

DREAM CONTENT, AFFECT, AND MENSTRUATION

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KATHERINE J. SCHULTZ

**A dissertation submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
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ABSTRACT

Dream Content, Affect, and Menstruation

Katherine J. Schultz

Ten women slept in the laboratory for two adaptation and three experimental nights. Each of the experimental nights were from different menstrual cycle phases; premenses, menses, or mid-cycle. Dreams were collected from every REM period. Contrary to predictions, there were no significant changes in dream affect levels as a function of cycle phase and no significant changes were found in the dream content or in postsleep affect. Quantitatively small but significant changes were found in the presleep measures of control, anxiety, and surgency. The results are discussed in light of presleep stimuli impact and subject characteristics.

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CHAPTER I

REVIEW OF THE LITERATURE

The ongoing process of life is a composite of numerous intermeshed and overlapping cycles. Some cycles, such as, recurring periods of hunger and thirst or fluctuations in alertness and fatigue are easily observable. Others, such as body temperature fluctuations or changes in tolerance of pain or drug dosages, are much less evident. Reciprocal cycle effects are only beginning to be studied and, as yet, a great deal about cyclic inter-relations remains unknown. The cycle of sleep and the menstrual cycle are two of the more widely studied cycles but their relation to each other has not been fully examined. The purpose of this study is to examine how one facet of sleep, dream content affect levels, is influenced by three different phases of the menstrual cycle.

The Sleep Cycle

Sleep itself contains patterns, broadly differentiated as non-rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep. Non-rapid eye movement sleep has been further divided into four stages, Stage 1, 2, 3, and 4 each characterized by its own EEG pattern. Sleep throughout the night consists of continuing progressions from Stage 1 sleep, through Stage 2 and 3, to Stage 4, followed by the re-ascent through the NREM stages. Stage 1 sleep is characterized by low amplitude EEG waves of relatively fast, mixed frequencies. Stage

2, is characterized by the occurrence of K-complexes and sleep spindles. K-complexes are paroxysmal waves of high amplitude while sleep spindles are rhythmic bursts of 12 to 14 cps, lasting for one to two seconds. Stage 3 and 4 sleep contain high amplitude, slow delta waves of 0.5 to 2 cps. If less than one half of a given period is delta waves, then it is classified as Stage 3 sleep, if greater than half of the tracing is delta waves, then it is designated as Stage 4 sleep (Rechtschaffen & Kales, 1968). The descent and ascent through the NREM stages continues throughout the night, but approximately 70 to 80 minutes after the onset of sleep the sleeper enters REM sleep or, as it is also known, the D-state, dreaming sleep, or paradoxical sleep. This stage is characterized by the recurrence of Stage 1 EEG patterns which are now accompanied by numerous physiological changes, such as, rapid eye movements, suppression of muscle activity, irregular breathing, and increases in brain temperature and cerebral blood flow (Dement, 1972). The cyclic alternation of NREM and REM sleep continues throughout the night with an average cycle length of 90 minutes. In the early part of the night, sleep is dominated by NREM activity, primarily Stages 3 and 4, but towards morning, REM periods become longer and NREM intervals become shorter. During the average night's sleep of about seven hours an adult could spend roughly one and a

half to two hours or about 22 percent of total sleep time in REM sleep.

In addition to being characterized by different EEG patterns, levels of activation, and distribution over total sleep time, REM and NREM sleep can also be differentiated by the type of mentation that occurs during the respective stages. When awakened from REM sleep, a person is most likely to report mentation that is consistent with the popular notion of a dream, that is, having thematic continuity, visual imagery, vividness, and organization. A NREM mentation report is more likely to resemble thinking, being more conceptual, less vivid, and containing little visual imagery.

Influencing the Sleep Cycle

Information about the function of sleep can be gained by studying deviations from the normal sleep pattern and their causes. Studies of the function of sleep and dreaming examine deviations from normal sleep patterns which are associated with induced or naturally occurring events. Events as diverse as paid bonuses for decreased dreaming (Rechtschaffen & Verdone, 1964), induced thirst (Koulack, 1970), and marathon encounter group participation (Glaubman & Hartmann, 1975) have been found to result in changes in the sleep cycle, and many other events such as, social isolation (Wood, 1962), concen-

trated periods of problem solving (Hauri, 1969), and anticipation of surgery (Breger, Hunter, & Lane, 1971) have resulted in changes in dream content.

In studies by Baekeland, Koulack, and Lasky (1968) and by DeKoninck and Koulack (1975) stress was induced by presleep viewing of films. In the Baekeland et al (1968) study, the film depicted the rite of passage among a tribe of Australian aboriginies, while in the DeKoninck and Koulack (1975) study, the film portrayed maiming and fatal industrial accidents. In both studies the presleep viewing of these stressful films resulted in changes in sleep patterns. Baekeland et al (1968) found increased spontaneous REM awakenings and increased REM density, while DeKoninck and Koulack (1975) found increased sleep onset latency, and decreased REM period latency.

Sleep patterns also have been found to be altered by the stress induced by participation in marathon encounter groups (Glaubman & Hartmann, 1975). It was found that sleep and REM latencies were reduced and there was a tendency for total sleep time to increase.

Dream recall frequency also has been shown to be influenced by stress (Cohen, 1972b; Goodenough, Witkin, Lewis, Koulack, & Cohen, 1974). Cohen (1972) found that when stress was induced by the prospect of participation in an experiment

in which the subject believed he would receive electrical shock, frequent dream recallers recalled more dreams, while infrequent recallers remembered fewer dreams. Goodenough et al (1974) found that film induced presleep stress lead to decreased recall in field-dependent subjects but not in field-independent subjects.

And finally, in addition to sleep patterns and dream recall, it has been found that the dream's content itself is influenced by stressful experiences. Breger, Hunter, and Lane (1971) found that dream content reflected the stress of participation in group therapy and the stress of anticipated surgery, while Goodenough, Witkin, Koulack, and Cohen (1975) found that the presleep viewing of stressful films led to changes in the affective content of dreams.

Because certain phases of the menstrual cycle are considered by many researchers (e.g. Benedek, 1973; Dalton, 1969; Moos, 1968) to be stressful or aversive, it is possible that menstrual phase also influences various aspects of sleep and dream content. The purpose of the present study is to explore the possibility that a regularly occurring, internal, cyclical change, in this case the menstrual cycle, can influence dream content.

The Physiology of the Menstrual Cycle

Menstruation, the regular shedding of the inner lining of the uterus, is regulated by five hormones, follicle stimulating hormone, lutenizing hormone, luteotropic hormone, estrogen, and progesterone. Follicle stimulating hormone is secreted by the anterior lobe of the pituitary gland and incites the development of an ova within the follicles of the ovary. It is secreted in quantities that increase following menstruation, peak just prior to ovulation and then decrease. A rising level of follicle stimulating hormone causes increasing amounts of estrogen to be secreted in the ovarian follicle. The estrogen inhibits the production of follicle stimulating hormone, while stimulating the pituitary gland to release lutenizing hormone. This hormone induces the final maturation of the ovum and the rupturing of the follicle wall, allowing for the release of the ovum. Then, the continued presence of lutenizing hormone causes the corpus luteum to form where the follicle wall has ruptured. The pituitary gland releases a third hormone, luteotropic hormone, at this time, and this hormone causes the newly formed corpus luteum to manufacture progesterone. Progesterone causes the lining of the uterus to thicken in preparation for the implantation of a fertilized egg. If implantation does not occur, the corpus luteum degenerates, causing a rapid decrease in pro-

gesterone stimulation, which leads to regression of the uterine lining and finally, menstruation. Follicle stimulating hormone production is stimulated by the premenstrual decline in estrogen and progesterone levels and, the cycle begins again (Avers, 1974). Normal cycles vary in length from 20 to 36 days (Dalton, 1969).

The menstrual cycle is often characterized simply in terms of the gonadal hormones, estrogen and progesterone. Estrogen secretion increases during the first half of the cycle, with an estrogen peak just prior to ovulation. The secretion of both estrogen and progesterone then increases during the latter half of the cycle and diminishes rapidly in the days just prior to menstruation. (See Figure 1). The amount of estrogen present during the cycle ranges from approximately .005 mg during menstruation to .018 mg at ovulation, while progesterone amounts vary from about 1 mg in the first half of the cycle to 4 mg in the latter half (Hafez, 1973).

Affect and Hormone Fluctuations

Both the natural menstrual cycle and the cycle which can be induced by the ingestion of oral contraceptives provide cyclically changing levels of estrogen and progesterone. Many attempts have been made to link these hormonal fluctu-

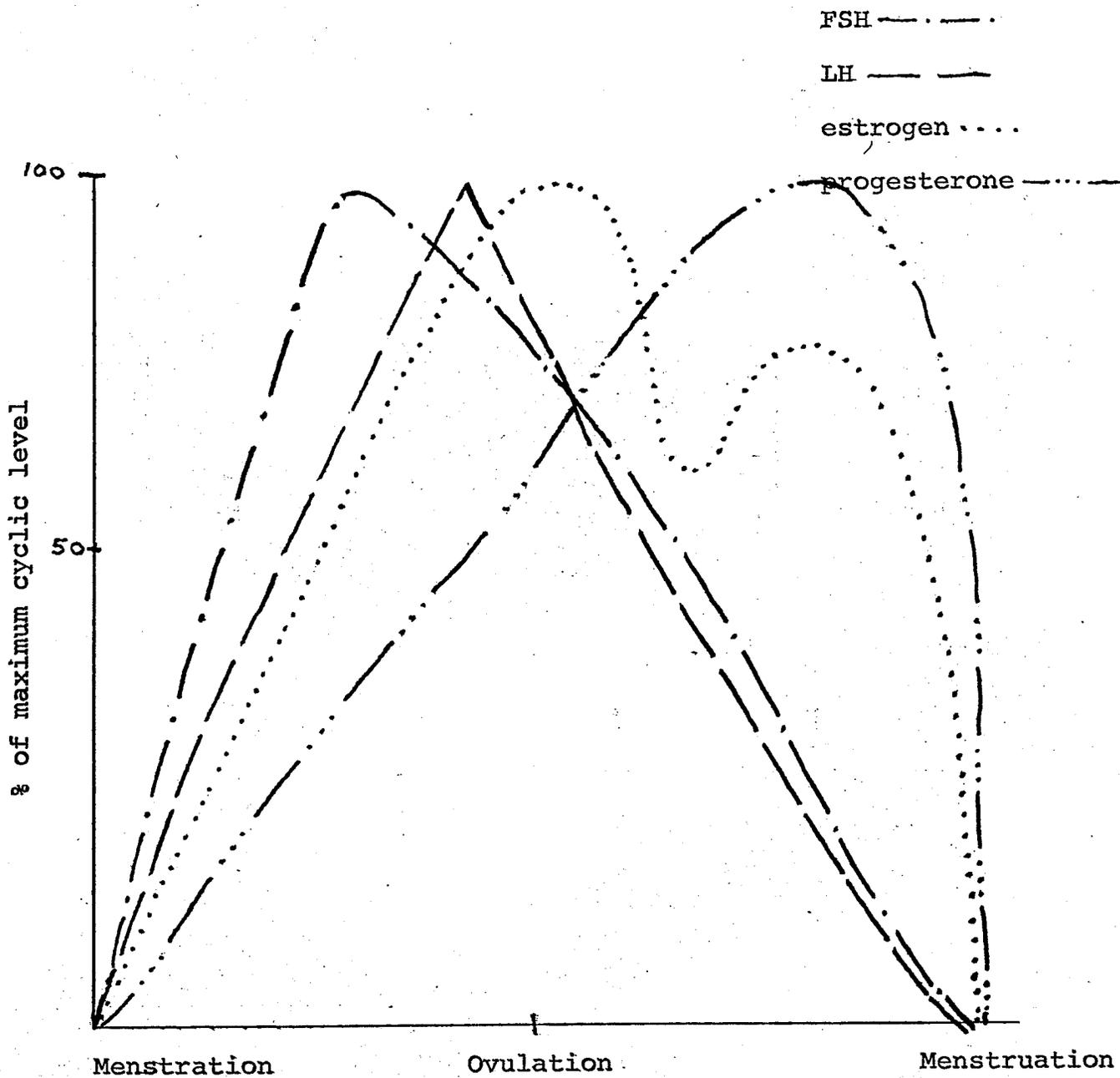


FIGURE I

ations with changes in affect. Frank (1931) focused medical attention on menstrually related affect changes through his discription of a number of cyclically occurring symptoms, varying from cardiac irregularity to asthma and suicidal depression, which he ascribed directly to excessive hormonal stimulation. He labeled these symptoms, which repeatedly occurred seven to ten days preceeding menstruation, as premenstrual tension. Since that time, numerous studies (Coppen & Kessel, 1963; Dalton, 1969; Moos, 1968; Paulson, 1956; Sutherland & Steward, 1965) have corraorated other cyclical symptom patterns (increases in anxiety, depression, irritability, and tension) in the days immediately preceeding menstruation and during menstruation itself. In addition, numerous clinical discriptions of women in psychoanalysis report affective changes occurring around the time of menstruation (Abraham, 1948; Balian, 1937; Chadwick, 1952; Deutsch, 1944; McCance, Luff & Widdowson, 1937; Rose, 1949; Silberman, 1937). The explanations given these emotional fluctuations vary, depending on the theoretical orientation of the author, but these reports describe marked increases in anxiety, depression, psychological conflict, hostility, and loneliness just prior to menstruation and often continuing until cessation of menstrual bleeding.

One of the more physiologically exacting studies

seeking to establish menstrually related affect fluctuations was done by Benedek and Rubenstein (1942). Cycle phase was established through the use of both daily vaginal smears and basal body temperatures. Daily psychoanalytic interviews established the mode of psychological functioning. In total, 152 menstrual cycles from 15 women, were studied. Benedek and Rubenstein (1942) concluded that each phase of the menstrual cycle is characterized by a distinctive pattern of psychological functioning, and further, that cycle phase can be determined solely on the basis of the content of psychoanalytic material, most importantly, dreams, associations, and the nature of the transference. According to the authors as estrogen levels increased, during the first half of the cycle, there were corresponding increases in feelings of well-being and alertness expressed in the psychoanalytic material. However, during the second half of the cycle, when progesterone and estrogen are both present, psychological functioning became progressively less integrated, until, during the premenstrual phase, when amounts of both hormones rapidly decrease, the number of emotional complaints characterized by feelings of hostility and fears of mutilation and death substantially increased. Benedek (1959) reported that during the menstrual phase itself, negative affect subsides. Although she felt that there were clear correlations between

physiological and psychological processes, she suggested (Benedek, 1959) that these relationships would not be as great in non-neurotic women and noted that even in her patients, the hormonal influence on psychological functioning was easily obscured by other factors.

Since the work of Benedek and Rubenstein (1942), other studies have attempted to link cycle phase with patterns of affect change. Gottschalk, Kaplan, Gleser, and Winget (1962) ascertained cycle phase through the use of basal temperature changes and menstrual history. They then collected and scored daily short verbal samples from five women on anxiety and hostility scales. Although neither the test nor the levels of significance were reported, the authors state that during the menstrual cycle four of the five women showed significant changes in the magnitude of at least one affect dimension studied. The changes were described as individual and idiosyncratic, varying from woman to woman.

Ivey and Bardwick (1968) recorded five minute verbal samples from 26 college women at ovulation and again two to three days premenstrually for two menstrual cycles. Cycle phase was determined on the basis of menstrual history or in the case of irregular cycles, basal temperature changes. The verbal samples were scored on the Gottschalk et al (1962) anxiety and hostility scales. The levels of two subcategor-

ies, death and diffuse anxiety, were found to be significantly higher premenstrually than at ovulation. In another study, again using basal temperatures to determine cycle phase, Zimmermen and Parlee (1973) found no significant fluctuations in daily self-ratings of mood.

In addition to the work examining natural menstrual cycles, other investigators have studied the effects of oral-contraceptive-induced hormone fluctuations. In the oral contraceptive cycle, synthetic estrogen and progesterone are administered for 20 or 21 days in the minimum dosage required to prevent ovulation. These substances inhibit the production of the natural hormones and are present in much larger quantities than those found in the natural cycle. In studying their effect on mood, Pincus (1965) reported a decrease in the frequency of premenstrual depression in a large number of women taking oral contraceptives, Wiseman (1965) reported significant decreases in premenstrual depression, tiredness, and irritability in women using oral contraceptives. In addition, Janowsky, Gorney, and Kelly (1966), Kane and Keller (1965) and Swanson, Barron, Floren, and Smith (1965) reported reductions of severe cyclic "psychiatric" upsets in women on the pill.

Other studies have compared cyclic mood changes found in normally menstruating women with those of women taking

oral contraceptives. In a survey of over 7,000 women, Kutner and Brown (1972) found that a significantly smaller percentage of the women who were taking oral contraceptives reported symptoms of severe premenstrual depression. Paige (1969), using the Gottschalk, Winget, and Gleser (1969) anxiety and hostility scales, analyzed short verbal samples from 102 married women, collected at four different cycle times, to determine whether the mood fluctuations associated with the menstrual cycle occurred in women taking oral contraceptives. She found that cycle phase had a very significant effect on anxiety and hostility levels of women who were not using oral contraceptives or who were using sequential contraceptives. Their hostility levels were highest premenstrually, but then decreased sharply and reached the lowest levels at ovulation. For these two groups of women, anxiety levels were lowest at midcycle. A different pattern emerged for women taking combination contraceptives, with constant high levels of both estrogen and progesterone. For these women, there were no significant cycle variations in the levels of either anxiety or hostility. The women using combination contraceptives remained at a high level of hostility throughout the cycle, a level equal to that found in normal cycle women just prior to menstruation, while anxiety levels remained relatively constant with a non-significant tendency to rise at mid-cycle.

However, Oakes (1970) failed to replicate these findings.

Silbergeld, Brast and Noble (1971), in a double-blind study, found that during the natural menstrual cycle, affect patterns were consistent with those described by Benedek and Rubenstein (1942), that is, they found that negative affect increased premenstrually while positive affect increased at mid-cycle. It was also found that oral contraceptives had an overall tranquillizing effect, reducing the degree of affect fluctuation.

Thus, while there is some evidence which suggests that hormonal fluctuations are associated with affect changes (Abraham, 1948; Balian, 1937; Benedek & Rubenstein, 1942; Chadwick, 1952; Coppen & Kessel, 1963; Dalton, 1969; Deutsch, 1944; Gottschalk et al, 1962; Ivey & Bardwick, 1968; McCance et al, 1937; Moos, 1968; Paulson, 1956; Paige, 1968; Rose, 1949; Silbergeld et al, 1971; Silberman, 1937; Sutherland & Steward, 1965) these findings are by no means conclusive. There seems to be a general lack of agreement as to what constitutes the premenstrual syndrome and to what degree women in general are affected by it. On one hand, natural variations in hormones are seen to be linked to premenstrual increases in negative affect and mid-cycle feelings of well-being (Benedek & Rubenstein, 1942; Benedek, 1959; Ivey & Bardwick, 1968) and the introduction of hormones through the

use of oral contraceptives is also seen as increasing negative affect levels (Paige, 1969). On the other hand, the presence of large amounts of oral contraceptive induced hormones also has been found to be a tranquillizing effect (Silbergeld et al, 1971) and to lessen premenstrual depression, tiredness, and irritability (Janowsky et al, 1965; Kane & Keller, 1965; Kelly, 1966; Kutner & Brown, 1972; Swanson et al, 1965).

Not all investigators would agree with the contention that the presence or absence of certain hormones is responsible for affect shifts, some suggest that factors related to the social environment are more relevant. Thus, Paige (1971) found that premenstrual and menstrual anxiety levels were more closely linked to the number of days of menstrual flow and to the observance of a menstrual sex taboo than to hormonal variations. Koeske and Koeske (1975), using an attributional approach to menstrual affect fluctuations, found a clear cut attributional pattern linking negative affect to the premenstrual cycle phase and an assumption premenstrually of internal causation of mood, regardless of extenuating situational factors. Parlee (1974) administered the Moos (1969) Menstrual Distress Questionnaire to 25 female and 34 male undergraduates. The questionnaire's instructions were changed from asking women to rate their own experiences of

the listed symptoms premenstrually, menstrually, and for the remainder of the cycle, to asking the subjects to indicate which symptoms women in general experience during each of the three cycle phases. It was found that males and females gave similar reports of the kind of symptom changes that occur before or during menstruation. In 23 of the 24 symptom scales (eight for each of the three cycle times rated) the males rated symptoms present to a higher degree than did females. As a result of this finding, it was suggested that questionnaires concerning menstruation may provide measures of stereotyped conceptions about premenstrual and menstrual affect rather than measures of hormonally related psychological states.

There is continuing debate as to whether menstrually related affect changes exist and if they do, whether these changes are due to internal factors such as hormonal fluctuations or external factors such as social restrictions or expectations. While the literature supporting menstrually related affect changes can be drawn together to suggest an affect pattern where negative affect increases premenstrually, remains high during menstruation, and then gradually lessens, until at mid-cycle positive affect or feelings of well-being prevail, there is clearly conflicting evidence as to the cause of the affect pattern and the nature of the pat-

tern itself.

Menstrual Effects on Sleep and Dreaming

Only a limited amount of work has been done tying menstrual fluctuations to changes in sleep and dreams. In a study of sleep, Williams, Agnew, and Webb (1966) found no significant differences between the sleep patterns of a group of young females and a similar group of males. However, while it is known that none of the females studied were menstruating during laboratory nights, nothing further is known about their cycles.

In a more direct inquiry into menstrual cycle effects on sleep, Hartmann (1966) studied the sleep of seven women; four "normals" and three psychiatric in-patients. The women participated for one night per week for between 14 and 32 weeks. Cycle phase was determined by menstrual history or nursing staff notations. Hartmann found no cyclical changes in either total sleep time or the number of spontaneous awakenings but did find a general tendency for D-time (REM sleep) to increase late in the cycle. No statistical tests were reported. In a further study of menstrual effects on sleep, Ho (1972) examined 17 sleep parameters in a study of six women; three with normal menstrual cycles and three taking oral contraceptives. Each woman was studied for two

nights in each of three cycle phases over three menstrual cycles. Significant changes were found in only Stage 3 and 4 sleep. These stages increased premenstrually for the natural cycle women while decreasing during this phase for the oral contraceptive group.

Kapan, Bayer, Hellman, Tucker, and Weitzman (1972), in a study examining the relationship between LH secretion and sleep stage patterns, found that one of their four subjects had a major increase in REM sleep time on the night on which her LH surge occurred. Although this finding could be attributed to chance, they felt it was more indicative of large individual differences in reaction to menstrual cycle changes and urged that more extensive study of sleep during the menstrual cycle be done.

Other investigators have examined dream recall in relation to the menstrual cycle, generally by use of a dream diary or morning interview in which subjects either write down or relate any dreams they are able to remember from the previous night. Thus, Cohen (1972a) found that the greatest percent of contentless dream reports, that is, reports of having dreamed with an inability to recall dream content, and the smallest percent of dreamless reports, that is, reports of no dream having occurred prior to awakening, occur premenstrually. Garfield (1974) also reported that the least

number of dreams are recalled premenstrually and the most are recalled at mid-cycle. However, Trinder, Van de Castle, Bourne, and Frisbie (1973) reported no significant changes in dream recall throughout the cycle and suggest that individual differences in dream recall are a function of the subject's reporting characteristics, not a function of the dream experience. Shelldrake and Cormack (1974) also found that dream recall differed between individuals. In their study of women who were convergers, that is, scored high on conventional IQ tests and low on open-ended IQ tests, or who were divergers, had the opposite scoring profile, they found that convergers recalled more dreams premenstrually while divergers recalled most at mid-cycle.

In addition to studying the frequency of dream recall, menstrually related changes in dream content per se also have been studied. When Shelldrake and Cormack (1974) examined dream content, they found that aggressive dream content occurred more frequently for convergers premenstrually and for divergers, just prior to mid-cycle. Katzenstein (1975) found menstrually related changes in self-reported sleep and dream pleasantness, increases in regression, parturition, and mutilation premenstrually and menstrually and a trend toward an ovulatory increase in womb symbols. However, she found no changes in sex, aggression, or envy of women categories and

no cyclic variation in daily mood adjective checklist self-ratings. Hertz and Jensen (1975) found menstrual increases in hate and attraction dream content, as well as increased numbers of adult male characters, mentions of the mouth, and aggressive tendencies in interpersonal relationships.

Although there is a scarcity of laboratory studies examining the effects of the menstrual cycle on dream content, Swanson and Foulkes (1968) have studied some aspects of this relationship. On the basis of a suggestion that a premenstrual peak in sexual desire existed and was a result of anticipated sexual deprivation during menses (Ford & Beach, 1951), Swanson and Foulker hypothesized that overt heterosexual drive expression would be maximal in dreams reported during menstruation, a time considered to be coincidental with minimal sexual arousal during wakefulness. This hypothesis was investigated in a study of four subjects, each participating 11 nights. The menstrual cycle was divided into four broad phases which did not take hormonal fluctuations into account. Dreams were then collected and scored for manifest sexual content. This content was found to be highest premenstrually for one subject and menstrually for the remaining three subjects. For all subjects, the highest sexual content occurred during the cycle phase in which they reported the least waking sexual desire. In addition, other

content analyses found that overt dream hostility and self-rated dream unpleasantness were maximal during menses.

As previously indicated, the studies of menstrually related changes in dreaming have been primarily dream diary studies. Studies of this nature have access only to the dreams which a subject is able to recall following the night's sleep. Laboratory studies of dreams on the other hand, are able to examine a greater number of a subject's dreams each night because it is possible to awaken a person during each REM period and thereby have access to a greater number of dreams. Only two studies of menstrual effects on dreaming have been of this nature, the study of dream recall by Hartmann (1966) and the study of dream content by Swanson and Foulkes (1968). While each of these studies examined dreaming in only a small number of subjects, Hartmann (1966) using seven and Swanson and Foulkes using four, some menstrually related dream changes, as noted earlier, were reported in each case.

Considering laboratory and diary studies together, there is some evidence that sleep is influenced by menstrual cycle phase (Hartmann, 1966; Ho, 1972; Kapan et al, 1972) and that the influence extends to changes in REM sleep and dream content (Cohen, 1972b; Hartmann, 1966; Hertz & Jensen, 1975; Katzenstein, 1975; Sheldrake & Cormack, 1974; Swanson

& Foulkes, 1968). However, this evidence is far from conclusive and there continue to be conflicting results. For example, Katzenstein (1975) finds no cyclical changes in aggression while Sheldrake and Cormack (1974) report aggressive content changes for both convergers and divergers; Trinder et al (1973) report no cyclical patterns of dream recall, while Cohen (1972a), Garfield (1974), and Sheldrake and Cormack (1974) do find such patterns. However, evidence has been cited which concludes that menstrual cycle phase is linked to changes in sleep and dream patterns, that dream content is influencable by a variety of stimuli, and that changes in waking affect may be menstrually related. The present study is an attempt to more systematically examine the relationship between dream content and menstrual cycle phase and, on the basis of the above, tentative findings it is specifically hypothesized that:

Dream content will exhibit significantly higher levels of negative affect premenstrually and menstrually then during the mid-cycle phase.

CHAPTER II

METHOD

Design of the Study

Table 1 gives a summary of the design of the study. The subjects slept for five non-consecutive nights in the laboratory. Electroencephalogram (EEG), electro-oculogram (EOG), and Electromyogram (EMG) recordings were made throughout each night. Nights I and II were adaptation nights. During Night I there were no experimental awakenings. During Night II subjects were awakened for dream collection at each rapid eye movement period (REMP). Nights III, IV and V were experimental nights. Each experimental night was selected from a different menstrual cycle phase, either the premenstrual, menstrual, or mid-cycle phase. The order in which menstrual phases were studied varied between subjects but every cycle time was represented for all subjects. During experimental nights subjects were awakened for dream collection during all REM periods.

Subjects

Subjects were 10 paid women undergraduate volunteers from the University of Manitoba who were recruited through bulletin board and campus newspaper advertisements. When potential subjects first contacted the experimenter, it was

TABLE 1
DESIGN OF THE STUDY

S = 10

Adaptation		Experimental		
<u>Night I</u>	<u>Night II</u>	<u>Night III</u>	<u>Night IV</u>	<u>Night V</u>
No dream collection	Dream collection	One night from either the pre- menstrual, men- strual or mid cycle phase	One night from either of the two remaining cycle phases	One night from the remaining cycle phase
		Dream collection	Dream collection	Dream collection

explained that the study would involve sleeping in the laboratory for a total of five nights, over a period of approximately six weeks. They were also told that the study was to examine the relationship between menstruation and sleep, and only women with naturally occurring menstrual cycles, that is, who were not taking oral contraceptives, would be accepted into the study. If the women would be available for the required length of time, were not taking oral contraceptives, and were still interested in participating in the study, an individual meeting was arranged so that they could view the sleep laboratory and complete screening questionnaires. All potential subjects were asked to bring records of their menstrual cycle histories to this meeting. At these meetings, after viewing the laboratory bedrooms, each woman completed two questionnaires, a personality test, and a menstrual history calendar. The first questionnaire concerned sleep habits and past and present conditions which could influence the experiment (see Appendix A), and the second, the Moos (1969) Menstrual Distress Questionnaire, Form A, concerned the experiencing of various psychological, physical, and behavioral factors during three different menstrual cycle intervals. After this, the potential subjects completed the MMPI. Finally, each woman indicated the dates of her previous six month menstrual flows on a calendar provided for that purpose.

Women free from physical and psychological disabilities and with normal menstrual cycles were selected for the experiment. The subjects' ages ranged from 18 to 24 years (mean 21.6 years) and their menstrual cycle lengths ranged from 26 to 32 days (mean 28.8 days).

Cycle Phase Determination

Cycle phase was determined on the basis of the menstrual history information provided by each woman during the initial screening interview. Only those women whose cycles were fairly consistent in length, varying only one to three days during the previous six months, were admitted into the study. For a cycle with a mode of 28 days, the premenstrual laboratory night, Time 1 (T1), was one night from the five immediately prior to the onset of menses. The menstrual night, Time 2 (T2), was the night following the day on which menstruation had begun by noon. The midcycle night, Time 3 (T3), was one night falling between day 12 and day 16, inclusive. For cycles of lengths of other than 28 days, a corresponding span of nights was used for each cycle phase. For example, for a 32 day cycle, the premenstrual night, T1, would be one night from the six immediately prior to the onset of menses. An attempt was made to distribute the first experimental night across T1, T2, and T3 (see Table 2).

TABLE 2

Distribution of Experimental Nights Over
Menstrual Cycle Phase

Order of Experimental Nights	Number of Subjects with Nights so Ordered
T1 ^a , T2 ^b , T3 ^c	2
T2, T3, T1	1
T3, T1, T2	2
T2, T1, T3	2
T3, T2, T1	1
T1, T3, T2	2

- a. T1:premenses
b. T2:menses
c. T3:mid-cycle

To arrange for sleeping in the laboratory on the menstrual night, the subject notified the experimenter that she had begun her period. The other experimental nights were determined on the basis of menstrual history and were therefore, prearranged.

As a further check on cycle phase, the subjects provided the experimenter with the date of onset of their first menstrual flow following their experimental participation. This information was used to verify that all experimental nights had been selected from the spans of days specified for each cycle phase. This was found to be true in all cases.

Procedure

Each subject reported to the laboratory approximately one half hour before her normal bedtime, completed a Menstrual Distress Questionnaire (MDQ), Form I (Moos, 1969), rating the amount of various physical, psychological and behavioral symptoms that she was experiencing at that time, and had electrodes attached. The procedure for that particular night was explained and the subject got into bed. Just prior to going to sleep, the subject rated her presleep mood on the mood adjective checklist (MACL). The adjectives comprising this measure were read to the subject by the experimenter over an intercom and the subject's responses were recorded. The subject was then

allowed to go to sleep.

During night I there were no experimental awakenings. During night II, the second adaptation night and nights III, IV, and V, the experimental nights, subjects were awakened and dreams were collected from each REM period. Subjects were awakened by an 85 decibal buzzer, played over the intercom. The first awakening occurred after five minutes of REM and in each subsequent REM period the time before awakening was increased by two minutes. For example, the awakening would occur after seven minutes in the second REM period, after nine minutes in the third REM period, and so forth.

Subjects had been instructed that upon hearing the buzzer, they should immediately begin recounting anything that had been going through their minds just prior to awakening. If, after approximately 45 seconds, the subject had not begun her report, she was asked if anything had been going through her mind when the buzzer rang. If, on any awakening, the subject said that she had nothing to report, she was asked to differentiate between whether she felt she had been dreaming but was unable to remember any content (ND report) and whether she felt that she had not been dreaming (N report).

After a dream report was concluded the subject completed a MACL for how she had felt in the dream. Upon completion of this checklist, the subject answered five addition-

al questions in which she rated aspects of the dream (her activity in the dream, the dream's activity, its busyness and vividness). She also estimated her sleep depth as light, moderate, or heavy. The subject was then allowed to return to sleep.

In the morning, the subject was awakened at a pre-arranged time and completed a mood adjective checklist rating her post-sleep mood.

Dream Affect Measures. The Gottschalk-Gleser content analysis scales of anxiety and hostility were used to assess the dream affect. Anxiety is rated on subscales of death, mutilation, separation, guilt, shame, and diffuse anxiety, while hostility is rated on scales of inward, outward, and ambivalent hostility.

For these scales dependent and independent clauses are used as the unit of scoring and, when scored, are scored on only one of the six anxiety subscales and one of the three hostility subscales. However, a single clause may be scored for both anxiety and hostility. Numerical weights from one to three are assigned to each scorable clause according to the intensity of the affect found in that statement. Scoring procedures are outlined in the Gottschalk et al (1969) scoring manual. As recommended only those dream reports of at least 70 words in length were included in the data analyses,

so that the scales' reliabilities would be maintained.

After a dream was scored, a "magnitude of affect" score was derived for that dream by summing the numerical weights assigned to each dream clause. Weights were summed within each of the nine subcategories. Then the six anxiety subcategory totals were combined to form the raw score for Total Anxiety (TA). The weights for the three hostility subcategories were summed to form the raw Total Hostility (TH) score. Finally, the numerical weights for all nine categories, both anxiety and hostility, were summed, providing the Total Negative Affect (TNA) raw score.

To control for individual differences in the amount of verbal output per dream, each raw score was divided by the number of words in the dream and then multiplied by 100. The square root of this figure was used as the final affect score.

The second measure used to assess dream affect was the mood adjective checklist (MACL), a modified version of the Nowlis (1969) Mood Adjective Check-List. This checklist consists of 24 mood descriptive adjectives, grouped in eight clusters of three adjectives each (see Appendix B). Each cluster is described by one of the following mood dimensions; aggression, anxiety, surgency, social affection, depression, distrust, quiet, or detachment. The checklist is

completed in agreement with self perceived dream mood by having each adjective rated on a four point scale in which much = 3, little = 2, don't know = 1, and not at all = 0.

Additional Scales

Added information on dream content fluctuations and self-perceived psychological, physical and behavioral changes was obtained through the use of additional scales. These included the Moos (1969) Menstrual Distress Questionnaire, a modified version of the Hall and Van de Castle (1966) friendly and sexual interaction scales, dream character scales and a pre- and post-sleep mood adjective check-lists.

Menstrual Distress Questionnaire. The Moos (1969) Menstrual Distress Questionnaire (MDQ) consists of 47 phrases which describe psychological, physical or behavioral conditions. These items fall into eight categories; pain, concentration, behavioral change, autonomic reactions, water retention, negative affect, arousal, and control. For each phrase, a woman indicates the degree to which she is experiencing or has experienced the factor described in that phrase. In Form A of the MDQ, the respondent rates each of three phases of her most recent menstrual cycle: menses, one week premeneses, and the remainder of the cycles, on all 47 items, using a six point scale ranging from 1, no experience of the symptom; to

6, acute or partially disabling experience of the symptom. After completing this rating, the respondent indicates in what way, if any, this most recent cycle has been unusual. In Form T of the MDQ, the same 47 items are rated on the same six-point scale, but the respondent indicated to what degree she is currently experiencing each symptom.

Friendly interaction and sexual interaction scales.

Modified versions of the Hall and Van de Castle (1966) scales of Friendly and Sexual Interactions were used to further examine dream content. The Friendly Interaction (FI) scale is composed of seven subcategories and the Sexual Interaction (SI) scale is composed of five (see Appendix C for scales and scoring examples). In the modified form, each subcategory simply defines an interaction and is not scored separately. Any interaction described by a scoring subcategory was scored as F on the FI scale or S on the SI scale. The number of F's and S's were then totaled for each dream and these totals were used in further data analyses.

Dream character scales. The final content analysis scales used were those for scoring adult male and baby or child characters or references. The scales used (see Appendix D) specify the difference between a character, someone actively present and participating in the dream, and a reference,

the mentioning of someone not actually present in the dream, and provide examples for scoring clarification. Each dream was scored for the total number of characters and references.

Pre- and post- sleep mood adjective check-list. The previously described modified version of the Nowlis (1969) Mood Adjective Check-List (MACL) was administered both immediately prior to and following sleep. At these administrations, the subjects rated their perceptions of current affect levels. This information was used as an additional assessment of waking affect fluctuation.

Rating Procedure

The dreams collected from experimental nights were scored on all content scales by two independent raters. The dreams were presented as typed transcriptions marked only by a code number and thus, devoid of any identification as to subject or cycle phase. Inter-scorer correlations obtained by Spearman's ρ were all above .80 with the exception of two scales, "group male characters" (.74) and "male references" (.48). These two scales were excluded from further data analyses.

Combination of the Data

The content and mood-adjective checklist scores were averaged across all dreams from a single subject for each

experimental night. Thus, for each subject, each menstrual phase was represented by one score on each scale. For the Gottschalk et al (1969) scales these were designated as Night Total Anxiety (NTA), Night Total Hostility (NTH), and Night Total Negative Affect (NTNA).

Statistical Procedures

The hypothesis that dream content would exhibit significantly higher levels of negative affect premenstrually and menstrually than during the mid-cycle phase was examined by the use of one-way analysis of variance, repeated measures procedures. With cycle phase as the independent variable, separate analyses were run for the dream content affect scales NTA, NTH, and NTNA.

In order to further explore the data and gain additional information on menstrually related dream content and affect changes the menstrual distress, friendly and sexual interaction, dream character, and pre-sleep, dream, and post-sleep mood adjective checklist scales were also analysed using a one-way analysis of variance, repeated measures procedures. When significance was found, those data were further examined by Scheffe's S Method (Kirk, 1968).

CHAPTER III

RESULTS

Menstrually Related Changes in Dream Content Affect Levels

There was no support for the hypothesis that negative affect would be higher in those dreams collected premenstrually and menstrually than in those collected at mid-cycle.

There were no significant changes in dream content affect levels between any cycle phase (Tables 3, 4, & 5).

TABLE 3

ANALYSIS OF VARIANCE IN DREAM CONTENT
ANXIETY SCORES (NTA) BETWEEN MENSTRUAL CYCLE PHASE

Source	df	SS	MS	F
cycle phase	2	5.04	2.52	0.59
subjects	8	28.04	3.51	0.82
error	16	68.51	4.28	

Critical values

$$F_{.05; 2, 16} = 3.63$$

$$F_{.01; 2, 16} = 6.23$$

Additional Affect and Content Analyses

In order to gain additional information on menstrually related changes in affect and dream content

TABLE 4

ANALYSIS OF VARIANCE IN DREAM CONTENT HOSTILITY
 SCORES (NTH) BETWEEN MENSTRUAL CYCLE PHASE

Source	df	SS	MS	F
cycle phase	2	46.53	23.26	2.69
subjects	8	104.69	13.09	1.48
error	16	141.57	8.85	

Critical values

$$F_{.05; 2, 16} = 3.63$$

$$F_{.01; 2, 16} = 6.23$$

TABLE 5

ANALYSIS OF VARIANCE IN DREAM CONTENT NEGATIVE
 AFFECT (NTNA) BETWEEN MENSTRUAL CYCLE PHASE

Source	df	SS	MS	F
cycle phase	2	77.11	38.55	2.53
subjects	8	113.65	14.21	0.53
error	16	243.59	15.23	

Critical values

$$F_{.05; 2, 16} = 3.63$$

$$F_{.01; 2, 16} = 6.23$$

of the Menstrual Distress Questionnaire and pre-sleep, dream, and post-sleep mood-adjective checklists, as well as the content scales for dream interactions and characters were examined with individual one-way analyses of variance, repeated measures, tests. Because of the infrequency with which they appeared the sexual interaction scale and all dream character scales except "adult male character" were eliminated from the analyses. Of the scales remaining, the MDQ subscales, the friendly interaction scale, the adult male character scale, and the MACL subscales, significance was found with the analysis of variance on three scales; the MDQ subscale, control, and the pre-sleep MACL measures of anxiety and surgency (Tables 6, 7, & 8). The means from the three cycle phases (Table 9, 10, & 11) were compared using Scheffe's S method for each scale, the MDQ control, the MACL anxiety, and the MACL surgency. For the control scale, the mean at T2, menses, was found to be significantly greater than the mean at either T1, premenses, or T3, mid-cycle ($p < .01$). On both presleep MACL scales, anxiety and surgency, the comparison of the combined means of T1, premenses, plus T2, menses, to the mean at T3, mid-cycle, was found to be significant ($p < .05$). Anxiety was significantly higher at T3, mid-cycle and surgency was significantly lower at this time.

TABLE 6

ANALYSIS OF VARIANCE IN MDQ SUBSCALE CONTROL
BETWEEN MENSTRUAL CYCLE PHASE

Source	df	SS	MS	F
cycle phase	2	0.27	0.14	4.84*
subjects	9	0.26	0.03	1.01
error	18	0.51	0.03	

*p < .05

TABLE 7

ANALYSIS OF VARIANCE IN PRESLEEP MACL ANXIETY
BETWEEN MENSTRUAL CYCLE PHASE

Source	df	SS	MS	F
cycle phase	2	3.27	1.63	3.65*
subjects	9	11.33	1.23	2.81
error	18	8.07	0.45	

*p < .05

TABLE 8

ANALYSIS OF VARIANCE IN PRESLEEP MACL SURGENCY
BETWEEN MENSTRUAL CYCLE PHASE

Source	df	SS	MS	F
cycle phase	2	33.80	16.90	3.86*
subjects	9	82.13	9.13	2.08
error	18	78.87	4.38	

*p < .05

TABLE 9

MEAN OF MDQ SUBSCALE CONTROL

CYCLE PHASE	MEAN
premenses T1	0.1
menses T2	0.1
mid-cycle T3	0.8

TABLE 10

MEAN OF MACL SUBSCALE ANXIETY

CYCLE PHASE	MEAN
premenses T1	0.1
menses T2	0.1
mid-cycle T3	0.8

TABLE 11

MEAN OF MACL SUBSCALE SURGENCY

CYCLE PHASE	MEAN
premenses T1	3.0
menses T2	2.9
mid-cycle T3	0.7

CHAPTER IV

DISCUSSION

The findings of this study run counter to the notion that menstrual cycle phase effects the emotionality of dreams. The measures of dream affect as well as other content and affect measures failed to reflect any clear cyclical fluctuations. These results may have originated in a number of factors, including an insufficient impact of menstrual fluctuations, the type of subjects who participated in the study, or the kind of measures used to quantify dream content and affect.

Witkin (1969) has stated that a presleep stimulus must be "charged", that is, have an impact on a person, in order to be able to influence subsequent dreaming. Because the menstrual cycle is an on-going and recurring process, the changes associated with it may not be charged enough to have any impact. No strong menstrually related fluctuations were obtained on any of the content or affect measures. Two of the waking, presleep MACL subscales, anxiety and surgency did show statistically significant changes over menstrual cycle phase. The possible mean ratings of mood on this scale range from zero, a rating signifying no experience of any of the three adjectives comprising the category, to nine, a rating equal to 'much' experience of all three adjectives comprising the category. For the subscale anxiety the means ranged from

0.1 to 0.8, all very low ratings of presleep anxiety. For the surgency subscale, the means ranged from 0.7 to 3.0, indicating a stronger experiencing of this emotion but, still a limited range of affect. The pattern of presleep affect found is also contrary to that which might have been predicted on the basis of previous findings. Surgency, a positive emotion, was here found to high premenstrually and menstrually, the cycle phases in which positive affect has been found to be lowest (Benedek & Rubenstein, 1942; Paige, 1969), while anxiety showed a statistically significant but empirically small mid-cycle increase.

If any menstrual cycle phase had substantial impact on a subject, one would expect that such an impact would be reflected in some dream affect measures. In those studies in which dream content has been found to be influenced by stressful experiences (Breger et al, 1971; Goodenough et al, 1975) dream content reflected stress that was also strongly evident during waking, that is dream content was consistent with the subject's continuing intense affect. In this study as well, dream content affect was consistent with waking affect but neither the waking affect levels nor the dream content affect levels showed notable menstrually related changes.

The lack of waking and dream content affect patterns may also be related to the subjects in the study. The women

were "non-neurotic", based on their MMPI profiles, and had low levels of self-rated menstrual distress. The strongest documentation of menstrually related affect fluctuation was provided by Benedek and Rubenstein (1942) in their study of 15 psychoanalytic patients. In discussing their findings, Benedek (1959) stated her belief that in non-neurotic women, hormonal influence on psychological functioning would be no more than a shadowy background which could be easily obscured by other factors. Further, Coppen and Kessel (1963) have found that the presence of premenstrual symptoms is positively correlated with neuroticism. Thus, by eliminating women with non-normal MMPI profiles, women with menstrually related affect changes may have been screened out of the study.

In addition, although menstrual distress has been estimated as occurring in anywhere from 25 to almost 100 percent of women (Sherman, 1971), severe symptoms have been estimated to occur in only about ten percent of the female population (Moos, 1969). None of the subjects in the present study fell within the severe symptom category. Thus, while none of these subjects exhibited dream affect changes as a function of menstrual cycle phase, it is possible the dreams of other women with high, menstrually related, levels of pain, depression, tension, irritability, and so forth would show menstrually related affect variations. In this study, there was

only one significant finding related to waking menstrual distress. The MDQ (Moos, 1969) subscale "control" was found to vary with cycle phase. During menses, T1, the symptoms that comprise the subscale (feelings of suffocation, chest pains, ringing in the ears, heart pounding, numbness, and fuzzy vision) were present to a significantly greater extent than at either mid-cycle, T3, or premenses, T2. However, at menses the average rating of the presence of these symptoms (1.33) was only slightly greater than the rating "no reaction at all" (1). So although the subscale control varied significantly with cycle phase, the significance does not seem to reflect meaningful changes in amounts of menstrual distress.

Finally, the finding of no cyclically related changes in dream affect levels may be associated with the type of scales used to access dream content. When content analysis scales have been used to quantify menstrually related affect fluctuations, few changes have been found. Gottschalk et al (1962) were able to find changes in either anxiety or in hostility for the waking verbal samples from the four women that they studied, but found no regular pattern of change across all subjects. Further, Ivey and Bardwick (1968) found significant differences on only the Gottschalk et al (1962) subscales of death anxiety and diffuse anxiety. Paige (1969) found significant affect differences over the menstrual cycle

on the Gottschalk et al (1969) scales for anxiety and hostility but Oakes (1970) failed to replicate these results. Content analysis, a technique in which scoring procedures are standardized, operationally specified, and in which subjects do not rate themselves, do not document the sweeping affect changes which have been found with other, less rigidly defined and less objective, means of affect assessment.

In this study it was found that, in the normal subjects studied, there were no menstrually related dream content affect fluctuations. There were small changes in the levels of presleep affect in directions contrary to those found in other research, but of insufficient impact to influence dream affect. If women for whom the menstrual cycle had more waking impact were studied, it is possible that menstrual influences would extend to dream content.

REFERENCES

- Abraham, K. Manifestations of the female castration complex. In K. Abraham (Ed.), Selected Papers on Psychoanalysis. London: Hogarth, 1948.
- Ayers, C. J. Biology of sex. New York: John Willey and Sons, Inc., 1974.
- Backeland, F., Koulack, D., & Lasky, R. Effect of a stressful presleep experience on electroencephalograph-recorded sleep. Psychophysiology, 1968, 4, 436-443.
- Balint, M. A contribution to the psychology of menstruation. Psychoanalytic Quarterly, 1937, 6, 346-352.
- Benedek, T. Psychoanalytic investigations: selected papers. New York: Quandrangle/The New York Times Book Co., 1973.
- Benedek, T., Sexual function in women and their disturbance. In S. Arieti (Ed.), American Handbook of Psychiatry (Vol. 1). New York: Basic Books, 1959.
- Benedek, T., & Rubenstein, B.B. The sexual cycle in women. Psychosomatic Medicine Monographs, 1942, 3 (Nos. 1 and 2).
- Breger, L., Hunter, I., & Lane, R. W. The effects of stress on dreams, Psychological Issues, 1971, 7 (3, Monograph 27).
- Chadwick, M., The psychological effects of menstruation. Nervous and Mental Diseases Monograph Series, 1952, 56.
- Cohen, D. B. Failure to recall dream content: contentless vs dreamless reports. Perceptual and Motor Skills, 1972a, 34, 1000-1002.
- Cohen, D. B. Presleep experience and home dream reporting: an exploratory study. Journal of Consulting and Clinical Psychology, 1972b, 38, 122-128.
- Coppen, A., & Kessel, N. Menstruation and personality. British Journal of Psychiatry, 1963, 109, 711-721.
- Dalton, K. The Menstrual cycle. London: Penguin Books, 1969.
- De Koninck, J.-M., & Koulack, D. Dream content and adaptation to a stressful situation. Journal of Abnormal Psychology, 1975, 84, 250-260.

- Deutsch, H. Psychology of Women (Vol. 1). New York: Grune & Stratton, 1944.
- Ford, C. S., & Beach, F. A. Patterns of Sexual Behavior. New York: Harper & Brothers, 1951.
- Frank, R. T. The hormonal causes of premenstrual tension. Archives of Neurology and Psychiatry, 1931, 26, 1053-1058.
- Garfield, P. L. Women, blood, and dreams. Sleep Research, 1974, 3, 106.
- Glaubman, H., & Hartmann, E. The relationship between prior day activity and sleep patterns. Association for the Psychophysiological Study of Sleep (APSS) 15th Annual Meeting, 1975, 125.
- Goodenough, D. R., Witkin, H. A., Koulack, D., & Cohen, H. The effects of stress films on dream affect and on respiration and eye-movement activity during rapid-eye-movement sleep. Psychophysiology, 1975, 12, 313-320.
- Goodenough, D. R., Witkin, H., Lewis, H. B., Koulack, D., & Cohen, H. D. Repression, interference, and field dependence as factors in dream forgetting. Journal of Abnormal Psychology, 1974, 83, 32-44.
- Gottschalk, L. A., Kaplan, S., Gleser, G. C., & Winget, C. M. Variations in magnitude of emotion: a method applied to anxiety and hostility during phases of the menstrual cycle. Psychosomatic Medicine, 1962, 23, 300-306.
- Gottschalk, L. A., Winget, C. N., & Gleser, G. C. Manual of instruction for using the Gottschalk-Gleser content analysis scales: anxiety, hostility, and social alienation - personal disorganization. Berkley and Los Angeles: University of California Press, 1969.
- Hafez, E. S. E., Epilogue. In E.S.E. Hafez & T. N. Evans (Eds.), Human reproductions conception and contraception. New York: Harper & Row, 1973.
- Hall, C. S., & Van de Castle, R. L. The content analysis of dreams. New York: Appleton-Century-Crofts, 1966.
- Hartmann, E. Dreaming sleep (the D-state) and the menstrual cycle. Journal of Nervous and Mental Disease, 1966, 143, 406-416.

- Hauri, P. The influence of evening activity on the onset of sleep. Psychophysiology, 1969, 5, 426-430.
- Hertz, D. G., & Jensen, M. R. Menstrual dreams and psychodynamics: emotional conflict and manifest dream content in menstruating women. British Journal of Medical Psychology, 1975, 48, 175-183.
- Ho, M. A. Sex Hormones and the sleep of women (Doctoral dissertation, Yeshiva University, 1972). Dissertation Abstracts International, 1972-73, 33, 1305-B. (University Microfilms No. 72-23, 572).
- Ivey, M. E., & Bardwick, J. M. Patterns of affective fluctuation in the menstrual cycle. Psychosomatic Medicine, 1968, 30, 336-345.
- Janowsky, D. S., Gorney, R., & Kelley, B. "The curse"--vicissitudes and variations of the female fertility cycle. Part 1. Psychiatric aspects. Psychosomatics, 1966, 7, 242-247.
- Kane, F. J., & Keeler, M. H. The use of envoid in postpartum mental disorders. Southern Medical Journal, 1965, 58, 1089-1091.
- Kapen, S., Boyar, R., Hellman, L., Tucker, K., & Weitzman, E. D. Changes in the sleep stage pattern during the menstrual cycle of normal females. Sleep Research, 1972, 1, 186.
- Katzenstein, V. N. The effects of the menstrual cycle on dream reports (Doctoral dissertation, Case Western Reserve University, 1975). Dissertation Abstracts International, 1975, 36, 1921-B. (University Microfilms No. 75-19, 218).
- Kirk, R. E. Experimental Design: procedures for the behavioral sciences. Belmont, California: Brooks/Cole Publishing Company, 1968.
- Koeske, R. K., & Koeske, G. F. An attributional approach to moods and the menstrual cycle. Journal of Personality and Social Psychology, 1975, 31, 473-478.
- Koulack, D. Effects of thirst on the sleep cycle. Journal of Nervous and Mental Diseases, 1970, 151, 718-725.

- Kutner, S. J., & Brown, W. J. Types of oral contraceptives, depression, and premenstrual symptoms. The Journal of Nervous and Mental Disease, 1972, 155, 153-162.
- McCance, R. A., Luff, M. C., & Widdowson, E. E. Physical and emotional periodicity in women. Journal of Hygiene, 1937, 37, 571-611.
- Moos, R. H. Psychological aspects of oral contraceptives. Archives of General Psychiatry, 1968, 19, 87-94.
- Moos, R. H. Menstrual Distress Questionnaire Preliminary Manual. Stanford, California, Department of Psychiatry, Stanford University, School of Medicine, June 1969.
- Nowlis, V. Research with the mood adjective checklist. In S. Tomkins & L. Izard (Eds.), Affects, cognition, and personality. New York: Springer, 1965.
- Oakes, M. R. Pills, periods, and personality (Doctoral dissertation, University of Michigan, 1970). Dissertation Abstracts International, 1971, 31, 7577-B. (University Microfilms No. 71-15, 253).
- Paige, K. The effects of oral contraceptives on affective fluctuations associated with the menstrual cycle. (Doctoral dissertation, The University of Michigan, 1969). Dissertation Abstracts International, 1970, 31, 2963B. (University Microfilms No. 70-21, 750).
- Paige, K. E. Effects of oral contraceptives on affective fluctuations associated with the menstrual cycle. Psychosomatic Medicine, 1971, 33, 515-537.
- Parlee, M. B. Stereotypic beliefs about menstruation: a methodological note on the Moos menstrual distress questionnaire and some new data. Psychosomatic Medicine, 1974, 36, 229-240.
- Paulson, M. J. Psychological concomitants of premenstrual tension. Unpublished doctoral dissertation, University of Kansas, 1956.
- Pincus, G. Control of conception by hormonal steroids. Science, 1966, 153, 493-500.

- Rechtschaffen, A., & Kales, A. A Manual of Standardized Terminology, Techniques, and Scoring System for Sleep Stages of Human Subjects. Public Health Service, U. S. Government Printing Office, Washington, D. C., 1968.
- Rechtschaffen, A., & Verdone, P. Amount of dreaming: effect of incentive, adaptation to laboratory, and individual differences. Perceptual and Motor Skills, 1964, 19, 947-958.
- Rose, A. A. Menstrual pain and personal adjustment. Journal of Personality, 1949, 17, 287-307.
- Sheldrake, P. & Cormack, M. Dream recall and the menstrual cycle. Journal of Psychosomatic Research, 1974, 18, 347-350.
- Silbergeld, S., Brast, N., and Noble, E. P. The menstrual cycle: a double-blind study of symptoms, mood, and behavior, and biochemical variables using envoid and placebo. Psychosomatic Medicine, 1971, 33, 411-428.
- Silbermann, I., A contribution to the psychology of menstruation. International Journal of Psychoanalysis, 1937, 6, 346-352.
- Sutherland, H., & Stewart, I. A critical analysis of the premenstrual syndrome. Lancet, June 5, 1965, 1, 1180-1183.
- Swanson, D., Barron, A., Floren, A., & Smith, G. The use of morethynodrel in psychotic females. American Journal of Psychiatry, 1964, 120, 1101-1103.
- Swanson, E. M., & Foulkes, D. Dream content and the menstrual cycle. The Journal of Nervous and Mental Disease, 1968, 145, 358-363.
- Trinder, J., Van de Castle, R., Bourne, R., & Frisbie, D. Dream recall as a function of menstrual cycle. Sleep Research, 1973, 2, 114.
- Williams, R. L., Agnew, H. W., & Webb, W. B. Sleep patterns in the young adult female: an EEG study. Electroencephalography and Clinical Neurophysiology, 1966, 20, 264-266.

- Wiseman, W. Four years' experience with ovulation inhibitors in clinical trial and routine use. In Recent Advances in Ovarian and Synthetic Steroids and the Control of Ovarian Function: Proceedings of a Symposium. Globe Commercial Party Ltd. Sydney, Australia, 1965.
- Witkin, H. A. Influencing dream content. In M. Kramer (Ed.), Dream psychology and the new biology of dreaming. Springfield, Illinois: Charles C. Thomas, 1969.
- Wood, P. Dreaming and social isolation (Doctoral dissertation, University of North Carolina, 1962). Dissertation Abstracts International, 1963, 23, 4749-4750. (University Microfilms No. 63-3571).
- Zimmerman, E., & Parlee, M. B. Behavioral changes associated with the menstrual cycle: an experimental investigation. Journal of Applied Social Psychology, 1973, 3, 4, 335-344.

APPENDIX A

SLEEP QUESTIONNAIRE

NAME

PRESENT ADDRESS

ADDRESS DURING THE SUMMER

TELEPHONE

SEX

MARITAL STATUS S M W D (Circle one)

DATE OF BIRTH

OCCUPATION

If you are a student, indicate: Faculty
Department
Year

History of disease or injuries: if other, please specify:

Allergic disease

Hay fever
Asthma
Drug allergic
Drug reaction
Other

Blood Disease

Anemia
Other

B.B.N.T.

Faulty Hearing
Faulty Vision
Wear glasses
Wear contacts
Speech defect
Other

Skin Disease

Acne
Other

Heart Disease

High blood pressure
Low blood pressure
Irregular heart beats
Other

Pulmonary Disease

Asthma
Shortness of breath
Chronic cough
Other

Nervous Disease

Epilepsy
Tension headaches
Migrain headaches
Other

Digestive Disease

Gastric ulcer
Nausea
Other

Kidney and Bladder

Bed wetting
Other

Sleep

Insomnia
Sleepwalking
Other

Are you currently under a doctor's care?
If yes, explain.

Are you currently under any medication?

Sleep Patterns

When do you normally go to bed? _____

When do you normally get up? _____

Do you have trouble going back to bed if awakened? _____

Do you generally have trouble sleeping in strange surroundings? _____

Would you classify yourself as a good sleeper? _____

poor sleeper? _____

fair sleeper? _____

How often do you dream? Once a night _____ once a week _____ once a month _____ less than once a month _____

Do you have nightmares? _____ once a night _____ once a week _____ once a month _____ less than once a month _____

Have you ever participated in a sleep and dream experiment? _____
If yes, please describe:-

APPENDIX B

MOOD ADJECTIVE CHECK-LIST

NAME: _____ DATE _____ TIME _____ REM _____

MOOD ADJECTIVE CHECK LIST

	AGGRESSION	ANXIETY	SURGENCY	SOCIAL AFFECTION	DEPRESSION	DISTRUST	QUIET	DETACHED
		jittery___	playful___			suspicious___	quiet___	detached___
	defiant___ angry___			warm-hearted___	sad___			
		fearful___	carefree___	affectionate___	regretful___			distant___
	rebellious___	clutched up___				skeptical___	placid___	remote___
			witty___	kindly___	sorry___	dubious___	still___	
TOTAL	___	___	___	___	___	___	___	___

Dream active _____
 You active _____
 Dream busy _____
 How vivid _____
 Sleep depth _____

Individual adjectives are scored as follows:
 MUCH is scored as 3, LITTLE as 2, DON'T KNOW
 as 1, and NO as 0. Factor scores are obtained
 by summing the scores of the individual adjectives
 in the factor.

APPENDIX C**FRIENDLY INTERACTION AND
SEXUAL INTERACTION SCALES**

FRIENDLY INTERACTIONS

The friendly interaction scale lists 7 categories describing interactions. These categories are provided to define a 'friendly interaction' but are not scored separately. An interaction which qualifies as a 'friendly interaction' under any category is given a notation of "F". For each dream, the number of "F's" scored is totaled and this constitutes the 'friendly interaction' score for that dream. Scorable friendly interactions may take place either between the dreamer and characters in that dream or between dream characters.

FRIENDLY INTERACTION CATEGORIES

FA - Friendliness expressed through a desire for a long-term close relationship with a character. Included in this subclass are getting married, becoming engaged, and falling in love.

EXAMPLES

F

I dreamed my boyfriend and I WERE GETTING MARRIED in this unusual looking church.

F

I was so happy because my boyfriend had just GIVEN ME A BEAUTIFUL ENGAGEMENT RING.

FB - Friendliness expressed through socially acceptable forms of physical contact. Included are shaking hands, cuddling a baby, dancing, nonsexual kissing and embracing.

EXAMPLES

F

Jim and I rushed toward each other, then STARTED TO SHAKE HANDS AND SLAP EACH OTHER ON THE BACK.

F

My son began TO PET the new puppy.

F

I was so glad to see Mom that I GAVE HER A BIG KISS.

F

My brother gave me A PAT ON THE SHOULDER.

FC - Friendliness expressed by taking the initiative in requesting a character to share in a pleasant social activity. Included are asking for a date, asking a character to accompany self somewhere, visiting someone. Simply accompanying another character is not scored.

EXAMPLES

My roommate ASKED ME TO SPEND THE WEEKEND at her home.

I phoned Judy to ASK FOR A DATE.

My cousin ASKED ME TO GO TO THE FAIR with him.

FD - Friendliness expressed through extending assistance to a character or offering to do so. Included are helping, protecting, and rescuing acts.

EXAMPLES

When we received the news, our family BEGAN TO PRAY FOR HIS RECOVERY.

I found out where the poor child lived and TOOK HER HOME.

I noticed this little kitten meowing high in a tree. I CLIMBED UP AND BROUGHT IT DOWN.

FE - Friendliness expressed by offering a gift or loaning a possession to a character.

EXAMPLES

John GAVE ME A LOVELY BLANKET for our anniversary.

I let my brother BORROW MY CAR for the trip.

FF-- General expressions of friendliness that may be conveyed through either verbal or gestural means. Included would be welcoming, greeting, waving hello or good-bye, introducing one person to another, smiling at someone, phoning or writing someone for a friendly purpose, and sympathizing with or praising someone.

EXAMPLES

I SMILED AT MYSELF IN A PLEASED WAY in the mirror.

He TOOTED THE CAR HORN IN RECOGNITION as he passed me on the street.

I CALLED my father TO TELL HIM THE GOOD NEWS.

I COMPLIMENTED Jean on her new dress.

Mother had sent some kind of CONGRATULATORY CARD to the Browns on the birth of their new son.

FG - Friendliness is felt for a character but is not expressed overtly.

EXAMPLES

I FELT SO GOOD INSIDE just to be with Tom.

I FELT VERY SORRY when I heard what happened to Mrs. Smith.

I THOUGHT that the new girl LOOKED VERY ATTRACTIVE.

SCORING RULES

1. It is considered to be a friendly act even though the befriender may be acting in a societal or professional role.

EXAMPLES

I dreamed our house caught on fire and a FIREMAN HELPED ME CLIMB DOWN A LADDER from the second floor.

The DOCTOR SET my baby's broken leg.

2. If a character treats another character's possessions in a friendly manner, it is scored.

EXAMPLE

My girlfriend ADMIRE MY NEW CAR.

SEXUAL INTERACTIONS

The sexual interaction scale lists 5 categories describing interactions. These categories are provided to define a 'sexual interaction' but are not scored separately. An interaction which qualifies as a 'sexual interaction' under any category is given a notation of "S". For each dream, the number of "S's" scored is totaled and this constitutes the 'sexual interaction score' for that particular dream. Scorable sexual interactions may take place either between the dreamer and characters in that dream or between dream characters.

SEXUAL INTERACTION CATEGORIES

SA - a character has or attempts to have sexual intercourse with another character.

EXAMPLE

My girl was willing and I was just getting ready to
 S
 INSERT MY PENIS when I woke up. It was a wet dream.

SB - Characters involved in various types of fore-play activities generally preceding intercourse. Included are handling another character's sex organs and related petting and fondling activities.

EXAMPLE

I dreamed I looked in the window across the street
 S
 and I saw this man I didn't recognize FONDLING THE
 NEIGHBOR LADY'S BREASTS.

SC - Necking and "non-platonic" kissing.

EXAMPLE

S
 And then my boyfriend KISSED me long and hard.

SD - A character makes sexual overtures to or "propositions" another character.

EXAMPLE

This good-looking woman, who was a stranger to me,
 S
 SUGGESTED WE GO TO HER APARTMENT AND MAKE LOVE.

SE - A character has sexual thoughts or fantasies about another character.

EXAMPLE

I IMAGINED what it would be like to SLEEP WITH
 S
 Elizabeth Taylor.

SCORING RULES

1. It is considered a sexual act even though the initiator is acting in a professional role.

EXAMPLE

S
 A red-headed PROSTITUTE walked up and ASKED ME if it were worth five dollars for a little fun up in her room.

2. If there is a continued sequence of sexual activities between the same initiator and recipient and these activities involve the same subclass, only one sexual activity is scored.

EXAMPLE

I dreamed that J.R. and I were married and it was our
 S
 wedding night. WE WERE MAKING LOVE and trying out different positions. First J.R. lay on top of me, then we had relations lying on our side, and then finally I got on top of him.

3. If more than one sexual activity takes place between the same initiator and recipient, score each different sub-class involved.

EXAMPLE

I was in a hotel room with some gorgeous-looking blond wearing a flimsy nightgown. I walked over to
 S
 the bed where she was and started to KISS HER. I got
 S
 into bed and began to RUN MY HANDS OVER HER BODY.
 S
 Just as I started to ENTER HER, I woke up and had to change my pajamas.

4. When sexual activities are separated in time through intervening events, score each sexual activity even if the same sub-class of sex is involved between the same initiator and recipient.

EXAMPLE

S
 My boyfriend and I WERE NECKING on my livingroom couch. My parents came home and we all watched TV for a while and had some coffee later. After they went upstairs
 S
 to bed, we BEGAN TO NECK AGAIN.

5. Reciprocated sexual acts are scored according to the same rules applied to initiated sexual acts.

APPENDIX D

DREAM CHARACTER SCALES

ADULT MALE CHARACTERS - Scoring notation # ♂

A character is a participant in the dream, who in some way takes part in the action of the dream. In order to qualify as adult, the character must be 15 years old or older. If age is not clearly stated, it can sometimes be inferred from the dream content.

EXAMPLE

1 ♂

MY BROTHER drove to Detroit.

1 ♂

FRED and Sonja Kasynguk were celebrating their tenth anniversary.

1 ♂

THE OLD MAN fell from the train.

- If the age can not be determined - score as adult male.

EXAMPLE

I thought someone was following me, but when I turned
around, HE was gone.

1 ♂

Then TOM, who's still in high school, found the answer.

- If a single male character is repeatedly mentioned, that character is scored only once.

EXAMPLE

1 ♂

HERBERT downed the 26 and HE passed out on the couch. Nevertheless, when I returned from church HE was making lunch.

1 ♂

SAM, stunned, retained enough presence of mind to kill the lasers with a quick swipe of his hand. Then, gripping the operating table with both hands in his agitation, HE peered at the dials and meters that told him HE had botched the operation.

- If a character is mentioned only by professional title, score that character if the profession is predominately male.

EXAMPLES

1 ♂

THE CHAUFFEUR gave her a sober wink from the side.

1 ♂

The adoption was finalized by the JUDGE.

1 ♂

THE BUTCHER had taken the afternoon off.

- If adult male characters occur in groups, score each member once.

EXAMPLES

12 ♂

These 12 PROFESSIONAL BASEBALL PLAYERS wear PF Flyers.

150 ♂

Over the hill, I could see 150 MEN marching in circles.

6 ♂

When the mice took over the space capsule, the 6 CREWMEN were forced to sleep on the floor.

- If adult male characters occur in groups for which it is impossible to determine the number of characters present, the following score is used - G ♂

EXAMPLES

G ♂

The MEN of the village held a meeting.

G ♂

After the fire, the CROWD dispersed and I went home.

G ♂

THE CLASS questioned the exam results.

G ♂

There was a BUNCH OF PEOPLE standing around the table.

ADULT MALE REFERENCES - Scoring notation # ♂ R

A reference is a male mentioned in the dream but who is in no way involved in the dream, someone referred to but not physically present. If a reference is made to a character that is scorable on the Adult Male Character Scale that reference is not scored.

EXAMPLES

Scored -

The smell of the after shave reminded me of my
1 ♂ R
UNCLE.

The gloves I found were similar to the ones I had
1 ♂ R
given my FATHER.

Not Scored -

1 ♂
BILL turned and walked out of the room and after
HE had gone I felt relieved.

I had thought about HIM all day so finally I gave
1 ♂
in and went to visit MR. MATHESON.

- The reference must be to a male 15 years of age or older. If the age is not stated it can often be inferred from the content of the dream.

EXAMPLES

1 ♂ R
Although I was invited to my UNCLE'S third wedding on
Saturday, I went canoeing instead.

1 ♂ R
When I think of my OLDER BROTHER I get angry.

- If the age can not be determined - score as an adult male reference.

EXAMPLES

1 ♂ R

Hanging on the line was a shirt just like my BROTHER'S.

She said that at one time she went to the same school
 1 ♂ R
 as VICTOR.

- If a male is repeatedly referred to only one reference is scored.

EXAMPLES

1 ♂ R

I sat there thinking about HIM, HIS charming good looks, HIS analitical mind, HIS strength and courage, and finally I concluded that HE'D never be good enough.

1 ♂ R

He walked just like my GRANDFATHER, even had my GRAND-FATHER'S way with words.

- If the reference is by professional category and that profession is predominately male, the reference is scored.

EXAMPLES

For at least a year I found myself thinking of the
 1 ♂ R
 CARPENTER.

1 ♂ R

The speech reminded me of something a MINISTER had once said.

- If adult males are referred to in groups, each member is scored as a reference.

EXAMPLES

12 ♂ R

Suddenly the faces of 12 angry MEN flashed through my mind.

2 ♂ R

The shape of the trees reminded me of two UNCLES of mine.

- If references are made to a group of adult males and it is impossible to determine the number of males referred to, the following score is assigned - G ♂ R

EXAMPLES

I reminded her that legal business should be left to
G ♂ R
LAWYERS.

G ♂ R
I remembered the CROWD at the football game.

G ♂ R
I heard her say, MEN have all the answers.

G ♂ R
I remember reading that most POLITICIANS are crooks.

BABY AND CHILD CHARACTERS - Scoring notation # BC

A character is a participant in the dream who in some way takes part in the dream. Baby and child characters are those characters under the age of 15 and either male or female.

EXAMPLES

As I came out of the door, I saw the neighbor and her
1 BC
BABY.

1 BC
I watched the CHILD walk across the field.

- If the character is repeatedly mentioned, it is only scored once.

EXAMPLE

1 BC
First she fed the BABY and then she put HIM to bed for HIS nap.

1 BC
The LITTLE GIRL ran home but later SHE was outside again, playing.

- If babies and children occur in groups, each member of the group is scored once.

EXAMPLE

10 BC
The 10 KIDS on the Little League team came over for lunch.

13 BC
The poor woman was in charge of 13 TWO YEAR OLDS.

- If the number of babies and children in a group can not be determined, the following score is assigned - G BC

EXAMPLES

G BC
The nursery was crowded with KIDS.

G BC
The playground was swarming with CHILDREN.

BABY AND CHILD REFERENCES - Scoring notation # BCR

References are babies or children mentioned in the dream but who are not present as characters in that dream. If a dream Baby or Child Character is referred to in the dream it is not scored.

EXAMPLES

Scored -

1 BCR

She was worried about the BABY'S visit next week and hoped everything would go smoothly.

As I rode on the bus I thought about six year old

1 BCR

SARA and her cat.

Not scored -

1 BC

I gave CINDY her breakfast and watched her leave for the first day of kindergarten. All that morning I thought about HER.

1 BC

Just as I was thinking of TED, HE burst into the room with a report on his new grade six teacher.

- If a baby or child is repeatedly referred to it is scored only once.

EXAMPLES

1 BCR

My mother could talk of nothing but, the BABY this and the BABY that and the BABY the other.

1 BCR

First she said the CHILD was happy, then she said HE was mad and then she couldn't decide what HE was.

- If babies and children are referred to in groups, each group member is scored as a reference.

EXAMPLES

16 BCR

The room looked as if 16 3 YEAR OLDS had been turned loose in it.

3 BCR

She told me what her THREE LITTLE SONS could do with clay.

- If a group of babies and children is referred to and it is not possible to determine the number in the group, the following score is assigned - G BCR

EXAMPLES

G BCR

I thought of THE CHILDREN at the beach.

G BCR

She told me how the BOYS could only get ice time at 6 AM on Sundays.

TRANSFORMATIONS

If a character is transformed from Adult Male to Baby or Child or a Baby or Child transformed to an Adult Male each form is scored as a character.

EXAMPLES

As I stood there, the OLD MAN became a CHILD and began to cry for his mother. 1 ♂ 1 BC

The KID I was babysitting for suddenly turned into STANFIELD, the underwear king. 1 BC

When the 5 MEN sat down at the table, the room became a nursery and they became wailing BABIES. 5 ♂ 5 BC

The little BOY crossed the street and when he reached the other side, he had become my Kung Fu INSTRUCTOR and was off to teach his next class. 1 BC 1 ♂

- If a character is transformed from a non-scored form (Female, Animal, Object) or vice versa, the scorable character is scored.

EXAMPLES

As I sat there, the DOCTOR became a mouse. 1 ♂

She ran all these funny tests and at the end the BOY had been turned into a squirrel. 1 BC

When I looked again, the girl had changed into MR. JASON. 1 ♂

The witch then turned my HUSBAND into a very handsome chesterfield. 1 ♂