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# EFFECTS OF BIOFEEDBACK AND AUTOGENIC TRAINING ON MENSTRUAL EXPERIENCES; RELATIONSHIPS AMONG ANXIETY, LOCUS OF CONTROL AND DYSMENORRHEA

by

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## Abstract

EFFECTS OF BIOFEEDBACK AND AUTOGENIC TRAINING ON MENSTRUAL EXPERIENCES: RELATIONSHIPS AMONG ANXIETY, LOCUS OF CONTROL AND DYSMENORRHEA

by

Maria Doros Heczey

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I. Effects of Self-Regulatory Training on Dysmenorrhea and other Menstrual Symptoms

It was hypothesized that individual and group autogenic relaxation training will reduce dysmenorrhea and other menstrual discomforts; also that vasomotor self-regulation training using vaginal thermo-feedback (APL Digitherm 600) will facilitate autogenic therapy in alleviation of uterine cramps. Forty-four dysmenorrheal college women recorded daily the strength and duration of seven menstrual symptoms for five consecutive cycles. During the third and fourth cycles 34 training Ss received eight 30 min exercise sessions in autogenic relaxation. Eleven Ss (BT) learned to elevate volitionally their vaginal temperature (VT) during deep relaxation using visual thermo-feedback. Eleven Ss (IT) received autogenic training individually and 12 Ss (GT) in subgroups of four, on equivalent time schedule without feedback. Ten

control Ss (CO) did not receive training. One-hundred percent of BT Ss learned to elevate VT (mean: .265 F degree, $p<.05$). The mean ratio of improvement in dysmenorrhea was 92% in BT, 76% in IT, 64% in GT and no improvement in CO. The improvement of all training groups was significantly high ($p<.001$) compared to control; the improvement in BT was marginally greater ($p<.065$) than in the IT and GT groups, supporting the hypotheses. In other recorded symptoms trends of improvement were evidenced, decrease of dysmenorrhea correlated with decreases in negative affect ($p<.01$) and bleeding ($p<.05$).

II. Relationships among Anxiety, Locus of Control and Dysmenorrhea

It was hypothesized that dysmenorrheal women will demonstrate higher trait anxiety and more of an external locus of control than non-dysmenorrheal women and men. An unselected college student sample (n=92) responded to the I-E Scale (Rotter, 1966) and to the STAI Scales (Spielberger et al., 1970). It was found that external locus of control correlated with high trait anxiety in the sample ($r=.381$, $p<.001$). There was no significant difference in the I-E and STAI scores between non-dysmenorrheal women and men. Dysmenorrheal women showed significantly higher trait anxiety ($p<.001$) and more of an external disposition ($p<.01$) than non-dysmenorrheal women, supporting the hypothesis. It was also hypothesized that alleviation of dysmenorrhea will decrease trait anxiety and

external disposition. The 44 experimental Ss responded to the I-E and STAI Scales before and after treatment to compare changes. It was found that all training groups reduced trait anxiety scores significantly ($p<.038$) as compared to controls. However, alleviation of dysmenorrhea did not result in reduction in anxiety above the reduction due to treatment. Trained groups did not reduce I-E scores significantly as compared to controls but Ss who alleviated dysmenorrhea showed significant reduction in I-E scores ($p<.02$) as compared to Ss who did not improve in dysmenorrhea. The hypothesis was partially supported: while training itself did not affect locus of control, Ss who alleviated dysmenorrhea also shifted toward a more internal disposition. The findings were consistent with the suggested etiologic explanation of dysmenorrhea based on a "vicious circle" model, with personality determinants of behavior and physiologic events of the menstrual cycle as interacting variables.

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# INTRODUCTION

## Primary Dysmenorrhea: Etiological Considerations

Fear of menstrual blood, taboos and stigmatization of menstruating women are probably as old as patriarchal societies. In our century with the dawn of women's demands of equal rights, medical and behavioral scientists promptly invented the Premenstrual Syndrome. The female body was conceptualized as a battleground of raging hormones which made her biologically unfit for positions monopolized by men in the society. Recently, inspired or prompted by the Women's Liberation Movement, psychologists took a second look at the menstrual experience with less biological and political biases. Studies accumulated evidence that although women may undergo cyclic changes in affect, there is no concurrent performance change to be found (Sommer, 1972; Zimmerman & Parlee, 1973; Golub, 1976). This should provide scientific grounds for equal rights, were it not for another frequent menstrual experience: dysmenorrhea, or painful uterine cramps. Over 50% of young women in most samples investigated in Western societies reported experiencing dysmenorrhea (Kessel & Coppen, 1963; Theano, 1968; Herzberg, 1971; and Paige, 1973). Kistner (1965) estimated that about 140 million working hours were lost in the USA yearly due to dysmenorrhea. Since it does not afflict every woman, dysmenorrhea is obviously not an

evolutionary error: the mythical price to be paid for the ambiguous privilege of being able to give birth. Gynecologists ususally treat dysmenorrheal women with nothing more than benevolent indulgence reserved for hypochondriacs. Medical science never established the etiology of primary dysmenorrhea because no matter how traumatic and debilitating it could be, with its absence of pathology it does not fit the medical model of illness. Since dysmenorrhea is not a pathologic process but an organ dysfunction, a behavioral model of maladaptive learning offered an efficacious approach to explain its etiology.

A number of psychological studies indicated that premenstrual tension may be the result of cultural expectations and social reinforcement of the distress associated with menstrual bleeding (Shainess, 1961; Ivey & Bardwick, 1968; Paige, 1971 and 1973). Dysmenorrhea may also be conceptualized as uterine neurosis resulting from the fear of menstruation itself, maintained by the secondary gains of illness-behavior. It may be postulated that young women often perceive the stereotypically expected (Parlee, 1974; Clarke & Ruble, in press) menstrual beleeding and cramps as strongly threatening, thus responding to the anticipated menstrual phase with autonomic arousal typical of anxiety. This prolonged arousal may initiate a dysponesis of energy focused on the uterus: the locus of threat. Dysponesis, as defined by Whatmore & Kohli (1968, p. 103) is: ". . .a psychopathologic state made up of

errors in energy expenditure within the nervous system." Ponesis refers to effort, to production of nerve impulses or action potentials in pathways leading to somatic or autonomic organs.

Dysponesis may well explain the aberrant contractility pattern of the myometrium (uterine smooth muscle tissue) observed by Filler and Hall (1970). They recorded the motility pattern of the uterus in several groups of women in different phases of the menstrual cycle, using latex intrauterine balloons connected to a pressure meter. They found that ". . . patients with dysmenorrhea have an inherent hypercontractibility of the uterus demonstrated more by elevated tonus than by changes in the intensity of contractions" (p. 105). Filler and Hall also observed that during menstruation patients did not complain of severe pain even if the contractions were of high amplitude. But when the contractions were dysrhythmic and showed a "notching" pattern, the patients experienced severe pain. They concluded that elevated uterine muscle tonus and dysrhythmic tetany (sustained contractions) resulted in focal ischemia (loss of adequate blood supply) and hypoxia in the myometrium, causing the pain sensation.

As explained by Ruch (1965), the pain stimulus in muscle tissues is a chemical substance arising from the contraction process. The toxic substance (lactic acid, histamine, potassium, etc.) is normally eliminated by metabolism. However, if the blood vessels are compressed in the muscle during

sustained contractions, the metabolic process is inhibited due to lack of oxygen in the stagnant circulation. The pain receptors in the muscle become irritated and discharged, sending homeostatic danger signals to the Central Nervous System. Typical of smooth muscle pains, uterine pain is often diffused and deferred, thus many women experience not only abdominal cramps but also aches in the lower back and legs.

Dysmenorrhea appears most often when the young woman begins ovulating. Shainess (1961) reported that three-quarters of her sample anticipated the onset of menarche with "anxiety, fear and dread." At the pre-menarcheal stage this anxiety is probably free-floating and becomes focused on the uterus only after the onset of menarche when the source of threat is localized in the woman's body image. It is not exactly known why non-ovulating women--like girls up to two years after menarche--do not have uterine cramps and only bleed moderately. But it was suggested (Kerenyi, 1971) that ovulation causes changes in hormone-dominance in the intricate interplay of hormones regulating the menstrual cycle. This change may cause more proliferation of the endometrial tissue (the inner lining of the uterus which is sloughed off during menstruation) and stronger excitatory estrogen-priming of the myometrium. It is probable that following the first ovulation the myometrium has to extend a yet unexperienced amount of labor to shed the mature endometrium, causing a

sort of "Charley Horse" in the uterus in some individuals. This experience may be perceived by the young woman as fulfillment of the prophecy, reinforcing her fear of the "curse." The vicious cycle then commences: the initial pain causes heightened dread of menstruation and dysponesis of energy focused on the uterus; which in turn causes an even more painful menstrual period. More pain begets more anxiety, more anxiety begets more pain, escalating the effect of the interaction until uterine cramping behavior is habitually triggered by phasic clues of the menstrual cycle.

Limited by the disease model, gynecology provided neither a satisfactory explanation nor a cure for dysmenorrhea. To devise preventive and therapeutic countermeasures, it it necessary to understand at least some of the antecedents of any disease or functional disorder. The described escalating interaction model of the positive feedback-loop between emotions and physiologic events of the menstrual cycle was proposed to offer an etiologic explanation of primary dysmenorrhea. The hypothetical etiology was gleaned from the cited literature and was tentatively offered to dysmenorrheal women during informal discussions. Based on retrospection and introspection, most women supported the model. Retrospection and introspection may not provide reliable data but can inspire intuition in the inductive stage of an investigation.

A Behavioral Approach to Alleviation of Dysmenorrhea

Based on the known physiologic correlates of dysmenorrhea and the uterine neurosis hypothesis, a behavior modification approach in therapy was indicated. It was proposed that dysmenorrhea can be reduced or alleviated by re-education of both mental and somatic attitudes of afflicted women. A promising method to teach women responses incompatible with uterine tensing was autogenic relaxation exercises (Luthe, 1963) facilitated by temperature-feedback directly tapping the reproductive tract. During the past decade physiologists, psychologists and clinicians have demonstrated the fact that involuntary responses of the human body can be brought under voluntary control. Individuals are not usually aware of their autonomic responses unless the response is traumatic. However, control of involuntary responses can be learned with relative ease and speed if they are converted into visual or auditory signals by external, mechanical means readily monitored by the individual. These signals complete the sensory link in the sensory-motor feedback loop, which is the working principle in voluntary functioning. Known as "biofeedback," researchers and clinicians from a variety of disciplines have applied the phenomenon to a wide field of experimental and therapeutic use. A great number of studies in biofeedback have been reported in recent years (Barber et al., 1971; Stoyva et al., 1972; Shapiro et al., 1973; Kamiya et al., 1975; and Brown, 1974). In various laboratories and clinics

people have learned to self-control their heart rate, their blood pressure, the electrical conductivity of their skin, the temperature of their limbs and their brain waves.

A number of therapists have combined autogenic training with biofeedback to alleviate disorders such as insomnia, hypertension, headaches and spastic muscular disorders. For example, Sargent, Green and Walters (1973) used temperature-feedback combined with autogenic training to teach migraine sufferers to raise temperature in their hands, a response which was found to be an effective treatment for migraine headaches. Developed by Schultz and Luthe (1969) autogenic training was based on the observation that the effects of this training on the body were diametrically opposed to changes elicited by stressors. Luthe (1963) described autogenic training as a psychophysiologic therapy which is carried out by the patient following suggestive instructions, using passive concentration upon his somatic, autonomic and mental processes. Practiced concentration on the imagery of heaviness and warmth in limbs and inner organs apparently leads to deep relaxation of skeletal and smooth muscles. Autogenic training was found therapeutic in numerous types of disorders of the autonomic, and especially the vasomotor system. The disadvantage of classic autogenic training alone is that it may take several months up to a year to achieve adequate self-control. Organ-specific autogenic training however tends to speed up symptom reduction. Feedback of a relevant signal

during autogenic exercises was found to facilitate faster learning of the stress-reducing responses.

In a preliminary study, Heczey (1975) hypothesized that if the uterine myometrium can be brought under voluntary control by autogenic feedback training, its relaxation may correct the elevated tonus and the painful dysrhythmic condition. Since muscle relaxation is accompanied by vasodilation and a subsequent rise in temperature (Engel & Chism, 1967), it was proposed that a tele-thermomenter may provide appropriate exteroceptive signals for uterine relaxation training. Because the same hypogastric branch of the internal iliac artery supplies the uterus, the cervix and the vaginal wall, it was assumed that vasomotor responses of this system may be picked up reliably by monitoring the temperature changes in the vagina which is accessible with an adapted thermoprobe. In the preliminary study, 24 college women suffering from primary dysmenorrhea recorded for five consecutive cycles the daily severity and duration of five common menstrual symptoms: nervousness, water retention, headache, dysmenorrhea, bleeding and the duration of the period in days. After two months of baseline recording, the Ss received eight 30 min. training sessions, once a week, always at the same time on the same day. Twelve Ss were trained in autogenic relaxation method with visual vaginal temperature (VT) feedback. Signals from the upper dorsal wall of the vagina were monitored by digital read-out electric tele-thermometer (YSI Model 48). Nine of these Ss learned to elevate their VT by the criterion of successful volitional VT elevation during

the last three sessions. Three of these Ss achieved VT elevation only in a less reliable pattern. Twelve other Ss received the same treatment but without veridical feedback. Their VT was monitored only by the experimenter (E) and the Ss were told that they achieved their goal of elevation every time when their VT changed in any direction. Thus these Ss were verbally reinforced for their idiosyncratic tendencies to respond with increases or decreases in VT during attempts of self-regulation. Nine of these Ss learned to lower and three to elevate VT. This indicated that the significant majority ($p<.02$ by Fisher's Exact) learned to self-regulate their vaginal vasomotor responses and Ss given veridical feedback learned to elevate VT. Given false information regarding the direction of achieved VT changes, the majority of the Ss learned to lower their VT. Contrary to expectations, no significant differences were found between the two groups in improvement rates in any of the recorded symptoms. Reduction of headaches and water retention did not reach significance due to large variance. But in the combined sample nervousness, bleeding ($p<.02$), duration of period ($p<.01$) and most of all dysmenorrhea ($p<.001$) decreased significantly from baseline, as analysed by Two-Way Anova for repeated measures. As a control measure, 60 additional college women were randomly interviewed at the end of the study. Based on retrospection, these women reported no significant changes in their menstrual experiences for the previous five months.

The clinical results of the preliminary study were encouraging but many questions were left open. Eighty-three percent of the entire sample reduced dysmenorrhea substantially (the mean reduction rate was 81%), regardless of the direction of the learned VT response. This suggested that autogenic relaxation training was the effective manipulation since it was equally applied to both groups. The fact that all recorded symptoms were reduced--even though several had little to do with vasomotor responses of the uterus--indicated that fear of menstruation, anxiety and general nervous system activation play a part in turning the normal menstrual process into a troubled, prolonged, painful experience. It was concluded that the key to the relief may be learning to be mentally and bodily relaxed about the menstrual experience; and autogenic training can be instrumental to this achievement. However, dismissal of biofeedback training as a redundant or useless manipulation would have been premature based on the finding that Ss who learned to vasoconstrict their vagina achieved comparable relief to Ss who learned to vasodilate or relax their vagina, which was hypothesized to correct the painful condition. Masters and Johnson (1965) observed that orgasm tends to relieve menstrual cramps, while simultaneous muscle contractions and pronounced vasodilation occurred both in uterus and vagina. As measured with the experimental apparatus, during self-stimulated orgasm there was an initial drop of 0.4 F degree in VT, followed by 0.5 F

degree rise resulting in a 0.1 F degree net elevation within two minutes after the orgasmic peak, which then persisted for at least 30 minutes. (This observation was made on six trials by three volunteers, without variation.) Since it was found that during orgasm VT followed a down-then-up pattern, it seems possible that volitional contraction of the reproductive tract may also be followed by relaxation above the resting baseline. It is probable that Ss who learned to contract their vagina during the experimental trials achieved the desired relaxation and vasodilation once they released the volitional tension. Volitional tensing of muscles in order to achieve deep relaxation upon release of tension is in fact the working principle of the progressive relaxation exercises devised by Jacobson (1938). Thus, it may be assumed that both groups in the preliminary study learned vaginal relaxation but by two different methods of self-regulation, both aided by the received feedback.

The first aim of the present research was to clarify the respective roles of autogenic training and organ-specific feedback training in successful reduction of dysmenorrhea, by giving autogenic training alone and autogenic training facilitated by feedback training to two separate comparison groups of dysmenorrheal women. The first hypothesis was that autogenic training alone will reduce dysmenorrhea significantly as compared to a no-treatment control. The second hypothesis was that autogenic training facilitated by veridical VT

feedback will be more effective in reduction of dysmenorrhea than autogenic training alone. A third hypothesis addressed a methodological consideration. Part of the positive results in the preliminary study may have been due to experimental error (Ss may have been overly impressed by the demand characteristics of the biofeedback instrumentation) and due to experimenter's effect (the Ss received a great deal of individual attention from the E); creating a placebo effect above the unavoidable amount which is operant in every therapy situation. To measure the effect of these possible errors, autogenic training alone was given under two conditions. In one condition Ss received individualized attention with exposure to the biofeedback instrumentation but without actual signal-monitoring. In another conditon Ss received autogenic training in small groups with divided attention and without exposure to the biofeedback instrument. It was proposed that significant error effects can be ruled out by evidence of comparable dysmenorrhea improvement rates under individual and group autogenic training conditions.

## Dysmenorrhea: A Model of Interaction between Physiologic Events and Personality Determinants of Behavior

In its broadest definition, anxiety is an emotional state of apprehension in face of anticipated threatening events. In most samples investigated, menstruation was perceived as a negative event by the large majority. Frank et al. (1951) characterized the onset of menarche as an event

frought with negative affect, feelings of insecurity, ambivalence about the female role and general anxiety. Considerable reserarch indicated that adults hold well-defined beliefs about the menstrual experience, most of which is negative. In addition to studies of women's ratings of their own cycles (Moos, 1968; Wilcoxon, et al., 1976), Parlee (1974) found that both men and women rate the menstrual experience of "women in general" in similar negative terms. It may be assumed that in our society menstruation is generally perceived as a threatening event with its anticipated affective and physical discomforts. Consequently it may be assumed that menstruation is often anticipated with anxiety by women. Anxiety is usually listed among menstrual symptoms implicating some unknown hormonal influence as a cause. It appears to be more realistic to consider that the cause of the evidenced anxiety is the anticipation of discomforts associated with the mestrual phase. For example, Paige (1971) has shown using the Gottschalk-Gleser technique that with hormone changes held constant, premenstrual anxiety directly correlated with the amount of bleeding. Uterine cramps may well be more threatening than the "messy business of bleeding" and it is highly probable that dysmenorrheal women anticipate menstruation with above average level of anxiety.

Anxiety was described by Spielberger et al. (1970) as both an emotional state and a trait or enduring personality characteristic. According to their definition: "State

anxiety (A-State) is conceptualized as a transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension and heightened autonomic nervous system activity." "Trait anxiety (A-trait) refers to relatively stable individual differences in anxiety proneness, that is, to differences between people in the tendency to respond to situations perceived as threatening with elevations in A-State intensity" (p. 3). The development of high trait anxiety can be best conceptualized by the escalating interaction model: the more experienced state anxiety, the higher anxious disposition, which in turn becomes a potential to trigger even higher state anxiety in response to stressors, and so on. This vicious cycle resembles and can be superimposed over the escalating interaction model of dysmenorrhea: the more experienced menstrual pain, the higher pervasive apprehension which in turn triggers a dysponesis of energy focused on the myometrium, resulting even more menstrual pain, and so on. It was postulated that women stereotypically learn to fear menstruation, this apprehension enters into the vicious cycle of state-trait anxiety which then manifests itself in menstrual distress.

The second goal of the study was to investigate the role of anxiety in the etiology of dysmenorrhea. The behavioral explanation of the etiology of dysmenorrhea was proposed to be supported by establishing correlations between dysmenorrheal

condition and high trait anxiety. It was hypothesized that in an unselected sample dysmenorrheal women will have significantly higher trait anxiety scores than non-dysmenorrheal women and men. It was also hypothesized that alleviation of dysmenorrhea will tend to reduce trait anxiety in treated women, establishing one causal link in the proposed interaction model (e.g. removing the threat of menstrual pain will reduce state and consequently trait anxiety).

The third objective of the study was to investigate a possible effect of dysmenorrheal experiences on the locus of control, which is another trait or personality determinant of behavior that may be affected by the relentless reoccurrence of menstrual distress. Locus of control was defined by Rotter in terms of belief of causality (1966, p. 1):

> "When a reinforcement is perceived by the subject as following some action of his own but not entirely contingent upon his action, then in our culture it is typically perceived as the result of luck, chance, fate, as under the control of powerful others or as unpredictable because of the great complexity of forces surrounding him. When the event is interpreted in this way by the individual, we have labeled this belief in external control. If the person perceives that the event is contingent upon his own behavior or his relatively permanent characteristics, we have labeled this belief in internal control."

In a post-experimental questionnaire, Ss of the preliminary study were asked to assess what they gained by their participation. Besides the achieved relief in menstrual distress, which was most frequently noted, a number of Ss remarked that learning control over autonomic functions encouraged them to take control over other aspects of their

lives. These remarks inspired the thought that the somewhat more external locus of control in females, found by Rotter and others (Phares, 1973) in some samples may be explained as reflections of dysmenorrheal experiences in the investigated populations. Women who feel helplessly incapacitated periodically may believe that their biology interferes with their plans and control over events. To have the painful "curse" is popularly perceived as a result of bad luck.

Rotter (1966) postulated that experiences shape generalized expectancies which then become pervasive personality determinants of behavior and proposed that locus of control is such a personality dimension. The development of external disposition may be also conceptualized by the escalating interaction model: the more experienced lack of control over events, the more external belief, which in turn influences perceptions of events as uncontrollable. Dysmenorrhea is generally perceived as predictable but an uncontrollable event, which may be both cause and effect of an external belief. It was hypothesized that in an unselected sample, dysmenorrheal women will show more of an external locus of control than non-dysmenorrheal women and men. It was also hypothesized that alleviation of dysmenorrhea in treated women will shift their locus of control toward an internal disposition, establishing one causal link in the interaction model (e.g. gaining control over the previously uncontrollable menstrual distress will generalize to the perception of other events).

The purpose of the study was only partly the evaluation of the effectiveness of self-regulatory training in alleviation of dysmenorrhea. Beyond that goal, the training program provided an opportunity to observe changes in some personality characteristics in a sample of women as their menstrual experiences changed. As Koeske (1977) pointed out in her overview of the theoretical approaches in past menstrual cycle research: the biological variable approach was too often prey to reductionistic bias discounting social and personal meaning of particular cyclic symptom patterns apart from their hypothesized hormonal influences. On the other hand, as a reactance to the sexist abuses of the biological approach, the socio-cultural approach tended to hypothesize away somatic menstrual experiences. Koeske called for an interactionistic perspective in the menstrual cycle research that acknowledges women's own perceptions of their bodily events and their meaning. Dysmenorrhea was a taboo subject in past research, especially for feminist psychologists since it was viewed as a truly negative aspect of being a woman, even more so than the "raging hormones." Yet dysmenorrhea is a real and often profound experience for the majority of young women: and it is time to take the phenomenon out of the closet, out of the medical textbooks. Dysmenorrhea offers an excellent model to study interactions among emotions, behavior patterns and physiologic processes. A similar model was proposed and widely accepted by investigators of

the Type-A personality or behavior pattern and cardiovascular disease (Glass, 1977). The wholistic approach of body-mind interaction--as already applied in psychosomatic medicine--should open up new perspectives in the study of the unique female experience. This research attempted to make a step in this direction by investigating the interaction between the somatic events of dysmenorrhea and personality determinants of behavior such as trait anxiety and locus of control.

Summary of Hypotheses

1. Dysmenorrheal women receiving autogenic relaxation training will evidence significant relief in dysmenorrhea and other menstrual comforts.

2. Organ-specific thermo-feedback facilitation of autogenic training will result in a superior rate of alleviation of dysmenorrhea.

3. Relief in dysmenorrhea will be comparable whether the autogenic training is given individually with exposure to biofeedback instrumentation, or in small groups with divided attention and without impressive instrumentation.

4. Dysmenorrheal women will have higher trait anxiety than non-dysmenorrheal women and men.

5. Alleviation of dysmenorrhea will result in reduction of trait anxiety in women trained in self-regulation.

6. Dysmenorrheal women will have more of an external locus of control than non-dysmenorrheal women and men.

7. Alleviation of dysmenorrhea will result in a shift toward a more internal disposition in trained women.

# METHOD

## Subjects

Women were recruited to volunteer for experimental treatment of dysmenorrhea by flyers displayed on college campuses in the New York area. Interested students were invited to an introductory meeting held at the CUNY graduate center. The physiologic processes of the menstrual cycle and specifically of uterine cramps were explained to the participants by the experimenter (E). Previous findings and proposed training procedures were described accurately for their information. It was made clear that only women who were not taking contraceptive pills, did not use Intra-Uterine Devices (IUDs) and had primary dysmenorrhea (absence of pathology) as confirmed by their gynecologists were accepted for participation. The precautions were taken to control for the unknown effects of hormonal or physical interventions of the above methods of contraception on the menstrual pattern, and to assure that women with pathologic dysmenorrhea were not seeking behavioral treatment where medical treatment was appropriate.

Advised consent was obtained from 34 Ss with mean age of 26 years, ranging from 18 to 40 years. The Ss were full or part-time students; 33% were Jewish, 29% Catholic, 13% Protestant and 25% did not claim affiliation to religious

groups. Three Ss were natural mothers; 62% of the sample was married or cohabited with their sex-partner. The majority of the Ss were Caucasians, six Ss belonged to minority groups. The large majority (83%) of the Ss reported coming from lower middle-class families.

An additional ten dysmenorrheal students from the E's social psychology class volunteered to supply control data. Their mean age was 23 years, raning from 18 to 38 years. Nine of these Ss were Caucasians, six of them lived on the rural campus of The College of Saint Elizabeth, N.J. in dormitories. The majority came from middle-class families (80%), one was married. They were all nulliparous, did not use contraceptive pills or IUDs and had primary dysmenorrhea. They were given course credit for their participation.

For correlational investigations, a larger unselected sample was tested. The Ss were day and evening students at Brooklyn College, CUNY, and were given course credit for their participation. After discarding the data of students older than 40 years and of women who took contraceptive pills or used IUDs or reported only occasional uterine cramps, 92 Ss' data was submitted to analysis. In this sample 34 women reported dysmenorrhea, 28 women reported no dysmenorrhea and 30 Ss were males. Their mean age was 21 years ranging from 18 to 40 years; 72% of them were Caucasian, 38% were Jewish, 19% Catholic, 22% Protestant, 2% other and 19% did not claim religious affiliation.

Apparatus

a. Electric tele-thermometer with digital read-out registering immediate temperature changes in tenth of F degree sensitivity. Operable with battery or on household current (APL Digitherm 600).

b. One all-purpose and one adapted vaginal thermo-probe with six-foot long cables.

c. Four commercial mercury oral thermometers with twentieth of F degree sensitivity (C-OBP IIII USA Oral).

d. Zephiran, surgical disinfectant.

Materials

a. Educational self-help material: "The Menstrual Experience Part I-II" (Heczey, 1976).

b. Menstrual Symptoms Inventory (MSI) sheets.

c. Relaxation Exercise Log (REL) sheets.

d. Experimenter's charting paper for feedback responses.

e. Test-Booklets with appropriate introductions and addendums for training, control and unselected groups, which contained the STAI and the I-E Scale. Booklets for pre-treatment testing and for the unselected population contained a biographic and health-status (including menstrual) questionnaire. Booklets for post-treatment testing contained the STAI, the I-E Scale and a questionnaire regarding responses to the treatment for the training Ss.

STAI, Spielberger et al. (1970)

The STAI consists of two separate 20-item self-report rating scales measuring state and trait anxiety. On the state scale Ss are instructed to report how they feel at the time of administration, whereas on the trait scale they are asked to indicate how they feel generally. The score is the sum of responses made on the four-point scales. Since state anxiety at any given time is the result of a large variety of preceding individual experiences outside of the testing situation, an additional situational state anxiety scale was included in the test in an attempt to introduce a common anxiety-evoking stimulus to override the uncontrolled individual apprehensions of the Ss. This control procedure was suggested by Izard (in Spielberger, 1972). The Ss were instructed to imagine that they anticipated minor surgery and then respond to the state scale again.

I-E Scale, Rotter (1966)

The test is made up of 29 forced choice items including six filler items. On each item the respondents are instructed to indicate their identification with one of two statements, which expressed either external or internal beliefs regarding perceived reinforcement contingencies in different life situations. The score is the total number of external choices made.

Pre-training Procedure for all Training Groups

On the introductory meeting volunteers for experimental treatment were asked to respond to the tests and questionnaires contained in the Test-Booklets (Appendix A). They were told that based on their responses to the psychological tests they would be assigned to one of the three treatment conditions "to best suit their personality." This was the only deception applied in the course of the study, designed to mask the hypotheses regarding relationships between dysmenorrhea, anxiety and locus of control. In fact, the Ss were matched into the three groups by their age, ethnicity and retrospectively reported dysmenorrhea severity; otherwise the assignment was random. The Ss were asked to deposit ten dollars at the start of the training, to be fully reimbursed at the completion of the procedures. This measure was designed to reduce drop-outs and negligence in reporting data. Thirty-four women signed a commitment stating that they understood the purpose, the procedures and the requirements of the experiment. All 34 Ss completed the training.

The Ss were instructed to record their menstrual experiences through two cycles before starting the training to establish their baselines; and to continue recording during and after training for at least a total of five consecutive cycles. The Ss received written instructions on how to keep their records in a standardized method and received a supply of MSI sheets (Appendix B). According to instructions, the

Ss filled out a separate MSI daily on menstrual days, starting on the first day when bleeding or cramps occurred, concluding on the day when bleeding or cramps terminated for the period. The MSI is a self-scaling tool developed to obtain daily numerical values of the absence or relative severity of seven most common menstrual symptoms: (1) Negative emotional and mental state; (2) Positive emotional and mental state; (3) Headache; (4) Intestinal disturbance (nausea, vomiting, diarrhea); (5) Dysmenorrhea (abdominal cramps, backache); (6) Water retention (bloatedness, sore breasts); (7) Bleeding. On the first five items Ss indicated the time duration of the experience. To obtain daily symptom indices, on the first five items the scaled value (0 to 6) of severity was multiplied by the time duration recorded; for the last two symptoms (which can not be readily timed because they usually last all day) the scaled value itself provided the index. After each period the E collected the MSIs and summed the indices for each symptom across the menstrual days. Thus, for each S for each period eight indices were established: one for each scaled symptom plus the length of period in days. To provide baseline or "before" measure, the indices of the first two pre-training periods were averaged. The indices of the fifth or post-treatment period were used as the "after" measure of symptoms. The Ss were instructed to record only experiences which they perceived to result from their menstrual period and also record any

medication they took on each recorded day regardless for what reason. They were asked to refrain from analgesics, diuretics and tranquilizers during the following recorded periods.

The introductory meeting was held in the beginning of October and training sessions started in December. Both pre-and-post experimental testing were designed to take place in mid-semester (fall and spring) to control for effects of anxieties associated with the starting and the final phase of a semester. About two months after the introductory meeting the Ss were contacted by telephone and training schedules were established. Before the training started each S had an individual intake interview with the E during which specific menstrual patterns, health and emotional problems were discussed and rapport established. At this time two newspaper articles (Heczey, 1976) were given to each S. The articles' aim was to point out the prevalent misconceptions about menstruation and to offer self-help advice to relieve menstrual discomforts. The communication also stressed proper attributions to the para-menstrual nervous system activation in an effort to counter-bias the socially learned negative affective behavior associated with the menstrual period.

The experimental training was conducted under three conditions. In the first condition, Ss were given individual autogenic relaxation training facilitated with veridical VT feedback. In the second condition Ss received individual autogenic training and used the biofeedback instrument to

measure oral temperature (OT) before and after the trials without the signal-monitoring technique of biofeedback training. In the third condition Ss were given autogenic training in small groups without exposure to the biofeedback instrument. While all training Ss were aware that training was conducted under three different conditions, they were led to believe that their assignment to a condition was based on their personality characteristics "which made them more responsive to a specific condition." All Ss expressed their acceptance of the explanation regarding their assignment.

Training Procedures for Group I in the Biofeedback Training (BT) Condition

Eleven Ss assigned to this condition received eight 30 min individual training sessions: once a week, always on the same day at the same time. Training was conducted in a small quiet office at the CUNY Graduate Center. The protocol for the autogenic relaxation training was as follows. The S was instructed to relax in the lobby for 15 min before each session to obtain a reliable base temperature for the session. Before and after each exercise-trial the S's OT was measured by the Digitherm. It was found during the preliminary study that general deep relaxation was accompanied by elevation in OT within the normal parameters. Although this procedure was not biofeedback proper, it was used to motivate Ss by demonstrating that their efforts in deep relaxation affected such a general autonomic response like

body temperature. During autogenic exercises the S was seated in an ordinary contoured office chair, both feet firmly on the ground, hands resting on the thighs, head slightly bent, eyes optionally closed. The S was given autogenic phrases adapted from Luthe (1963) to progressively relax and vasodilitate her body. The phrases were recited at each session by the E, the S was instructed to repeat the phrases subvocally and attempt to evoke the suggested sensations and images. The key phrases applied prgressively to sets of skeletal and smooth muscles were: very relaxed, calm, loose, limp, softly heavy, tingling, warm. The sequence of the progression was: right foot, leg; left foot, leg; both feet and legs and lower back; abdominal and stomach muscles; uterus, intestines and stomach; upper back and chest muscles; right hand and arm; left hand and arm; shoulders and neck; facial muscles (forehead cool!); entire body. Heartbeat: strong and even. Breathing: free, slow, deep;--chest and abdomen movements in unison. After relaxation and vasodilitation of each anatomic set, the S was instructed to visualize with eyes closed the relaxed limb or organ turning smooth and glowing pink. The suggested image for the relaxed uterus was: a shiny pink balloon, floating freely in the warmth of the abdomen. At the beginning of the training about 20 min was allowed for relaxation and warming of the body. As training progressed, body-relaxation time was decreased and the increasing additional time was spent on mental

relaxation. Key phrases for total relaxation were: "My mind is my entire body." "My body and my mind are in harmony." "I feel free and healthy." "I am at peace." For further total relaxation images of a tranquil beach scene were suggested: the setting sun warming the body, breathing along with the calm movements of the ocean-waves. To motivate the S her OT was measured by the Digitherm before and after each session and evidence of deep relaxation as shown in OT rise was verbally reinforced by the E ("You did well!").

After the fourth session, Ss were instructed to do the autogenic exercises on their own every day at least once for at least 20 min. The Ss were advised to attempt deep relaxation in adverse situations (on public transportation, before exams, etc.) especially during the paramenstrual days. The Ss were encouraged to use deep relaxation at the first signs of stress-related or menstrual discomforts. During the last four weeks of training Ss were asked to keep a daily log (REL, Appendix C) recording the success and the time spent in deep relaxation. On request Ss were allowed to tape a session and play it at home in case they had difficulties in relaxation without the aid of the recital of the autogenic phrases.

In addition to autogenic training as described above, Ss in the BT condition received thermo-feedback training. The protocol for the biofeedback training was as follows. During the first four sessions the all-purpose thermo-probe

was taped to the S's forefinger on the dominant hand. During the relaxation exercises the temperature changes displayed on the Digitherm were recorded by the E. The S either monitored the changes or if she opted to do the exercises with closed eyes, the E informed her of changes in temperature as they occurred. Thus the Ss had a choice at any given time in the modality of the feedback. Volitional hand-warming was found to be a useful pre-training for self-regulation of VT by Sedlacek & Heczey (1977). Elevating OT or the hand temperature was observed to be a relatively easy task to learn, whereas initial difficulty in VT regulation tended to discourage Ss. The faster success in achieving a rise in OT and hand temperature was used to shape and motivate Ss in the initial learning phase. The organ-specific biofeedback training was conducted during the second half of the training period. During the last four sessions an adopted thermoprobe was carefully disinfected and inserted into the vagina by the S. The probe was curved to facilitate the correct and comfortable placement of the sensor tip, touching the dorsal wall of the vagina just below the cervix. Changes in VT were monitored and recorded by the E on all trials and Ss received auditory or visual feedback of their VT responses. The E verbally reinforced any rise in VT ("Very good, you elevated your VT!"). After each session arising problems and the progress of Ss were discussed. After the last training session Ss completed the post-training tests and questionnaire

(Appendix D). They were reimbursed for their deposit once they handed in the records of the post-treatment period.

Procedures for Group II in the Individual Training (IT) Condition

Eleven matched Ss assigned to this condition received deep relaxation training individually precisely following the above described protocol for autogenic training, but without the facilitation of biofeedback training. The Ss' OT was measured before and after each session by the Digitherm. Recording and post-training testing procedures were the same as for the BT group.

Procedures for Group III in the Group Training (GT) Condition

Twelve matched Ss assigned to this condition received autogenic relaxation training following the described protocol, in subgroups of four. The subgroups met in a small conference room at the Graduate Center and were seated around a round table during sessions. Their OT was measured before and after the exercises by commercial mercury thermometers. The groups were encouraged to stay together for an additional 30 min after the sessions discussing their problems and progress with the E and with each other. Shared experiences and goals were designed to promote beneficial group-processes evidenced by Alcoholic Anonymous and Weight Watcher groups. Recording and post-testing procedures were the same as for

the other two training groups.

Procedures for Group IV in the Control (CO) Condition

Ten Ss did not receive any training but were exposed to the E once a week in the role of teacher of social psychology. Although proper matching with the training groups was not possible, this sample was chosen for control in attempt to approximate the E-S interaction which was inherent in the training situation. There is no known "placebo" for behavior therapy because any mode of control treatment may have effect on the dependent variables. The teacher-student interaction as independent variable was proposed to serve as "placebo-manipulation" to control for some experimental and experimenter's errors such as E's influence on attitudes and S's desire to please the E.

The control Ss completed and submitted their MSIs for five cycles during the spring semester. The first two sets of averaged indices and indices of the fifth recorded period established the "before" and "after" measures of this group. The pre- and post-treatment tests (STAI, I-E) and questionnaires were completed by the controls before and after the five months recording period. The controls also received copies of the re-educational articles on the Menstrual Experience after they completed their first set of MSIs.

Procedure for the Unselected Population

Shortly after the pre-test procedures of experimental Ss, a large unselected sample of college students were given the STAI, the I-E Scale and a questionnaire (Appendix E). These Ss responded anonymously in two groups, one scheduled for day and one for evening students to achieve a wide age-range comparable to the experimental sample. After completion of the task, the E explained the nature and purpose of the tests involved.

## DESIGN

For statistical analysis of data, Ss were designated to seven groups:

1. BT--Ss in individual autogenic and biofeedback training condition (n=11).
2. IT--S in individual autogenic training condition (n=11).
3. GT--Ss in group autogenic training condition (n=12).
4. CO--Ss in control condition (n=10).
5. DY--dysmenorrheal women in the unselected sample (n=34).
6. NO--non-dysmenorrheal women in the unselected sample (n=28).
7. MA--men in the unselected sample (n=30).

### Experiment A

To analyze differences in improvement ratios in the eight recorded menstrual symptoms due to treatment, the following orthogonal A Priori Contrasts were compared by t-Tests:

| BT | IT | GT | CO |
|---|---|---|---|
| +0.33 | +0.33 | +0.33 | -1.00 |
| 0 | +1.00 | -1.00 | 0 |
| +1.00 | -0.50 | -0.50 | 0 |

Experiment B

For analysis of differences in I-E and STAI score changes (D-scores) due to treatment, the above orthogonal comparisons were t-Tested. To analyze differences in I-E and STAI scores due to group-variables, the following comparisons were t-Tested: NO vs. MA; DY vs. NO; DY vs. BT+IT+GT Before; DY vs. BT+IT+GT After; BT+IT+GT Before vs. BT+IT+GT After.

For further analyses of correlations between reduction of dysmenorrhea and changes in I-E and STAI scores, the ten training Ss who achieved the most and the ten training Ss who achieved the least decrease in dysmenorrhea were regrouped to establish highly improved (Hi Imp) and not improved (Lo Imp) groups. Their I-E and STAI D-scores were compared by t-Tests.

# RESULTS

## Effects of Treatments on Menstrual Symptoms

One-hundred percent of the BT Ss learned to elevate their VT. Volitional VT elevation occurred in 42 out of 44 trials observed. The time by amount of achieved elevation roughly followed the normal learning curve (Figure 1). The mean amount of elevation over all trials was 0.265 F degree ranging from 0 to 0.5 degree. The occurrence and the direction of the VT changes during the 44 trials were found significantly consistent by two-tailed analysis of variance ($p<.05$).

The recorded symptom values before and after treatment (Table 1) were not used in raw form for statistical analysis because of high variance between Ss due to the subjective nature of the scaling procedure. On the 0-to-6 scale only 0 represented a consistent observation across Ss: absence of a symptom was assumed to have the same meaning for all Ss. However, six or the high extreme was described as "the most severe experience of the symptom you can imagine." Consequently the range and the six intervals on the scale depended upon individuals' past experiences with menstrual symptoms or with discomforts and pains comparable to menstrual symptoms and idiosyncratic perceptions of them. Based on the assumption that Ss rated their menstrual experiences

consistently on their own subjective scales, the raw index values were converted into change ratios with Ss serving as own control. For analysis of comparable changes the ratio of improvement for each symptom for each S was calculated (1 minus after/before index value) where zero represented no change in the symptom, a negative number represented increase and 100 represented complete alleviation of the symptom.

Group mean improvement ratios were computed for the eight dependent variables (Table 2) and subjected to One-Way analysis of orthogonal A Priori Contrasts to obtain two-tailed t-probabilities. No significant difference was found in improvement ratios between the treatment groups in positive affect, intestinal disorders, water retention, bleeding and duration of period. The combined training groups showed more reduction of negative affect than the control but this was significant only marginally ($p<.077$). Also the training groups' improvement ratio in headache was greater than that of the controls but did not yield significance due to large variance. However, the improvement rate in dysmenorrhea of the combined training groups was significantly greater than the control's ($p<.001$). There was no significant difference in dysmenorrhea improvement between the IT and GT groups, whereas the improvement rate of the BT group was marginally greater than the combined IT and GT groups' ($p<.065$). The first threee hypotheses were supported.

Data on dysmenorrhea was subjected to further analysis.

Complete alleviation of dysmenorrhea was reported by 54% of both BT and IT groups and by 33% of the GT group. The criterion of significant improvement for individual Ss was arbitrarily set as over 70% decrease in dysmenorrhea from baseline to post-training measure. The Ss unanimously declared before their commitment to training that they would consider 50% reduction in dysmenorrhea as a success. But since the dysmenorrhea change ratio for the controls ranged from +31% to -48%, a 50% change may be considered as a result of chance or uncontrolled variables. Thus 70% was chosen for criterion of dysmenorrhea improvement due to treatment as a more reliable cut-off. According to this criterion the ratio of improved Ss was 100% in the BT, 63% in the IT, 66% in the GT and 0% in the control group. Analyzed by Fisher's Exact Tests, as compared to the control the number of improved Ss in all three training conditions was significantly high (Table 3). Also using Fisher's Exact, the number of improved Ss in the BT condition was significantly higher ($p<.045$) than in the IT and marginally higher ($p<.059$) than in the GT condition; there was no significant difference between the IT and GT conditions. As established by this analysis, the most effective treatment to reduce dysmenorrhea was given in the BT condition, followed by GT and IT conditions respectively.

The differential effect of the exposure to re-educational communication on menstrual symptoms was illustrated by relative comparisons of Ss improvement ratios (Figure 2). The

control group's improvement rates were found relatively comparable to the improvement rates of the training groups in three menstrual symptoms: positive affect, intestinal disorders and water retention. Dysmenorrhea, headache and negative affect in controls were relatively little effected.

Correlational analysis of symptom change ratios showed that decrease in dysmenorrhea correlated with decreases in negative affect ($p<.01$) and bleeding ($p<.05$); decrease in negative affect correlated also with water retention ($p<.01$); decrease in water retention correlated also with bleeding ($p<.05$); and decrease in amount of bleeding correlated also with duration of period ($p<.05$). Changes in positive affect, headache and intestinal disorders did not correlate with any of the other recorded changes.

## Relationships among Anxiety, Locus of Control and Dysmenorrhea

In the entire sample trait and situational state anxiety scores showed high correlation ($r=.376$, $p<.001$). As expected, state anxiety scores of groups did not yield significant statistics due to very large variance. There were no significant differences between the scores of NO and MA groups on any of the anxiety scales. The mean trait anxiety score of DY Ss was significantly higher ($p<.001$) than the mean score of NO Ss by t-Test. The fourth hypothesis was substantiated.

Orthogonal A Priori Contrasts among mean D-scores (Table 4) of experimental groups showed that situational state anxiety

scores of the combined training Ss were significantly reduced ($p<.034$) as compared to controls. The BT Ss reduced situational state anxiety significantly more than the combined IT and GT Ss ($p<.013$) while there was no significant difference in reduction between IT and GT Ss (Figure 3). The combined training groups reduced A-Trait scores significantly as compared to controls ($p<.038$). There was no significant difference in reduction of trait anxiety between BT and the combined IT and GT groups. But GT Ss reduced trait anxiety scores significantly ($p<.014$) more than IT Ss (Figure 4). T-Test showed that DY Ss had significantly higher situational state anxiety scores ($p<.005$) and trait anxiety scores ($p<.001$) than training Ss after completion of training while their scores before training did not differ significantly. T-Test between D-scores of Hi Imp and Lo Imp training Ss showed no significant difference in reduction of trait anxiety; situational state anxiety was marginally more reduced ($p<.059$) in the Hi Imp group. The fifth hypothesis was not supported: while self-regulatory training significantly reduced anxiety scores, alleviation of dysmenorrhea did not result in reduction of trait anxiety above the reduction due to treatment.

In the entire sample external locus of control directly correlated with high trait anxiety scores ($r=.381$, $p<.001$). There was no significant difference in I-E scores between NO and MA. T-Test showed that the I-E scores of DY Ss were significantly higher than the scores of NO Ss ($p<.01$). The

sixth hypothesis was confirmed. All training groups showed more reduction in external scores than the control but orthogonal A Priori Contrasts among mean D-scores yielded no significant differences due to large variance. However, t-Test of D-scores between Hi Imp and Lo Imp Ss showed significantly ($p<.02$) more reduction of external scores in the Hi Imp group. The most reduction in I-E scores among the training groups was evidenced by the BT group (-2.82) which group showed also the highest improvement rate in dysmenorrhea. Similar score difference was found between DY and NO Ss (2.48), which difference yielded statistical significance due to larger n. The seventh hypothesis was substantiated: while self-regulatory training itself did not affect locus of control significantly, Ss who alleviated dysmenorrhea also shifted their locus of control toward a more internal disposition.

Table 1. Before and After Treatment Group-Mean Values of Eight Menstrual Symptoms in Four Experimental Groups.

| | BT | IT | GT | CO |
|---|---|---|---|---|
| Negative affect | | | | |
| before | 44.59 | 81.43 | 75.12 | 68.15 |
| after | 18.14 | 50.09 | 24.96 | 26.61 |
| Positive affect | | | | |
| before | 115.45 | 109.00 | 108.12 | 168.90 |
| after | 206.14 | 158.73 | 180.54 | 204.14 |
| Headache | | | | |
| before | 7.64 | 24.88 | 12.62 | 10.58 |
| after | 2.42 | 4.77 | 7.79 | 7.95 |
| Intestinal disorders | | | | |
| before | 20.64 | 54.80 | 17.22 | 32.88 |
| after | 5.43 | 8.81 | 6.58 | 28.90 |
| Dysmenorrhea | | | | |
| before | 48.76 | 69.39 | 66.95 | 57.29 |
| after | 4.64 | 17.65 | 31.29 | 53.80 |
| Water retention | | | | |
| before | 5.09 | 6.73 | 4.33 | 9.20 |
| after | 4.14 | 2.77 | 5.50 | 9.20 |
| Bleeding | | | | |
| before | 11.41 | 15.77 | 12.71 | 15.30 |
| after | 9.82 | 16.32 | 12.79 | 15.80 |
| Duration | | | | |
| before | 4.94 | 5.77 | 5.00 | 5.40 |
| after | 4.32 | 5.77 | 4.87 | 5.40 |

Table 2. Mean Improvement Ratios for Eight Menstrual Symptoms in Four Experimental Groups.

| | BT | IT | GT | CO |
|---|---|---|---|---|
| Negative Affect | 54.46 | 55.23 | 51.21 | 19.21 |
| Positive Affect | 49.53 | 69.55 | 33.79 | 57.67 |
| Headache | 32.30 | 42.33 | 58.27 | 9.40 |
| Intestinal Disorders | 72.21 | 46.04 | 57.17 | 46.47 |
| Dysmenorrhea*** | 91.62 | 75.97 | 64.11 | -9.76 |
| Water Retention | 50.44 | 56.17 | 62.83 | 54.46 |
| Bleeding | 12.28 | -2.50 | 0.47 | -0.73 |
| Duration | 8.04 | -1.96 | 1.96 | 2.78 |

Table 3. Fisher's Exact Analyses of Subjects Improved Significantly in Dysmenorrhea by All Possible Group Comparisons.

| Conditions Compared | # of Ss | |
|---|---|---|
| EXP : CO | 26 : 0 | p<.000017 |
| BT : CO | 11 : 0 | p<.00003 |
| IT : CO | 7 : 0 | p<.0028 |
| GT : CO | 8 : 0 | p<.0015 |
| BT : IT | 11 : 7 | p<.045 |
| BT : GT | 11 : 8 | p<.059 |
| IT : GT | 7 : 8 | p<.333 |

Table 4. Mean and D-Scores of Sampled Groups on STAI and I-E Scales.

| Scale | BT | IT | GT | CO | DY | NO | MA |
|---|---|---|---|---|---|---|---|
| A-State/Situ | | | | | 63.59 | 58.11 | 56.57 |
| Before Tr | 61.00 | 58.09 | 65.33 | 56.50 | | | |
| After Tr | 46.45 | 57.64 | 59.50 | 54.10 | | | |
| D | -14.54 | -0.45 | -5.83 | -2.50 | | | |
| A-Trait | | | | | 47.91 | 38.61 | 41.80 |
| Before Tr | 46.64 | 42.82 | 50.00 | 35.20 | | | |
| After Tr | 38.36 | 40.82 | 38.92 | 36.30 | | | |
| D | -8.27 | -2.45 | -11.08 | +1.10 | | | |
| Locus of Control | | | | | 14.73 | 12.25 | 12.67 |
| Before Tr | 12.82 | 12.27 | 12.58 | 11.90 | | | |
| After Tr | 10.00 | 10.90 | 11.17 | 11.60 | | | |
| D | -2.82 | -1.36 | -1.42 | -0.30 | | | |
| N | 11 | 11 | 12 | 10 | 34 | 28 | 30 |

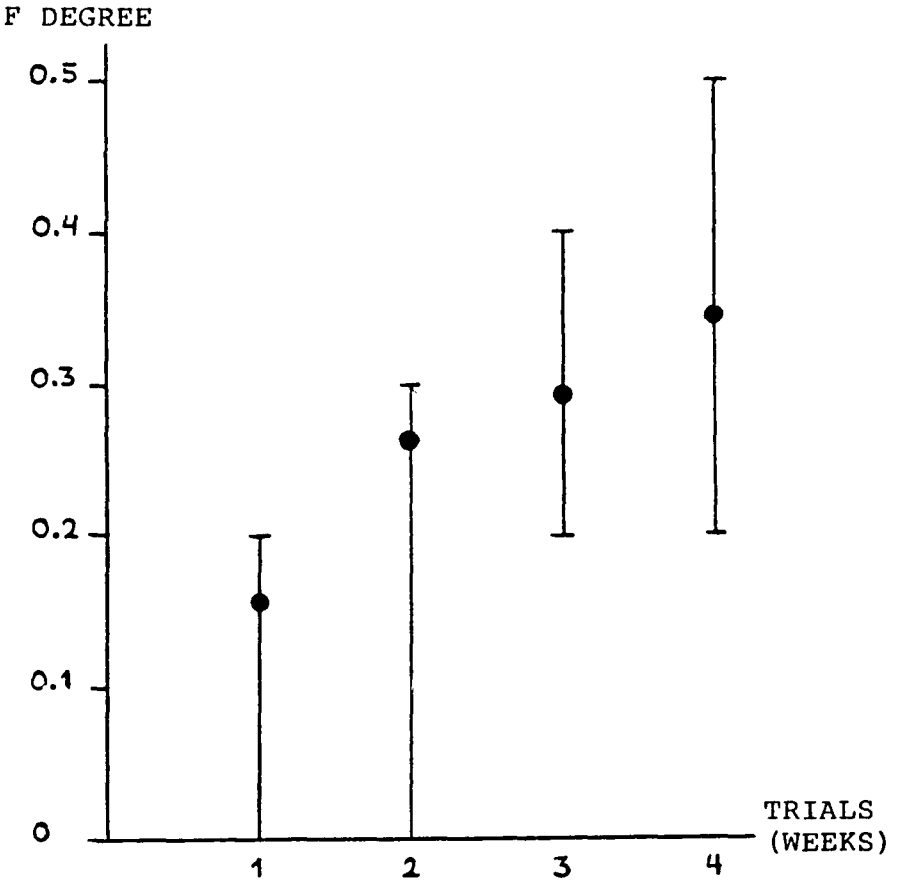


Figure 1. Volitional Vaginal Temperature changes of Eleven BT Subjects Through Four Weekly Trials.

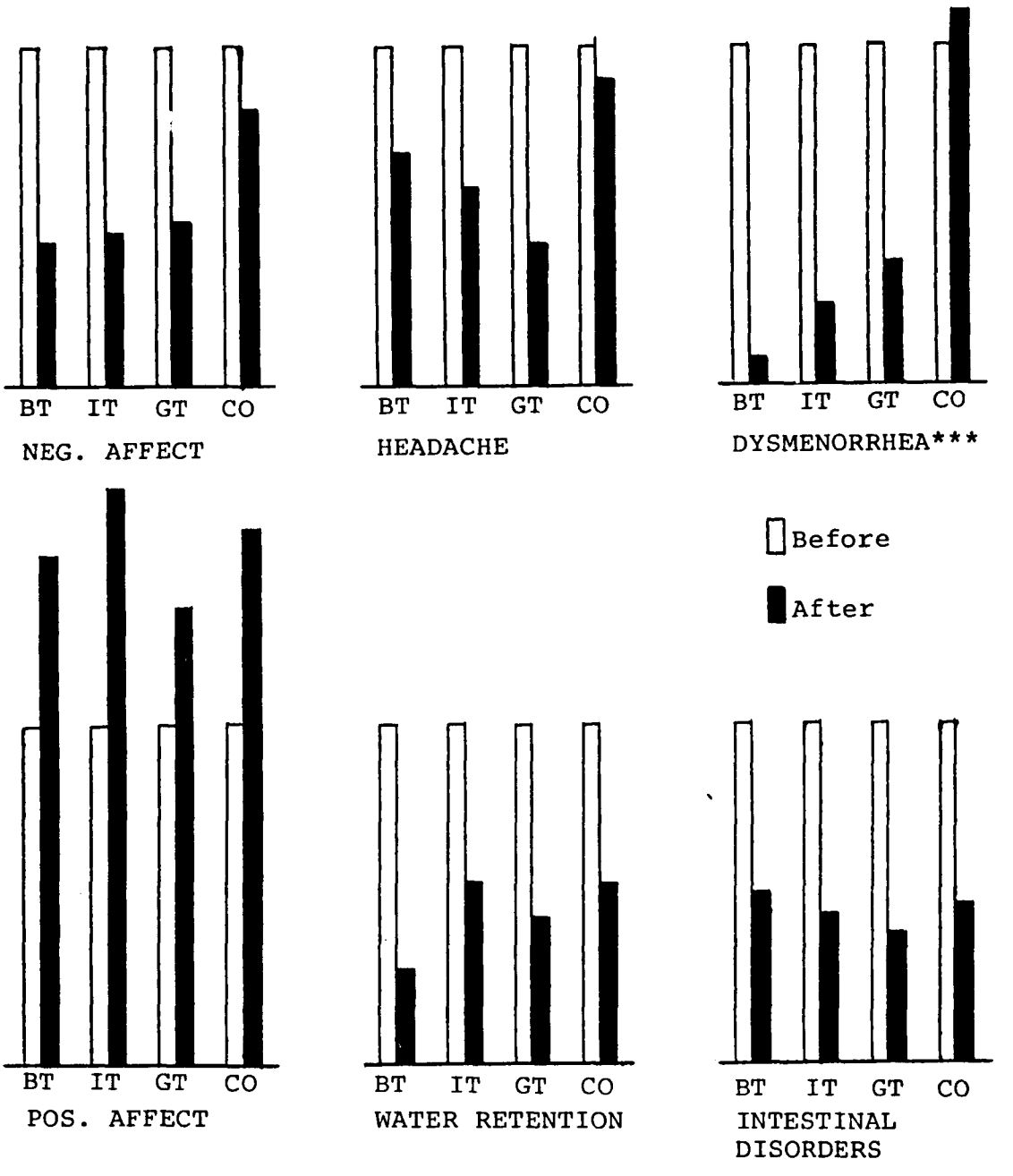


Figure 2. Bar Graphs of Change-ratio Means of Treatment Groups (Ss serving as own control) for Six Menstrual Symptoms.

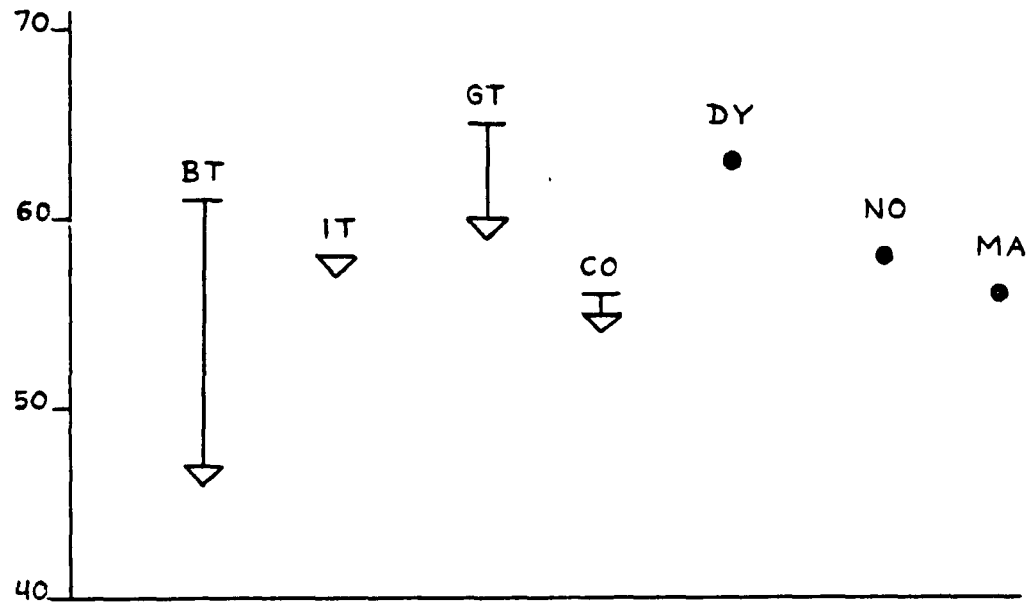


Figure 3. Mean Scores and Score Changes (before--after) for Sampled Groups in Situational State Anxiety.

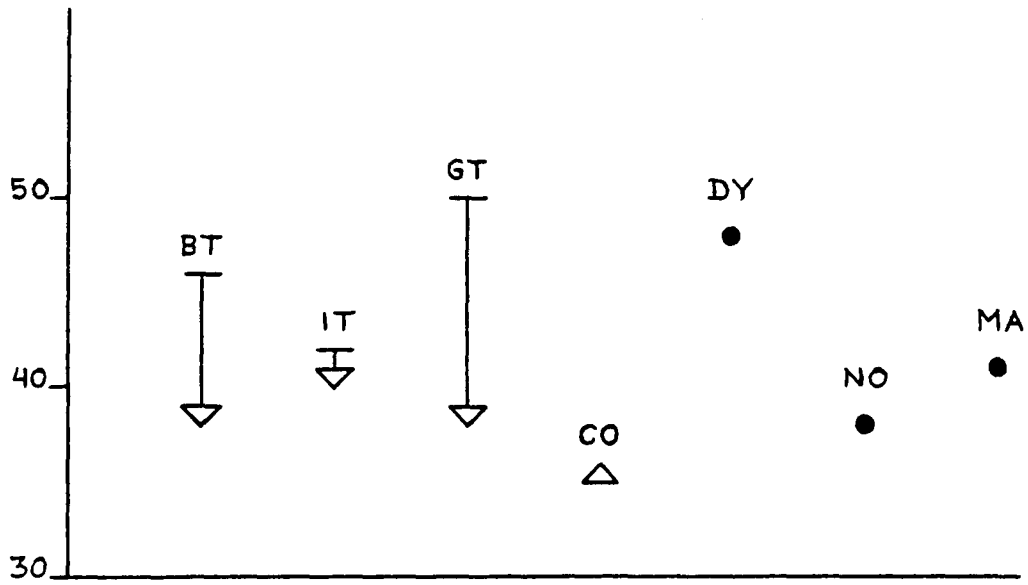


Figure 4. Mean Scores and Score Changes (before--after) for Sampled Groups in Trait Anxiety.

# DISCUSSION

## Therapeutic Effects of Biofeedback and Autogenic Training on Menstrual Experiences

Until recent years behavioral and medical sciences labored within the paradigm of a body and mind dichotomy. This cultural prejudice goes back at least as far as Plato's "individual dichotomy" between the higher, rational soul in the head and the lower, appetitive soul in the body. The art and science of healing evolved divergently based on the dichotomy. The Western idea of the life-process as an indivisible body-mind interaction--as investigated and demonstrated by Cannon (1929), Meyer (1951), Selye (1956) and Dohrenwend & Dohrenwend (1974)--opened up new converging directions for the healing professions. The role of emotions in the etiology of many somatic disorders was explored by the emerging fields of psychosomatic medicine and stress-psychology. While the body-mind interaction was frequently postulated as a pathogenic process in the etiology of somatic dysfunctions, therapy usually aimed to modify the somatic link by chemical or surgical means. Not until the discovery of biofeedback as a therapeutic tool was behavioral modification of organ-dysfunctions considered a justifiable and respectable approach in medicine. Menstrual distress, with social learning and cultural expectations strongly indicated as etiologic factors,

offered a model which lent itself to behavior modification in therapy. The applied treatments were designed to modify both mental and somatic attitudes of dysmenorrheal women, thus addressing both mental and somatic links involved in the vicious circle of dysfunction.

The manipulation to counter-bias socio-cultural expectancies and affective misattributions by exposure to re-educational communication was highly successful. All experimental Ss received such communication written by the E who was perceived by Ss as an authoritative source of information. In all groups positive emotional and mental states increased while negative affect decreased during menstrual days following the manipulation. This finding supported the arousability-labeling hypothesis of Koeske & Koeske (1975). They postulated a premenstrual increase in arousibility or sensitivity, when cues of autonomic arousal in conjunction with peripheral premenstrual symptoms may be interpreted by the woman as negative emotion whose source is seen as hormonal instead of situational. As Koeske (1977) suggested, women informed of the premenstrual autonomic activation might not invariably label their experiences in negative terms, like the Ss of Schachter & Singer (1962) who were informed to expect symptoms of arousal after administration of epinephrine. Koeske (1975) documented evidence of premenstrual arousibility (responsiveness to strong cues) using various physiological and performance measures. It is

probable that the premenstrually observed manifestations of arousibility operate during the entire paramenstruum, regardless of hormonal factors which do change during the phases of paramenstruum (Kessel & Coppen, 1963). The communication used in the present study explained that during the paramenstrual period most women experience a surge of energy which can be channeled into creative activity resulting in self-satisfaction, or can be utilized for negative emotional behavior resulting in negative self-perception. Thus the Ss were alerted to possible paramenstrual activation and were given a choice of positive and negative labels regarding their emotional experiences on the daily reports. Interestingly, even before the attributional manipulation Ss reported more positive than negative emotional experiences associated with menstruation, a phenomenon never investigated or reported before. The manipulation which reinforced the phenomenon only increased the positive perception of the menstrual affect while negative perceptions decreased. The decrease in negative affect correlated with decreases in dysmenorrhea and water retention, indicating that, to an extent, negative moods were directly caused by physical discomforts. Increase in positive affect did not correlate with changes in physical discomforts or with changes in negative affect. This indicated that positive and negative emotional experiences associated with menstruation have different sources and are independent from each other.

Increase in positive affect and decreases in water retention and intestinal disturbances were comparable in the training groups and the controls. This suggested that these menstrual symptoms tend to respond to re-educational communication without self-regulatory training. Nausea, vomiting and diarrhea have no known physiologic or hormonal causes inherent in the menstrual process; they are typical manifestations of dread and panic experienced by many individuals in the dentist's waiting-room for example. The communication given to all experimental Ss offered this explanation with the suggestion that staying calm during menstrual cramps may alleviate intestinal arousal. The manipulation proved to be effective. The communication also explained that water retention causes discomforts mainly by the irritation of the temporarily too tight clothing and suggested that women should wear loose clothes if their body becomes bloated. This self-help advice proved to be effective also. Although control procedures for the effect of the re-educational manipulation were not conducted, the affect changes in all groups were sufficiently substantial to rule out chance effect. It may be concluded that mental attitudes toward the menstrual experience can be modified by re-education which in turn modifies affective perceptions of the experience. It was found, however, that dysmenorrhea was not affected by either the postulated mental attitude change or by the self-help advices to relieve cramps, since the control Ss'

dysmenorrhea level did not change during the five months observation period.

Autogenic relaxation training, designed to modify body-attitudes was shown to be significantly successful in reduction of dysmenorrhea. Twenty-six out of the 34 trained Ss improved significantly by the criterion of over 70% reduction of dysmenorrhea. Correlational analyses of time spent on relaxation exercises, of initial symptom severity, of age, of initial anxiety and locus of control scores, did not yield a predictor for success in reduction of dysmenorrhea. The only clue to resistance was that five out of the eight non-improved Ss were simultaneously under psychoanalysis, four had male and one had a female analyst. Only one successful S was in analysis and with a woman lay-analyst. The incompatibility between the feminist-oriented behavioral treatment of dysmenorrhea used in this study and psychoanalysis was also observed during the preliminary study in 1975. In the present training sample 35% were in psychotherapy at the time of the experiment. All Ss in behavioral or eclectic therapy achieved significant relief and reported support regarding their participation in the study from their respective therapists. One may infer that psychoanalytic beliefs about femininity, notions of castration-fear, penis-envy and hysteria in the literal sense, conflict with the motivations necessary to learn and apply control over female biological functions.

Autogenic training was found almost equally successful in relief of menstrual cramps under inidividual and group training conditions. This suggested that individualized attention and the demand characteristics of the biofeedback instrumentation did not affect Ss' perception of their menstrual symptom changes considerably, supporting the third hypothesis. Still, some experimental effect may have exaggerated the improvement rate of the IT Ss, whereas the GT Ss may have actually benefitted from group support resulting in similar improvement rate. Based on this assumption it can be concluded that autogenic group-training was established as an effective treatment for menstrual disorders and preferable to individual training for economic reasons.

The hypothesized therapeutic superiority of biofeedback facilitated autogenic training was confirmed. Since the dysmenorrhea improvement rate and ratio in the BT group was substantially higher then in the other two training groups, the effectiveness of organ-specific feedback training was demonstrated. It was found that given VT elevation as goal and veridical feedback, all Ss in the BT condition learned to elevate their VT by volition. Although the mean amount of achieved elevation was not large, it was consistent enough to yield statistical significance. This relatively small VT elevation becomes more impressive when it is compared to VT elevation induced by orgasm. Orgasmic vasodilitation in the vagina was observed to result in a net .1 F degree

elevation in VT, less than half of the learned response (.265 F degree) of the BT Ss. The assumption that a small elevation in VT indicates uterine relaxation and vasodilitation remained an assumption but in the light of the therapeutic claims, a well supported one.

One hundred percent of the BT Ss improved significantly and more than half alleviated dysmenorrhea completely. Both BT and IT Ss were exposed to individual attention and the demand characteristics of the biofeedback instrumentation, yet the improvement ratio of the BT group was significantly higher ($p<.045$) than the IT group's. While the difference in improvement ratios between controls and IT ($p<.001$) or GT ($p<.002$) may incorporate some "placebo effect," the difference between improvement ratios of BT and IT groups can be considered a more error-free indicator of effect. The results established that menstrual distress can be reduced most successfully by simultaneous modification of women's mental, general somatic and specific uterine attitudes by addressing the dynamics of the cognitive, emotional and physiologic events of the menstrual cycle as it was done under the autogenic biofeedback training condition.

Based on these findings, the most effective and economical protocol for dysmenorrhea-therapy can be suggested as follows. Women in small groups shall receive information regarding the chemical and physicologic events of the menstrual cycle and communication to counter-bias learned

expectancies and misattributions of affect. Positive mental attitudes toward menstruation shall be reinforced through the therapy sessions. For the first four sessions, women shall be trained in autogenic deep-relaxation in groups, using OT as indicator of success in general body relaxation. Once the women learned to take a general relaxed body attitude, training shall continue individually with the facilitation of vaginal thermo-feedback until overlearning of the desired vasomotor response is achieved and transfer from therapeutic to real life situations is complete. Given more intensive training than was offered under the experimental conditions, an even higher ratio in complete alleviation of dysmenorrhea might be achieved. The first two-month follow-up indicated that trained Ss continued improving if they continued the prescribed daily relaxation exercises. None of the Ss reported set-back after the completion of training, even if they did not exercise deep relaxation regularly. This indicates that once the vicious cycle of dysmenorrhea is broken, the learned attitudes are able to maintain the normal distress-free menstrual cycle without persistent efforts in self-regulation.

Menstrual Distress and Anxiety

Trait anxiety, as described by Spielberger et al. (1970) has the characteristics of a class of constructs which Campbell (1963) referred to as acquired behavioral dispositions. "Acquired behavioral dispositions, according to

Campbell, involve residues of past experience that predispose an individual both to view the world in a particular way and to manifest 'object consistent' response tendencies" (Spielberger, et al., 1970, p. 3). It was postualted that episodes of menstrual distress and latent or consciously perceived fear of menstruation enter as experiences into the woman's intrapsychic dynamics which predisposes her to respond with high states of anxiety to unrelated threatening life events. It was hypothesized that the interaction between distressful menstrual experiences and acquired anxiety proneness will manifest itself in high correlation between evidence of dysmenorrhea and high trait anxiety. This hypothesis was strongly supported by the finding that in the unselected college student sample dysmenorrheal women had significantly higher A-Trait scores than non-dysmenorrheal women and men.

The obtained correlation was strongly suggestive regarding the postulated interaction but did not prove causality in any direction. In an interactional model causality is difficult to show because a change in one interacting factor may cause only a small change in the other factor within a few cycles of interaction, especially if that factor is a relatively enduring personality determinant of behavior. The experiment attempted to test one sequence of causality: that a significant reduction in threat (i.e. menstrual cramps) reduces an anxious disposition. It was found that although highly improved training Ss reduced their trait

anxiety scores more than the least improved Ss, the difference was not statistically significant. All training groups evidenced significant reduction in A-Trait scores even though not every S reduced dysmenorrhea significantly. This indicated that a reduction in trait anxiety due to treatment does not necessarily reduce dysmenorrhea, at least not within two-three menstrual cycles. In fact, any kind of manipulation to relieve dysmenorrhea (pregnancy, hormone treatment, hysterectomy) may cause changes in anxiety scores and the change may be the function of the manipulation rather than the elimination of dysmenorrhea. The only way to show clear-cut causality in the etiology of dysmenorrhea or anxiety would be to collect anxiety scores of pre-menarcheal girls then retest them after their menstrual patterns are established with other stressful life events held constant. If initially highly anxious respondents would develop dysmenorrhea, it may be established that high trait anxiety is the antecedent of dysmenorrhea. If dysmenorrheal respondents would increase their anxiety scores significantly more than non-dysmenorrheals, it may be established that the experience of dysmenorrhea predictively causes high trait anxiety. Until such longitudinal study is performed, only strong correlation can be stated between anxious disposition and dysmenorrhea. However, the A-State scores in response to imagined anticipation of minor surgery (a situation resembling menstrual pain and bleeding) offered some support for the hypothesis: Ss who alleviated dysmenorrhea reduced their situational

state anxiety scores marginally ($p<.059$) more than the unsuccessful Ss.

The demonstrated correlation has interesting implications regarding the personal meaning of dysmenorrheal experiences. Gorush (1969) found in college students that increases in trait anxiety were preceded by a period of time characterized by substantial increases in A-State, but higher levels of A-State did not necessarily lead to increases in A-Trait. Increases in A-Trait scores seemed to depend upon whether elevation in A-State was determined primarily by external factors or resulted from psychodynamic conflicts. Hodges and Felling (1970) found that college students' A-Trait scores correlated significantly with factors that involved psychological stress or threats to self-esteem, but showed no relationship to factors involving pain and pysical danger. In the light of these findings it seems that not the actual menstrual pain but rather its perception as a threat to self-esteem and the resulting conflicts are the stressors which are feared and reacted to with elevated trait anxiety. Golub (1976) found significantly higher premenstrual A-State scores in a group of women (35-40 yrs of age) but found no correlation between A-Trait and premenstrual A-State scores. This suggests that among the physiologic and perceived events of the menstrual phase, dysmenorrhea is the cause of traumatic psychological stress which can result in a change in pervasive personality characteristics such as

trait anxiety. The present finding that Ss in the group training condition reduced trait anxiety more than Ss in the other training conditions also suggested that the anxiety causing stressor is not the pain sensation but its perception probably as degrading. The fact that improvement in dysmenorrhea was comparable in the IT and GT groups yet trait anxiety reduction was more significant in the GT group indicated that some group process modified the meaning of dysmenorrhea for the GT Ss. The realization that other women with desirable personality and behavioral characteristics also can have dysmenorrhea may have changed the Ss' perceptions of themselves as damaged organisms thus reducing the threat of dysmenorrhea to self-esteem. Researchers of the social comparison theory (Festinger, 1954) also found that "misery loves company" (Schachter, 1959); and affiliation with other people anticipating the same kind of physical discomforts reduces anxiety because of mutual sympathy and reassurance (Wrightsman, 1960). The remarkably low trait anxiety scores of the control group may be also explained by this phenomenon: most of the controls lived in the dormitory of a small rural Catholic college and all of them belonged to a close-knit social unit. On the other hand, the substantial reduction of situational state anxiety in the BT group indicated that autogenic feedback training offered a mode of coping with specific threats of physical discomforts.

Menstrual Distress and Locus of Control

Investigators of psychological stress often considered the role of perceived or actual lack of control in anxiety reactions. Champion (1950), Corah & Boffa (1970), Glass & Singer (1972) among others demonstrated that at least some perceived control over aversive stimulation reduces subjective and physiologic measures of anxiety, stress and its deteriorating effects on performance. Bowers (1968) found that the experience of a stressor as painful was directly correlated with the Ss' anxiety about the pain stressor; and hypothesized that lack of perceived control over a stressor was an antecedent of anxiety. As described by Rotter (1966), individuals with external locus of control (e.g scoring high on the I-E Scale) are predisposed to expect and perceive lack of control over events. Consequently, they might accumulate past experiences of high states of anxiety due to lack of perceived control which in turn contribute to development of high trait anxiety. Efran (as cited by Rotter, 1966) found no correlation between the I-E scores and Taylor's Manifest Anxiety Scale (MAS) scores in high school students. On the other hand, Watson & Baumal (1967) found that college students scoring high on MAS tended to have an external locus of control. This suggests that anxiety and external locus of control become correlated, synchronized with each other as individuals gain progressively more life experiences to shape interacting generalized expectancies

or personality characteristics.

Since dysmenorrhea could be perceived as a reoccurring uncontrollable pain-event, it was hypothesized that it may cause not only an anxious disposition but an external locus of control as well. Adapting an external disposition may also be a mode of coping with the distress. Bandler et al. (1968) found that attempts of control can be stressful exaggerating the perception of the stressor as painful. Houston (1972) demonstrated that Ss with external locus of control manifested less physiologic arousal while exposed to physical stressor than internally controlled Ss, although they did not differ in reported feelings of anxiety. This indicated that refusing the responsibility to take control may somewhat reduce arousal during stress. Houston concluded that the I-E scale not only measures generalized beliefs about control of events in a person's life, but it may also measure tendencies for use of defensive maneuvers. The belief, that menstrual distress--along with other aversive events traditionally seen as "part of the woman's lot"--is uncontrollable due to the great complexity of forces surrounding the individual, may be a stress-reducing coping strategy.

The results confirmed the hypothesized relationships among dysmenorrhea, high trait anxiety and external locus of control. In the entire sample external locus of control was directly and significantly correlated with high trait anxiety. It was also found that in the unselected sample dysmenorrheal

women had significantly higher external scores than non-dysmenorrheal women or men. The tests to show one causal sequence also supported the hypothesis: while the I-E scores of training Ss did not change significantly in the course of treatment, highly improved Ss reduced their external scores significantly more than Ss who did not improve in dysmenorrhea. One way to interpret this finding is that relief in dysmenorrhea caused a more internal disposition, which would also mean that experience of dysmenorrhea causes a more external disposition. However, this causal relationship can not be explicitly stated: some factor in the treatment may have caused a more internal disposition which in turn caused the success in reduction of dysmenorrhea. Lefcourt (1966) argued that any psychotherapy's goal is to induce more internal locus of control. Dua (1970) reported that both the action oriented and re-educative therapies they investigated increased internal responses in patients. Autogenic and biofeedback training qualify as action oriented and re-educative therapy and indeed resulted in a general (although not significant) decrease in external scores. The finding, that only those Ss who experienced relief in dysmenorrhea shifted toward internal disposition significantly, supported the hypothesized causality but did not prove it, because it can not be determined which change occurred first: decrease in dysmenorrhea or decrease in externality.

It may be concluded that the triple link between the

three escalating interactional models was demonstrated. The difficulty in establishing causal relationships between dysmenorrheal experiences, trait anxiety and external locus of control only emphasized the postulated dynamics of the intricate interaction between somatic, perceptual, cognitive and emotional factors in the menstrual experience.

Summary and Future Implications

Autogenic relaxation training was found to be an effective treatment for dysmenorrhea both in individual and in group setting. It was found that women can learn to elevate their vaginal temperature by volition which was assumed to indicate relaxation and vasodilitation of the entire reproductive tract including the myometrium. Vaginal thermofeedback facilitation of the autogenic training was shown to be the therapeutically superior mode of treatment for dysmenorrhea, demonstrating the effectiveness of organ-specific training. The results indicated that reduction in dysmenorrhea was accompanied by reductions of negative affect and bleeding. Communication aimed at counter-biasing sociocultural expectancies of negative menstrual affect resulted in the increase of positive and the decrease of negative perceptions of emotional experiences associated with the menstrual period.

Results indicated that dysmenorrheal women evidence significantly higher trait anxiety and more of an external locus of control than non-dysmenorrheal women and men.

Autogenic relaxation training reduced levels of anxiety; moreover, women successful in alleviation of dysmenorrhea showed a significant shift toward an internal disposition. Direct correlations among experience of dysmenorrhea, high trait anxiety and external locus of control was demonstrated and some causal relationships were considered but not explicitly established.

The study presented dysmenorrhea, trait anxiety and locus of control as a triply linked escalating interaction model; a theoretical approach which considers the individual's perceptions, cognitions and emotions in interaction with physiologic events. This approach was also applied to the treatment of dysmenorrhea combining efforts to modify mental, general somatic and organ-specific attitudes. The clinical results indicated that the interactional approach as applied was consistent with the results pertaining to the investigated personality variables. The escalating interaction model may be also successfully applied to therapeutic strategies in modification of other stress-related psychosomatic dysfunctions. It may be fruitful to investigate correlations between trait anxiety and stress-related disorders to establish a possible predictor and indicator of psychosomatic diseases, some of which already proved to be responsive to anxiety-reducing self-regulatory training.

Based on the findings it is suggested that proper education in psychology and physiology of women at pre-menarcheal

age may prevent development of menstrual distress. Initiating such an educational program should be a goal for the Women's Liberation movement. Another goal should be to establish behavioral dysmenorrhea-clinics accessible to women who already suffer the discomforts and intimidation of menstrual distress. The negative affects of dysmenorrhea were shown in two personality dimensions but its influence may not be confined solely to these. Dysmenorrhea might adversely influence the majority of young women in their self-perceptions, in their vocational aspirations and achievements. Neglect and wishing away a "negative aspect of being a woman" will not liberate women from the inhibiting influence of menstrual distress. This study intended to advocate recognition of the problem along with potential solutions with a hope to inspire further multidimensional research of the unique female experience.

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# APPENDIX A

Graduate Center, C.U.N.Y.

Psychology of Women

Your name

Dear Participant,

in this booklet you will find a variety of tests and questionnaires. We intend to understand some aspects of your feelings, experiences and personality: it will help us to establish the most promising mode of treatment of your menstrual problems. At this stage we ask you to give your name above. You will be given a code number and your responses will be read only by the computer. Your therapist will know only the broad cathegory the computer will assign you to.

Each Part of this booklet will start with different directions. Read them carefully, but do not puzzle over individual items while you respond. There are no bad or good answers, only true ones. Don't try to rationalize your answers, we need your "gut-responses", your intuitive feelings and impressions. Work fast but with care. Proceed item after item, page after page in the given sequence. Don't go back and forth, it would only confuse you. Respond to every single item; if you overlook just one, or make more than one mark on a single item the computer will reject your entire data and you wasted valuable time. Remember : some psychological tests and questionnaires seem irrelevant or trivial for people naive to the methods of psychological procedures. Be assured that this battery contains items which proved to be valuable in assessment.

Thank you for your intelligent co-operation.

We wish you fast success in alleviation of your discomforts!

## PART I.

INSTRUCTIONS. This is a questionnaire to find out the way which certain events in society affect different people. Each item consists of a pair of alternatives, lettered a. or b. Please select the one statement of each pair (and only one!) by putting a circle around either (a) or (b) next to the statement you more strongly believe to be the case as far as you are concerned. Be sure to select the one you believe to be more true, rather than the one you would like to be true. In some instances you may discover that you believe both statements : in such cases select the one you more strongly believe to be true as far as you are concerned. You may also find items, where both statements seem to be disagreeable to you: in these cases mark the statement which is less obnoxious to you. There are no right or wrong answers; this is a measure of personal belief!

Please answer these items carefully but do not spend too much time on any one item. Also try to respond to each item independently when you make your choice; do not be influenced by your previous choices. Be sure to find an answer for every choice even if you do not like some!

* * *

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowdays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people do not take enough interest in politics.
   b. There will be always wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.
   b. Unfortunatelly, an individual's worth often passes unrecognized no matter how hard they try.

5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students do not realize the extent to which their grades are influenced by accidental happenings.

6. a. Without the right breaks one can not be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just do not like you.
   b. People who can not get others to like them do not understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.
   b. It is one's experience in life which determines what they are like.

9. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a deceision to take a definite course of action.

10. a. In case of well prepared student there is rarely if ever such thing as an unfair test.
    b. Many times exam questions tend to be so unrelated to course-work that studying is really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
    b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The avarage citizen can have an influence in government deceisions.
    b. This world is run by a few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain I can make them work.
    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
    b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.
    b. Many times we might as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b. Getting people to do the right thing depends on ability, luck has nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
    b. By taking active part in political and social affairs the people can control world events.

18. a. Most people do not realize the extent to which their lives are controlled by accidental happenings.
    b. There is really no such thing as "luck".

19. a. One should always be willing to admit mistakes.
    b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.
    b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.
    b. Most misfortunes are the results of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.
    b. It is difficult for people to have much control of things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at grades which they give.
    b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to deceide for themselves what they should do.
    b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.
    b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they do not try to be friendly.
    b. There is not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.
    b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.
    b. Sometimes I feel that I do not have enough control over the direction my life is taking.

29. a. Most of the time I can not understand why politicians behave the way they do.
    b. In the long run the people are responsible for bad government on a national as well as on local level.

## PART II.

INSTRUCTIONS : Under each of the following statements please indicate how do you feel RIGHT NOW, by marking the middle of the appropriate space on the scale with an X. Make sure you make only one mark on a single scale and respond to every item! Get in touch with your feelings and emotional state, the faster you work the more intuitive your description will be. Remember, we would like to know how you feel, not how you would like to feel.

1. I feel calm

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

2. I feel secure

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

3. I am tense

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

4. I am regretful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

5. I feel at ease

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

6. I feel upset

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

7. I am presently worrying over possible misfortune

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

8. I feel rested

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

9. I feel anxious

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

10. I feel comfortable

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

11. I feel self-confident

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

12. I feel nervous

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

13. I am jittery

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

14. I feel "high strung"

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

15. I am relaxed

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

16. I feel content

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

17. I am worried

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

18. I feel over-excited and rattled

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

19. I feel joyful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

20. I feel pleasant

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

*****

PART III.

INSTRUCTIONS: Each of us has our own idea as to the meaning of anxiety and the feelings that go with it. We may behave cool and collected but none of us can avoid feelings of anxiety in many situations. We would like you to use the scales below to describe your personal experience, your own feelings when you are anxious. Do your best to imagine the following situation : you have a nasty boil on your lower back (derriere). It does not hurt you right now, but the doctor tells you that tomorrow he has to lance (cut open) the boil. Afterwards, you may have considerable pain for a day or two; and there will be bleeding for days so you will have to change the dressing frequently. Now, close your eyes and concentrate on this hypothetical situation until it becomes as real as possible. Than keep your feelings aroused by the imagined situation and indicate them on the following scales, as you did on the preceding Part III.

1. I feel calm

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

2. I feel secure

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

3. I am tense

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

4. I am regretful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

5. I feel at ease

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

6. I feel upset

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

7. I am presently worrying over possible misfortune

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

8. I feel rested

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

9. I feel anxious

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

10. I feel comfortable

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

11. I feel self-confident

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

12. I feel nervous

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

13. I am jittery

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

14. I feel "high strung"

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

15. I am relaxed

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

16. I feel content

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

17. I am worried

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

18. I feel over-excited and rattled

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

19. I feel joyful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

20. I feel pleasant

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

PART Iv.

INSTRUCTIONS : Under each of the following statement please indicate how you GENERALLY feel, by marking the middle of the appropriate space on the scale with an X. Make sure you make only one mark on a single scale and respond to every item! 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 - not how you would like to feel or how your social environment expects you to feel.

1. I feel pleasant

| almost never | sometimes | often | almost always |
|---|---|---|---|

2. I tire quickly

| almost never | sometimes | often | almost always |
|---|---|---|---|

3. I feel like crying

| almost never | sometimes | often | almost always |
|---|---|---|---|

4. I wish I could be as happy as others seem to be

| almost never | sometimes | often | almost always |
|---|---|---|---|

5. I am loosing out on things because I can't make up my mind soon enough

| almost never | sometimes | often | almost always |
|---|---|---|---|

6. I feel rested

| almost never | sometimes | often | almost always |
|---|---|---|---|

7. I am "calm, cool and collected"

| almost never | sometimes | often | almost always |
|---|---|---|---|

8. I feel that difficulties are piling up so that I can't overcome them

| almost never | sometimes | often | almost always |
|---|---|---|---|

9. I worry too much over something that really doesn't matter

almost never | sometimes | often | almost always

10. I am happy

almost never | sometimes | often | almost always

11. I am inclined to take things hard

almost never | sometimes | often | almost always

12. I lack self-confidence

almost never | sometimes | often | almost always

13. I feel secure

almost never | sometimes | often | almost always

14. I try to avoid facing a crisis or difficulty

almost never | sometimes | often | almost always

15. I feel blue

almost never | sometimes | often | almost always

16. I am content

almost never | sometimes | often | almost always

17. Some unimportant thought runs through my mind and bothers me

almost never | sometimes | often | almost always

18. I take disappointments so keenly that I can't put them out of my mind

almost never | sometimes | often | almost always

19. I am a steady person

| almost never | sometimes | often | almost always |
|---|---|---|---|

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

| almost never | sometimes | often | almost always |
|---|---|---|---|

PART V. . Biographic data, health status.

1. Female_____; Male_____;

2. Your age : _____;

3. Your occupational aspiration :_____;

4. On the avarage, how many days per year do you spend home because of illness? _____days/year

5. Do you have any chronical disease or disability? YES_____; NO_____;

On the following items, please circle the one letter next to the statement which is most appropriate in your case!

6. a. I am very active physically (sports, dance, exercises)
   b. I am fairly active physically
   c. I take part in physical activities only occasionally
   d. I am a sedentary person (not active physically)

7. a. I live with my parents
   b. I live with my sex-partner (married, co-habit)
   c. I live with friend(s)
   d. I live alone

8. Your mother's (foster or stepmother's) education level :
   a. Some Grammar schooling
   b. Graduated from Grammar School
   c. Some Highschool education
   d. Graduated from Highschool
   e. Attended Trade School
   f. Some College education
   g. Bachelor degree
   h. Some Graduate schooling
   i. Master or Doctoral degree

9. Your religious affiliation : _____;

10. Your subculture or country of origin (for example : American, Hispanic-American, Black-American, Italian-American or Taiwan, England, Barbedos, etc.) :

## PART VI. FOR WOMEN ONLY!

1. Do you take contraceptive pills? YES_____; NO_____;

2. Do you use Intra Uterine Device (IUD) ? YES_____; NO_____;

3. Did you ever give birth? YES_____; NO_____;

On the following items, please circle the one letter which is next to the most appropriate statement describing your case!

4. During the days before my menstrual period :
   a. I have neither mood changes nor physical discomfort
   b. I experience mood changes but have no physical discomfort
   c. I feel some discomfort but it does not affect my mood
   d. I experience both physical and emotional discomforts

5. During my period (flow) :
   a. I don't experience any discomfort
   b. I experience some discomfort but have no menstrual cramps
   c. I have menstrual cramps occasionally
   d. I have menstrual cramps very often
   e. I always have menstrual cramps
   f. I suffer a great deal during my periods

6. (If applicable!) I used to have menstrual cramps, but it stopped when :
   a. I started taking hormone pills
   b. I gave birth
   c. cramps just disappeared
   d. other : _____

7. To the best of my recollection, the first day of my past period was on _____ (give date).

(TEAR OFF this page and keep it till the end of the meeting when you will be asked to complete it. Hand in your Test-Booklet.)

ADMINISTRATIVE RECORD.

If you deceided to become a Participant in the Training Program : we are glad to have you. If you deceided not to participate in the training, you may still want to contribute to our studies. We will need some respondents with dysmenorrhea in a couple of month to complete a similar test. At that time we will be able to offer you payment for your contribution.

Please indicate :
I want to participate in the Training Program ☐
I want to participate in future test for a fee ... ☐
In either case we want to keep in touch. Please PRINT :

Name : _____

Address : _____

Phone home:_____ best time to call: _____

work:_____ best time to call: _____

* * *

Please circle the number next to the statement which best describe your case:

1. My recent periods are slightly painful.
2. My recent periods are moderately painful.
3. My recent periods are very painful.
4. My recent periods are extremely painful.
5. My recent periods are debilitatingly painful.

# APPENDIX B

## INSTRUCTIONS : HOW TO KEEP YOUR MENSTRUAL RECORDS.

- The day when you start bleeding or have uterine cramps is the first day of your period. On this day fill out your Pre-menstrual Symptoms Inventory carefully. You will have to use this form only once per period. On your Pre-menstrual form you have to indicate the number of days that you experienced the listed symptoms preceding the onset of the period. Many women do not have pre-menstrual symptoms; if this is your case just indicate "0", but fill out the form regardless.
- On the first day of your period start using the Menstrual Inventory forms, one per day, until all the symptoms are gone. Remember : on the first day of your period you are to use both forms; and than only the Menstrual Inventory every day during your period.
- On your Menstrual Inventory you are to scale the absence or severity of each symptom listed. Zero represents the absence of the symptom on that day. Six stands for the most severe occurance of the symptom you ever experienced or you think the symptom would be in a most extreme case. The numbers in between represent escalating degrees of severity of the experience. Make a good estimation of the daily avarage of the severity of the symptom - some of your symptoms may wax and wane through the day: take the overall avarage for the day. Next to the first five symptom you are to indicate the closest approximate time-duration you experienced the symptom for the day. Finally record your remarks under a, b and c.

IMPORTANT! Keep your records daily, never put it off for next day. Time, even a day can distort the memory of discomforts considerably. The best way to keep your records up to date is to keep the forms next to your bed and complete them every evening as part of your going-to-bed routine.

- You will be asked to hand in your records periodically.
- If you have any problems or questions, you may call me evenings at my home, or write:

Maria D. Heczey, 500 East 85 St #21L; N.Y.C. 10028 phone: 249-0810

THANK YOU!

# MENSTRUAL SYMPTOMS INVENTORY.

NAME _____ DATE _____

Today I experienced :

1. Negative emotions & mental state

   0 - 1 - 2 - 3 - 4 - 5 - 6 _____hrs _____min

2. Positive emotions & mental state

   0 - 1 - 2 - 3 - 4 - 5 - 6 _____hrs _____min

3. Headache

   0 - 1 - 2 - 3 - 4 - 5 - 6 _____hrs _____min

4. Intestinal disturbance (nausea, vomiting, diarrhea)

   0 - 1 - 2 - 3 - 4 - 5 - 6 _____hrs _____min

5. Dysmenorrhea (abdominal, back pains and cramps)

   0 - 1 - 2 - 3 - 4 - 5 - 6 _____hrs _____min

6. Water retention (bloatedness, sore breasts)

   0 - 1 - 2 - 3 - 4 - 5 - 6

7. Bleeding(menstrual discharge)

   0 - 1 - 2 - 3 - 4 - 5 - 6

a. Record here any other discomforts you had today:

b. Record here all the medication you took today:

c. Record on the other side any event of the day which you think was a consequence of your period : emotional behavior, staying in bed, taking naps, abstaining from routine activities like work, classes, exercise, entertainment, etc :

# APPENDIX C

# RELAXATION EXERCISE LOG.

NAME _____ DATE (of Monday) _____

| | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|---|
| a. | 0123456 | 0123456 | 0123456 | 0123456 | 0123456 | 0123456 | 0123456 |
| b. | | | | | | | |
| c. | | | | | | | |
| d. | 0123456 | 0123456 | 0123456 | 0123456 | 0123456 | 0123456 | 0123456 |

a. Circle on the scale the appropriate number to indicate how much general stress you experienced each day of the week.

b. Indicate with a number how many times did you exercise relaxation on each day.

c. Sum up the time-duration (hrs, min) you spent with relaxation exercising during each day.

d. Circle on the scale the appropriate number to indicate how successful was your relaxation on each day.

IMPORTANT! Make a check mark next to the day on the days of your period.

Remarks :

# APPENDIX D

Graduate Center, CUNY
Psycholory of Women

Your Name (PRINT!)

Dear Participant,

in this booklet you will find a variety of tests and questionnaires. They are similar to those you completed before, but not the same. Everyone changes over time in some aspects and remains unchanged in others. We are interested in this phenomenon. Please try not to remember how you responded previously: it would be impossible to recall it anyhow. We are interested in you RIGHT NOW, in your present self.

Each Part of this booklet will start with different directions. Read them carefully, but do not puzzle over individual items while you respond. There are no bad or good answers, only true ones. Don't try to rationalize your answers, we need your "gut-responses", your intuitive feelings and impressions. Work fast but with care. Proceed item after item, page after page in the given sequence. Don't go back and forth, it would only confuse you. Respond to every single item; if you overlook just one, or make more than one mark on a single item the computer will reject your entire data and you wasted valuable time. Remember : some psychological tests and questionnaires seem irrelevant or trivial for people naive to the methods of psychological procedures. Be assured that this battery contains items which proved to be valuable in assessment.

THANK YOU FOR YOUR INTELLIGENT CO-OPERATION!

## PART I.

INSTRUCTIONS. This is a questionnaire to find out the way which certain events in society affect different people. Each item consists of a pair of alternatives, lettered a. or b. Please select the one statement of each pair (and only one!) by putting a circle around either (a) or (b) next to the statement you more strongly believe to be the case as far as you are concerned. Be sure to select the one you believe to be more true, rather than the one you would like to be true. In some instances you may discover that you believe both statements : in such cases select the one you more strongly believe to be true as far as you are concerned. You may also find items, where both statements seem to be disagreeable to you: in these cases mark the statement which is less obnoxious to you. There are no right or wrong answers; this is a measure of personal belief!

Please answer these items carefully but do not spend too much time on any one item. Also try to respond to each item independently when you make your choice; do not be influenced by your previous choices. Be sure to find an answer for every choice even if you do not like some!

* * *

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowdays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people do not take enough interest in politics.
   b. There will be always wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.
   b. Unfortunatelly, an individual's worth often passes unrecognized no matter how hard they try.

5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students do not realize the extent to which their grades are influenced by accidental happenings.

6. a. Without the right breaks one can not be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just do not like you.
   b. People who can not get others to like them do not understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.
   b. It is one's experience in life which determines what they are like.

9. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a deceision to take a definite course of action.

10. a. In case of well prepared student there is rarely if ever such thing as an unfair test.
    b. Many times exam questions tend to be so unrelated to course-work that studying is really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
    b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The avarage citizen can have an influence in government deceisions.
    b. This world is run by a few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain I can make them work.
    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
    b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.
    b. Many times we might as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b. Getting people to do the right thing depends on ability, luck has nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
    b. By taking active part in political and social affairs the people can control world events.

18. a. Most people do not realize the extent to which their lives are controlled by accidental happenings.
    b. There is really no such thing as "luck".

19. a. One should always be willing to admit mistakes.
    b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.
    b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.
    b. Most misfortunes are the results of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.
    b. It is difficult for people to have much control of things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at grades which they give.
    b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to deceide for themselves what they should do.
    b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.
    b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they do not try to be friendly.
    b. There is not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.
    b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.
    b. Sometimes I feel that I do not have enough control over the direction my life is taking.

29. a. Most of the time I can not understand why politicians behave the way they do.
    b. In the long run the people are responsible for bad government on a national as well as on local level.

## PART II.

INSTRUCTIONS : Under each of the following statements please indicate how do you feel RIGHT NOW, by marking the middle of the appropriate space on the scale with an X. Make sure you make only one mark on a single scale and respond to every item! Get in touch with your feelings and emotional state, the faster you work the more intuitive your description will be. Remember, we would like to know how you feel, not how you would like to feel.

1. I feel calm

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

2. I feel secure

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

3. I am tense

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

4. I am regretful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

5. I feel at ease

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

6. I feel upset

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

7. I am presently worrying over possible misfortune

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

8. I feel rested

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

9. I feel anxious

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

10. I feel comfortable

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

11. I feel self-confident

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

12. I feel nervous

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

13. I am jittery

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

14. I feel "high strung"

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

15. I am relaxed

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

16. I feel content

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

17. I am worried

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

18. I feel over-excited and rattled

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

19. I feel joyful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

20. I feel pleasant

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

*****

PART III.

INSTRUCTIONS: Each of us has our own idea as to the meaning of anxiety and the feelings that go with it. We may behave cool and collected but none of us can avoid feelings of anxiety in many situations. We would like you to use the scales below to describe your personal experience, your own feelings when you are anxious. Do your best to imagine the following situation : you have a nasty boil on your lower back (derriere). It does not hurt you right now, but the doctor tells you that tomorrow he has to lance (cut open) the boil. Afterwards, you may have considerable pain for a day or two; and there will be bleeding for days so you will have to change the dressing frequently. Now, close your eyes and concentrate on this hypothetical situation until it becomes as real as possible. Than keep your feelings aroused by the imagined situation and indicate them on the following scales, as you did on the preceding Part III.

1. I feel calm

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

2. I feel secure

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

3. I am tense

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

4. I am regretful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

5. I feel at ease

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

6. I feel upset

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

7. I am presently worrying over possible misfortune

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

8. I feel rested

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

9. I feel anxious

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

10. I feel comfortable

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

11. I feel self-confident

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

12. I feel nervous

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

13. I am jittery

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

14. I feel "high strung"

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

15. I am relaxed

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

16. I feel content

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

17. I am worried

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

18. I feel over-excited and rattled

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

19. I feel joyful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

20. I feel pleasant

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

PART Iv.

INSTRUCTIONS : Under each of the following statement please indicate how you GENERALLY feel, by marking the middle of the appropriate space on the scale with an X. Make sure you make only one mark on a single scale and respond to every item! 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 - not how you would like to feel or how your social environment expects you to feel.

1. I feel pleasant

| almost never | sometimes | often | almost always |
|---|---|---|---|

2. I tire quickly

| almost never | sometimes | often | almost always |
|---|---|---|---|

3. I feel like crying

| almost never | sometimes | often | almost always |
|---|---|---|---|

4. I wish I could be as happy as others seem to be

| almost never | sometimes | often | almost always |
|---|---|---|---|

5. I am loosing out on things because I can't make up my mind soon enough

| almost never | sometimes | often | almost always |
|---|---|---|---|

6. I feel rested

| almost never | sometimes | often | almost always |
|---|---|---|---|

7. I am "calm, cool and collected"

| almost never | sometimes | often | almost always |
|---|---|---|---|

8. I feel that difficulties are piling up so that I can't overcome them

| almost never | sometimes | often | almost always |
|---|---|---|---|

9. I worry too much over something that really doesn't matter

| almost never | sometimes | often | almost always |
|---|---|---|---|

10. I am happy

| almost never | sometimes | often | almost always |
|---|---|---|---|

11. I am inclined to take things hard

| almost never | sometimes | often | almost always |
|---|---|---|---|

12. I lack self-confidence

| almost never | sometimes | often | almost always |
|---|---|---|---|

13. I feel secure

| almost never | sometimes | often | almost always |
|---|---|---|---|

14. I try to avoid facing a crisis or difficulty

| almost never | sometimes | often | almost always |
|---|---|---|---|

15. I feel blue

| almost never | sometimes | often | almost always |
|---|---|---|---|

16. I am content

| almost never | sometimes | often | almost always |
|---|---|---|---|

17. Some unimportant thought runs through my mind and bothers me

| almost never | sometimes | often | almost always |
|---|---|---|---|

18. I take disappointments so keenly that I can't put them out of my mind

| almost never | sometimes | often | almost always |
|---|---|---|---|

19. I am a steady person

| almost never | sometimes | often | almost always |
|---|---|---|---|

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

| almost never | sometimes | often | almost always |
|---|---|---|---|

PART V.

Instructions : Please circle the number next to the statement on each item which best describe your case.

* * *

0. My recent period was painless.

1. My recent period was slightly painful.

2. My recent period was moderately painful.

3. My recent period was very painful.

4. My recent period was extremely painful.

5. My recent period was debilitatingly painful.

* * *

Since you started the self-control training, did you experience change of severity of dysmenorrhea?

1. It got worse.

2. No change.

3. It got a little better.

4. It got considerably better.

5. I practically got rid of dysmenorrhea.

* * *

How did you feel about the training sessions?

1. I felt very uncomfortable.

2. They were boring me.

3. No feelings.

4. I liked them.

5. I enjoyed them.

(Addendum for Training Ss only.)

Part V.

* * *

*Please circle the number next to the statement which best describe your case :

0. My recent periods are painless.

1. My recent periods are slightly painful.

2. My recent periods are moderately painful.

3. My recent periods are very painful.

4. My recent periods are extremely painful.

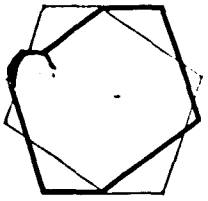
5. My recent periods are debilitatingly painful.

* * *

*If your menstrual discomforts changed since the previous test, describe it in your own words why do you think the change occured :

(Addendum for Control Ss only.)

# APPENDIX E



**The Graduate School and University Center**
of the City University of New York

Ph D Program in Psychology

Dear Anonymous Participant,

in this booklet you will find a variety of questionnaires and test-scales we ask you to respond to. We are interested to find out how the college student population feels and thinks about certain aspects of life and themselves, in comparison to other groups. While responding to these items, you may gain better understanding about yourself; and you will give us valuable informations. Some psychological questionnaires and tests may seem irrelevant or trivial for people naive to the methods of psychological procedures. Be assured this battery containes items which proved to be valuable in assessment of some aspects how people feel about many things and how they experience living. Your responses will remain confidential: only the computer will read them and supply us with avarages and percentages.

Each Part of this booklet will start with different directions. Read them carefully, but do not puzzle over individual items as you respond. There are no good or bad answers! Don't try to rationalize your responses, we need your "gut-responses", your intuitive feelings and first impressions. Work fast but with care. Proceed item after item, page after page in the given sequence. Don't go back and forth, it would only confuse you. Respond to every single item; if you overlook just one, or make more than one mark on a single item the computer will reject your entire data and you wasted your valuable time.

THANK YOU FOR YOUR INTELLIGENT CO-OPERATION!

## PART I.

INSTRUCTIONS. This is a questionnaire to find out the way which certain events in society affect different people. Each item consists of a pair of alternatives, lettered a. or b. Please select the one statement of each pair (and only one!) by putting a circle around either (a) or (b) next to the statement you more strongly believe to be the case as far as you are concerned. Be sure to select the one you believe to be more true, rather than the one you would like to be true. In some instances you may discover that you believe both statements : in such cases select the one you more strongly believe to be true as far as you are concerned. You may also find items, where both statements seem to be disagreeable to you: in these cases mark the statement which is less obnoxious to you. There are no right or wrong answers; this is a measure of personal belief!

Please answer these items carefully but do not spend too much time on any one item. Also try to respond to each item independently when you make your choice; do not be influenced by your previous choices. Be sure to find an answer for every choice even if you do not like some!

* * *

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowdays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people do not take enough interest in politics.
   b. There will be always wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.
   b. Unfortunatelly, an individual's worth often passes unrecognized no matter how hard they try.

5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students do not realize the extent to which their grades are influenced by accidental happenings.

6. a. Without the right breaks one can not be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just do not like you.
   b. People who can not get others to like them do not understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.
   b. It is one's experience in life which determines what they are like.

9. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a deceision to take a definite course of action.

10. a. In case of well prepared student there is rarely if ever such thing as an unfair test.
    b. Many times exam questions tend to be so unrelated to course-work that studying is really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
    b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The avarage citizen can have an influence in government deceisions.
    b. This world is run by a few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain I can make them work.
    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
    b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.
    b. Many times we might as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b. Getting people to do the right thing depends on ability, luck has nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
    b. By taking active part in political and social affairs the people can control world events.

18. a. Most people do not realize the extent to which their lives are controlled by accidental happenings.
    b. There is really no such thing as "luck".

19. a. One should always be willing to admit mistakes.
    b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.
    b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.
    b. Most misfortunes are the results of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.
    b. It is difficult for people to have much control of things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at grades which they give.
    b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to deceide for themselves what they should do.
    b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.
    b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they do not try to be friendly.
    b. There is not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.
    b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.
    b. Sometimes I feel that I do not have enough control over the direction my life is taking.

29. a. Most of the time I can not understand why politicians behave the way they do.
    b. In the long run the people are responsible for bad government on a national as well as on local level.

## PART II.

INSTRUCTIONS : Under each of the following statements please indicate how do you feel RIGHT NOW, by marking the middle of the appropriate space on the scale with an X. Make sure you make only one mark on a single scale and respond to every item! Get in touch with your feelings and emotional state, the faster you work the more intuitive your description will be. Remember, we would like to know how you feel, not how you would like to feel.

1. I feel calm

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

2. I feel secure

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

3. I am tense

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

4. I am regretful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

5. I feel at ease

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

6. I feel upset

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

7. I am presently worrying over possible misfortune

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

8. I feel rested

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

9. I feel anxious

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

10. I feel comfortable

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

11. I feel self-confident

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

12. I feel nervous

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

13. I am jittery

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

14. I feel "high strung"

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

15. I am relaxed

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

16. I feel content

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

17. I am worried

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

18. I feel over-excited and rattled

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

19. I feel joyful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

20. I feel pleasant

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

*****

PART III.

INSTRUCTIONS: Each of us has our own idea as to the meaning of anxiety and the feelings that go with it. We may behave cool and collected but none of us can avoid feelings of anxiety in many situations. We would like you to use the scales below to describe your personal experience, your own feelings when you are anxious. Do your best to imagine the following situation : you have a nasty boil on your lower back (derriere). It does not hurt you right now, but the doctor tells you that tomorrow he has to lance (cut open) the boil. Afterwards, you may have considerable pain for a day or two; and there will be bleeding for days so you will have to change the dressing frequently. Now, close your eyes and concentrate on this hypothetical situation until it becomes as real as possible. Than keep your feelings aroused by the imagined situation and indicate them on the following scales, as you did on the preceding Part III.

1. I feel calm

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

2. I feel secure

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

3. I am tense

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

4. I am regretful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

5. I feel at ease

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

6. I feel upset

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

7. I am presently worrying over possible misfortune

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

8. I feel rested

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

9. I feel anxious

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

10. I feel comfortable

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

11. I feel self-confident

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

12. I feel nervous

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

13. I am jittery

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

14. I feel "high strung"

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

15. I am relaxed

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

16. I feel content

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

17. I am worried

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

18. I feel over-excited and rattled

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

19. I feel joyful

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

20. I feel pleasant

| not at all | somewhat | considerably | very strongly |
|---|---|---|---|

PART Iv.

INSTRUCTIONS : Under each of the following statement please indicate how you GENERALLY feel, by marking the middle of the appropriate space on the scale with an X. Make sure you make only one mark on a single scale and respond tc every item! 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 - not how you would like to feel or how your social environment expects you to feel.

1. I feel pleasant

| almost never | sometimes | often | almost always |
|---|---|---|---|

2. I tire quickly

| almost never | sometimes | often | almost always |
|---|---|---|---|

3. I feel like crying

| almost never | sometimes | often | almost always |
|---|---|---|---|

4. I wish I could be as happy as others seem to be

| almost never | sometimes | often | almost always |
|---|---|---|---|

5. I am loosing out on things because I can't make up my mind soon enough

| almost never | sometimes | often | almost always |
|---|---|---|---|

6. I feel rested

| almost never | sometimes | often | almost always |
|---|---|---|---|

7. I am "calm, cool and collected"

| almost never | sometimes | often | almost always |
|---|---|---|---|

8. I feel that difficulties are piling up so that I can't overcome them

| almost never | sometimes | often | almost always |
|---|---|---|---|

9. I worry too much over something that really doesn't matter

almost never | sometimes | often | almost always

10. I am happy

almost never | sometimes | often | almost always

11. I am inclined to take things hard

almost never | sometimes | often | almost always

12. I lack self-confidence

almost never | sometimes | often | almost always

13. I feel secure

almost never | sometimes | often | almost always

14. I try to avoid facing a crisis or difficulty

almost never | sometimes | often | almost always

15. I feel blue

almost never | sometimes | often | almost always

16. I am content

almost never | sometimes | often | almost always

17. Some unimportant thought runs through my mind and bothers me

almost never | sometimes | often | almost always

18. I take disappointments so keenly that I can't put them out of my mind

almost never | sometimes | often | almost always

19. I am a steady person

| almost never | sometimes | often | almost always |
|---|---|---|---|

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

| almost never | sometimes | often | almost always |
|---|---|---|---|

## PART V. Biographic data, health status.

1. Female_____; Male_____;

2. Your age : _____;

3. Your occupational aspiration :_____;

4. On the avarage, how many days per year do you spend home because of illness? _____days/year

5. Do you have any chronical disease or disability? YES_____; NO_____;

On the following items, please circle the one letter next to the statement which is most appropriate in your case!

6. a. I am very active physically (sports, dance, exercises)
   b. I am fairly active physically
   c. I take part in physical activities only occasionally
   d. I am a sedentary person (not active physically)

7. a. I live with my parents
   b. I live with my sex-partner (married, co-habit)
   c. I live with friend(s)
   d. I live alone

8. Your mother's (foster or stepmother's) education level :
   a. Some Grammar schooling
   b. Graduated from Grammar School
   c. Some Highschool education
   d. Graduated from Highschool
   e. Attended Trade School
   f. Some College education
   g. Bachelor degree
   h. Some Graduate schooling
   i. Master or Doctoral degree

9. Your religious affiliation : _____;

10. Your subculture or country of origin (for example : American, Hispanic-American, Black-American, Italian-American or Taiwan, England, Barbedos, etc.) :

## PART VI. FOR WOMEN ONLY!

1. Do you take contraceptive pills? YES_____; NO_____;

2. Do you use Intra Uterine Device (IUD) ? YES_____; NO_____;

3. Did you ever give birth? YES_____; NO_____;

On the following items, please circle the one letter which is next to the most appropriate statement describing your case!

4. During the days before my menstrual period :
   a. I have neither mood changes nor physical discomfort
   b. I experience mood changes but have no physical discomfort
   c. I feel some discomfort but it does not affect my mood
   d. I experience both physical and emotional discomforts

5. During my period (flow) :
   a. I don't experience any discomfort
   b. I experience some discomfort but have no menstrual cramps
   c. I have menstrual cramps occasionally
   d. I have menstrual cramps very often
   e. I always have menstrual cramps
   f. I suffer a great deal during my periods

6. (If applicable!) I used to have menstrual cramps, but it stopped when :
   a. I started taking hormone pills
   b. I gave birth
   c. cramps just disappeared
   d. other : _____

7. To the best of my recollection, the first day of my past period was on _____ (give date).