significant effects for this analysis.

Given that scale symptoms across all three phases of the cycle were significant and a significant interaction effect occurred in the premenstrual phase, univariate analyses of variance (ANOVA) were conducted on the Menstrual Distress Questionnaire to determine which scales and phases

Table 4

Frequencies, Percentages, Chi-Square, and p of Subject Demographics Comparing Chippewa Native Americans and Caucasian Americans

Demographics	Chippewa Frequency	%	Caucasian Frequency	%	X^2	df	p
Contraceptive Type							
Condoms	10	19.6	1	2.2	7.35	2	.025*
Nothing	41	80.4	45	97.8			
Source Told to Expect Symptoms							
Relative	41	80.4	33	71.7	1.00	1	.317
Education	5	9.8	11	23.9	3.50	1	.062
Health Professional	5	9.8	13	28.3	5.45	1	.020*
Non-Relative	2	3.9	1	2.2	.25	1	.620
No Source of Info.	1	1.9	1	2.2		1	
Experience Symptoms							
Yes	41	80.4	43	93.5	3.57	1	.059
No	10	19.6	3	6.5			

(Table 4 continues)

Demographics	Chippewa Frequency	%	Caucasian Frequency	%	X^2	df	p
Told to Expect Symptoms							
Yes	36	70.6	31	67.4	.12	1	.734
No	15	29.4	15	32.6			
Symptoms Told to Expect							
Pain	14	27.5	12	26.1	.02	1	.880
Concentration	0	0.0	0	0.0	-	1	-
Behavioral Change	0	0.0	0	0.0	-	1	-
Autonomic Reactions	1	2.0	2	4.3	.46	1	.500
Water Retention	4	7.8	9	19.6	2.86	1	.090
Negative Affect	3	5.9	3	6.5	.02	1	.900
Arousal	0	0.0	0	0.0	-	1	-
Control	0	0.0	0	0.0	-	1	-
Nothing	16	31.4	15	32.6	.02	1	.900
Monthly Discharge	16	31.4	19	41.3	1.03	1	.310
Age of Onset	0	0.0	1	2.2	1.12	1	.290

(Table 4 continues)

Demographics	Chippewa Frequency	%	Caucasian Frequency	%	X^2	df	p
Duration	2	3.9	5	10.9	1.74	1	.190
Education	2	3.9	11	23.9	8.33	1	.001*
Products to Use	5	9.8	7	15.2	.65	1	.420
Premenstrual Syndrome	2	3.9	6	13.3	2.66	1	.100
Normal Process	9	17.6	11	23.9	.58	1	.450
Probability of Pregnancy	4	7.8	1	2.2	1.59	1	.210
Not to be Scared	3	5.9	0	0.0	2.79	1	.090
Inform Mom	3	5.9	0	0.0	2.79	1	.090
Use of Medications							
Yes	21	41.2	29	63.0	4.63	1	.031*
No	30	58.8	17	37.0			
Type of Medication							
Analgesics	16	31.4	22	47.8	2.75	1	.097
NSAIDS	5	9.8	12	26.1	4.44	1	.035*

(Table 4 continues)

Demographics	Chippewa Frequency	%	Caucasian Frequency	%	X^2	df	p
Antacids	1	2.0	0	0.0	.91	1	.340
History of Pregnancy							
Yes	2	3.9	1	2.2	.25	1	.620
No	49	96.1	45	97.8			
Flow (General)							
Light	5	9.8	5	10.9	.08	2	.963
Moderate	40	78.4	35	76.1			
Heavy	6	11.8	6	13.0			
Prior Month Flow							
Light	7	13.7	5	10.9	.20	2	.905
Moderate	36	51.4	34	73.9			
Heavy	8	15.7	7	15.2			
April Flow							
Light	3	5.9	6	13.0	2.50	2	.287
Moderate	45	88.2	35	76.1			

(Table 4 continues)

Demographics	Chippewa Frequency	%	Caucasian Frequency	%	X^2	df	p
Heavy	3	5.9	5	10.9			
May Flow							
Light	3	5.9	3	6.5	1.31	2	.520
Moderate	47	92.2	40	87.0			
Heavy	1	2.0	3	6.5			
Phase During DDQ/MDQ							
Menstrual	11	21.6	12	26.1	.73	2	.694
Premenstrual	9	17.6	10	21.7			
Intermenstrual	31	60.8	24	52.2			
Phase During DACLA/STAI-1							
Menstrual	8	15.7	5	10.9	.56	2	.756
Premenstrual	5	9.8	4	8.7			
Intermenstrual	38	74.5	37	80.4			

(Table 4 continues)

Demographics	Chippewa Frequency	%	Caucasian Frequency	%	X^2	df	p
Phase During DACLD/STAI-2							
Menstrual	12	23.5	4	8.7	3.87	2	.144
Premenstrual	9	17.6	10	21.7			
Intermenstrual	30	58.8	32	69.6			

Note. DDQ = Demographic Data Questionnaire, MDQ = Menstrual Distress Questionnaire, STAI-1 = State-Trait Anxiety Inventory, first administration, STAI-2 = State-Trait Anxiety Inventory, second administration.

* $p < .05$

Table 5

Menstrual Distress Questionnaire (MDQ) Means and Standard Deviations Comparing Chippewa Native Americans and Caucasian Americans During the Menstrual, Premenstrual and Intermenstrual Phases of the Cycle

	Menstrual				Premenstrual				Intermenstrual			
	Chippewa		Caucasian		Chippewa		Caucasian		Chippewa		Caucasian	
MDQ Scale	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Pain	2.67	1.13	2.74	.93	2.03	.90	2.09	.99	1.40	.70	1.20	.38
Concentration	1.43	.69	1.35	.41	1.27	.55	1.26	.42	1.21	.58	1.08	.23
Behavioral Change	2.02	.77	1.73	.67	1.56	.76	1.39	.47	1.32	.68	1.06	.12
Autonomic Reactions	1.68	.86	1.49	.60	1.39	.72	1.21	.46	1.27	.74	1.02	.07
Water Retention	2.23	1.01	2.28	.79	1.79	.92	1.91	.78	1.32	.74	1.10	.20
Negative Affect	2.18	1.00	2.20	.79	1.43	.68	1.71	.80	1.20	.61	1.12	.40
Arousal	1.42	.50	1.45	.61	1.34	.73	1.36	.54	1.33	.77	1.36	.61
Control	1.52	.79	1.25	.37	1.30	.71	1.18	.28	1.20	.54	1.04	.16

Table 6

Repeated Measures Multivariate Analysis of Variance on the Menstrual Distress Questionnaire Comparing the Chippewa Native American Group and Caucasian American Group Across the Premenstrual, Menstrual, and Intermenstrual Phases of the Cycle

Phase Symptoms Experienced	Effect	Sum of Squares	df	Mean Square	F-Test	p
Premenstrual	Scale	5683.02	7	811.86	94.92	.000*
	Group	40.06	1	40.06	.06	.805
	Group x Scale	63.94	7	9.13	1.07	.383
	Phase x Scale	162.92	14	11.64	1.36	.167
	Group x Phase x Scale	222.76	14	15.91	1.86	.028*
Menstrual	Scale	9631.75	7	1375.96	114.79	.000*
	Group	22.35	1	22.35	.03	.858
	Group x Scale	118.09	7	16.87	1.41	.199
	Phase x Scale	145.82	14	10.42	.87	.593
	Group x Phase x Scale	213.75	14	15.27	1.27	.218

(Table 6 continues)

Phase Symptoms Experienced	Effect	Sum of Squares	df	Mean Square	F-Test	p
Intermenstrual	Scale	2296.55	7	328.08	93.90	.000*
	Group	1072.73	1	1072.73	2.40	.125
	Group x Scale	27.90	7	3.99	1.13	.340
	Phase x Scale	60.03	14	4.29	1.12	.256
	Group x Phase x Scale	139.75	14	9.98	2.84	.000*

*p<.05

were significant between the two groups. Bonferroni-t tests ($p < .05$) were used for post-hoc analyses where appropriate.

Symptoms for completion of questionnaire during the menstrual phase of the MDQ are presented first. The only significant results were the main effect of group for behavioral change symptoms (e.g., stay at home, avoid social activities): $F(2,91) = 3.95$, $p < .050$, and of phase for arousal symptoms (e.g., bursts of energy, excitement): $F(2,91) = 4.41$, $p < .015$. Subjects from the Chippewa Native American group reported more behavioral change symptoms such as avoiding social activities and staying in bed. The findings obtained for phase that subject was in during completion of the MDQ indicated that arousal symptoms are highest in the menstrual phase, followed by the premenstrual and intermenstrual phases respectively. Thus, both groups are more likely to experience greater arousal symptoms in the menstrual phase of the cycle. There were no other significant effects. The results appear in Table 7.

For subjects responding during the premenstrual phase, there was a significant phase by group interaction effect on negative affect symptoms: $F(2,91) = 3.31$, $p < .041$. The interaction effects were broken down to compare the means across each of the three phases of the cycle within each group as well as between each group. Bonferroni-t analyses were then conducted to determine if each mean difference was significant. For the Native American group, the menstrual

Table 7

Analysis of Variance on the Menstrual Distress Questionnaire (MDQ) Comparing Chippewa Native Americans and Caucasian Americans as a Function of the Phase of Cycle (Premenstrual, Menstrual, and Intermenstrual) Subject was in During Completion of the MDQ

Phase of Cycle & MDQ Scale	Effect	Sum of Squares	df	Mean Square	F-Test	p
Menstrual Phase						
Pain	Phase	13.98	2	6.99	.18	.838
	Grp	26.11	1	26.11	.66	.419
	Grp x Phase	66.99	2	33.50	.85	.432
Concentration	Phase	69.46	2	34.73	1.66	.196
	Grp	1.41	1	1.41	.07	.796
	Grp x Phase	15.42	2	7.71	.37	.693
Behavioral Change	Phase	1.10	2	.55	.04	.959
	Grp	52.27	1	52.27	3.95	.050*
	Grp x Phase	41.01	2	20.51	1.55	.218

(Table 7 continues)

Phase of Cycle & MDQ Scale	Effect	Sum of Squares	df	Mean Square	F-Test	p
Autonomic Reactions	Phase	10.46	2	5.23	.57	.565
	Grp	2.51	1	2.51	.28	.601
	Grp x Phase	16.79	2	8.39	.92	.401
Water Retention	Phase	6.66	2	3.33	.26	.775
	Grp	17.33	1	17.33	1.33	.252
	Grp x Phase	74.09	2	37.05	2.85	.063
Negative Affect	Phase	4.99	2	2.49	.05	.955
	Grp	.03	1	.03	.00	.982
	Grp x Phase	85.41	2	42.71	.78	.459
Arousal	Phase	64.05	2	32.02	4.41	.015*
	Grp	.18	1	.18	.02	.877
	Grp x Phase	6.81	2	3.41	1.47	.627
Control	Phase	34.02	2	17.01	1.24	.293
	Grp	21.05	1	21.05	1.54	.218
	Grp x Phase	68.38	2	34.19	2.50	.088

(Table 7 continues)

Phase of Cycle & MDQ Scale	Effect	Sum of Squares	df	Mean Square	F-Test	p
Premenstrual						
Pain	Phase	5.82	2	2.91	.09	.916
	Grp	.01	1	.01	.00	.984
	Grp x Phase	21.91	2	10.95	.33	.719
Concentration	Phase	24.05	2	12.02	.75	.475
	Grp	.56	1	.56	.04	.852
	Grp x Phase	3.92	2	1.96	.12	.885
Behavioral Change	Phase	9.45	2	4.73	.47	.629
	Grp	36.22	1	36.22	3.57	.062
	Grp x Phase	41.80	2	20.90	2.06	.133
Autonomic Reactions	Phase	15.14	2	7.57	1.28	.282
	Grp	8.93	1	8.93	1.51	.222
	Grp x Phase	8.17	2	4.08	.69	.503

(Table 7 continues)

MDQ Scale	Effect	Squares	df	Square	F-Test	p
Water Retention	Phase	7.43	2	3.72	.31	.737
	Grp	1.57	1	1.57	.13	.720
	Grp x Phase	1.99	2	1.00	.08	.921
Negative Affect	Phase	53.02	2	26.51	.62	.540
	Grp	17.10	1	17.10	.40	.528
	Grp x Phase	282.32	2	141.16	3.31	.041*
Arousal	Phase	39.75	2	19.88	1.92	.153
	Grp	.08	1	.08	.01	.932
	Grp x Phase	4.40	2	2.20	.21	.809
Control	Phase	17.08	2	8.54	.78	.460
	Grp	4.49	1	4.49	.41	.523
	Grp x Phase	19.29	2	9.65	.89	.416

(Table 7 continues)

Phase of Cycle & MDQ Scale	Effect	Sum of Squares	df	Mean Square	F-Test	p
Intermenstrual						
Pain	Phase	1.01	2	.51	.04	.958
	Grp	33.27	1	33.27	2.82	.097
	Grp x Phase	45.64	2	22.82	1.93	.150
Concentration	Phase	38.82	2	19.41	1.49	.231
	Grp	11.50	1	11.50	.88	.350
	Grp x Phase	3.91	2	1.96	.15	.861
Behavioral Change	Phase	8.80	2	4.40	.70	.497
	Grp	37.40	1	37.40	5.99	.016*
	Grp x Phase	18.26	2	9.13	1.46	.237
Autonomic Reactions	Phase	7.96	2	3.98	.84	.437
	Grp	14.11	1	14.11	2.96	.089
	Grp x Phase	4.74	2	2.37	.50	.610

(Table 7 continues)

Phase of Cycle & MDQ Scale	Effect	Sum of Squares	df	Mean Square	F-Test	p
Water Retention	Phase	12.75	2	6.38	1.31	.275
	Grp	18.58	1	18.58	3.82	.054*
	Grp x Phase	6.40	2	3.20	.66	.520
Negative Affect	Phase	22.51	2	11.26	.52	.594
	Grp	37.31	1	37.31	1.73	.191
	Grp x Phase	84.42	2	42.21	1.96	.146
Arousal	Phase	12.44	2	6.22	.50	.606
	Grp	.03	1	.03	.00	.961
	Grp x Phase	25.99	2	13.00	1.05	.353
Control	Phase	17.79	2	8.90	1.49	.230
	Grp	9.80	1	9.80	1.64	.203
	Grp x Phase	4.91	2	2.45	.41	.664

* $p < .05$

mean (M = 8.09) versus the premenstrual mean (M = 8.11) and the premenstrual mean versus the intermenstrual mean (M = 9.45) revealed in significant results: t(91) = 1.86 and t(91) = 1.84, respectively. In both cases, the pattern of results suggested that the Chippewa Native American group experienced negative affect symptoms across the three phases of the cycle. For the Caucasian American group, there were significant mean differences between the menstrual mean (M = 10.75) versus the intermenstrual mean (M = 8.63) and the significant difference between the premenstrual mean versus the intermenstrual mean: t(91) = 3.59 and t(91) = 2.01, respectively. These analyses suggest that the negative affect symptoms are lowest in the intermenstrual phase of the cycle. As for between group differences, the Bonferroni-t analysis indicated significant differences between the means for the premenstrual phase and the menstrual phase of the cycle: t(91) = 2.04 and t(91) = 3/64 respectively, suggesting that the Caucasian American group had more negative affect symptoms than the Chippewa Native American group for these phases. However, there were no significant differences in negative affect symptoms in the intermenstrual phase of the cycle. Thus, the two groups appear to differ from each other in regard to the phase of cycle in which negative affect symptoms are greatest. The means are presented in Table 8.

Table 8

Phase of Cycle Means for Interaction Effects on Negative Affect Symptoms

Group	Menstrual Mean	Premenstrual Mean	Intermenstrual Mean
Native American	6.45	7.67	8.32
Caucasian American	7.42	6.30	7.29

For subjects responding during the intermenstrual phase, there were significant main effects of group in both behavioral change symptoms: $F(2,91) = 5.99$, $p < .016$, and water retention symptoms: $F(1,91) = 3.82$, $p < .054$. The Chippewa Native American group reported more of these symptoms than the Caucasian American group. No other symptoms were significant in regards to main and interaction effects.

Chi-square Analyses on April and May Cycles

As mentioned earlier, subjects reported whether or not symptoms occurred in the premenstrual, menstrual, and intermenstrual phases of the cycle for two consecutive months. This was done in addition to the MDQ and was collected via an index card for the months of April and May. Chi-square analysis was conducted for each index card comparing both groups across the three phases of the cycle.

Each month, phase, and symptom occurring in that phase will be discussed next. Results appear in Tables 9 and 10.

Chi-square analysis was conducted on all of the symptoms reported on the two index cards. The first to be discussed are symptoms that occurred in April across the three phases of the cycle as a function of the phase the subject was in at time of administration of the questionnaires. Index cards were coded according to the phase of the cycle a person was in when it was filled out. The chi-square analysis revealed significant negative affect symptoms reported to occur menstrually while subjects were in the menstrual phase of the cycle: X^2 (1) =3.74, $p < .05$; and significant water retention symptoms reported to occur in the menstrual phase while subjects were in the premenstrual phase of the cycle: X^2 (1) = 5.63, $p < .02$. The Chippewa Native American group was more likely to report these symptoms than the Caucasian American group. No other results reached significance. The results can be reviewed in Table 9.

During the May cycle, chi-square analysis revealed significant results for negative affect symptoms reported to occur in the menstrual phase while subjects were in the premenstrual phase of the cycle: X^2 (1) = 4.34, $p < .04$; and water retention symptoms reported to occur in the intermenstrual phase while subjects were in the intermenstrual phase of the cycle: X^2 (1) = 4.56, $p < .03$.

Table 9

Chi-Square Analysis for Symptoms Experienced in April Cycle as a Function of Phase During Administration of Index Card Comparing Chippewa Native Americans and Caucasian Americans

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Premenstrual Phase	Symptoms in Premenstrual Phase						
Pain	2	3.9	2	4.3	1	.09	.76
Concentration	1	1.9	0	0.0	1	.90	.34
Behavioral Change	1	1.9	0	0.0	1	.90	.34
Autonomic Reactions	2	3.9	0	0.0	1	2.06	.15
Water Retention	1	1.9	2	4.3	1	.90	.34
Negative Affect	0	0.0	1	2.2	1	1.41	.24
Arousal	1	1.9	1	2.2	1	.03	.86
Control	1	1.9	0	0.0	1	.90	.34
Nothing	2	3.9	1	2.2	1	.23	.64
Menstrual Phase							
Pain	3	5.9	1	2.2	1	.44	.51
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	0	0.0	0	0.0	1	-	-
Autonomic Reactions	0	0.0	1	2.2	1	1.73	.19
Water Retention	2	3.9	2	4.3	1	.33	.57
Negative Affect	4	7.8	2	4.3	1	.12	.72
Arousal	2	3.9	0	0.0	1	1.48	.22

(Table 9 Continues)

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Control	0	0.0	0	0.0	1	-	-
Nothing	3	5.9	1	2.2	1	.44	.51
Intermenstrual Phase							
Pain	21	41.2	22	47.8	1	.13	.71
Concentration	1	1.9	3	6.5	1	1.11	.29
Behavioral Change	2	3.9	0	0.0	1	2.00	.16
Autonomic Reactions	1	1.9	2	4.3	1	.38	.54
Water Retention	17	33.3	12	26.1	1	1.20	.27
Negative Affect	10	19.6	14	30.4	1	1.14	.28
Arousal	4	7.8	1	2.2	1	1.84	.17
Control	3	5.9	0	0.0	1	3.04	.08
Nothing	10	19.6	5	10.9	1	1.92	.17
Premenstrual Phase	Symptoms in Menstrual Phase						
Pain	4	7.8	2	4.3	1	.90	.34
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	1	1.9	1	2.2	1	.03	.86
Autonomic Reactions	0	0.0	0	0.0	1	-	-
Water Retention	5	9.8	1	2.2	1	5.63	.02*
Negative Affect	3	5.9	1	2.2	1	1.10	.29
Arousal	2	3.9	2	4.3	1	.09	.76
Control	0	0.0	1	2.2	1	1.41	.24
Nothing	0	0.0	0	0.0	1	-	-

(Table 9 Continues)

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Menstrual Phase							
Pain	7	13.7	4	8.7	1	.13	.72
Concentration	7	13.7	4	8.7	1	.13	.72
Behavioral Change	1	1.9	0	0.0	1	.68	.41
Autonomic Reactions	2	3.9	0	0.0	1	1.48	.22
Water Retention	2	3.9	1	2.2	1	.04	.84
Negative Affect	6	11.8	1	2.2	1	3.74	.05*
Arousal	1	1.9	0	0.0	1	.68	.41
Control	1	1.9	0	0.0	1	.68	.41
Nothing	1	1.9	1	2.2	1	.13	.72
Intermenstrual Phase							
Pain	27	52.9	30	65.2	1	1.03	.31
Concentration	1	1.9	4	8.7	1	2.02	.16
Behavioral Change	3	5.9	0	0.0	1	3.04	.08
Autonomic Reactions	5	9.8	3	6.5	1	.50	.48
Water Retention	13	25.5	15	32.6	1	.32	.57
Negative Affect	18	35.3	12	26.1	1	1.74	.19
Arousal	2	3.9	0	0.0	1	2.00	.16
Control	3	5.9	0	0.0	1	3.04	.08
Nothing	4	7.8	3	6.5	1	.13	.72

(Table 9 Continues)

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Premenstrual Phase	Symptoms in Intermenstrual Phase						
Pain	2	3.9	1	2.2	1	.23	.64
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	0	0.0	0	0.0	1	-	-
Autonomic Reactions	0	0.0	0	0.0	1	-	-
Water Retention	0	0.0	0	0.0	1	-	-
Negative Affect	0	0.0	0	0.0	1	-	-
Arousal	3	5.9	2	4.3	1	.09	.76
Control	0	0.0	0	0.0	1	-	-
Nothing	1	1.9	1	2.2	1	.03	.86
Menstrual Phase							
Pain	2	3.9	0	0.0	1	1.48	.22
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	0	0.0	0	0.0	1	-	-
Autonomic Reactions	0	0.0	0	0.0	1	-	-
Water Retention	1	1.9	0	0.0	1	.68	.41
Negative Affect	1	1.9	0	0.0	1	.68	.41
Arousal	6	11.8	2	4.3	1	1.59	.21
Control	1	1.9	0	0.0	1	.68	.41
Nothing	1	1.9	3	6.5	1	3.26	.07

(Table 9 Continues)

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Intermenstrual Phase							
Pain	7	13.7	4	8.7	1	.87	.35
Autonomic Reactions	1	1.9	0	0.0	1	.99	.32
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	1	1.9	0	0.0	1	.99	.32
Water Retention	3	5.9	1	2.2	1	1.00	.32
Negative Affect	3	5.9	2	4.3	1	.19	.67
Arousal	18	35.3	16	34.8	1	.13	.72
Control	0	0.0	0	0.0	1	-	-
Nothing	11	21.6	17	37.0	1	2.32	.13

*p < .05

Again, the Chippewa Native American group was more likely to report these symptoms than the Caucasian American group. No other symptoms reached significance. The results appear in Table 10.

Depression Questionnaire and Questionnaire Analyses

As anxiety and depression are often central complaints in PMS, the DACL and STAI questionnaires were administered to assess for these symptoms during the April and May menstrual cycles. All subjects in both groups filled out the State-Trait Anxiety Inventory (STAI) on two separate occasions and the Depression Adjective Check List (DACL) Forms A and D, each one given only once on two separate occasions. The means and standard deviations for the DACL

Table 10

Chi-Square Analysis for Symptoms Experienced in May Cycle as a Function of Phase During Administration of Index Card Comparing Chippewa Native Americans and Caucasian Americans

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Premenstrual Phase	Symptoms in Premenstrual Phase						
Pain	4	7.8	6	13.0	1	.46	.50
Concentration	0	0.0	1	2.2	1	.95	.33
Behavioral Change	1	1.9	0	0.0	1	1.17	.28
Autonomic Reactions	2	3.9	1	2.2	1	.53	.47
Water Retention	4	7.8	5	10.9	1	.06	.81
Negative Affect	2	3.9	2	4.3	1	.01	.91
Arousal	1	1.9	2	4.3	1	.28	.60
Control	1	1.9	0	0.0	1	1.17	.28
Nothing	2	3.9	1	2.2	1	.53	.47
Menstrual Phase							
Pain	9	17.6	2	4.3	1	.87	.35
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	0	0.0	0	0.0	1	-	-
Autonomic Reactions	0	0.0	0	0.0	1	-	-
Water Retention	6	11.8	1	2.2	1	.76	.38
Negative Affect	3	5.9	1	2.2	1	.001	.00
Arousal	0	0.0	0	0.0	1	-	-
Control	1	1.9	0	0.0	1	.36	.55

(Table 10 Continues)

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Nothing	2	3.9	1	2.2	1	.14	.71
Intermenstrual Phase							
Pain	21	41.2	22	47.8	1	.01	.92
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	1	1.9	0	0.0	1	1.08	.30
Autonomic Reactions	2	3.9	2	4.3	1	.00	.95
Water Retention	10	19.6	11	23.9	1	.01	.93
Negative Affect	9	17.6	11	23.9	1	.14	.71
Arousal	0	0.0	0	0.0	1	-	-
Control	0	0.0	0	0.0	1	-	-
Nothing	5	9.8	4	8.7	1	.22	.64
Premenstrual Phase	Symptoms in Menstrual Phase						
Pain	7	13.7	8	17.4	1	.01	.91
Concentration	1	1.9	1	2.2	1	.01	.94
Behavioral Change	1	1.9	0	0.0	1	1.17	.28
Autonomic Reactions	0	0.0	0	0.0	1	-	-
Water Retention	4	7.8	4	8.7	1	.04	.84
Negative Affect	7	13.7	3	6.5	1	4.34	.04*
Arousal	1	1.9	0	0.0	1	1.17	.28
Control	1	1.9	0	0.0	1	1.17	.28
Nothing	0	0.0	1	2.2	1	.01	.94

(Table 10 Continues)

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Menstrual Phase							
Pain	12	23.5	3	6.5	1	3.20	.07
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	0	0.0	0	0.0	1	-	-
Autonomic Reactions	0	0.0	0	0.0	1	-	-
Water Retention	3	5.9	1	2.2	1	.001	.00
Negative Affect	2	3.9	1	2.2	1	.14	.71
Arousal	0	0.0	0	0.0	1	-	-
Control	0	0.0	0	0.0	1	-	-
Nothing	0	0.0	1	2.2	1	3.20	.07
Intermenstrual Phase							
Pain	24	47.1	26	56.5	1	.02	.90
Concentration	1	1.9	3	6.5	1	.94	.33
Behavioral Change	0	0.0	0	0.0	1	-	-
Autonomic Reactions	0	0.0	0	0.0	1	-	-
Water Retention	10	19.6	10	21.7	1	.03	.86
Negative Affect	10	19.6	7	15.2	1	1.02	.31
Arousal	5	9.8	4	8.7	1	.22	.64
Control	0	0.0	0	0.0	1	-	-
Nothing	2	3.9	4	8.7	1	.60	.44
Premenstrual Phase	Symptoms in Intermenstrual Phase						
Pain	1	1.9	1	2.2	1	.01	.94
Concentration	0	0.0	0	0.0	1	-	-

(Table 10 Continues)

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Behavioral Change	0	0.0	0	0.0	1	-	-
Autonomic Reactions	1	1.9	0	0.0	1	1.17	.28
Water Retention	0	0.0	0	0.0	1	-	-
Negative Affect	0	0.0	0	0.0	1	-	-
Arousal	6	11.8	5	10.9	1	.54	.46
Control	0	0.0	0	0.0	1	-	-
Nothing	3	5.9	5	10.9	1	.54	.46
Menstrual Phase							
Pain	1	1.9	0	0.0	1	.36	.55
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	0	0.0	0	0.0	1	-	-
Autonomic Reactions	0	0.0	0	0.0	1	-	-
Water Retention	1	1.9	0	0.0	1	.36	.55
Negative Affect	1	1.9	0	0.0	1	.36	.55
Arousal	6	11.8	1	2.2	1	.76	.38
Control	0	0.0	0	0.0	1	-	-
Nothing	4	7.8	3	6.5	1	2.12	.15
Intermenstrual Phase							
Pain	0	0.0	0	0.0	1	-	-
Concentration	0	0.0	0	0.0	1	-	-
Behavioral Change	2	3.9	0	0.0	1	2.20	.14
Autonomic Reactions	0	0.0	0	0.0	1	-	-

(Table 10 Continues)

Symptom/Phase of Cycle of Subject	Chippewa Frequency	%	Caucasian Frequency	%	df	X^2	p
Water Retention	4	7.8	0	0.0	1	4.56	.03*
Negative Affect	4	7.8	2	4.3	1	.89	.35
Arousal	10	19.6	15	32.6	1	1.18	.28
Control	1	1.9	0	0.0	1	1.08	.30
Nothing	11	21.6	14	30.4	1	.32	.57

*$p < .05$

can be reviewed in Table 10. The ANOVA results are present in Table 11.

As can be reviewed in Table 11, the Chippewa Native American group had similar scores during the April cycle for the administration of the State-Trait Anxiety Inventory, Form Y-1, which measures state anxiety or how a person feels at the moment, to those of the Caucasian American group. Thus, both groups were similar in terms of state anxiety symptoms. On the STAI, form Y-2, which measures trait anxiety symptoms or how a person generally feels, the Chippewa Native American group had similar scores to those of the Caucasian American group. Thus, both groups were similar in regards to trait anxiety. During the May cycle of the administration of the STAI, form Y-1, the Chippewa Native American group had a higher score than the Caucasian American group. Also during the May cycle of the STAI, form Y-2, the Chippewa Native American group again scored higher than the Caucasian American group. This result suggests

that the Chippewa Native American group was more anxious during the May observation than the Caucasian American group. The results appear in Table 11.

An analysis of variance was also conducted for each reporting period when the DACL questionnaires were administered. This was done to determine whether each group was more depressed at any given phase of the cycle (menstrual, premenstrual, and intermenstrual). April Cycle analyses for depression are presented first.

The Depression Adjective Check List (Form A), April Cycle, yielded similar results for both groups in regards to main effects or interaction effects. This result suggests that both groups were similar for depression symptoms experienced in the April Cycle. The ANOVA appears in Table 12.

The Depression Adjective Check List (Form D), May Cycle, yielded a significant main effect of group: $F(1,91) = 17.71$, $p < .001$; and an interaction effect of group by phase: $F(2,91) = 311.23$, $p < .041$. The Native American group had greater depression symptoms across all three phases of the cycle than the Caucasian American group with the biggest mean difference in the menstrual phase which would account for the group main effect. The interaction effects were broken down to compare the means across the three phases of the cycle within each group as well as

Table 11

Means and Standard Deviations Comparing Chippewa Native Americans and Caucasian Americans on the State-Trait Anxiety Inventory and Depression Adjective Check List

	Chippewa		Caucasian	
Questionnaire	Mean	SD	Mean	SD
Depression Adjective Check List, Form A	10.08	5.98	7.52	4.95
Depression Adjective Check List, Form D	12.65	5.55	7.98	4.34
State-Trait Anxiety Inventory Form Y-1				
State Anxiety				
First Administration (April)	41.20	9.43	38.11	10.89
Second Administration (May)	43.61	9.08	36.65	10.95
State-Trait Anxiety Inventory Form Y-2				
Trait Anxiety				
First Administration (April)	44.61	8.92	41.80	8.95
Second Administration (May)	44.39	8.31	39.39	9.09

Table 12

Analysis of Variance on the Depression Adjective Check List (Forms A & D) and the State-Trait Anxiety Inventory Comparing Chippewa Native Americans and Caucasian Americans Across the Premenstrual, Menstrual, and Intermenstrual Phases of the Cycle

Questionnaire	Effect	Sum of Squares	df	Mean Square	F-Test	p
DACL-A	Phase	130.36	2	65.18	2.20	.116
(April Cycle)	Grp	91.78	1	91.78	3.10	.081
	Grp x Phase	39.69	2	19.85	.67	.514
State-Trait Anxiety	Phase	595.87	2	297.93	2.96	.057
Inventory Form Y-1	Grp	41.96	1	41.96	.42	.520
(April Cycle)	Grp x Phase	36.27	2	18.14	.18	.836
State-Trait Anxiety	Phase	95.68	2	47.84	.61	.545
Inventory Form Y-2	Grp	26.50	1	26.50	.34	.562
(April Cycle)	Grp x Phase	404.26	2	202.13	2.58	.081
DACL-D	Phase	120.52	2	60.26	2.62	.078
(May Cycle)	Grp	407.24	1	407.24	17.71	.001*

(Table 12 continues)

Questionnaire	Effect	Sum of Squares	df	Mean Square	F-Test	p
	Grp x Phase	60.21	2	30.11	1.31	.275
State-Trait Anxiety	Phase	172.84	2	86.42	.92	.402
Inventory Form Y-1	Grp	1504.36	1	1504.36	16.04	.001*
(May Cycle)	Grp x Phase	622.46	2	311.23	3.32	.041*
State-Trait Anxiety	Phase	171.66	2	85.83	1.12	.330
Inventory Form Y-2	Grp	451.59	1	451.59	5.91	.017*
(May Cycle)	Grp x Phase	27.83	2	13.91	.18	.834

Note. Grp = Group, DACL = Depression Adjective Check List.

* $p < .05$

between each group. Bonferroni-t analyses were then conducted to determine if the means were significantly different. For the Chippewa Native American group, the menstrual mean (M = 16.75) versus the premenstrual mean (M = 11.44) and the menstrual mean versus the intermenstrual mean (M = 11.37) revealed significant results: $t(91) = 5.47$ and $t(91) = 5.54$ respectively. The pattern of results suggests that the Chippewa Native American group experienced more depression in the menstrual phase than the other two phases of the cycle. As for the Caucasian American group, the menstrual mean (M = 9.00) versus the premenstrual mean (M = 6.50) was significantly different: $t(91) = 2.57$, while he menstrual mean versus the intermenstrual mean (M = 8.31) did not reach significance: $t(91) = 1.86$. This pattern suggests that depression symptoms are greater in the menstrual phase compared to the premenstrual phase only. As for between- group comparisons, the Bonferroni-t analyses revealed significant results across all three phases of the cycle: $t(91) = 7.98$ for the menstrual phase, $t(91) = 5.09$ for the premenstrual phase, and $t(91) = 3.15$ for the intermenstrual phase. In all cases, the Chippewa Native American group was more likely to experience more depressive symptoms across the three phases of the cycle than the Caucasian American group. The greatest depression for the Chippewa Native American group was in the menstrual phase of

the cycle. The means of the interactions are presented in Table 13.

The State-Trait Anxiety Inventory (STAI), Forms Y-1 and Y-2, yielded similar results for both groups in regard to main effects or interaction effects. Thus, both groups were similar in regard to both state and trait anxiety for the April Cycle.

The May cycle data on the STAI yielded different results from the April cycle data. The results of the ANOVA appear in Table 12. On the STAI, (Forms Y-1 and Y-2), there was a main effect of group state anxiety: $F(1,91) = 1504.36$, $p < .001$; a group x phase interaction effect on state anxiety: $F(2,91) = 622.46$, $p < .041$; and a group main effect on trait anxiety: $F(1,91) = 451.59$, $p < .017$. The group main effect suggests that the Chippewa Native American group had more anxiety than the Caucasian American group with the greatest mean difference occurring in the menstrual phase of the cycle. The interaction effect was broken down to compare the state anxiety means across the three phases of the cycle within as well as between each group. Bonferroni-t analyses were then conducted to determine if the means across the phases of the cycle were significantly different from each other. For the Chippewa Native American group, the menstrual mean ($M = 49.67$) versus the premenstrual mean ($M = 40.67$) and the menstrual mean versus the intermenstrual mean ($M = 42.07$) revealed

significant results: $t(91) = 4.59$, and $t(91) = 3.88$, respectively. This pattern of results suggests that the Chippewa Native American group's state anxiety was higher in the menstrual phase than in the other two phases of the cycle. As for the Caucasian American group, the intermenstrual mean ($M = 38.53$) versus the menstrual mean ($M = 30.50$) and the intermenstrual mean versus the premenstrual mean ($M = 33.10$) revealed significant results: $t(91) = 4.09$ and $t(91) = 2.77$, respectively. This pattern of results suggests that the Caucasian American group had more state anxiety symptoms in the intermediate phase of the cycle than in the other two phases of the cycle. As for between group comparisons, the Chippewa Native American group had significantly more state anxiety in both the menstrual and premenstrual phases of the cycle than the Caucasian American group. The interaction means appear in Table 14.

Regression Analyses

Several multiple regression analyses via the backward method were conducted on the scales of the MDQ, DACLs, and STAIs, taking into account several possible predictor variables: group, age, grade, phase of cycle, medication (NSAIDs), source of information (via health professional), symptom told to expect (via education/films), age of cycle regulation, and days of cycle duration. These analyses were done for exploratory purposes only because of the "newness" of the current area of study.

Table 13

Phase of Cycle Means for Interaction Effects on Depression Symptoms on the Depression Adjective Check List (Form D) for May Cycle

Group	Menstrual Mean	Premenstrual Mean	Intermenstrual Mean
Native American	16.75	11.44	11.37
Caucasian American	9.00	6.50	8.31

Table 14

Phase of Cycle Means for Interaction Effects on State Anxiety Symptoms on the State-Trait Anxiety Inventory for May Cycle

Group	Menstrual Mean	Premenstrual Mean	Intermenstrual Mean
Native American	49.67	40.67	42.07
Caucasian American	30.50	33.10	38.53

The Prediction of Menstrual Cycle Symptoms

The first multiple regressions to be discussed are the symptom scales on the MDQ, menstrual phase, that suggested significant predictor variables. All of the regression analyses appear in Tables 15-44 of Appendix A. The non-significant regression analysis will not be discussed. The first regression focuses on pain symptoms with the nine predictor variables mentioned previously. Step 1 shows that

when all nine of the variables were entered into the equation, medication (NSAIDs) was a significant predictor of pain symptoms, yielding an inverse relationship. That is, if the person took medications, fewer pain symptoms would occur. In the final step of the analysis, medication was the only variable left in the equation and maintained its significance as a predictor for the absence of pain symptoms. The results appear in Table 15.

There were no significant predictors of behavioral change symptoms experienced menstrually in Step 1 of the analysis. However, in the final step, both group and source of information (via health professional) remained in the equation with group being a significant predictor of behavioral change symptoms, yielding an inverse relationship between the two variables. Thus, being in one group such as the Caucasian American group would account for the lack of behavioral change symptoms, whereas being in the Chippewa Native American group would account for the presence of these symptoms. The results appear in Table 17.

There was a significant predictor of autonomic reaction symptoms in Step 1 of the analysis, with medication (NSAIDs) having an inverse relationship to these symptoms. In the final step, medication and grade remained in the equation with the former variable again yielding a significant inverse relationship to autonomic reaction symptoms. This suggests that taking medications would account for the lack

of autonomic reaction symptoms and not taking medications would account for the presence of such symptoms. The results appear in Table 18.

Medication (NSAIDs) yielded a significant inverse relationship with negative affect symptoms in Step 1 of the analysis. Medication was also the only variable to remain in the equation in the final step and this did not yield significant results. Thus, medication appears to be a good predictor for the absence of negative affect symptoms when compared with the other eight variables but loses its predictor value when it is the only variable left in the equation. The results appear in Table 20.

In Step 1 of the regression analysis for arousal symptoms experienced menstrually, phase of cycle yielded a significant positive relationship and medication (NSAIDs) yielded a significant inverse relationship. Therefore, phase of cycle appears to be a good predictor for the presence of such symptoms and medications appears to be a good predictor for the absence of such symptoms. Both of these variables remained in the equation in the final step and maintained their significance as predictors of arousal symptoms. The results appear in Table 21.

Medication (NSAIDs) was a significant predictor of control symptoms experienced menstrually in Step 1, yielding an inverse relationship. A subject was less likely to have control symptoms if she took medications. In the final

step, group, medication, age of cycle regulation, and grade remained in the equation with both group and medication yielding significant inverse relationships with control symptoms. Thus, being in the Caucasian American group may be a fairly good predictor for the absence of such symptoms whereas being in the Chippewa Native American group would account for the presence of symptoms. As for medications, the symptoms are less likely to be present if medications are used and symptoms may be more likely to be present if medications are not used. The results appear in Table 22.

The next regressions to be discussed were performed on premenstrual symptoms of the cycle. Again, only those regressions producing significant predictor variables will be discussed. The results appear in tables 23-30. In Step 1 of behavioral change symptoms being experienced premenstrually, grade yielded a significant inverse relationship suggesting that being in a certain grade would predict the absence of such symptoms. In the final step of the analysis, grade was the only variable left in the equation and the significance as a predictor variable dropped out. Thus, when compared with all of the other eight variables, it can be a good predictor for the absence of symptoms, but loses its predictor value when it is the only variable left in the equation. The results appear in Table 25.

In Step 1 of water retention symptoms being experienced premenstrually, days of cycle duration and source of information (via health professional) were both significant predictor variables with both yielding an inverse relationship. Thus both were fairly good predictors for the absence of such symptoms. In the final step, both of these variables remained in the equation in addition to symptom told to expect (via education/films). The only significant predictor was source of information which again yielded an inverse relationship. Thus, source of information appears to be a good predictor for the absence of water retention symptoms. The results appear in Table 27.

In Step 1 of negative affect symptoms being experienced premenstrually, source of information (via health professional) yielded a significant inverse relationship and symptom told to expect (via education/films) yielded a significant positive relationship. Thus source of information would be a good predictor for the absence for negative affect symptoms and symptom told to expect would be a good predictor for the presence of such symptoms when compared to the other seven variables. In the final step, both of these variables remained in the equation and again yielded significant results as predictor variables. Group was another variable that remained in the equation in the final step but did not reach significance, suggesting that

it did not have an effect on negative affect symptoms. The results appear in Table 28.

The next regressions to be discussed are those dealing with intermenstrual symptoms and appear in tables 31-38 in Appendix A. Again, only those regressions suggesting significant predictor variables will be discussed.

In Step 1, source of information (via health professional) was a significant predictor of behavioral change symptoms being experienced intermenstrually, yielding an inverse relationship. That is, being informed by a health professional would lessen the likelihood of having behavioral change symptoms, possibly because the individual would be better informed and prepared for such symptoms. In the final step, source of information and group remained in the equation and both variables yielded significant predictors for the lack of behavioral control symptoms. The results appear in Table 33.

In Step 1 of autonomic reaction symptoms being experienced intermenstrually, source of information (via health professional) yielded a significant inverse relationship. Thus being informed about autonomic reaction symptoms by a health professional would lessen the likelihood of such symptoms. In the final step, source of information and group once again remained in the equation but only the former yielded significant results as a predictor variable of autonomic reaction symptoms. Thus,

group had no effect on autonomic reaction symptoms while source of information would be a good predictor of such symptoms. The results appear in Table 34.

In Step 1 of water retention symptoms being experienced intermenstrually, there were no significant predictor variables. In the final step, group was the only variable left in the equation and yielded a significant inverse relationship. Thus being in the Caucasian American group would lessen the likelihood of such symptoms while being in the Chippewa Native American group would increase the likelihood of having such symptoms. The results appear in Table 35.

In Step 1 of negative affect symptoms being experienced intermenstrually, source of information (via health professional) yielded a significant inverse relationship. In the final step of the analysis, source of information, grade, and symptom told to expect (via education/films) remained in the equation with only the source of information being a predictor of lack of negative affect symptoms. Thus, being informed about what to expect during the menstrual cycle would account for lack of negative affect symptoms whereas not being informed would account for the presence of these symptoms. The results appear in Table 36.

In Step 1 of arousal symptoms being experienced intermenstrually, source of information (via health professional) yielded a significant inverse relationship and

symptom told to expect (via education/films) yielded a significant positive relationship. Thus, when all of the variables were entered into the equation, source of information would lessen the likelihood of arousal symptoms experienced. On the other hand, symptom told to expect would increase the likelihood of such symptoms. In the final step, both of these variables remained in the equation as significant predictor variables of arousal symptoms. The results appear in Table 37.

Predictors of Depression and/or Anxiety

Multiple regressions were also performed on depression, state, and trait anxiety symptoms for the months of April and May. These results can be reviewed in tables 39-44. The regressions which suggested significant predictor variables are discussed. The non-significant regressions will not be discussed. The first to be discussed are depression symptoms. In Step 1, phase of cycle yielded a significant inverse relationship and source of information (via health professional) yielded a significant positive relationship as predictor variables of depression during the April menstrual cycle when all of the variables were entered into the equation. This suggests that phase of cycle would increase the likelihood of depression occurring across the various phases of the cycle. Source of information would increase the likelihood of such symptoms. In the final step of the analysis, both of these variables remained in the

equation in addition to medication (NSAIDs), with only the former two variables yielding significant results. Thus, medication did not have an effect on depression symptoms. The results appear in Table 39.

Phase of cycle yielded a significant inverse relationship in Step 1 of the analysis on state anxiety symptoms being experienced in the April cycle. This was also the only variable left in the equation in the final step and it maintained its significance as a predictor for the lack of state anxiety symptoms. Thus, such symptoms are dependent on the various phases of the cycle. The results appear in Table 40.

In Step 1 of depression symptoms being experienced in the May cycle, both group and phase of cycle yielded significant inverse relationships, suggesting that these variables would predict fewer symptoms in the Caucasian American group and presence of such symptoms in the Chippewa Native American group. Days of cycle yielded a positive relationship, suggesting that it is a good predictor of having depression symptoms in either group. In the final step, all three variables remained in the equation in addition to age of regulation of cycle, which yielded a significant inverse relationship suggesting that it would predict fewer symptoms. Thus, all four of these variables appear to be fairly good predictors for the presence or

absence of depression symptoms. The results appear in Table 42.

In Step 1 of state anxiety symptoms being experienced in the May cycle, group was a significant predictor variable yielding an inverse relationship. In the final step, group was the only variable left in the equation and maintained its significance as a predictor variable for state anxiety symptoms. This suggests that when compared to the other eight variables in the equation, being in the Caucasian American group would lessen the likelihood of state anxiety symptoms, while being in the Chippewa Native American group would increase the likelihood of such symptoms. The results appear in Table 43.

Finally, in Step 1 of trait anxiety symptoms being experienced in the May cycle, group was a significant predictor variable yielding an inverse relationship. This suggests that being in the Caucasian American group would predict the absence of such symptoms, while being in the Chippewa Native American group would increase the likelihood of such symptoms. In the final step of the analysis, group was the only variable left in the equation maintaining its significance as a predictor variable of trait anxiety symptoms. The results appear in Table 44.

CHAPTER IV

DISCUSSION

It appeared that the Chippewa Native American group and the Caucasian American group differed on several variables measured in this study. Subjects from the Chippewa Native American group were slightly younger than were subjects from the Caucasian American group.

The Chippewa Native American group's menstrual cycles also became regulated at a significantly younger age than the Caucasian American group. It is uncertain what accounts for a younger Chippewa Native American group that regulates menstrual cycles at a younger age than the Caucasian American group. Perhaps this was due to level of maturity and degree of disclosing personal information about the menstrual cycle since literature suggested that younger girls are more likely to "share" personal information whereas older girls were more likely to be "secretive" about personal information (Clarke & Ruble, 1978; Koff et al, 1981; Havens & Swensen, 1986). The current study appeared to replicate this finding of younger girls disclosing personal information but only in the Native American group. The reverse was true on the Caucasian American group in that the older girls were more likely to disclose personal

information. If this was the case, then the hypothesis that Chippewa Native American group having a more accepting, positive attitude toward menarche would not be supported since the older Caucasian group was just as likely to disclose personal information. Perhaps there is a difference between the two groups as to when (i.e. age) the disclosing of this information is most likely to occur. In addition, attitude per se was not directly addressed in the current study. So, it could not be determined whether there were differences of attitudes toward menarche within as well as between the two ethnic groups. Definite conclusions could not be made as to why more younger Chippewa Native American girls participated than the older Chippewa Native American girls or why more older Caucasian American girls participated than the younger Caucasian American girls. However, in general, the differences between the two groups are small on these factors and not likely clinically important.

The Chippewa Native American group also was more likely to use condoms as a contraceptive than the Caucasian American group. Recent literature on surveys conducted on adolescent condom use and sexual practices indicated that there was an increase in condom use as a preventative measure for sexually transmitted diseases and pregnancies (Joffe, 1993; Cromer & Brown, 1992). Use of condoms also appeared to be inconsistent in that the person may have used

condoms only once and not thereafter, or for anal intercourse only and not for other types of intercourse (i.e., vaginal or oral). Cromer and Brown (1992) pointed out that although rates for sexually active adolescents were higher among African Americans, Caucasian American teenagers have narrowed the gap significantly. Unfortunately, and of grave concern, was that condom use by adolescents who may have been at risk for HIV and other sexually transmitted diseases and pregnancy was quite low: 27% of boys and 47% of girls (aged 11 to 17 years) in a New York runaway shelter never used condoms during sexual acts in which exchange of semen or vaginal fluid was possible (Joffe, 1993). However, sexual activity per se was not addressed in the present study and the reason why condom use was more prevalent in the Chippewa Native American group than the Caucasian American group remained unclear.

One speculation was that condoms were easier to obtain as a contraceptive method than other contraceptives such as oral contraceptives which required gynecological exams before using them. Condoms could be bought over-the-counter at any pharmacy or drug store. In addition, condoms were freely available without any cost at the local clinic for the Chippewa Native American group and the availability/cost is not known for the Caucasian American group. This factor may have accounted for or at least contributed to the higher rate of use among the Chippewa Native American group than

the Caucasian American group. Thus, the Chippewa Native American group may have been more sexually active than the Caucasian American group as a result of easy availability of condoms. However, this reasoning appeared to be contradictory with data from the National Survey of Family Growth collected ten years ago which found that condom use was associated with upper socioeconomic status, white ethnicity, rural residence (blacks only), and residence in the Western United States (Rind, 1991). All of the past studies reviewed on adolescent females (Larsen, 1961; Whisnant & Zegans, 1975; Logan, 1980; Clarke & Ruble, 1978; Havens & Swenson, 1986; Koff et al., 1981) have focused primarily on middle or upper class Caucasian females (not necessarily only Caucasian Americans), limiting comparisons of this study since socioeconomic status was not addressed in the present study. It was also unknown how often condoms were used and for what types of sexual practices they were used. The data in general did not address the logistics of why an adolescent would use condoms (e.g., prevention of pregnancy and/or sexually transmitted diseases). The only definite conclusion that could be made was that the Chippewa Native American group in this sample was more likely to use condoms as a birth control method than the Caucasian American sample.

Both groups were told in advance to expect symptoms during the menstrual cycle. As for sources of information

on symptoms of the menstrual cycle or information about the cycle in general, both groups cited "mother" as the main source of information. This finding was similar to that of several of the studies reviewed (Whisnant & Zegans, 1975; Larsen, 1961; Havens & Swenson, 1986; Logan, 1980; Koff et al., 1981; Clarke & Ruble, 1978; Ruble & Brooks-Gunn, 1982). Although there were no significant differences between the two ethnic groups on this variable, it did lend some support to the hypothesis that the Chippewa Native American group may have still practiced the "traditional" belief that menarche was to be explained to the girl by the mother or grandmother. In the past, the primary "traditional" informant was the grandmother. The finding in the present study suggested a possible trend of shifting the responsibility of explaining menarche to the mother. Nevertheless, "traditional" beliefs were not directly addressed thereby limiting the interpretability of the results. However, a significant difference between the two groups emerged in terms of utilizing a health professional (e.g., nurse, physician) as a resource for information on the menstrual cycle, with subjects from the Caucasian American group receiving information from health professional sources more often than the subjects from the Chippewa Native American group. This finding was similar to results from Larsen (1961) where health professionals were cited as an important source of information about

menstruation among Caucasian teens. The Caucasian American group was also significantly more likely to be shown educational films/material on symptoms to expect during the menstrual cycle than the Chippewa Native American group. This also replicated earlier findings (Clarke & Ruble, 1978; Whisnant, Brett, & Zegans, 1975; Larsen, 1961; Whisnant & Zegans, 1975).

Both groups indicated that they used medications to relieve symptoms. A significant difference emerged in the use of medications in general, but more specifically for the use of NSAIDs (non-steroidal anti-inflammatory drugs) as a medication for symptom relief. Results indicated that the subjects from the Caucasian American group were more likely to medicate symptoms via NSAIDs than were subjects from the Chippewa Native American group. This was similar to the findings obtained by Ruble and Brooks-Gunn (1982) and Fisher et al., (1989) that medications were used to relieve symptoms. However, the type of medication used was not specified in these studies. One interpretation for the more symptoms reported was that since the Chippewa Native American group was less likely to medicate symptoms, they were more likely to report them. Perhaps symptoms reported were not as severe in the Chippewa Native American group as in the Caucasian American group suggesting a difference in perceived level of discomfort from symptoms experienced.

Differences also emerged in types of symptoms experienced at each phase of the cycle as indicated on the Menstrual Distress Questionnaire (MDQ). The Chippewa Native American group reported more symptoms in general across the three phases of the cycle than the Caucasian American group. More specifically, the Chippewa Native American group reported more behavioral change symptoms and control symptoms menstrually; behavioral change symptoms, autonomic reaction symptoms, water retention symptoms, and control symptoms intermenstrually; and negative affect symptoms premenstrually. It appeared that more symptoms occurred in the intermenstrual phase than the other two phases. However, there were still symptoms that occurred in the premenstrual phase of adolescent cycles as well. As mentioned previously, adolescent cycles were reported to be longer than that of adult menstrual cycles. Therefore, there may have been more symptom overlap across all three phases of the cycle in general. This issue increased the difficulty of establishing PMS in adolescent cycles as opposed to adult cycles. Perhaps, the criteria utilized to establish PMS in adult cycles need to be adjusted for adolescent cycles to better get at PMS issues. Another problem with establishing the re-occurrence of symptoms across the phases of the cycle was that symptoms experienced changed month-to-month. This area of discussion is addressed next.

In this study, symptoms were reported for two consecutive months. It was interesting to note that the types of symptoms experienced differed from those experienced on the MDQ. For the April cycle, the Chippewa Native American group reported both more negative affect symptoms and water retention symptoms menstrually. For the May cycle, the Chippewa Native American group reported significant negative affect symptoms menstrually and significant water retention symptoms intermenstrually. Both groups reported symptoms in the premenstrual phase, but no significant differences emerged between both groups. Although the symptoms across the cycles reported changed as a function of the phase of cycle, the results suggested that adolescents did have symptoms across the different phases of the menstrual cycle. Across the two months, negative affect symptoms and water retention symptoms were reported although the phases in which they occurred changed. Again, this was similar to past studies that reported adolescents experienced symptoms across the three phases of the menstrual cycle (Ruble & Brooks-Gunn, 1982; Whisnant & Zegans, 1975; Golub & Harrington, 1981; Fisher et al., 1989; Wood et al., 1979; Koff et al., 1981; Clarke & Ruble, 1978; Havens & Swenson, 1986).

As mentioned previously, symptoms changing from month to month made it difficult to establish PMS criteria in the adolescent group. However, if they experienced symptoms in

the same symptom cluster across two consecutive cycles, they could still meet the requirements necessary for a PMS diagnosis. Nevertheless, this raised an issue of whether or not adolescents were less likely to report PMS symptoms than the adult population and lead to problems of reliability of symptoms experienced from cycle to cycle. Again, this was not directly asked in the present study and therefore, symptoms experienced in one cycle may not be the same ones experienced in the next monthly cycle.

Depression and anxiety data were collected across two consecutive months (April and May) to establish whether there was a consistency in these symptoms required to meet PMS criteria. The results indicated that the Chippewa Native American group reported significantly more depression on Form D of the Depression Adjective Check List, May cycle only, than the Caucasian American group. The Chippewa Native American group also reported significantly more state and trait anxiety on the State-Trait Anxiety Inventory for the last month only (May) than the Caucasian American group. Perhaps the anxiety and depression were due to the end of the school year (e.g., tests, passing grades, etc.). However, there was not as much anxiety and depression among the Caucasian American group who was also experiencing similar situations. Thus, the factors related to these symptoms could not be discerned.

Despite the fact that past studies had shown that anxiety and/or depression were experienced by adolescent females (Golub & Harrington, 1981), who were similar in symptom severity to adult females, the results obtained in this study suggested Chippewa Native Americans had more symptoms such as depression and anxiety than the Caucasian American group.

Another reason for symptom differences dealt with preparation and timing. Since Chippewa Native American girls had regulated cycles at a younger age, they may have been more prepared for the onset of menses than the Caucasian American group. It was hypothesized that the Native American group may have been better prepared to deal with menarche since they were informed what to expect by grandmother or mother. This "preparedness," in turn, would lessen the severity of symptoms since the girl would be told what to expect during menarche. On the other hand, the Caucasian group would be less prepared, and therefore more likely to report more severe symptoms during menarche. Again, the current study provided some support for this hypothesis. Although the Chippewa Native American group reported more severe symptoms than the Caucasian American group, they were less likely to medicate them, perhaps due to this "preparedness." However, due to such a small difference between the two groups, only possible explanations are given. Perhaps being more informed about

what to expect helped them deal with the symptoms experienced. For example, if the girl was told to expect the menstrual cycle as a "normal process" that every female goes through, she may have perceived the symptoms she experienced as part of that process. Another possibility was that since the groups differed on regulation of menstrual cycles, the Caucasian American group may not have been as prepared from the onset of one cycle to the onset of the next. This lack of preparedness may have lead to subjective feelings of severe symptoms in which the only relief from these symptoms was via medications. The medications thereby establish a mechanism of control for these unexpected symptoms and may have helped the Caucasian American girls "prepare" themselves for the next cycle. This may have also tied in with the finding of not medicating symptoms since symptoms were a part of this "normal process." Thus, coping mechanisms developed in dealing with a variety of symptoms may have also differed. Reasons for utilizing medications were not addressed in this study, so only possible interpretations for this result could be given.

Another interesting finding was that the Caucasian American group had significantly longer cycles. They reported more days between cycles, that is, onset of menstruation in one cycle to the onset of the next menstrual cycle. Perhaps this finding was related to differences of

age at regulation of cycle. The Chippewa Native American group reported regular cycle intervals at a younger age than the Caucasian American group; thus, they may have been more likely to have shorter intervals between cycles than the Caucasian American group. All of the Chippewa Native American adolescents reported regular cycles while two of the Caucasian American adolescents reported irregular cycles, all others being regulated. Nevertheless, this study suggested a difference between the two groups on days between cycles. This could possibly be addressed in future studies to determine if cycles are in fact longer in other Caucasian American samples and shorter in other Chippewa Native American samples.

Furthermore, subjects were primarily adults in the cross-cultural samples reviewed earlier (Logan, 1980; Beumont et al., 1978; Brown, 1981; Hasin et al., 1988; Janiger et al., 1972; Larsen, 1961; Prakash & Rao, 1982; Sherry et al., 1988; Stout & Steege, 1985; Trunnell et al., 1988; Van den Boogaard & Bijleveld, 1988; Wood et al., 1979), again limiting meaningful comparisons to the present study. Further, this study suggested that differences in terms of severity and types of symptoms experienced did exist, at least between the two groups sampled in this study. However, generalizability of findings across the different ethnic groups (e.g., Asian, Black) was not plausible. Thus, findings may have been relevant only to

the Chippewa Native American group and the Caucasian American group in the present study. Despite these limitations, the present study had replicated several findings of past studies which suggested similarities of menstrual cycle complaints across the different groups studied. It did raise some important considerations for future studies in ethnic groups.

Conclusions and Recommendations for Future Research

The present study provided some support that cross-cultural differences existed between adolescent female menstrual cycles. The present study also provided some support for the hypotheses of preparation/timing for menarche, and being informed by mother and/or grandmother which was a more "traditional" way of handling menarche in the Chippewa Native American group. However, due to the lack of addressing these issues directly in the current study, interpretability of results was limited. The results further replicated past studies on adolescent cycles which showed that adolescent females also experienced symptoms across all phases of the cycle. This study suggested that anxiety and depression symptoms, behavioral change symptoms, control symptoms, negative affect symptoms, and water retention symptoms were more prevalent in the Chippewa Native American group than the Caucasian American group. Furthermore, the Caucasian American group was more likely to use medications, especially non-steroidal anti-inflammatory

drugs (NSAIDs) such as Advil or Nuprin, to relieve symptoms. The Chippewa Native American group also reported a younger age of menstrual regulation and shorter cycles than the Caucasian American group. In general, the adolescents in this study had shorter cycles than the adult females that were reported in past studies.

Although the focus of this study was on whether or not cross-cultural differences existed between the two groups on symptoms experienced throughout cycle and sources of information or other resources that may have influenced symptoms per se, it could not be established whether PMS existed more in one group than the other.

The multiple regressions done for exploratory purposes yielded several significant predictor variables for several different types of symptoms experienced throughout the menstrual cycle. Most of the relationships produced were inverse, suggesting the presence or absence of the symptom depended upon the presence or absence of the predictor variable (e.g., the absence of pain symptoms occurred with the presence of medications). There were also a few positive relationships between predictor variables and symptoms suggesting that the presence of one predicted the presence of the other (e.g., the phase of cycle which was the menstrual phase predicted the presence of arousal symptoms).

Lastly, since "traditionality" of menstrual puberty rites were not asked directly on the questionnaires given, it could not be established whether such views or practices still existed or to what extent they existed. It was postulated that the Chippewa Native American group in the sample were less likely to be traditional. However, it could not be said for certain that this was the case. Future research could focus on this issue as well.

Implications for Future Research

Results from the present study raised several suggestions for future research. Results suggested a younger age of menstrual regulation in the Chippewa Native American group than the Caucasian American group. The Chippewa Native American group was also significantly younger than the Caucasian American group. Perhaps age of regulation and onset of menstruation are correlated. Future research can focus on this aspect. Future research could also look at comparisons of other ethnic groups.

Another interesting finding was that the Chippewa Native American group was more likely to utilize condoms as a contraceptive method than the Caucasian American group. Reasons for use of condoms was speculative since they were not addressed directly. Thus, future research could focus on contraceptive use (types, frequency of use, reasons for use, etc.) and on determining whether the current finding was a consistent finding.

Still another finding was that Caucasian Americans were more likely to utilize health professionals as a source of information about the menstrual cycle than the Chippewa Native American group. Since this was addressed as a closed-ended question in the current study, it was uncertain what the reasons for utilizing health professionals are (e.g., level of comfort, girl does not want family to know, education programs in schools, etc.). Again, future research could focus on this issue via more open-ended questions or listing several reasons and having the subject check the ones that apply to her.

Caucasian Americans were also more likely than Chippewa Native Americans to have had education/films in regard to the menstrual cycle. Reasons for this difference is unknown and again reasons can only be speculative in the current study. Perhaps health education courses were offered only to juniors/seniors and not to the freshman/sophomore groups since the Caucasian American group was older than the Chippewa Native American group and more likely to be educated about the menstrual cycle. Again, future research could focus on this issue.

As for symptoms experienced during any phase of the menstrual cycle, the Chippewa Native American group reported more symptoms (e.g., depression, anxiety, negative affect, behavioral control) than the Caucasian American group. Yet, the former group was less likely to use medications such as

Advil or Nuprin to relieve symptoms than the latter group. Again, medication use was a closed-ended question and therefore, reasons for use are unknown. Frequency of use was also unknown. This could be addressed in future research. Symptom consistency necessary for diagnosing of premenstrual syndrome was also lacking. The current study suggested that adolescent females did experience different types of symptoms throughout the phases of the cycle. However, some of the symptoms changed across the phases of the cycle. Again, this could be addressed in future research. A cautionary note should be added in regard to the analyses conducted in symptoms reported on the two index cards. There were several chi-square analyses conducted on these symptoms leading to problems of Type I errors (obtaining false positives for specific symptoms) since it was highly probable that, with at least one in every twenty subjects, symptoms would be significant at the .05 level. Thus, future research would need to take this matter into consideration when conducting analyses.

Related to the issue of symptoms changing across the phases of the cycle was the issue of length of cycle. That is, the Caucasian American group had significantly longer cycles than the Chippewa Native American group. Therefore, symptoms per se may have appeared in different phases of the cycle which may have changed from cycle to cycle. Length of cycle in general was found to be longer in the adolescent

groups as compared to adult cycles. This last finding suggested an overlap between the phases of the cycle and therefore future research may need to adjust criteria accordingly. Future research could focus on these two issues to determine if adolescent cycles tend to be longer and whether or not there are differences in other ethnic groups.

Another possibility is to do cross-cultural research on tribes who still celebrate puberty rites (e.g., Navajo and Apache) and assess if differences exist between the various groups studied and compare them with a control sample, such as a Caucasian American group who does not celebrate puberty ceremonies. Since several confounds existed (e.g., socio-economic status, drug/alcohol use, etc.) yet were not controlled for in the present study, this limited generalizability of results. Furthermore, as mentioned previously, some tribal groups still utilize "traditional" puberty practices. Thus, these groups may differ from the tribal group in this study, which was unlikely to utilize traditional practices. Given these limitations, the present study does provide impetus for future research. Until then, more definite conclusions cannot be made in reference to traditional views/practices and differences of menstrual cycle symptoms.

Still other possible explanations to consider for the findings include socioeconomic status, geographical

location, whether or not person uses drugs/alcohol, smokes cigarettes, is involved in a male-female relationship, and social support system since at least one past study (Wood et al., 1979) found these variables to be contributory factors of severity or types of symptoms experienced in the menstrual cycle. Again, these factors were not directly addressed, limiting interpretation of the findings. Future research could look at these variables and determine whether or not they influence types and severity of symptoms experienced in the menstrual cycle.

APPENDIX A

LISTS OF MATERIALS USED IN DATA COLLECTION AND MULTIPLE REGRESSION TABLES

Consent Form

The present study is being conducted by Shelly Peltier, a graduate student from the University of North Dakota, Psychology department. This study will ask for your adolescent's perceptions associated with her menstrual cycle. The experimenter wants to examine whether or not adolescents from two ethnic groups (Chippewa Native American and Caucasian American) differ in their perceptions of their menstrual cycle. No names will be used for identifying questionnaires, and your adolescent's responses will be kept strictly confidential. There are four different questionnaires for this study and two of these, the Menstrual Questionnaire (MQ) and the Demographic Data Questionnaire (DDQ) will be administered once in the first session, while the other two, the Depression Adjective Check List (DACL) and the State-Trait Anxiety Inventory (STAI) will be administered on two different occasions. The MQ involves questions that will ask about various symptoms associated with the menstrual cycle (e.g., cramps, bloating, weight gain). The DDQ asks background information about the individual (e.g., ethnic group, age, grade). The STAI and DACL ask questions about the subject's emotional states (e.g., excited, anxious, depressed). The first administration of the DACL and STAI will take place three weeks after the administration of the MQ and DDQ, and the

second administration will take place two weeks after the first administration of the DACL and STAI. Each of these questionnaires takes about five minutes to fill out, thus requiring 10 minutes each for the three separate sessions. Two index cards requiring information about your adolescent's menstrual cycle will also be collected at the end of two consecutive months. The cards will take about two minutes to fill out. These cards will be collected in a box located near the nurse's station. If your adolescent decides to participate, she is free to discontinue participation at any time without penalty. If you or your adolescent have any questions prior to signing this consent form and/or participating in this study, you may contact Shelly Peltier at Corwin-Larimore, Psychology Department, Telephone Number 777-3451 (main office) or 777-3212 (my office). If you decide that your adolescent may participate, you and your adolescent must sign and date the consent form below and return this form to the investigator.

Thank you for your time and cooperation.

_____ _____

Participant's Signature Today's Date

_____ _____

Parent/Guardian's Signature Today's Date

Demographic Data Questionnaire

Subject Number _____ Grade _____

Ethnic Group (select only one):

_____ Caucasian _____ Black

_____ Chippewa Native American _____ Hispanic _____ Other

Age _____ Telephone Number _____

Have you started a monthly periodic cycle?

_____ Yes _____ No

If so, list age when menstrual cycle began _____.

Age when menstrual cycle became regulated _____.

Give approximate number of days of menstrual onset of one cycle to the menstrual onset of the next cycle _____.

Have you ever been pregnant? _____ Yes _____ No

Are you currently pregnant? _____ Yes _____ No

Are you currently using any type of contraceptive?

_____ Yes _____ No

If so, list type(s):

_____

_____

Were you told what to "expect" before you started your menstrual cycle? _____ Yes _____ No

If so, what were you told?

_____

_____

_____

From whom (source) were you informed about your menstrual cycle and what to expect?

_____

What is your typical menstrual flow like? (select only one):

_____ Low _____ Moderate _____ Heavy

Do you experience any symptoms before, during or after your cycle? _____ Yes _____No

If so, list when these symptoms occur and the specific symptoms experienced:

_____

_____

_____

_____

Do you take any medications for your menstrual cycle?

_____ Yes _____ No

If so, list type(s):

_____

Menstrual Questionnaire

Subject Number _____ Date _____

Write the approximate dates of your most recent menstrual period (flow) in the space provided:

From _____ To _____ .

The following is a list of symptoms which women sometimes experience. Please describe your experience with each of these symptoms during the following time periods: A) During your most recent menstrual flow; B) During the one week prior to your menstrual flow; and C) The remaining two (2) weeks after your most recent menstrual flow.

Your answer should be accurate for your experience during <u>each</u> of the specified time periods. Also, please report these symptoms whether or not they seem to you to be related to your menstrual cyccle.

For each answer choose the descriptive category listed which best describes your experience of that symptom during <u>each</u> of the specified time periods (A, B, and C). Write the number the descriptions are exactly correct, choose the one that best describes your experience. Do not leave any blank spaces.

Descriptive Categories

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

A = During most recent cycle
B = One week before cycle begins
C = Two weeks after recent cycle

	A	B	C
1. Weight gain	_____	_____	_____
2. Insomnia	_____	_____	_____
3. Crying	_____	_____	_____
4. Lowered school or work performance	_____	_____	_____
5. Muscle stiffness	_____	_____	_____
6. Forgetfullness	_____	_____	_____
7. Confusion	_____	_____	_____
8. Take naps or stay in bed	_____	_____	_____
9. Headache	_____	_____	_____
10. Skin Disorders	_____	_____	_____
11. Loneliness	_____	_____	_____
12. Feelings of Suffocation	_____	_____	_____
13. Affectionate	_____	_____	_____
14. Orderliness	_____	_____	_____
15. Stay home from work or school	_____	_____	_____

	A	B	C
16. Cramps (uterine/pelvic)	_____	_____	_____
17. Dizziness or faintness	_____	_____	_____
18. Excitement	_____	_____	_____
19. Chest pains	_____	_____	_____
20. Avoid social activities	_____	_____	_____
21. Anxiety	_____	_____	_____
22. Backache	_____	_____	_____
23. Cold sweats	_____	_____	_____
24. Lowered judgement	_____	_____	_____
25. Fatigue	_____	_____	_____
26. Nausea or vomiting	_____	_____	_____
27. Restlessness	_____	_____	_____
28. Hot flashes	_____	_____	_____
29. Difficulty in concentration	_____	_____	_____
30. Painful or tender breasts	_____	_____	_____
31. Feeling of well-being	_____	_____	_____
32. Buzzing or ringing in ears	_____	_____	_____
33. Distractible	_____	_____	_____
34. Swelling (e.g., abdomen, breasts or ankles)	_____	_____	_____
35. Accidents (e.g., cut finger, break dishes)	_____	_____	_____
36. Irritability	_____	_____	_____

	A	B	C
37. General aches and pains	_____	_____	_____
38. Mood swings	_____	_____	_____
39. Heart pounding	_____	_____	_____
40. Depression (feeling sad or blue)	_____	_____	_____
41. Decreased efficiency	_____	_____	_____
42. Lowered motor coordination	_____	_____	_____
43. Numbness or tingling in hands or feet	_____	_____	_____
44. Change in eating habits	_____	_____	_____
45. Tension	_____	_____	_____
46. Blind spots or fuzzy vision	_____	_____	_____
47. Bursts of energy or activity	_____	_____	_____

Please answer the following questions for time period A (during your most recent flow).

In what ways, if any, was your most recent menstrual cycle unusual?

Please estimate the volume of your last menstrual period by placing an "X" on the line below.

Extremely Extremely

Light Heavy

CHECK LIST - DACL FORM D

By Bernard Lubin

Subject Number _____ Age _____ Date _____

Highest grade completed in school _____

Directions: Below you will find words which describe different kinds of moods and feelings. Check the words which describe How You Feel Now--Today. Some of the words may sound alike, but we want you to check all the words that describe your feelings. Work rapidly and check all of the words which describe how you feel today.

1. ____ Depressed
2. ____ Elated
3. ____ Awful
4. ____ Lifeless
5. ____ Griefstricken
6. ____ Inspired
7. ____ Woeful
8. ____ Lonely
9. ____ Suffering
10. ____ Mellow
11. ____ Drooping
12. ____ Rejected
13. ____ Fortunate
14. ____ Dreary
15. ____ Lousy
16. ____ Good
17. ____ Fit
18. ____ Lonesome
19. ____ Unloved
20. ____ Glad
21. ____ Grave
22. ____ Sunk
23. ____ Shot
24. ____ Merry
25. ____ Wasted
26. ____ Washed Out
27. ____ Clear
28. ____ Gruesome
29. ____ Tired
30. ____ High
31. ____ Worse
32. ____ Drained

CHECK LIST - DACL FORM A

By Bernard Lubin

Subject Number _____ Age _____ Date _____

Highest grade completed in school _____

Directions: Below you will find words which describe different kinds of moods and feelings. Check the words which describe How You Feel Now--Today. Some of the words may sound alike, but we want you to check all the words that describe your feelings. Work rapidly and check all of the words which describe how you feel today.

1. ___ Wilted
2. ____ Safe
3. ____ Miserable
4. ____ Gloomy
5. ____ Dull
6. ____ Gay
7. ____ Low-spirited
8. ____ Sad
9. ____ Unwanted
10. ____ Fine
11. ____ Broken-hearted
12. ____ Down-cast
13. ____ Enthusiastic
14. ____ Failure
15. ____ Afflicted
16. ____ Active
17. ____ Strong
18. ___ Tortured
19. ____ Listless
20. ____ Sunny
21. ____ Destroyed
22. ____ Wretched
23. ____ Broken
24. ____ Light-hearted
25. ____ Criticized
26. ____ Grieved
27. ____ Dreamy
28. ____ Hopeless
29. ____ Oppressed
30. ____ Joyous
31. ____ Weary
32. ____ Droopy

SELF-EVALUATION QUESTIONNAIRE - STAI Form Y-1

Developed by Charles D. Spielberger in collaboration with

R. L. Gorsuch, R. Lushene, P. R. Vagg, & G. A. Jacobs

Subject Number _____ Age _____ Date _____

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then write in the appropriate number (1, 2, 3, or 4) to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best. Do not leave any blank lines.

Descriptive Categories

1 = Not At All 2 = Somewhat

3 = Moderately So 4 = Very Much So

---

1. I feel calm . . . . . _____
2. I feel secure . . . . . _____
3. I am tense . . . . . _____
4. I feel strained . . . . . _____
5. I feel at ease . . . . . _____
6. I feel upset . . . . . _____
7. I am presently worrying over possible misfortune . . . . . _____
8. I feel satisfied . . . . . _____
9. I feel frightened . . . . . _____

10. I feel comfortable . . . . . _____

11. I feel self-confident . . . . . _____

12. I feel nervous . . . . . _____

13. I am jittery . . . . . _____

14. I feel indecisive . . . . . _____

15. I am relaxed . . . . . _____

16. I feel content . . . . . _____

17. I am worried . . . . . _____

18. I feel confused . . . . . _____

19. I feel steady . . . . . _____

20. I feel pleasant . . . . . _____

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Subject Number _____

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then write in the appropriate number (1, 2, 3, or 4) to the right of the statement to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

Descriptive Categories

1 = Almost Never 2 = Sometimes

3 = Often 4 = Almost Always

---

21. I feel pleasant . . . . . _____
22. I feel nervous and restless . . . . . _____
23. I feel satisfied with myself . . . . . _____
24. I wish I could be as happy as others seem to be _____
25. I feel like a failure . . . . . _____
26. I feel rested . . . . . _____
27. I am "calm, cool, and collected" . . . . . _____
28. I feel that difficulties are piling up so that I cannot overcome them . . . . . _____
29. I worry too much over something that really does not matter . . . . . _____
30. I am happy . . . . . _____

31. I have disturbing thoughts . . . . . _____

32. I lack self-confidence . . . . . _____

33. I feel secure . . . . . _____

34. I make decisions easily . . . . . _____

35. I feel inadequate . . . . . _____

36. I am content . . . . . _____

37. Some unimportant thought runs through my mind and bothers me . . . . . _____

38. I take disappointments so keenly that I cannot put them out of my mind . . . . . _____

39. I am a steady person . . . . . _____

40. I get in a state of tension or turmoil as I think over my recent concerns and interests . . _____

Subject Number: _____ Date: _____

Date of Menstrual Cycle: From: _____ To: _____

Menstrual Flow (Circle One only):

Heavy Medium Light

List symptoms, if any, for each of the following time periods: Before, During, and After cycle (use back of page, if necessary).

Before:

During:

After:

Table 15

Regression Analysis of Group and Phase of Cycle on Pain Symptoms Experienced Menstrually

STEP 1:	Multiple R = 0.2661			
	R Square = 0.0708			
	Adjusted R = -0.0253			
	p = 0.6741			
Predictor Variable	Beta	B	SE B	SIG T
Group	0.0226	0.2787	1.5427	0.8570
Grade	-0.2803	-1.4913	1.5369	0.3346
Phase of Cycle	-0.0716	-0.5293	0.7999	0.5100
Age	0.2528	1.2179	1.3385	0.3654
Age Regulated	-0.0274	-0.1132	0.4809	0.8144
Days of Cycle	-0.0209	-0.0289	0.1559	0.8535
Medication (NSAIDs)	-0.2423	-3.9265	1.7713	0.0292*
Source of Information (Health Professional)	-0.0837	-1.3261	1.8623	0.4783
Symptom to Expect (Education/Films)	0.1207	2.1832	2.2143	0.3269
FINAL STEP:	Multiple R = 0.2186			
	R Square = 0.0478			
	Adjusted R = 0.0378			
	p = 0.0314			
Medication (NSAIDs)	-0.2186	-3.5426	1.6223	0.0314*

*p < .05

Table 16

Regression Analysis of Group and Phase of Cycle on Concentration Symptoms Experienced Menstrually

STEP 1:		Multiple R = 0.2939		
		R Square = 0.0864		
		Adjusted R = -0.0082		
		p = 0.5173		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.0581	-0.5287	1.1285	0.6406
Grade	-0.4436	-1.7409	1.1243	0.1251
Phase of Cycle	0.0699	0.3812	0.5851	0.5165
Age	0.2666	0.9474	0.9791	0.3359
Age Regulated	0.1191	0.3631	0.3518	0.3050
Days of Cycle	0.0057	0.0058	0.1141	0.9598
Medication (NSAIDs)	-0.1929	-2.3057	1.2957	0.0787
Source of Information (Health Professional)	-0.1492	-1.7443	1.3623	0.2038
Symptom to Expect (Education/Films)	0.1039	1.3864	1.6198	0.3944
FINAL STEP:		Multiple R = 0.1214		
		R Square = 0.0147		
		Adjusted R = 0.0044		
		p = 0.2363		
Grade	-0.1214	-0.4764	0.3997	0.2363

Table 17

Regression Analysis of Group and Phase of Cycle on Behavioral Change Symptoms Experienced Menstrually

STEP 1:		Multiple R = 0.3372		
		R Square = 0.1137		
		Adjusted R = 0.0220		
		p = 0.2816		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.2217	-1.6231	0.8939	0.0729
Grade	-0.2557	-0.8070	0.8906	0.3674
Phase of Cycle	-0.0049	-0.0218	0.4635	0.9626
Age	0.1360	0.3887	0.7756	0.6175
Age Regulated	0.1598	0.3917	0.2787	0.1634
Days of Cycle	-0.0887	-0.0727	0.0904	0.4231
Medication (NSAIDs)	-0.0381	-0.3658	1.0264	0.7224
Source of Information (Health Professional)	-0.1501	-1.4109	1.0791	0.1945
Symptom to Expect (Education/Films)	-0.0736	-0.7896	1.2831	0.5399
FINAL STEP:		Multiple R = 0.2698		
		R Square = 0.0728		
		Adjusted R = 0.0531		
		p = 0.0287		

(Table 17 continues)

Predictor Variable	Beta	B	SE B	SIG T
Group	-0.2422	-1.7726	0.7483	0.0199*
Source of Information				
(Health Professional)	-0.1895	-1.7817	0.9612	0.0669

*p < .05

Table 18

Regression Analysis of Group and Phase of Cycle on Autonomic Reaction Symptoms Experienced Menstrually

STEP 1:		Multiple R = 0.3478		
		R Square = 0.1209		
		Adjusted R = 0.0300		
		p = 0.2332		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1721	-1.0324	0.7295	0.1606
Grade	-0.2772	-0.7169	0.7268	0.3267
Phase of Cycle	0.0715	0.2569	0.3782	0.4988
Age	0.1246	0.2918	0.6329	0.6459
Age Regulated	0.0926	0.1859	0.2274	0.4157
Days of Cycle	0.0496	0.0333	0.0737	0.6524
Medication (NSAIDs)	-0.2899	-2.2845	0.8376	0.0077*
Source of Information (Health Professional)	8.1937	0.0063	0.8806	0.9943
Symptom to Expect (Education/Films)	-0.0819	-0.7197	1.0471	0.4937
FINAL STEP:		Multiple R = 0.2811		
		R Square = 0.0790		
		Adjusted R = 0.0594		
		p = 0.0209		

(Table 18 continues)

Predictor Variable	Beta	B	SE B	SIG T
Medication (NSAIDs)	-0.2463	-1.9405	0.7898	0.0159*
Grade	-0.1801	-0.4659	0.2593	0.0756

*p < .05

Table 19

Regression Analysis of Group and Phase of Cycle on Water Retention Symptoms Experienced Menstrually

STEP 1:		Multiple R = 0.2337		
		R Square = 0.0547		
		Adjusted R = -0.0431		
		p = 0.8265		
Predictor Variable	Beta	B	SE B	SIG T
Group	0.0775	0.5607	0.9125	0.5405
Grade	-0.2580	-0.8051	0.9091	0.3783
Phase of Cycle	-0.0233	-0.1011	0.4731	0.8313
Age	0.2089	0.5899	0.7917	0.4581
Age Regulated	-0.0376	-0.0909	0.2845	0.7499
Days of Cycle	-0.1844	-0.1495	0.0923	0.1087
Medication (NSAIDs)	-0.0583	-0.5536	1.0477	0.5986
Source of Information (Health Professional)	-0.0563	-0.5229	1.1016	0.6361
Symptom to Expect (Education/Films)	-0.0118	-0.1256	1.3098	0.9239
FINAL STEP:		Multiple R = 0.1791		
		R Square = 0.0321		
		Adjusted R = 0.0219		
		p = 0.0792		
Days of Cycle	-0.1791	-0.1452	0.0818	0.0792

Table 20

Regression Analysis of Group and Phase of Cycle on Negative Affect Symptoms Experienced Menstrually

STEP 1:		Multiple R = 0.2887		
		R Square = 0.0833		
		Adjusted R = -0.0115		
		p = 0.5475		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.0229	-0.3321	1.7936	0.8535
Grade	-0.4241	-2.6409	1.7870	0.1431
Phase of Cycle	-6.0591	-0.0052	0.9300	0.9955
Age	0.3872	2.1833	1.5562	0.1642
Age Regulated	0.0938	0.4538	0.5592	0.4192
Days of Cycle	-0.0099	-0.0161	0.1813	0.9294
Medication (NSAIDs)	-0.2166	-4.1076	2.0594	0.0492*
Source of Information (Health Professional)	-0.1843	-3.4179	2.1653	0.1181
Symptom to Expect (Education/Films)	0.1483	3.1393	2.5746	0.2260
FINAL STEP:		Multiple R = 0.1646		
		R Square = 0.0271		
		Adjusted R = 0.0168		
		p = 0.1072		
Medication (NSAIDs)	-0.1646	-3.1213	1.9195	0.1072

*p < .05

Table 21

Regression Analysis of Group and Phase of Cycle on Arousal Symptoms Experienced Menstrually

STEP 1:		Multiple R = 0.4365		
		R Square = 0.1905		
		Adjusted R = 0.1068		
		p = 0.0243		
Predictor Variable	Beta	B	SE B	SIG T
Group	0.0088	0.0483	0.6418	0.9402
Grade	-0.4311	-1.0223	0.6394	0.1135
Phase of Cycle	0.2416	0.7957	0.3328	0.0190*
Age	0.3011	0.6465	0.5568	0.2488
Age Regulated	0.1205	0.2219	0.2001	0.2705
Days of Cycle	0.0666	0.0411	0.0649	0.5285
Medication (NSAIDs)	-0.2912	-2.1029	0.7369	0.0054*
Source of Information (Health Professional)	-0.1603	-1.1321	0.7748	0.1476
Symptom to Expect (Education/Films)	0.1209	0.9751	0.9212	0.2928
FINAL STEP:		Multiple R = 0.3637		
		R Square = 0.1323		
		Adjusted R = 0.1138		
		p = 0.0013		

(Table 21 continues)

Predictor Variable	Beta	B	SE B	SIG T
Medication (NSAIDs)	-0.2347	-1.6948	0.6941	0.0165*
Phase of Cycle	0.2826	0.9304	0.3165	0.0041*

*p < .05

Table 22

Regression Analysis of Group and Phase of Cycle on Control Symptoms Experienced Menstrually

STEP 1:		Multiple R = 0.4195		
		R Square = 0.1760		
		Adjusted R = 0.0908		
		p = 0.0414		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1496	-1.1432	0.8998	0.2073
Grade	-0.4014	-1.3227	0.8965	0.1437
Phase of Cycle	0.1428	0.6533	0.4666	0.1650
Age	0.1848	0.5513	0.7807	0.4819
Age Regulated	0.2066	0.5287	0.2805	0.0628
Days of Cycle	-0.1258	-0.1078	0.0909	0.2395
Medication (NSAIDs)	-0.2593	-2.6022	1.0331	0.0136*
Source of Information (Health Professional)	-0.0038	-0.0377	1.0863	0.9724
Symptom to Expect (Education/Films)	0.0826	0.9253	1.2916	0.4757
FINAL STEP:		Multiple R = 0.3721		
		R Square = 0.1384		
		Adjusted R = 0.1384		
		p = 0.0078		

(Table 22 continues)

Predictor Variable	Beta	B	SE B	SIG T
Group	-0.2213	-1.6909	0.8148	0.0407*
Grade	-0.2078	-0.6847	0.3737	0.0701
Age Regulated	0.1848	0.4729	0.2728	0.0863
Medication (NSAIDs)	-0.2598	-2.6077	1.0027	0.0108*

*p < .05

Table 23

Regression Analysis of Group and Phase of Cycle on Pain Symptoms Experienced Premenstrually

STEP 1:	Multiple R = 0.2871			
	R Square = 0.0824			
	Adjusted R = -0.0125			
	p = 0.5565			
Predictor Variable	Beta	B	SE B	SIG T
Group	0.1780	1.9952	1.3926	0.1555
Grade	-0.2555	-1.2349	1.3875	0.3759
Phase of Cycle	-0.0123	-0.0825	0.7221	0.9093
Age	0.1281	0.5606	1.2082	0.6438
Age Regulated	-0.0715	-0.2683	0.4342	0.5382
Days of Cycle	-0.2039	-0.2562	0.1408	0.0722
Medication (NSAIDs)	-0.0032	-0.0480	1.5989	0.9761
Source of Information (Health Professional)	-0.0920	-1.3244	1.6812	0.4330
Symptom to Expect (Education/Films)	0.1787	2.9353	1.9989	0.1456
FINAL STEP:	Multiple R = 0.1773			
	R Square = 0.0315			
	Adjusted R = 0.0213			
	p = 0.0823			
Days of Cycle	-0.1773	-0.2227	0.1268	0.0823

Table 24

Regression Analysis of Group and Phase of Cycle on Concentration Symptoms Experienced Premenstrually

STEP 1:	Multiple R = 0.2643			
	R Square = 0.0699			
	Adjusted R = -0.0264			
	p = 0.6838			
Predictor Variable	Beta	B	SE B	SIG T
Group	0.0489	0.3839	0.9804	0.6963
Grade	-0.3260	-1.1018	0.9768	0.2624
Phase of Cycle	0.0297	0.1392	0.5084	0.7849
Age	0.4518	0.8506	0.1477	0.5967
Age Regulated	-0.0038	-0.0099	0.3056	0.9740
Days of Cycle	-0.0645	-0.0566	0.0991	0.5693
Medication (NSAIDs)	-0.1039	-1.0692	1.1257	0.3448
Source of Information (Health Professional)	-0.2141	-2.1549	1.1835	0.0721
Symptom to Expect (Education/Films)	0.1545	1.7752	1.4073	0.2105
FINAL STEP:	Multiple R = 0.1347			
	R Square = 0.0182			
	Adjusted R = 0.0078			
	p = 0.1883			
Grade	-0.1347	-0.4553	0.3435	0.1883

Table 25

Regression Analysis of Group and Phase of Cycle on Behavioral Change Symptoms Experienced Premenstrually

STEP 1:		Multiple R = 0.2959		
		R Square = 0.0876		
		Adjusted R = -0.0068		
		p = 0.5055		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.0763	-0.4883	0.7934	0.5399
Grade	-0.5639	-1.5569	0.7904	0.0521*
Phase of Cycle	-0.0851	-0.3265	0.4114	0.4296
Age	0.4574	1.1434	0.6883	0.5438
Age Regulated	0.0477	0.1024	0.2473	0.6800
Days of Cycle	-0.0681	-0.0489	0.0802	0.5438
Medication (NSAIDs)	-0.0408	-0.3434	0.9109	0.7071
Source of Information (Health Professional)	-0.1786	-1.4687	0.9578	0.1288
Symptom to Expect (Education/Films)	0.1737	1.6304	1.1388	0.1558
FINAL STEP:		Multiple R = 0.1278		
		R Square = 0.0163		
		Adjusted R = 0.0060		
		p = 0.2122		
Grade	-0.1278	-0.3529	0.2809	0.2122

*p < .05

Table 26

Regression Analysis of Group and Phase of Cycle on Autonomic Reaction Symptoms Experienced Premenstrually

STEP 1:		Multiple R = 0.3379		
		R Square = 0.1142		
		Adjusted R = 0.0026		
		p = 0.2779		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.0302	-0.1469	0.5939	0.8052
Grade	-0.4314	-0.9051	0.5918	0.1298
Phase of Cycle	0.1722	0.5017	0.3079	0.1069
Age	0.2626	0.4989	0.5153	0.3357
Age Regulated	-0.0019	-0.0032	0.1852	0.9862
Days of Cycle	-0.1382	-0.0754	0.0600	0.2129
Medication (NSAIDs)	-0.1362	-0.8706	0.6819	0.2052
Source of Information (Health Professional)	-0.0581	-0.3628	0.7170	0.6141
Symptom to Expect (Education/Films)	0.1153	0.8219	0.8526	0.3377
FINAL STEP:		Multiple R = 0.2508		
		R Square = 0.0629		
		Adjusted R = 0.0430		
		p = 0.0472		
Grade	-0.1860	-0.3902	0.2095	0.0656
Phase of Cycle	0.1665	0.4851	0.2909	0.0988

Table 27

Regression Analysis of Group and Phase of Cycle on Water Retention Symptoms Experienced Premenstrually

STEP 1:		Multiple R = 0.3357		
		R Square = 0.1127		
		Adjusted R = 0.0209		
		p = 0.2886		
Predictor Variable	Beta	B	SE B	SIG T
Group	0.1334	0.9085	0.8319	0.2778
Grade	-0.0935	-0.2744	0.8289	0.7414
Phase of Cycle	-0.0137	-0.0557	0.4314	0.8975
Age	0.1734	0.4609	0.7218	0.5248
Age Regulated	-0.0509	-0.1159	0.2594	0.6560
Days of Cycle	-0.2265	-0.1728	0.0841	0.0429*
Medication (NSAIDs)	0.0746	0.6673	0.9552	0.4867
Source of Information (Health Professional)	-0.2327	-2.0347	1.0043	0.0458*
Symptom to Expect (Education/Films)	0.2235	2.2301	1.1941	0.0652
FINAL STEP:		Multiple R = 0.2901		
		R Square = 0.0842		
		Adjusted R = 0.0546		
		p = 0.0417		

(Table 27 continues)

Predictor Variable	Beta	B	SE B	SIG T
Days of Cycle	-0.1917	-0.1463	0.0762	0.0579
Source of Information (Health Professional)	-0.2485	-2.1731	0.9693	0.0273*
Symptom to Expect (Education/Films)	0.1920	1.9160	1.1018	0.0853

*p < .05

Table 28

Regression Analysis of Group and Phase of Cycle on Negative Affect Symptoms Experienced Premenstrually

STEP 1:	Multiple R = 0.3649			
	R Square = 0.1332			
	Adjusted R = 0.0435			
	p = 0.1660			
Predictor Variable	Beta	B	SE B	SIG T
Group	0.2034	2.7348	1.6235	0.0957
Grade	-0.1777	-1.0301	1.6176	0.5259
Phase of Cycle	-0.0561	-0.4517	0.8418	0.5929
Age	0.1746	0.9167	1.4086	0.5169
Age Regulated	-0.0333	0.1499	0.5062	0.7678
Days of Cycle	-0.0243	-0.0366	0.1641	0.8239
Medication (NSAIDs)	-0.0068	-0.1195	1.8641	0.9490
Source of Information (Health Professional)	-0.3219	-5.2820	1.9599	0.0057*
Symptom to Expect (Education/Films)	0.2680	5.2820	2.3304	0.0259*
FINAL STEP:	Multiple R = 0.3523			
	R Square = 0.1241			
	Adjusted R = 0.0959			
	p = 0.0062			

(Table 28 continues)

Predictor Variable	Beta	B	SE B	SIG T
Group	0.1854	2.4919	1.3757	0.0733
Source of Information (Health Professional)	-0.3080	-5.3184	1.8762	0.0056*
Symptom to Expect (Education/Films)	0.2454	4.8354	2.1755	0.0287*

*p < .05

Table 29

Regression Analysis of Group and Phase of Cycle on Arousal Symptoms Experienced Premenstrually

STEP 1:	Multiple R = 0.2979			
	R Square = 0.0887			
	Adjusted R = -0.0055			
	p = 0.4941			
Predictor Variable	Beta	B	SE B	SIG T
Group	0.0549	0.3509	0.7908	0.6583
Grade	-0.4086	-1.1252	0.7879	0.1568
Phase of Cycle	0.1691	0.6466	0.4100	0.1185
Age	0.3087	0.7696	0.6861	0.2651
Age Regulated	-0.0916	-0.1959	0.2465	0.4291
Days of Cycle	-0.0096	-0.0069	0.0799	0.9319
Medication (NSAIDs)	-0.1450	-1.2166	0.9080	0.1838
Source of Information (Health Professional)	-0.1307	-1.0717	0.9547	0.2647
Symptom to Expect (Education/Films)	0.1529	1.4308	1.1351	0.2109
FINAL STEP:	Multiple R = 0.1922			
	R Square = 0.0369			
	Adjusted R = 0.0268			
	p = 0.0593			
Phase of Cycle	0.1922	0.7349	0.3850	0.0593

Table 30

Regression Analysis of Group and Phase of Cycle on Control Symptoms Experienced Premenstrually

STEP 1:		Multiple R = 0.3282		
		R Square = 0.1077		
		Adjusted R = 0.0154		
		p = 0.3263		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.0519	-0.3402	0.8036	0.6731
Grade	-0.5158	-1.4588	0.8006	0.0719
Phase of Cycle	0.1247	0.4897	0.4167	0.2431
Age	0.3308	0.8469	0.6972	0.2278
Age Regulated	0.1082	0.2377	0.2505	0.3454
Days of Cycle	-0.1089	-0.0800	0.0812	0.3272
Medication (NSAIDs)	-0.1921	-1.6547	0.9227	0.0764
Source of Information (Health Professional)	-0.1152	-0.9702	0.9701	0.3200
Symptom to Expect (Education/Films)	0.0802	0.7705	1.1534	0.5059
FINAL STEP:		Multiple R = 0.1533		
		R Square = 0.0235		
		Adjusted R = 0.0132		
		p = 0.1339		
Grade	-0.1533	-0.4335	0.2867	0.1339

Table 31

Regression Analysis of Group and Phase of Cycle on Pain Symptoms Experienced Intermenstrually

STEP 1:		Multiple R = 0.2631		
		R Square = 0.0692		
		Adjusted R = -0.0271		
		p = 0.6905		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1219	-0.8417	0.8642	0.3328
Grade	-0.0819	-0.2440	0.8611	0.7775
Phase of Cycle	-0.0021	-0.0074	0.4481	0.9869
Age	-0.0652	-0.1757	0.7498	0.8152
Age Regulated	0.0826	0.1910	0.2694	0.4802
Days of Cycle	0.0266	0.0206	0.0874	0.8145
Medication (NSAIDs)	-0.0021	-0.0187	0.9923	0.9850
Source of Information (Health Professional)	-0.1345	-1.1929	1.0433	0.2560
Symptom to Expect (Education/Films)	0.1691	1.7113	1.2406	0.1713
FINAL STEP:		Multiple R = 0.1392		
		R Square = 0.0194		
		Adjusted R = 0.0090		
		p = 0.1740		
Symptom to Expect (Education/Films)	0.1391	1.4084	1.0283	0.1740

Table 32

Regression Analysis of Group and Phase of Cycle on Concentration Symptoms Experienced Intermenstrually

STEP 1:		Multiple R = 0.3318		
		R Square = 0.1101		
		Adjusted R = 0.0180		
		p = 0.3081		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1027	-0.7398	0.8818	0.4038
Grade	-0.4357	-1.3538	0.8786	0.1270
Phase of Cycle	0.1508	0.6507	0.4572	0.1583
Age	0.2811	0.7908	0.7651	0.4042
Age Regulated	0.1027	0.2478	0.2749	0.3698
Days of Cycle	-0.0466	-0.0377	0.0892	0.6737
Medication (NSAIDs)	-0.1724	-1.6320	1.0125	0.1106
Source of Information (Health Professional)	-0.1474	-1.3642	1.0645	0.2034
Symptom to Expect (Education/Films)	0.1241	1.3112	1.2658	0.3031
FINAL STEP:		Multiple R = 0.1732		
		R Square = 0.0299		
		Adjusted R = 0.0198		
		p = 0.0898		
Phase of Cycle	0.1732	0.7473	0.4360	0.0898

Table 33

Regression Analysis of Group and Phase of Cycle on Behavioral Change Symptoms Experienced Intermenstrually

STEP 1:		Multiple R = 0.4111		
		R Square = 0.1690		
		Adjusted R = 0.0830		
		p = 0.0830		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.2001	-1.0245	0.6054	0.0942
Grade	-0.3007	-0.6638	0.6032	0.2742
Phase of Cycle	0.0475	0.1458	0.3139	0.6436
Age	0.0818	0.1635	0.5253	0.7563
Age Regulated	0.1157	0.1983	0.1887	0.2963
Days of Cycle	-0.0291	-0.0167	0.0612	0.7860
Medication (NSAIDs)	-0.0824	-0.5544	0.6951	0.4273
Source of Information (Health Professional)	-0.2924	-1.9230	0.7309	0.0101*
Symptom to Expect (Education/Films)	0.2128	1.5967	0.8690	0.0696
FINAL STEP:		Multiple R = 0.3232		
		R Square = 0.1045		
		Adjusted R = 0.0854		
		p = 0.0056		

(Table 33 continues)

Predictor Variable	Beta	B	SE B	SIG T
Group	-0.3005	-1.5387	0.5144	0.0035*
Source of Information (Health Professional)	-0.2099	-1.3806	0.6607	0.0393*

*p < .05

Table 34

Regression Analysis of Group and Phase of Cycle on Autonomic Reaction Symptoms Experienced Intermenstrually

STEP 1:		Multiple R = 0.3762		
		R Square = 0.1415		
		Adjusted R = 0.0527		
		p = 0.1297		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1993	-0.8795	0.5303	0.1008
Grade	-0.2375	-0.4519	0.5284	0.3947
Phase of Cycle	0.1312	0.3468	0.2750	0.2107
Age	0.0775	0.1335	0.4601	0.7724
Age Regulated	0.1422	0.2102	0.1653	0.2071
Days of Cycle	-0.0726	-0.0359	0.0536	0.5051
Medication (NSAIDs)	-0.0726	-0.0359	0.0536	0.5051
Source of Information (Health Professional)	-0.2337	-1.3248	0.6402	0.0415*
Symptom to Expect (Education/Films)	0.1370	0.8859	0.7612	0.2477
FINAL STEP:		Multiple R = 0.2903		
		R Square = 0.0842		
		Adjusted R = 0.0648		
		p = 0.0160		

(Table 34 continues)

Predictor Variable	Beta	B	SE B	SIG T
Group	-0.2726	-1.2029	0.4483	0.0743
Source of Information (Health Professional)	-0.5758	-1.0393	0.5758	0.0086*

*p < .05

Table 35

Regression Analysis of Group and Phase of Cycle on Water Retention Symptoms Experienced Intermenstrually

STEP 1:		Multiple R = 0.2655		
		R Square = 0.0705		
		Adjusted R = -0.0256		
		p = 0.6773		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1509	-0.6725	0.5571	0.2307
Grade	-0.0615	-0.1182	0.5551	0.8319
Phase of Cycle	0.0845	0.2253	0.2889	0.4375
Age	-0.0144	-0.0251	0.4834	0.9587
Age Regulated	0.0473	0.0705	0.1737	0.6857
Days of Cycle	-0.0946	-0.0473	0.0563	0.4038
Medication (NSAIDs)	-0.0285	-0.1669	0.6397	0.7948
Source of Information (Health Professional)	-0.1326	-0.7587	0.6726	0.2624
Symptom to Expect (Education/Films)	0.1221	-0.7969	0.7997	0.3217
FINAL STEP:		Multiple R = 0.1983		
		R Square = 0.0393		
		Adjusted R = 0.0292		
		p = 0.0516		
Group	-0.1983	-0.8832	0.4480	0.0516*

*p < .05

Table 36

Regression Analysis of Group and Phase of Cycle on Negative Affect Symptoms Experienced Intermenstrually

STEP 1:	Multiple R = 0.2664			
	R Square = 0.0709			
	Adjusted R = -0.0252			
	p = 0.6729			
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.0210	-0.1949	1.1584	0.8667
Grade	-0.2165	-0.8651	1.1541	0.4555
Phase of Cycle	8.4259	0.0047	0.6007	0.9938
Age	0.0486	0.1757	1.0051	0.8617
Age Regulated	0.0241	0.0749	0.3611	0.8362
Days of Cycle	-0.0128	-0.0133	0.1171	0.9097
Medication (NSAIDs)	-0.0146	-0.1773	1.3301	0.8943
Source of Information (Health Professional)	-0.2330	-2.7728	1.3984	0.0505*
Symptom to Expect (Education/Films)	0.1928	2.6176	1.6628	0.1191
FINAL STEP:	Multiple R = 0.2638			
	R Square = 0.0696			
	Adjusted R = 0.0396			
	p = 0.0806			

(Table 36 continues)

Predictor Variable	Beta	B	SE B	SIG T
Grade	-0.1687	-0.6738	0.4038	0.0986
Source of Information (Health Professional)	-0.2301	-2.7378	1.3358	0.0432*
Symptom to Expect (Education/Films)	0.1919	2.6062	1.5119	0.0881

*p < .05

Table 37

Regression Analysis of Group and Phase of Cycle on Arousal Symptoms Experienced Intermenstrually

STEP 1:		Multiple R = 0.4474		
		R Square = 0.2002		
		Adjusted R = 0.1174		
		p = 0.0168		
Predictor Variable	Beta	B	SE B	SIG T
Group	0.0354	0.2451	0.8041	0.7613
Grade	-0.3437	-1.0272	0.8011	0.2032
Phase of Cycle	0.0603	0.2502	0.4169	0.5501
Age	0.2480	0.6712	0.6977	0.3387
Age Regulated	0.0596	0.1383	0.2507	0.5826
Days of Cycle	0.0224	0.0174	0.0813	0.8307
Medication (NSAIDs)	-0.0139	-0.1267	0.9233	0.8911
Source of Information (Health Professional)	-0.4580	-4.0776	0.9707	0.0001*
Symptom to Expect (Education/Films)	0.3191	3.2416	1.1542	0.0061*
FINAL STEP:		Multiple R = 0.4183		
		R Square = 0.1750		
		Adjusted R = 0.1574		
		p = 0.0001		

(Table 37 continues)

Predictor Variable	Beta	B	SE B	SIG T
Source of Information (Health Professional)	-0.4515	-4.0196	0.9263	0.0000*
Symptom to Expect (Education/Films)	0.2947	2.9941	1.0570	0.0056*

*p < .05

Table 38

Regression Analysis of Group and Phase of Cycle on Control Symptoms Experienced Intermenstrually

STEP 1:		Multiple R = 0.3643		
		R Square = 0.1327		
		Adjusted R = 0.0430		
		p = 0.1684		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1684	-0.8313	0.5962	0.1668
Grade	-0.3109	-0.6617	0.5940	0.2684
Phase of Cycle	0.1730	0.5112	0.3091	0.1018
Age	0.1412	0.2721	0.5173	0.6002
Age Regulated	0.1433	0.2369	0.1859	0.2059
Days of Cycle	-0.0757	-0.0418	0.0603	0.4894
Medication (NSAIDs)	-0.1201	-0.7785	0.6845	0.2586
Source of Information (Health Professional)	-0.1831	-1.1604	0.7197	0.1105
Symptom to Expect (Education/Films)	0.0839	0.6070	0.8558	0.4800
FINAL STEP:		Multiple R = 0.2602		
		R Square = 0.0677		
		Adjusted R = 0.0479		
		p = 0.0371		
Group	-0.1850	-0.9131	0.4930	0.0671
Phase of Cycle	0.1690	0.4994	0.2952	0.0941

Table 39

Regression Analysis of Group and Phase of Cycle on Depression Symptoms Experienced During April Cycle

STEP 1:	Multiple R = 0.4370			
	R Square = 0.1910			
	Adjusted R = 0.1073			
	p = 0.0239			
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1268	-1.4233	1.3085	0.2797
Grade	-0.0522	-0.2529	1.3027	0.8465
Phase of Cycle	-0.2688	-2.1338	0.7873	0.0081*
Age	0.0054	0.0238	1.1381	0.9834
Age Regulated	-0.1179	-0.4434	0.4087	0.2810
Days of Cycle	0.0364	0.0458	0.1289	0.7230
Medication (NSAIDs)	0.1362	2.0082	1.5034	0.1851
Source of Information (Health Professional)	0.2427	3.4997	1.6004	0.0314*
Symptom to Expect (Education/Films)	-0.1332	-2.1927	1.8837	0.2476
FINAL STEP:	Multiple R = 0.3782			
	R Square = 0.1431			
	Adjusted R = 0.1154			
	p = 0.0024			

(Table 39 continues)

Predictor Variable	Beta	B	SE B	SIG T
Phase of Cycle	-0.2681	-2.1286	0.7655	0.0066*
Medications (NSAIDs)	0.1643	2.4226	1.4157	0.0904
Source of Information (Health Professional)	0.2379	3.4308	1.3907	0.0155*

*p < .05

Table 40

Regression Analysis of Group and Phase of Cycle on State Anxiety Symptoms Experienced During April Cycle

STEP 1:		Multiple R = 0.3502		
		R Square = 0.1226		
		Adjusted R = 0.0318		
		p = 0.2232		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.0828	-1.6839	2.4685	0.4970
Grade	-0.1828	-1.6039	2.4577	0.5157
Phase of Cycle	-0.2031	-2.9219	1.4852	0.0523*
Age	0.2753	2.1864	2.1470	0.3113
Age Regulated	0.0541	0.3687	0.7711	0.6337
Days of Cycle	-0.1593	-0.3631	0.2432	0.1391
Medication (NSAIDs)	0.1037	2.7709	2.8363	0.3313
Source of Information (Health Professional)	0.0965	2.5221	3.0193	0.4058
Symptom to Expect (Education/Films)	0.0179	0.5345	3.5536	0.8808
FINAL STEP:		Multiple R = 0.2162		
		R Square = 0.0467		
		Adjusted R = 0.0367		
		p = 0.0335		
Phase of Cycle	-0.2162	-3.1089	1.4408	0.0335*

*p < .05

Table 41

Regression Analysis of Group and Phase of Cycle on Trait Anxiety Symptoms Experienced During April Cycle

STEP 1:		Multiple R = 0.2497		
		R Square = 0.0624		
		Adjusted R = -0.0346		
		p = 0.7574		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.1097	-1.9696	2.2485	0.3844
Grade	-0.0722	-0.5582	2.2387	0.8037
Phase of Cycle	-0.0662	-0.8390	1.3529	0.5368
Age	0.1426	0.9980	1.9557	0.6111
Age Regulated	-0.0903	-0.5419	0.7024	0.4425
Days of Cycle	-0.1129	-0.2267	0.2216	0.3089
Medication (NSAIDs)	0.1087	2.5596	2.5836	0.3246
Source of Information (Health Professional)	-0.0252	-0.5800	2.7502	0.8355
Symptom to Expect (Education/Films)	0.0011	0.0299	3.2369	0.9926
FINAL STEP:		Multiple R = 0.1375		
		R Square = 0.0189		
		Adjusted R = 0.0086		
		p = 0.1792		
Days of Cycle	-0.1375	-0.2763	0.2041	0.1792

Table 42

Regression Analysis of Group and Phase of Cycle on Depression Symptoms Experienced During May Cycle

STEP 1:		Multiple R = 0.5612		
		R Square = 0.3149		
		Adjusted R = 0.2441		
		p = 0.0001		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.3680	-4.0391	1.1916	0.0011*
Grade	-0.1373	-0.6497	1.1720	0.5808
Phase of Cycle	-0.2516	-1.8120	0.6638	0.0077*
Age	0.1188	0.5090	1.0188	0.6186
Age Regulated	-0.1679	-0.6172	0.3674	0.0966
Days of Cycle	0.2406	0.2960	0.1166	0.0129*
Medication (NSAIDs)	-0.0237	-0.3414	1.3560	0.8018
Source of Information (Health Professional)	-0.0215	-0.3028	1.4229	0.8320
Symptom to Expect (Education/Films)	0.1327	2.1344	1.6901	0.2100
FINAL STEP:		Multiple R = 0.5483		
		R Square = 0.3006		
		Adjusted R = 0.2702		
		p = 0.0000		

(Table 42 continues)

Predictor Variable	Beta	B	SE B	SIG T
Group	-0.4109	-4.5101	1.0093	0.0000*
Age Regulated	-0.1830	-0.6728	0.3310	0.0450*
Phase of Cycle	-0.2386	-1.7179	0.6424	0.0089*
Days of Cycle	0.2540	0.3125	0.1129	0.0068*

*p < .05

Table 43

Regression Analysis of Group and Phase of Cycle on State Anxiety Symptoms Experienced During May Cycle

STEP 1:		Multiple R = 0.3973		
		R Square = 0.1578		
		Adjusted R = 0.0707		
		p = 0.0773		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.4352	-9.1468	2.5300	0.0005*
Grade	-0.0493	-0.4473	2.4883	0.8578
Phase of Cycle	-0.0550	-0.7585	1.4092	0.5918
Age	0.1738	1.4259	2.1631	0.5115
Age Regulated	0.0549	0.3886	0.7801	0.6214
Days of Cycle	0.1374	0.3237	0.2475	0.1945
Medication (NSAIDs)	-0.0804	-2.2186	2.8791	0.4430
Source of Information (Health Professional)	-0.0034	-0.0906	3.0210	0.9761
Symptom to Expect (Education/Films)	-0.0331	-1.0188	3.5882	0.7771
FINAL STEP:		Multiple R = 0.3309		
		R Square = 0.1095		
		Adjusted R = 0.1001		
		p = 0.0009		
Group	-0.3309	-6.9557	2.0350	0.0009*

*p < .05

Table 44

Regression Analysis of Group and Phase of Cycle on Trait Anxiety Symptoms Experienced During May Cycle

STEP 1:		Multiple R = 0.3125		
		R Square = 0.0977		
		Adjusted R = 0.0043		
		p = 0.4106		
Predictor Variable	Beta	B	SE B	SIG T
Group	-0.3048	-5.4655	2.2344	0.0165*
Grade	0.0133	0.1025	2.1976	0.9629
Phase of Cycle	0.0405	0.4767	1.2446	0.7027
Age	-0.0053	-0.0373	1.9103	0.9845
Age Regulated	-0.0488	-0.2934	0.6889	0.6712
Days of Cycle	-0.0200	-0.0402	0.2186	0.8544
Medication (NSAIDs)	0.0380	0.8947	2.5427	0.7258
Source of Information (Health Professional)	-0.1090	-2.5095	2.6681	0.3495
Symptom to Expect (Education/Films)	-0.0437	-1.1492	3.1690	0.7177
FINAL STEP:		Multiple R = 0.2789		
		R Square = 0.0778		
		Adjusted R = 0.0681		
		p = 0.0057		
Group	-0.2789	-5.0010	1.7669	0.0057*

*p < .05

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