THESIS

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BEHAVIORAL AND HEALTH FACTORS WHICH DIFFERENTIATE AMONG WOMEN WITH TWO TYPES OF DYSMENORRHEA AND WOMEN WITH NO DYSMENORRHEA

by

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ABSTRACT

BEHAVIORAL AND HEALTH FACTORS WHICH DIFFERENTIATE AMONG WOMEN WITH TWO TYPES OF DYSMENORRHEA AND WOMEN WITH NO DYSMENORRHEA

By

Mary Kathleen Roberson

This thesis was designed to study health, physiological, and behavioral components of the life experiences of women who suffer from primary dysmenorrhea. Subjects (n=113, ages 18 through 25) were recruited from undergraduate classes. Measures used were the Jenkins Activity Survey (JAS), Habits of Nervous Tension (HNT), and Autonomic Nervous System Questionnaire (ANS). Additional questionnaires were constructed for dysmenorrhea classification, a health scale, an experience of anger scale, family medical history, and demographic data.

The following variables (in descending order) significantly predicted dysmenorrhea classification in a stepwise discriminant function analysis: family history, parasympathetic nervous system related diseases; JAS, college

involvement; ANS, adrenergic responder to anxiety; family history, sympathetic nervous system related diseases; experience of anger scale; HNT, dependency; health scale; HNT,anger; ANS, adrenergic responder to anger; attitude toward expression of anger. These results, as well as gender related measurement issues highlighted by this study, were discussed.

to women

ACKNOWLEDGMENTS

I conceived of this project years ago, and it seems sometimes as if I am almost a different person upon its completion. It was a journey of increasing my understanding and love for women which in turn led to my feminist awakening. Many groups of women contributed to this process: the Women's Research Group, the Women's Advisory Committee to the Provost, Women's Studies Program, Feminist Remedial Volleyball, and especially the women's community.

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career that make it seem like a worthwhile endeavor. I am truly lucky to have a family with whom I can communicate clearly and honestly. I love them dearly!

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Introduction

Statement of the Problem

The purpose of this study is to explore certain components of the life experiences of women who suffer from primary dysmenorrhea, a menstrual disorder characterized by pain during the first day or two of the menses. Historically, this condition has been placed by many physicians within the realm of psychoneurotic pain. Only in the last two decades have measurable physiological events been associated with primary dysmenorrhea. This research is not being undertaken in order once again to place the cause of primary dysmenorrhea on the psychological side of Cartesian mind-body split. "Concepts of single causes and of unilinear causal sequences--for example, from psyche to soma and vice versa--are simplistic and obsolete. The dynamic interaction of multiple factors occurring in varying constellations and time sequences, and modified by feedback effects, underlies all changes in health. To break down the

complexity into testable hypotheses and validate them, to formulate integrative theories, and to develop effective preventative and therapeutic methods are the chief objectives of psychosomatic medicine today" (Lipowski, 1977, p. 234). Therefore, this study is a survey to explore hypotheses based on an interdisciplinary theoretical structure derived from research within the fields of medicine, psychology, and sociology. The ultimate purpose is to work toward the identification of: (1) life-style related behaviors and sociological phenomena that may be related to placing someone at higher risk to develop the physiological correlates and the experience of primary dysmenorrhea; (2) those factors associated with enhancing health and resistance to the disorder; (3) possible strategies that might help those who are suffering to cope more effectively with primary dysmenorrhea (Lipowski, 1977); and (4) strategies to reduce dependence upon pharmocological methods of balancing the physiology.

Overview

The major hypothesis of this study is that women who suffer from primary dysmenorrhea may respond to stress in such a way that involves an over response of the sympathetic nervous system. Very briefly, at the point in a woman's menstrual cycle when estrogen and progesterone are low, she may be at higher physiological risk for sympathetic over response when under stress. This is especially the case if she cannot discharge physiological arousal from anxiety provoking situations by expressing her autonomy, her needs, and her anger. These instrumental abilities are not as well socialized for women, and also society maintains powerful prohibitions against the direct expression of anger, especially for women. Therefore, women may be at greater risk to funnel these emotions into their physiology.

Basic Assumptions

Lipowski (1977) listed in his work two sets of core assumptions which form a framework to guide this research: (1) "man's (*sic.*) symbolic activity . . . influences organismic processes at all other levels of organizations down to the cellular level" and (2) there are "enduring psychological and physiological tendencies to react to specific stimuli with individually specific patterns of cognitive, emotional, behavioral, and physiological responses" (p. 236).

Delimitations and Objectives

This study is an inquiry into different aspects of women's experiences as they occur from the time of early adolescence (retrospectively) to young adulthood (currently). Recent research and theory indicates that people are best studied in their life environments, if possible. For example, Carol Gilligan's (1977, 1983) work on the moral development of women indicates that different and more valid

results are obtained when using a moral dilemma that the women were actually experiencing rather than an abstract one constructed by the researcher. Although studying anyone in his or her context is optimal, it is especially important in studying females since their value systems and identities are very relationship oriented. Because of their socialization, women's identities or experience of self include to a greater extent the bonds of their relationships and the process aspect (as opposed to the end product) of completing tasks (e.g., Chodorow, 1978; Dinnerstein, 1976). This study is a limited attempt to identify some historical and self-reported physiological attributes, to identify patterns in descriptions of life events which may be indicative of socialization trends, and to describe individual life events which may be associated with either or both of those physical and sociological factors. The results of this study will be helpful in future research for purposes of identifying both at risk individuals and also what actual situations or contexts in which adolescent girls should be studied as they develop primary dysmenorrhea.

Limitations

The lack of direct physiological measures is one important limitation of this study. Primary dysmenorrhea is pain at the time of menses which has not been associated with an abnormality of anatomy or physiology. It has been estimated that approximately 10% of women diagnosed by a physician as having primary dysmenorrhea actually have secondary dysmenorrhea or pain which is caused by an anatomical abnormality or a clear disease process. There may be some diagnostic error in this study especially since it uses the women's self report of results of past gynecological exams. For a clear diagnosis, one must use very intrusive techniques which, for example, measure uterine contractions by the insertion of instruments into the uterine cavity at the onset of menses (Lundstrom, 1981). To diagnose endometriosis, the most common type of secondary dysmenorrhea, one must undergo a laparoscopy, a procedure usually performed under general anaethesia during which the physician inserts a small viewing device into the abdominal cavity.

Review of the Literature

As stated previously, this is a study which is interdisciplinary in its conception so that the subjects may be described phenomenologically or from numerous perspectives. Combining the physical, the psychological, and the sociological contexts constructs a fuller portrait of the individual and unites mind, body, and objects of experience.

Therefore, this review will consist of a brief summary of four main branches of study related to this research:

(1) Medicine: Normal menstrual cycle events, the etiology of primary dysmenorrhea, and the prostaglandins.

(2) Individual Psychology: Biases and methodological problems in primary dysmenorrhea research and a summary of the findings.

(3) Social Psychology: Both a review of findings that relate specifically to possible socialization or cultural factors in the development of primary dysmenorrhea and also a brief overview of the sex roles research and theory as it relates to the expression of anger by women in general in this culture.

(4) Health Psychology: A summary of the interface of the overresponse of the sympathetic nervous system and its behavioral correlates.

Medical Literature

Pertinent Normal Menstrual Cycle Events

In an average 28-day menstrual cycle there are 3 phases: (1) the menstrual phase (days 1-5); (2) the follicular phase (days 6-14); and the luteal phase (days 15-28). During these phases hormones are produced by the hypothalamus, the anterior pituitary and the ovaries, all of which in turn begin physiological changes in the reproductive system: production of an ovum, build-up of the endometrial lining, ovulation and (without fertilization) shedding of the endometrium. In the latter portion of the luteal phase, there is a rapid decrease in the production of the ovarian hormones, estradiol and progesterone. The fall of these hormone levels causes a breakdown of the endometrial tissues and the menstrual period begins (Lein, 1979).

Definition of Primary Dysmenorrhea

Dysmenorrhea is from the Greek word meaning difficult monthly flow (Ylikorkala & Dawood, 1978). A more colloquial expression is "menstrual cramps," which has been described as "a sharp gripping lower mid-abdominal pain which may radiate to the lower back or upper thigh" (Lamb, 1981). The adjective "primary" differentiates this type of dysmenorrhea from secondary dysmenorrhea, which is menstrual pain caused by a discernable abnormality in anatomy of the pelvic organs or a diagnosed disease process. Additionally, research indicates that primary dysmenorrhea occurs in normal ovulatory cycles as opposed to cycles in which ovulation does not occur (Wentz & Jones, 1976). In other words, primary dysmenorrhea occurs in women who have pelvic organs that appear to be normal in function and anatomy.

The diagnosis of primary dysmenorrhea usually peaks in the teens and early twenties and begins to fall off as the chances for secondary organic difficulties rise in the thirties and forties. The pain is usually associated with the first day of the period and lasts up to 48 hours, i.e., 2 days out 28. Because the amount of pain or discomfort varies

greatly, Morrison (1981) recommends a further restriction in the definition of primary dysmenorrhea to limit it to women women who have self-medicated or have sought medications from a physician for the pain that they experience.

Etiology of Primary Dysmenorrhea

There is now substantial agreement within the medical field that the etiology of primary dysmenorrhea is related to a group of compounds called prostaglandins (PG) (e.g., Akerlund, 1979; Dawood, 1981; Pickles, Hall, Best & Smith, 1965; Wilqvist, 1979). Prostaglandins, in particular PGF_{2alpha}, have been found in significantly higher amounts in the menstrual fluids of women who suffer from primary dysmenorrhea. PGF_{2alpha} increases uterine contractility. On the other hand, PGE_2, although it seems to have a relaxing effect on the uterus, appears to increase neural sensitivity and thus perhaps to lower the threshold for contractility or pain. There is some evidence that indicates that the PGF_{2alpha}/PGE_2 ratio is important in establishing the contractility pattern of the uterus in non-pregnant women (Bygdeman, Bremme, Gillespie & Lundstrom, 1979). In women who have primary dysmenorrhea, the amplitude, frequency, and resting tonus of the uterine contractions and the

intrauterine pressure are all higher than in controls (Lundstrom, 1981).

At the end of a woman's normal menstrual cycle the progesterone level falls off, breakdown of the endometrial tissue occurs, and enzymes are released which initiates a biochemical reaction ending in the production of prostaglandins. Theoretically, an imbalanced ratio of PGF_{2alpha}/PGE_2 causes hypercontractility of the uterus, which in turn produces pain and decreased blood flow (ischemia) which is also often associated with pain (Akerlund, 1979).

The linear medical model is one in which etiology or cause is so important that the possibility too often exists that the "cure" based on the theoretical cause often has side effects sometimes not apparent at the time the new drugs are approved for use. One extreme example of this is the widespread prescribing between 1943 and 1970 of diethylstilbestrol (DES), a synthetic nonsteroidal estrogen, to prevent miscarriage. Ninety percent of DES daughters have a condition of (benign) vaginal adenosis and DES daughters have a much higher incidence of adenocarcinoma (Sherman, Goldrath, Berlin, Vakariya, Banooni, Michaels, Goodman, and Brown, 1983). In addition, the fact that a certain drug is helpful in relieving symptoms of a disease state is sometimes cited as causal evidence that the particular unbalanced physiological state is the primary cause of that disease.

Such assumptions are detrimental when they lead to abandonment of research aimed toward prevention.

Instead when the process is not clear, researchers should strive to take a more global view of the associational links thus far identified by the research, despite the temptation to ascribe causality. They may then find further factors implicated in the disease process or further elaborate the body's physiological mechanisms so that nonpharmacological solutions may be sought. The literature on dysmenorrhea has numerous hints of such a factor related to the sympathetic nervous system. For instance, the uterus is innervated primarily by the sympathetic nervous system (Ash & Greenblatt, 1978). Some of these neurons are short adrenergic nerves which tend to degenerate during pregnancy and not to regenerate completely (Sjöberg, 1979). Note that primary dysmenorrhea is less common in women who have had children than in those who have not (Morrison, 1981).

Calcium antagonist drugs are helpful in certain cardiovascular diseases because of their effect on an over stimulated sympathetic nervous system. These drugs also relieve the pain of primary dysmenorrhea (Dawood, 1981). Jollie (1981), an anatomist, makes numerous statements which compare the similar functioning of uterine and cardiac muscle cells. For example, "In both the heart and uterus . . . efferent nerve impulses regulate the contraction of the

muscle instead of initiating it" (p. 5). He also stated that the contractility of the uterus is affected by changes in the autonomic nervous system (ANS).

Researchers have asserted that women's ovarian hormones play a protective role with regard to the development of cardiovascular diseases until menopause (Vander, Sherman, & Luciano, 1980). At the time when women suffer from primary dysmenorrhea, these same ovarian hormones are at their lowest monthly level (Lein, 1979). This particular physiological state may place her at greater risk to experience sympathetic nervous system overarousal if she is under stress in her environment and/or has behavior patterns consonant with this physiological state and/or has a constitutional predisposition.

Prostaglandins

As stated earlier, abnormal prostaglandin production is clearly implicated in the occurrence of primary dysmenorrhea. However, prostaglandins are very enigmatic substances. They appear in the bloodstream, in joint fluids, and intracellularly in tissues all over the body. In a theoretical article, Yabrov (1980) defines the role of prostaglandins as being an intracellular hormone of sorts.

Prostaglandins would then be in charge of communication within the cell to provide for the adequate functioning of the cell. Indeed, research indicates that prostaglandins do provide specificity of function of different cells or organs when present in appropriate ratios (Lundstrom, 1981). In other words, normal ratios may lead to normal function.

Yabrov (1980) also maintains that "two systems exist for the regulation of the adequate functioning of the cell: One enabling the cell to respond to the demand of the organism, and the other providing for the needs of the cell itself" (p. 337). There must be a relative balance because an extreme drift in either direction will lead either to a dysfunction of the organ, the organ system, or alternatively, to the death of the cell. Prostaglandins then may be a part of the process which maintains this balance for optimal functioning of the total person.

In 1975 Wolfe reviewed numerous studies on the possible roles of prostaglandins in the nervous system. He concluded that "stimulation of sympathetic or parasympathetic nerves is associated with the release of prostaglandins, principally PGE_2 and PGF_{2alpha} . . . . The prostaglandins are not released from preformed stores, rather, *de novo* biosynthesis is accelerated during the stimulation period" (p.31). In addition, there is considerable evidence that indicates that prostaglandins act as modulators of the ANS (Brody &

Kadowitz, 1974; Wolfe, 1975). These studies further indicate that ANS factors should be explored when studying primary dysmenorrhea.

Individual Psychological Research

"Dysmenorrhea is a disease of theories" (Kroger, 1956). Psychosomatic reseach and theorizing on this subject through the mid-1970s have widely varied conclusions, most of which make bold statements regarding the supposed psychogenic aspects of primary dysmenorrhea. The early writers of the 1930s and 1940s based their comments primarily on clinical observations of women with primary dysmenorrhea. For example, "Dysmenorrhea is generally of psychogenic origin. On the basis of several hundred cases it was shown that psychotherapy brings relief of menstrual difficulties (pain, migraine, nausea, vomiting, fainting, etc.)" (Nabor, 1931, p. 108). The conclusions of these authors influenced the hypotheses and designs of the research of the next generation.

A small number of studies (Coppen & Kessel, 1963; Hirt, Kirtz, & Ross, 1967) found no significant correlation of dysmenorrhea with neuroticism. However, since studies with no significant results are usually not published, it is hard

to estimate the effect that bias against negative results has had on the publication of studies with findings in opposition to a psychoneurotic etiology of primary dysmenorrhea. Even those correlational studies which report positive findings and point out that directionality can be interpreted either way still make a statement which firmly links neuroticism and dysmenorrhea in the mind of the reader. Further, there is a general "sick" bias that runs through the menstrual research. Researchers tend to study only negative aspects and attitudes when in fact women also have positive attitudes toward menstruation (Brooks-Gunn, 1973). Following is a critique of the major historical lines of early research.

In their literature review for a study which finds a significant negative association between acceptance of the feminine role and dysmenorrhea, Berry and McGuire (1972, p. 84) quote Menninger: "The envy of the male cannot be repressed and serves to direct her hostility in two directions; she resents the more favored and envied males while secretly trying to emulate them, and at the same time she hates and would deny her own femaleness" (Menninger, 1939).

Deutsch (1947) stated that the mother-daughter relationship is important in determining a girl's attitude toward menstruation and that there may be a tendency for the mother to pass the resentment and rejection of the feminine

role on to her daughter.

Kroger and Freed (1956) found that a group of women with primary dysmenorrhea were four times as often emotionally maladjusted as children than the control group. They cite Wittkower and Wilson (1940) in their review: "Many patients with dysmenorrhea had been either unusually aggressive and boisterous tomboys resentful of their feminine role or ailing, complaining children unwilling to give up their childish dependence on their parents and possessing strong needs or cravings for sympathy and protection." Kroger and Freed also describe these patients in their adult years: "Except during menstruation [they] present a facade of poise and maturity which conceals their underlying instability."

Dunbar (1954) takes another approach to the cause of menstrual pain--the suggestibility of women. "The suggestive significance of the terms 'unwell' or 'sick' can hardly be overestimated" (Dunbar, 1954, p. 506). To substantiate her claim that dysmenorrhea is psychogenic, Dunbar cites Naber (1931) who concludes that in "several hundred cases it was shown that psychotherapy brings relief of menstrual difficulties (pain, migraine, nausea, vomiting, fainting, etc.)" (Dunbar, 1954, p. 507) She also cites Hunter and Rolf (1947) who state, "By suggestion, persuasion, introspection and fear some patients perceive subliminal impulses of which normally they would be unaware. Many

individuals, unfortunately, are born with a lowered 'pain threshold' and throughout their lives are considered by their friends as hypersensitive, delicate, and neurotic." She also indicated that when hormone treatment affected dysmenorrhea it is only by suggestion, citing a number of articles (e.g., Novak, 1932; Randall & Odell, 1943) as evidence. The Novak reference is actually a theoretical article which posits that dysmenorrhea is a disorder of contractility of the uterus. Randall and Odell administered estrogen to dysmenorrheic women. Although they did not find significant treatment effects, some women did experience relief. In neither one of these references do the authors make a statement regarding the suggestibility of women from data.

The research methods in these studies are quite questionable. There are no good operational definitions of primary dysmenorrhea, and many (as stated previously) are based on clinical observations. While this type of study can produce useful information, recent guidelines on non-sexist research conclude that researchers must clearly examine and state their biases before undertaking their studies so that the results may be interpreted accordingly (APA Division 35 Task Force, 1981).

Clearly, there is a strong flavor of misogynist bias in many of the above described publications. For instance, the studies which label as neurotic those women who reject the feminine role either as children or as adults are all too common. Gove's (1976) research strongly suggests that it is actually the traditional female role as defined in this society (increasingly since World War II) which contributes to the mental illness of women. With this information, one might then view these dysmenorrhea subjects somewhat differently. Women who rebel against conforming to society's narrow definition of what a female should be risk the disapproval of society but also behave in such a way that in the long run diminishes the risk of mental illness.

There are two ways in which girls are said to reject their feminine roles: (1) the aggressive tomboy or (2) the complaining dependent. These are both labeled neurotic or maladjusted. This brings to mind the Broverman, Broverman, Clarkson, Rosenkrantz, and Vogel (1970) research. These researchers found that clinicians' judgments of mentally healthy women differed from judgments of mentally healthy men. Women were described as more submissive, less independent, less adventurous, less objective, more easily influenced, less aggressive, less competitive, more excitable in minor crises, more emotional, more conceited about their

appearance, and having their feelings more easily hurt. (These phrases also describe children.) However, when the clinicians were asked to characterize a healthy adult, the ratings did not differ from those that they choose to describe mentally healthy men. Therefore, healthy women are perceived as significantly less healthy than men. Furthermore, women who are not submissive, dependent, etc., are perceived as mentally unhealthy women.

These biases described in the Broverman *et. al* (1972) study which placed women in a no-win double bind were prevalent in the early research and shaped subsequent research (e.g. Berry & McGuire, 1971; Kroger & Freed, 1956; Menninger, 1939; Wittkower & Wilson, 1940). It is no wonder that clinical studies and experimental studies using instruments designed with these underlying biases often found associated neurotic characteristics, especially considering the tendency of editors not to publish studies with nonsignficant results. Lennane and Lennane (1973) described the research and thought on dysmenorrhea as "cloudy," as it is on a number of other disturbances affecting only women. "Although such scientific evidence as exists clearly implicates organic causes, acceptance of a psychogenic origin has led to an irrational and ineffective approach to [its] management" (p. 288).

The more recent researchers have been less willing to make causal statements, and therefore do not conclude that primary dysmenorrhea is psychoneurotic. However, the studies are still plagued by some methodological and conceptual problems. Psychological researchers often do not adequately define primary dysmenorrhea. For instance, many researchers still use the Menstrual Symptom Questionnaire (MSQ) which dichotomizes congestive and spasmodic dysmenorrhea (Chesney & Tasto, 1975). This differentiation was first proposed by Dalton (1964) and refers basically to premenstrual pain commencing up to three days prior to the onset of menstruation (congestive) and primary dysmenorrhea commencing on the first day of the menses (spasmodic). The physiological definitions of these types of dysmenorrhea have not been clarified thus far, leaving results from all studies which use the MSQ to define dysmenorrhea unclear. Further research by Cox (1977) found that the dimension was continuous rather than dichotomous. Yet another study (Webster, Martin, Uchalik, & Gannon, 1979) recommends that the labels be discontinued since their factor analysis revealed seven factors instead of two.

Additionally, Moos' Menstrual Distress Questionnaire (MDQ) (Moos & Leiderman, 1978) has been widely used to classify subjects. This questionnaire yields eight scale scores (e.g., pain, concentration, negative affect) which in turn permit the development of a profile for each woman. The pain scale has subcomponents of headache, cramps, and backache. The pain scale does not measure dysmenorrhea; rather, it is an ipsative measure of pain as it occurs in numerous areas of the body. Therefore, researchers who use this score cannot draw conclusions that relate specifically to dysmenorrhea (cramps) alone.

Despite these limitations, behavioral medicine researchers have designed numerous treatment programs which provided relief for dysmenorrhea sufferers. The following studies had positive significant treatment effects: Reich (1972)--group systematic desensitization; Denmark, Kerenyi, and Murgatroyd (1976)--autogenic and temperature feedback training; Tubbs and Carnahan (1976)--biofeedback; Cox (1978)--individual systematic desensitization; Fleischauer (1977)--education, mechanics of breathing and conditioned neuromuscular relaxation (Lamaze); and Sedlacek and Heczey (1977)--biofeedback. A number of these studies associated anxiety with dysmenorrhea, as well. Heczey (1978) characterized the anxiety as trait anxiety (versus state

anxiety).

It can be concluded from these studies that most dysmenorrheic women physiologically responded to behavioral treatment methods designed to relax them by increasing peripheral blood flow or decreasing muscle tensions. It seems reasonable to conclude that the physiology of these women were out of balance--geared up--and that calming the physiology was helpful. This is further evidence that the overaroused sympathetic nervous system may be involved in the process of primary dysmenorrhea.

Social Psychological Research

Although the behavioral medicine studies mentioned in the previous section did not usually address causality, they are still reductionistic in their design and conceptualization. The are based on a narrow definition of psychology. They do not begin to address the sociological and interpersonal context of these women's lives in order to understand the myriad and complex factors that enter into the formation of life style patterns associated with the physiological imbalance. Women who have primary dysmenorrhea are seen as responsible for their own pain, yet forced to be dependent upon either the medical or psychological community

for medication and/or treatment programs.

In a chapter entitled, "The Concept of Culture and the Psychosomatic Approach," Margaret Mead (1953) wrote, "The culturally disoriented person is subject to new strains of loneliness and isolation which exacerbate the tensions within the personality, and [s]he is at the same time robbed of culturally usual means of reducing these tensions. The available materials on which to work out psychic conflict become one's own body and its immediate environment and one's own family, especially children" (p. 391). The purpose of this section is (1) to examine the sociological context of women as it is related to child rearing patterns in this culture which in turn are related to certain general adult behavioral patterns; and (2) to review relevant sociological research as it applies to primary dysmenorrhea.

Since primary dysmenorrhea is a disorder affecting as many as 29-59% (Morrison, 1981) of women, "society is the patient" (Frank, 1936). Therefore, it may be helpful to explore anger, an emotion often linked to sympathetic nervous system functioning, as it relates to the socialization of women. When examining the range of behaviors most unavailable to women in this culture in terms both of deficits of their social learning histories and also of societal taboos, we find those behaviors which are clear expressions of anger and/or assertiveness which relate to

fulfillment of the individual woman's needs.

There has been little research done which measures or explores anger because it is an experienced emotion. The behavioral trends have instead developed along a line of study using the concept of aggression. Maccoby and Jacklin's (1974) research found that indeed there is a sex difference, males behaving more aggressively than females. Research by Hyde and Schuck (1977) indicates that there are most likely small gender differences which are biologically-based, but that cultural forces interact to create a significant increase in this difference. Earilier work by Eron *et. al* (1974) found that punishment of a child for aggressive behavior increases aggression if the child is not identified with the punisher (mother/son) while if the child is highly identified with the adult, aggression decreases with punishment (mother/daughter). This may be one of the ways socialization of children acts to exacerbate the gender gap relative to aggression.

Current psychoanalytic and object relations theorists (e.g., Chodorow, 1974, 1976, 1978; Dinnerstein, 1976) describe the early development of girls and boys in relation to their mothers who are almost always the primary caretakers, fathers being predominantly absent from the home and nurturing activities. From infancy boys are socialized by caretakers to be more independent than girls are. They

develop their masculine identity in terms of becoming what mother is not. Since in their early childhood, abstract ability does not permit him to figure out how he then should behave, he learns by mother punishing him for inappropriate behaviors. He thus learns to deny his relatedness with mother, develops an identification with mother's idealized unconscious concept of masculinity, and begins to devalue that which is feminine or female. His identity is in terms of self and not in relationship to others.

According to these object relations theorists, mothers with little girls, on the other hand, prolong the dependency due perhaps to the mother's identification with her daughter, redintegrating the bond with her own mother. Thus, the girl develops her sense of being female from direct identification with mother. For oedipal-aged girls who later appear heterosexual, the attraction transfers over to the father, but never completely. She maintains her primary relational attachment to the mother. Therefore, girls develop both a rich affective inner object life and also a feminine identity characterized as self in relation to others.

Lerner (1981) summarizes other theorists' writings on the early mother-infant bond. The infant's first sense of self includes the mother as she provides for his or her needs. As the infant begins to differentiate, he or she experiences the mother as a separate omnipotent person whose

needs are not always in accord with his or her own, an experience which causes feelings of fear, impotence, and frustration. Bernardez (1978) suggests that men and women unconsciously collude in their relationships to maintain the woman in the role of the good, all-providing, selfless mother and to avoid reevoking the feelings associated with the frightening experiences of moments when mother did not provide.

The expression of anger by a woman entails (1) achieving a sense of self-in-the-self, an identity for which women in general are not as well-socialized (Chodorow, 1978); (2) overcoming the unconscious myth that her anger will destroy the relationship (Bernardez, 1978); and last, (3) dealing with the probability of a negative response by the people to whom she is relating and of being labeled as castrating, neurotic, etc. Thus, many women's ability to express anger in a mature way may remain somewhat underdeveloped.

Moving to research that relates specifically to primary dysmenorrhea, one of the most frequently cited sociological studies is by Paige (1973). She found that adherence to the Orthodox Jewish menstrual taboos and rituals was associated with increased menstrual distress. For Catholics, the traditional feminine woman who is not career-oriented and considers a woman's place to be in the home was most likely to experience cramps. She did not find a variable which

predicted for Protestants. Overall, however, no particular religious group had a higher incidence of menstrual difficulties.

Sherif (1980) also emphasizes that women must be studied in their sociological contexts. In her study of the menstrual cycle relating numerous variables to experiences of men and women across a 35-day time span, she found in every case that the largest portion of the variance was accounted for by individual differences. This, in combination with Paige's study, indicates a need for more complex and larger studies which allow patterns of individual responses to varied sociological constructs to emerge.

One study of interest was performed by Widholm and Kantero (1971) on 8,000 Finnish girls and their mothers. He found a significant correlation between mothers and daughters who had dysmenorrhea. One can intrepret such findings within the context of the nature-nurture controversy over genetics versus learning. But this research may also be indicative of the importance of the mother-daughter bond, as hypothesized by the object relations theorists.

Health Psychology

In 1968 Alexander proposed the theory of specificity which hypothesized that every emotional conflict has its own physiological syndrome. He drew a dichotomy between those who would respond to a stressful environmental event (a) by preparation for fight or flight response or (b) by withdrawal from activity. He believed that the latter type showed a regressive, help-seeking, dependent pattern and that this was associated physiologically with a response by the parasympathetic nervous system. Related diseases are ulcers, asthma, and ulcerative colitis. Alternatively, the person who responded with the fight or flight response would have conflicts that related to neurotic anxiety and repressed or inhibited rage. Examples of sympathetic diseases classically associated with these conflicts are rheumatoid arthritis (RA) and hypertension. The theory of specificity has had varied success when tested by research. It seems as though the conflicts themselves have never been unequivocally related to certain disease states, but there is some evidence that indicates that typically people physiologically respond to stress by activation of either the parasympathetic or the

sympathetic nervous system (Wenger & Cullin, 1972).

People who develop cardiovascular diseases and rheumatoid arthritis have a higher incidence of these diseases in their family medical histories. Coronary heart disease and other cardiovascular difficulties are clearly associated with both the sympathetic nervous system (Vander, Sherman, & Luciano, 1980) and the Type A behavior pattern (Jenkins, Rosenman, & Zyzanski, 1974). Additionally, certain health behaviors have been associated with dysmenorrhea. For example, a higher incidence of dysmenorrhea has been reported in subjects who are obese and in subjects that smoke; also, there is a lower incidence of dysmenorrhea in female athletes (Timonen & Procope, 1973; Widholm & Kantero, 1971).

Summary and Hypotheses

This study falls mid-way between being exploratory and being firmly grounded in hypotheses derived from existing research. It is known that women who suffer from primary dysmenorrhea have a higher concentration of prostaglandins in their menstrual fluids. Some studies indicate that the function of prostaglandins is to maintain the balance of individual cells within organ systems. Last, it has been shown that there is an associational link between

prostaglandins and the autonomic nervous system. The major hypothesis of this study is that women who suffer from primary dysmenorrhea may respond to stress in such a way that involves an overresponse of the adrenergic nerves or the sympathetic nervous system. This hypothesis is based on an assumption that sympathetic tonus during early menstruation is higher than usual, associated with the hormonal balance specific to the onset of menses. This assumption has not yet been tested by physiological researchers.

One of the possible reasons that these women may overrespond is that women are not as well-socialized as men to express their own needs for autonomy or their anger. In addition, this society also maintains powerful prohibitions against the expression of anger, particularly for women (Bernardez, 1978; Lerner, 1981). At the same time, the definition of what is an appropriate way of being for a woman is still constrained. The somaticization of unexpressed anger might occur either when women feel hurt and not angry in response to events in which they were victimized in some way or they realize that they feel angry but feel they must not express it because of prohibitions against doing so. The somaticization process most likely involves increased stimulation of the sympathetic nervous system. In primary dysmenorrhea then, the body may be responding by creating a physiological pain state. Pain usually leads people to

withdraw in order to heal or take care of their needs. This withdrawal from the stimulus leads to a situation in which the body and psyche can then begin to restore its balance. The rest then helps to calm the physiology and psychology.

Numerous diseases have been associated to higher sympathetic arousal (e.g., forms of cardiovascular disease). Certain symptoms have also been linked to either sympathetic or parasympathetic arousal. Last, certain behavior patterns are associated with increased risk of disease. Through either genetic inheritance and/or social learning of lifestyle related behaviors, diseases such as coronary heart disease, rheumatoid arthritis, and cancer are passed along through the generations.

In summary, it is hypothesized that difficulty with experiencing or expressing anger would be more likely to occur in women who suffer from primary dysmenorrhea. A second hypothesis links primary dysmenorrhea with a tendency toward sympathetic nervous system overarousal. A corollary of this hypothesis is that good health habits (e.g., diet and exercise) tend to mitigate the effects of sympathetic overarousal and therefore subjects with primary dysmenorrhea will tend to have poorer health habits than the nondysmenorrheic group. Last, since Type A behavior patterns have been linked to cardiovascular disorders (which have sympathetic nervous system involvement), it is hypothesized

that primary dysmenorrheic women would be more likely to exhibit these behavior patterns.

The operationalized definition of primary dysmenorrhea for this study includes all of the following five conditions: (1) no anatomical or physiological abnormalities of the uterus, ovaries or fallopian tubes; (2) experience of menstrual pain or injestion of medication to avoid pain in either of the two previous menstrual periods; (3) the menstrual pain begins the first or second day of the period; (4) the pain lasts two days or less; and (5) the woman either takes medication to mitigate or prevent pain or she finds that the pain interferes with her physical or mental activities.

Method

Subjects

Data were collected from both male and female participants as a part of a larger study. The data on male subjects were not analyzed for this thesis. Subjects were recruited in a number of settings. (1) Undergraduate students taking the following courses: Developmental Psychology, American Thought and Language--Women in America, The Psychology of Women, and Introductory Psychology. Subjects in the latter two classes received extra course credit for participating; (2) Olin Student Health Center Gynecology Clinic; and (3) WomanCare of Lansing, a health care clinic specializing in providing services to women.

One hundred thirty-two women responded to the survey: 11 from WomanCare (7 working women and 4 undergraduate students), 5 from Olin Student Health Center, and 116 from the undergraduate classes. One of the research instruments (Jenkins Activity Survey) has different forms for working

persons as opposed to students. The 7 employed WomanCare subjects were therefore dropped because of insufficient numbers to analyze these data separately. Six subjects were dropped (1--WomanCare, 2--Olin, and 3-Classes) because they responded "Yes" to the question, "Are you taking oral contraceptives (birth control pills)?" This left only 3 subjects each in the WomanCare and the Olin samples. These 6 subjects were dropped in order to have a homogeneous sample with regard to method of recruitment. The final sample was 113 women from undergraduate classes.

Measures

Four measures were constructed and three existing measures were chosen for this thesis.

(1) The following measures were constructed for the purpose of this study. More information on content, reliability, and construction appears in the measurement section.

(a) Questionnaire to characterize the sample: age, marital status, education, religion, ethnicity, and family variables such as religion and socioeconomic status (Hollingshead & Redlich, 1950).

(b) Health psychology questions to obtain information on (1) family medical history of parasympathetic and sympathetic nervous system related diseases and (2) health habits of subjects (diet, exercise, smoking).

(c) A survey to characterize subjects' experience of anger-provoking situations as they occurred during adolescence, subjects' attitude toward the expression of anger, and subjects' relative tendency to express anger.

(d) A gynecological questionnaire to classify whether the subjects were experiencing primary dysmenorrhea; and to characterize the subjects' experience of the pain, how it impacts their lives, and how they cope with it.

(2) Autonomic Nervous System (ANS) Questionnaire (Neziroglu & Yaryura-Tobias, 1977): This instrument asks the subjects to rate the frequency with which various physical symptoms occur when they experience both anger and anxiety. Half of the symptoms are signs of the adrenergic portions of the ANS; the other half are signs of the cholinergic portion. The test yields four scores: (a) adrenergic/anger, (b) cholinergic/anger, (c) adrenergic/anxiety, and (d) cholinergic/anxiety. Adrenergic responders correspond to

sympathetic nervous system responders in the Wenger & Cullen (1972) study mentioned earlier. Further background on the use of this and subsequent instruments will be given in the measurement section.

(3) Habits of Nervous Tension (HNT) (Thomas & Ross, 1963). This instrument asks subjects to indicate whether they experience each of 25 symptoms when under stress. Subjects can then be scored on 8 different factors which indicate patterns of response to stress: (a) activity, (b) appetite, (c) irritation, (d) visceral reaction, (e) general stress, (f) dependency, (g)compulsivity, and (h) stimulation. In addition, one can obtain an HNT score (based on 8 items) which in the original study predicted concurrent serum cholesterol levels. The association of serum cholesterol with emotional stress, diet, heredity, and coronary heart disease all have been demonstrated (summary in Thomas & Ross, 1963). Research continues to the present to sort out these factors.

(4) Jenkins Activity Survey. Two forms were utilized:

(a) The first was Form C for employed people (Jenkins, Zyzanski, & Rosenman, 1979). This form generated four factor scores: Type A behavior; Factor S, speed and impatience; Factor J, job involvement; and Factor H, hard-driving and competitive. The Jenkins Activity Survey was first standardized on

middle class, employed, middle-aged men. Males and females who score high on Type A behavior have been found to be significantly more likely to suffer from cardiovascular disease later in their lives (e.g., Jenkins, Rosenman, & Zyzanski, 1974; Jenkins, 1978).

(b) Form T for students (Glass, 1977). The wording of the adult Form C was modified by dropping 8 of 52 items that referred solely to employment (such as income and job responsibility) and by substituting words so that the items related to college or scholastic involvement rather than job involvement. For example, "When you are in the midst of doing a job . . ." was changed to "When you are in the midst of studying . . ." The student JAS is scored by a unit weighting procedure to derive a Type A score. Two factors emerged from Glass's analysis of 459 male college students: Factor H, hard driving and competitive; and Factor S, speed and impatience.

Operationalized Hypotheses

It was hypothesized that subjects suffering from primary dysmenorrhea will have the following pattern of results of the measures used in this study: (1) fewer positive health habits, (2) greater incidence of sympathetic nervous system related diseases in their family medical histories, (3) less experience of anger or more experience of anger without expression of anger, (4) lower scores on the Activity and Appetite Factors and higher scores on the Dependency Factor and the HNT Scale on the Habits of Nervous Tension Instrument, (5) greater incidence of adrenergic responders on the Autonomic Nervous System Questionnaire, and (6) higher Type A behavior scores on the Jenkins Activity Survey.

Procedure

Either the researcher or an undergraduate research assistant in the classroom settings and personnel from the medical settings briefly explained the purpose of the study, criteria for participation, and an incentive drawing of three

$20 cash awards. Criteria for participation were that subjects be between the ages of 18 and 25, inclusive, and that subjects not be taking oral contraceptives.

The purpose of the study was stated as follows: "Some behavior patterns and emotions have been linked with physical symptoms. The purpose of this study is to explore these relationship as they occur for women who have menstrual cramps and those who do not. In addition, women's responses for some parts of the questionnaire will be compared to men's to see how they are different or how they are the same. The eventual aim of this research is not to find that emotions or behavior cause pain, disease, or discomfort, but to make people aware of potentially health-related and disease-related signs so that they may participate more actively in maintaining health rather than recovering from or treating disease or discomfort."

Last, the incentive of a drawing for three $20 awards among the first 150 subjects to respond was explained. Potential subjects simultaneously received a recruitment letter which explained the purpose of the study and also requested that those interested take a research packet with them to be completed at a later time and returned by mail. The packet included an instruction sheet, a drawing entry blank, a research consent form, and six research instruments. Copies of both the recruitment letter and research packet

contents can be found in the Appendix.

This study was approved by the University Committee on Human Subjects. Informed consent was obtained prior to participation. Responses were anonymous and confidential in that all identifying forms were separated from the research documents immediately upon receipt. Subjects were also informed that if any questions arose during or after the process of completing the instruments, they were to feel free to call the researcher.

Analyses

Dependent variables using a nominal level of measurement were analyzed by Chi square against the dependent measure of primary dysmenorrhea. The remaining interval level variables were analyzed by analysis of variance (ANOVA). All variables were then entered into a discriminant function analysis in order to find which were signficant predictors of primary dysmenorrhea.

Measurement

Classification of Dysmenorrhea

Women subjects were classified as having primary dysmenorrhea if they satisfied all five of the following criteria: (1) no physiological or anatomical abnormalities in the reproductive system; (2) pain during either the last menstrual period or the period two months ago; (3) the pain usually begins on the day the menses begins; (4) the pain lasts for two days or less; (5) either the pain interferes somewhat with work or recreational activities or the subject takes medication for the pain. The specific related questions and percent frequencies of responses in this sample are listed in Table 1.

When classifying subjects it became clear that the group that did fit the operationalized definition of primary dysmenorrhea outlined for this study actually had 2 distinct subgroups. These subgroups were (a) those who had either no pain/discomfort or very little and (b) those who violated the

Table 1

Questions Relevant to Classification of Primary Dysmenorrhea[a]

Item Number	Item Content	Percent Frequency
3	Apart from vaginal discharges and infections, did any doctor ever mention any abnormalities in your uterus, ovaries, or fallopian tubes? (n=113)	
	yes	8
	*no	92
9	Did you either experience pain or take medication so that you would not have pain at the time of your period last month? (n=113)	
	*yes	58
	no	42
10	Did you experience pain and/or take medication at the time of your period two months ago? (n=113)	
	*yes	63
	no	37
13	When does your pain begin in relation to your period? (n=82)	
	the day before my period begins	36
	*the day my period begins	48
	*the second day of my period	2
	none of the above	14
14	How long does your pain last? (n=82)	
	*less than one day	5
	*one day	35
	*two days	42
	greater than two days	19
16	Does the pain usually interfere with the concentration you give to your work or recreational activities? Read through the following responses and check the response that best describes you during the time that you are in pain. (n=82)	
	I find that my attention span increased during menstruation.	0
	My concentration is no different.	23
	*My attention is sometimes carried away from what I am doing.	44
	*My attention is carried to the pain quite a lot.	31
17	To what extent does the pain interfere with your activities? Read through the following responses and check the response that best describes you during the time when you are in pain. (n=82)	
	It does not interfere.	17
	*I must limit my physical activity.	11
	*I would like to limit my physical activity, but I don't.	33
	*I must lie down and rest.	38
20	What, if anything, do you take for your pain most of the time? (n=82)	
	I take no medication at all.	11
	*Aspirin	19
	*Tylenol, or other non-aspirin preparations (e.g., Anacin-3)	20
	*Over-the-counter medications for menstrual pain/blues (e.g., Pamprin, Midol?)	27
	*Prescription medications for menstrual pain (e.g., Motrin, Naprosyn)	17
	*Prescription medications for pain in general (e.g., Darvon, Tylenol #3)	4
	*I'm not sure what I take.	0
	*Other (please specify_____)	2

[a] Subject must mark one astericked item in each of the five sections separated by a dotted line in order to be classified as having primary dysmenorrhea.

criteria primarily because either the pain lasted more than 2 days (8 subjects) or the pain began the day before the onset of menses (10 subjects). The subjects in the latter subgroup (b), however, were experiencing significant discomfort or pain. Because these 2 subgroups were so different, they were separated for the purpose of running further analyses. Therefore, regarding the classification of subjects for dysmenorrhea, three groups emerged: Group 1, Primary Dysmenorrhea (PD), n=51 or 48%; Group 2, Dysmenorrhea (DYS), n=21 or 20%; and Group 3, No Dysmenorrhea (ND), n=35 or 32%. Three subjects were coded as disqualified because they had an IUD, endometriosis, and an ovarian cyst. Additionally, 3 subjects were classified as missing data because they had not answered all of the questions related to defining dysmenorrhea. There were a total of 107 subjects classified.

Health Scale

Six health habit related items were combined to form a scale. These included items about regularity of eating habits, amount of animal fat in diet, amount and regularity of exercising, and smoking. The items are numbered 12, 13, 14, 16, 17, and 18 on the first questionnaire, labeled "Health Psychology Research Study." The items and their

response frequencies are listed in Table 2. The standardized item alpha of the scale was .52. Examination of the corrected item-total correlations revealed that the smoking item did not contribute to the scale (r=.03). It was therefore dropped leaving five items for the Health Scale. The internal consistency reliability (alpha) for the new Health Scale was .62. Item statistics appear in Table 3. Analyses on the smoking item were run separately.

Anger Scale

Six items related to expression and experience of anger were combined to form a scale. The items and percent frequencies of responses are listed in Table 4. For items 3 and 4, subjects were asked to check feelings they had had as a result of disagreeing with each of their parents during adolescence. Since a number of subjects endorsed more than one response, the responses were dichotomized into those who had marked that they had been angry (65%) and those who had not experienced anger (35%). Item 5 asked subjects to imagine an event during which they had been very angry and to mark the response which corresponded to their experience of anger. The responses were: never felt angry, disappointment, dissatisfaction, irritation, somewhat angry, very angry. The

Table 2

Health Items and Response Percent Frequencies

Item	Item Content	Percent Frequency (n=113)
12	Do you eat breakfast regularly?	
	yes	47
	no	53
13	Do you exercise regularly?	
	yes	62
	no	38
14	How many days per week do you usually engage in exercise or physical acticity?	
	Ø days per week	0
	1 or 2 days per week	30
	3 to 5 days per week	48
	6 or 7 days per week	22
16	How would you characterize your activity level in relation to your peers?	
	very minimal; sedentary	0
	less than average	16
	moderate or average	47
	more than average	31
	very active	6
17	Do you smoke cigarettes?	
	no	86
	I smoke less than ½ pack per day.	7
	I smoke ½ to 1 pack per day.	7
	I smoke more than 1 pack per day.	0
18	Do you eat meat?	
	yes, I eat all kinds of meat.	78
	yes, but I avoid red meat and eat mostly chicken and fish	19
	no	4

Table 3

Item Statistics for the Health Scale

Item Content	Corrected Item-Total Correlation	Alpha If Item Deleted
1. Do you eat breakfast regularly?	.21	.63
2. Do you exercise regularly?	.52	.51
3. How many days per week do you exercise?	.45	.52
4. What is your activity level in relation to your peers?	.48	.50
5. Do you eat meat?	.25	.62

Internal Consistency Reliability for Scale = .62

Table 4

Anger Items and Response Percent Frequencies

Item	Item Content	Percent Frequency
3	During incidents when you and your mother disagreed about something that was important to you, which of the following feelings described how you felt?	
	experienced anger	65
	did not experience anger	35
4	When it was your father and you disagreeing, how did you feel?	
	experienced anger	46
	did not experience anger	54
5	Think of an actual event when you were very angry with someone else (e.g., parent, friend, teacher, etc.) during high school. Read over the following responses and choose the one which most applies to you during the event.	
	I didn't ever get angry during high school.	1
	I felt disappointed and hurt.	28
	I felt dissatisfied with the other person.	8
	I was irritated at the other person.	13
	I was somewhat angry at the person.	15
	I was very angry at the person.	35
9	Did you let the other person know you were angry?	
	yes	81
	no	19
15	Do you think it is appropriate to express anger at someone?	
	yes	92
	no	8
16	Do you NOT get angry when you feel you should?	
	Never	17
	Sometimes	68
	Often	15

frequency distribution of the subjects' responses was somewhat bimodal. Therefore, despite the fact that the stem asked subjects to envision an event during which they were very angry, 37% of the subjects reported that they had not experienced any or only a minor amount of anger (never, disappointment, or dissatisfaction). The remaining items inquired if anger was expressed, if subjects thought it was appropriate to express anger, and how often subjects failed to get angry when they thought they should have. The standardized alpha for this scale was .46. Item 15, "Do you think it is appropriate to express anger at someone?", had a corrected item-total correlation of -.03. For this reason and also because it is an attitudinal item while the others relate to subjects' experience, item 15 was dropped from the scale. The resulting new scale, Anger Scale (adolescent experience of anger), was composed of 5 items. Their content and item statistics are listed in Table 5. The internal consistency reliability for the Anger Scale was .89. Further analyses of the dropped item on appropriateness of the expression of anger were run separately.

Table 5

Item Statistics for the Anger Scale

Item Content	Corrected Item-Total Correlation	Alpha If Item Deleted
1. How did you feel when you disagreed with your mother?	.30	.96
2. How did you feel when you disagreed with your father?	.88	.83
3. Choose an event that made you angry. Characterize your experience of anger.	.88	.83
4. Did you express your anger?	.86	.84
5. Do you NOT get angry when you feel you should?	.88	.83

Internal Consistency Reliability for Scale = .89

Autonomic Nervous System Questionnaire

Subjects were asked to rate how frequently they experienced certain physical symptoms under conditions of anxiety and anger. Neziroglu and Yaryura-Tobias (1977) recommended that subjects be given 15 points for endorsing "very frequently," 10 points for "often," 5 points for "sometimes," and no points for "never." They calculated scores for each of the scales: (1) cholinergic signs of anxiety, (2) cholinergic signs of anger, (3) adrenergic signs of anxiety, (4) adrenergic signs of anger. The cholinergic signs correspond to a parasympathetic nervous system response; the adrenergic signs correspond to a sympathetic nervous system response. The authors then used the means on each scale to determine a cut-off point. If a subject scored above the mean on a scale, they were said to have a response of the corresponding system to that particular emotion. If a subject scored above the mean on one system and below the mean on the other for a particular emotion, they were labeled as having a predominant response corresponding to the system with the high scale score.

Subjects for the original study were patients in a mental health center and a control group of staff with no history of psychiatric treatment. No diagnoses, sexual composition, ages, or other demographic data were given to characterize the sample. Summary statistics were reported only for the patient group with an accompanying statement that the control group was not statistically different. Additionally, frequency of item endorsements were similar for the two groups. Test-retest reliability on individual items tested varied from .60 to .80. The mean scale scores and their standard deviations from the original study and the current study are listed in Table 6. The cholinergic means from the two studies (Anxiety-1977 = 42.10, Anxiety-current = 42.45; Anger-1977 = 28.19, Anger-current = 28.30) are very similar. The adrenergic means are significantly larger in the current study (Anxiety-1977 = 57.75, Anxiety-current = 70.37, $t=5.53$, $df=175$, $p<.01$; Anger-1977 = 40.72, Anger-current = 51.18, $t=2.01$, $df=175$, $p<.05$). All current standard deviations are smaller, indicating a more homogeneous sample for the current data set. One of the assumptions underlying the t-test is homogeneity of variance. Although this assumption is violated, the significant differences are not likely to be erroneous since the t-test is very robust against violations of this particular

Table 6

Comparison Descriptive Statistics on Autonomic Nervous System Questionnaire

Neziroglu & Yaryura-Tobias (1977) and Current Study

	Anxiety [a]		Anger [b]	
	1977 Study	Current Study	1977 Study	Current Study
	n=69	n=108	n=69	n=106
Adrenergic				
$\bar{X}$	57.75	70.37	40.72	51.18
S.D.	42.09	35.08	38.14	30.71
Cholinergic				
$\bar{X}$	42.10	42.45	28.19	28.30
S.D.	31.52	24.48	26.88	18.49

[a] Adrenergic Response to Anxiety in the current study was significantly greater than the 1977 study ($t = 5.53$, $df = 175$, $p < .01$).

[b] Adrenergic Response to Anger in the current study was significantly greater than the 1977 study ($t = 2.01$, $df = 175$, $p < .05$).

assumption (Keppel & Saufley. 1980).

The most commonly endorsed items for both studies were somewhat similar. These items are listed in Table 7. The major difference between the two studies is that where all items on the most frequently endorsed list of the 1977 study were adrenergic symptoms, several cholinergic items appeared in the current study as well.

In the study some subjects did not mark every symptom correctly. If subjects skipped only 1 or 2 of the 24 items on either anxiety or anger, these items were recoded using the median score for that item. If a subject failed to mark 3 or more items, she was dropped from further analyses of this instrument as missing data.

First, in order to check on the validity of this instrument and the proposed scoring system, two principle factor analyses (PA2) were run (Varimax rotation and minimum eigenvalue=1.0) on items 1 through 24 for anxiety and anger. These both produced 8-factor solutions, accounting for 65.4 and 62.7 percent of the variance, respectively. However, neither of the factor solutions made any theoretical sense in terms of obtaining factors that represent either pure adrenergic or cholinergic factors. The factor loading matrices appear in Table 8. Numerous other factor solutions were run with no improvement in finding theoretically pure factors. This finding indicates that the symptoms do not

Table 7

Most Frequently Endorsed Items on
Autonomic Nervous System
Questionnaire
Niziroglu & Yaryura-Tobias (1977) and Current Study

1977 Study[a] (n=69)	Current Study (n=113)	% Endorsement[b]
Anxiety		
Butterflies in stomach[c]	Butterflies in stomach[c]	76
Heart palpitations[c]	Wet armpits[c]	64
Muscle(s) feel tense[c]	Sleeping less than usual[c]	52
Dry mouth[c]	Muscle(s) feel tense[c]	48
Sleeping less than usual[c]	Wet hands[c]	47
Wet armpits[c]	Excessive appetite[d]	47
Wet hands[c]	Urge to frequent urination[d]	41
Anger		
Muscle(s) feel tense[c]	Muscle(s) feel tense[c]	57
Sleeping less than usual[c]	Flushing of face[d]	45
Butterflies in stomach[c]	Wet armpits[c]	41
	Sleeping less than usual[c]	41

[a] The procedure the authors used to rank order the symptoms is unclear. They describe it as follows: "To determine which were the most common or more frequently exhibited symptoms under anxiety...and aggression for the patient population, the frequency of response for each symptom was calculated. The 'very often' and 'often' frequencies were used in this calculation since it was the higher incidence of the symptom which was of interest. Any symptom which scored above 20 was considered a symptom commonly or more frequently reported."

[b] based on % of people who endorsed "very frequently" or "often" in the current data set.

[c] adrenergic symptoms

[d] cholinergic symptoms

Table 8a

Factor Loading Matrix

Autonomic Nervous System

Questionnaire[a]

Anxiety Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Cholinergic								
heart burn	-.01	.12	.16	.07	.83	.09	-.00	-.09
diarrhea	(.49)	-.13	-.11	.03	(.47)	.21	.20	(-.44)
inc. urination	(.45)	.38	.01	-.08	(.47)	.06	-.18	.22
weak muscles	.14	.65	.08	.02	.13	.03	.16	.01
sleeping more	.05	.13	.04	-.78	-.09	.22	.07	-.04
flushed face	.18	.21	.52	.15	.36	-.04	.19	.28
waterish mouth	.12	-.02	.69	-.04	.09	-.20	.20	.20
inc. appetite	.31	.09	.07	-.54	.29	-.23	.16	.27
sexual arousal	.11	-.02	.07	-.05	.22	.06	.68	.08
difficult breath	.10	.38	.73	.04	-.03	.17	.08	-.31
stomach growls	.15	.56	-.09	-.07	.21	.22	.19	-.00
dry palms	-.06	.13	.10	.05	-.21	-.03	.78	.05
Adrenergic								
constipation	.01	-.00	.02	-.00	.25	.78	.06	.10
tense muscles	.48	.28	.11	.12	.24	-.04	.11	.31
sleeping less	.31	.19	.22	.60	.23	.17	.36	-.02
pallor of face	.34	.41	.02	-.08	-.23	.58	-.06	-.01
cold feet	.16	.74	.11	.04	-.07	-.03	-.15	.09
wet hands	.69	.30	.09	-.07	.10	-.06	-.18	.08
wet armpits	.75	.08	.13	-.15	-.04	.23	.20	-.08
heart palpitations	.15	-.15	.69	.10	.06	.39	-.13	.17
dry mouth	.43	.26	.18	.42	.08	.26	.00	.15
goose pimples	.11	.05	.13	-.04	-.06	.14	.14	.84
queasy stomach	.77	.14	.16	.22	-.02	.09	.06	.06
poor appetite	.23	.17	.25	.46	-.12	.46	.08	-.08

[a] Underlines indicate the highest clear loadings for each item.

Table 8b

Factor Loading Matrix

Autonomic Nervous System

Questionnaire[a]

Anger Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Cholinergic								
heart burn	.03	.18	.03	-.02	-.01	.01	.85	.01
diarrhea	.01	.69	-.02	.14	.18	-.02	.05	.18
inc. urination	.32	.47	.15	-.05	-.20	-.15	.28	-.18
weak muscles	.13	.19	.08	-.08	.26	.05	.02	.65
sleeping more	-.03	.32	.61	-.30	-.06	.24	-.24	.10
flushed face	.69	-.11	.17	.20	.39	-.04	.10	-.10
waterish mouth	.49	.04	.54	.16	.00	-.11	-.15	.20
inc. appetite	.27	.31	-.09	.18	-.68	-.26	.15	-.06
sexual arousal	-.04	-.01	-.00	.21	-.12	-.01	.03	.81
difficult breath	.12	.04	.62	.12	.30	.05	.33	.13
stomach growls	.11	.11	.68	.16	-.22	.02	.05	-.24
dry palms	.03	.21	-.24	.33	.58	-.22	-.22	.12
Adrenergic								
constipation	.05	.70	-.00	.14	-.14	.24	.11	.11
tense muscles	.44	.05	.04	.61	.19	.14	.00	.16
sleeping less	.03	.23	.15	.84	-.03	.03	.03	.09
pallor of face	.09	.60	.32	.12	.29	-.14	.04	-.08
cold feet	.33	-.21	.45	.21	-.05	.01	.22	.18
wet hands	.74	.05	.10	.07	-.05	.25	.11	.09
wet armpits	.66	.26	.06	-.02	-.07	.22	-.00	-.01
heart palpitations	.22	.04	.19	.29	.16	.45	.24	-.08
dry mouth	.02	.41	.14	.46	.24	.38	.16	-.10
goose pimples	.17	.00	-.03	-.02	.06	.78	-.04	.05
queasy stomach	.16	.07	.07	.26	-.03	.42	.47	.11
poor appetite	.19	.25	-.05	.10	.67	.13	.16	.01

[a] Underlines indicate the highest clear loadings for each item.

group in sets of symptoms that relate either to the parasympathetic or sympathetic nervous system. Therefore the factor scores were not used.

A unit weighting system was applied to the data. The four scales, Anxiety Cholinergic, Anxiety Adrenergic, Anger Cholinergic, and Anger Adrenergic were calculated and correlated. The intercorrelations of the four scales varied from .49 to .75. All correlations were statistically significant, indicating that subjects cannot differentiate along the lines of adrenergic and cholinergic responses to these emotional states. Possible implications of this finding follow in the discussion section. The scale intercorrelation matrix appears in Table 9.

Based on the current sample, neither the factor analysis or the intercorrelations of the scales indicate that this measure differentiates between adrenergic anad cholinergic responders. This casts some doubt on the validity of the instrument, given that the authors claim that it is "highly reliable and valid" in the measurement of predominance of the adrenergic or cholinergic system. The classification system suggested in the 1977 article will be used for further analyses of this instrument. The authors classified subjects as adrenergic responders if they scored above the mean for a particular emotion on the adrenergic scale responders were classified similarly.

Table 9

Inter Scale Correlations for
Autonomic Nervous System Questionnaire[a]

		Cholinergic		Adrenergic	
		Anxiety	Anger	Anxiety	Anger
Cholinergic					
	Anxiety	---			
	Anger	.66	---		
Adrenergic					
	Anxiety	.57	.49	---	
	Anger	.53	.63	.75	---

[a]All correlations are significant, $p < .001$

Habits of Nervous Tension

This instrument was originally factor analyzed on 1085 medical students, 92% of whom were male (Thomas & Ross, 1963). Twenty-five typical reactions to stress were listed and subjects were asked to indicate whether or not they usually reacted in these ways. Table 10 is a comparison of the two studies in terms of the frequency with which each item was endorsed. The total mean level of item endorsement for the current study was significantly higher ($t=10.90$, $df=1196$, $p< .001$). The following items contribute most to this effect: exhaustion, depressed feelings, increased urge to sleep, increased urge to eat, anger, irritability, urge to confide in others, and urge to withdraw. These data suggest that the original factor analysis might also be different from one done on the current data set.

In the original study all items with frequencies less than 5% were dropped, and a principal components analysis with varimax rotation was run, producing an 8-factor solution with eigenvalues greater than 1.00. Low scores on Factors I (activity) and II (appetite) and high scores on Factor VI (dependency) were associated with concurrent increased serum

Table 10

Item Frequencies for the
Habits of Nervous and Tension Questionnaire:
Thomas & Ross (1963) and Current Study[a]

Item	% Frequency of Endorsement	
	1963 Study n=1085	Current Study n=113
1. Exhaustion	14	42
2. Exhilaration	21	13
3. Depressed feelings	20	65
4. Uneasy or anxious feelings	49	61
5. General tension	80	82
6. Increased activity	65	52
7. Decreased activity	5	20
8. Increased urge to sleep	14	34
9. Increased difficulty in sleeping	45	59
10. Increased urge to eat	18	47
11. Loss of appetite	37	41
12. Nausea	6	22
13. Vomiting	1	4
14. Diarrhoea	15	13
15. Constipation	4	6
16. Urinary frequency	31	32
17. Tremulousness	16	24
18. Anger	22	57
19. Gripe sessions	16	38
20. Concern about physical health	4	12
21. Tendency to recheck work	23	39
22. Urge to confide	27	60
23. Urge to be alone	20	61
24. Irritability	9	25
25. Philosophic effort	24	10
Average percent endorsement per item	23.5%	36.8%

[a] $t=10.90$, $df=1196$, $p < .001$

cholesterol. Additionally, Thomas and Ross identified an HNT Scale using 942 white males. They rank ordered the men according to their serum cholesterol blood test and discovered items which differentiated those whose cholesterol levels were above the median from those below. The factors and the HNT Scale items for the 1963 study are displayed in Table 11.

A principle factors analysis with varimax rotation was done on the current data set with the subcomponents on item 18 scored separately (anger concealed and anger expressed) and with item 13 (vomiting) dropped from the analysis (frequency=4%). This produced a 10 factor solution with eigenvalues greater than 1.00. Five through 9 factor solutions were also run. The 8 and 9 factor solutions were most satisfactory in terms of theory. Alpha reliabilities were run on scales derived from both the 8 and 9 factor solutions. Based on greater factor internal consistency, the 9 factor solution was chosen. The factors and their internal consistency statistics are listed in Table 12. These factors accounted for 60.84% of the variance. The rotated factor loading matrix appears in Table 13.

Although in both studies the three major predicting factors (activity, appetite and dependency) emerged, the scales based on the factor solution of the current data set was chosen for further analysis. The internal consistency of

Table 11

8 - Factor Solution -- Habits of Nervous Tension
(Thomas & Ross, 1963)[a]

Factor		Items	Loading
I.	Activity[b]	decreased activity	+
		depression	+
		exhaustion	+
		urge to sleep	+
		increased activity	-
II.	Appetite[b]	loss of appetite	+
		nausea	+
		urge to eat	-
II.	Irritation	gripe sessions	+
		irritability	+
		anger	+
IV.	Visceral Reaction	urinary frequency	-
		nausea	-
		diarrhea	-
V.	General Stress	general tension	-
		difficulty sleeping	-
		philosophic effort	+
VI.	Dependency[c]	urge to confide and seek advice	+
		urge to be alone	-
VII.	Compulsivity	tendency to check & recheck work	+
VIII.	Stimulation	exhilaration	+
		increased activity	+
HNT Scale[b]		loss of appetite	+
		exhaustion	+
		urge to eat	-
		nausea	+
		anxiety	+
		urge to be alone	+
		tremulousness	+
		depression	+

[a] Sample = 1085 medical students (92% men)

[b] Associated with high concurrent serum cholesterol levels

[c] Associated with low concurrent serum cholesterol levels

TABLE 12

9-Factor Solution
Habits of Nervous Tension
(Current Study)

Factor		Item	Corrected Item Total Correlation	Alpha If Item Deleted	Scale Standardized Alpha
I	Activity	Depression	.45	.60	.67
		Increased Activity	.47	.58	
		Decreased Activity	.45	.60	
		Urge to Sleep	.44	.61	
II	Appetite	Loss of Appetite			.60
		Urge to Eat			
III	Anxiety	Anxiety	.39	.35	.51
		Urinary Frequency	.28	.45	
		Tremulousness	.35	.40	
		Check & Recheck Work	.19	.53	
IV	Low Energy	Exhaustion	.30	.35	.47
		General Tension	.27	.40	
		Irritability	.30	.34	
V	Physical Health	Nausea	.30	.34	.46
		Diarrhea	.28	.35	
		Constipation	.24	.40	
		Health Concerns	.23	.40	
VI	Dependency	Gripe Sessions	.26	.48	.50
		Urge to Confide in Others	.35	.33	
		Urge to Be Alone	.33	.37	
VII	High Energy	Exhiliaration			.22
		Difficulty Sleeping			
VIII	Anger	Anger Expressed			.19
		Anger Concealed			
IX		Philosophic Effort			

TABLE 13

Factor Loading Matrix -- Habits of Nervous Tension
(Current Study)[a]

Item	Activity	Appetite	Anxiety	Low Energy	Physical Health	Dependency	High Energy	Anger	Philosophic Effort
Fatigue	.25	-.11	.14	.54	.23	.03	.06	-.14	-.39
Exhiliaration	-.14	-.09	-.05	-.25	.06	.02	.72	.11	-.05
Depression	.62	.16	.03	.29	.06	-.07	-.16	-.04	.23
Anxiety	.11	.18	.69	.14	.01	-.07	.01	-.04	-.01
General Tension	.02	.13	-.13	.67	.10	-.24	-.03	.03	-.13
Increased Activity	-.69	.07	.05	.09	.04	.00	.28	-.07	.12
Decreased Activity	.77	-.07	.07	.01	.06	.06	.18	-.13	-.05
Urge to Sleep	.58	-.20	.07	.26	-.08	.11	-.13	.21	-.26
Difficulty Sleeping	-.08	.34	.09	.17	-.00	.00	.65	-.07	-.00
Urge to Eat	.18	-.81	.06	.02	.07	-.08	.05	-.13	.14
Loss of Appetite	.01	.83	.07	.12	.04	-.03	.18	-.16	-.02
Nausea	.13	.38	.31	.03	.44	.02	.06	.11	.08
Diarrhea	.23	.26	.24	-.18	.56	-.13	-.11	.04	.02
Constipation	-.15	.02	-.10	.11	.57	.35	-.03	-.21	-.12
Urinary Frequency	.03	-.25	.59	.16	.33	.10	-.04	-.14	.07
Tremulousness	.06	.04	.59	.02	.01	-.05	.43	-.01	-.03
Gripe Sessions	-.03	.01	.13	.38	.13	.46	.13	.39	.10
Concerned with Health	-.06	-.20	-.06	.10	.72	-.07	.13	.12	.00
Check & Recheck Work	-.19	-.05	.56	-.17	-.14	-.03	-.13	.23	-.17
Urge to Confide	.34	-.03	-.04	.03	.03	.58	.10	-.08	.45
Tendency to Withdraw	.01	-.05	.08	.10	.04	-.84	.06	-.01	.09
Irritability	.10	.02	.24	.63	-.10	.20	-.09	.01	.15
Philosophic Effort	-.13	-.16	-.04	-.07	.01	.02	-.08	.09	.74
Anger Expressed	.02	.03	-.04	.08	-.02	-.08	.10	.81	.18
Anger Concealed	.02	.08	-.06	.27	-.15	-.16	.18	-.57	.37
Eigenvalue	2.21	1.96	1.81	1.77	1.61	1.58	1.46	1.45	1.35
Percent Variance	8.85	7.83	7.23	7.09	6.44	6.34	5.86	5.79	5.41 = 60.84

[a] Underlines identify factor on which each item has the greatest loading

the HNT scale (as defined by the 1963 study) on the current data was .50.

Jenkins Activity Survey

The JAS for Type A behavior was developed empirically by selecting items which best discriminated Type A from Type B men, as measured by the Structured Interview technique. Jenkins (1975) defined Type A behavior as follows:

> " . . . an overt behavioral syndrome or style of living characterized by extremes of competitiveness, striving for achievement, aggressiveness (sometimes stringently repressed), haste, impatience, restlessness, hyperaltertness, explosiveness of speech, tenseness of facial muscles, and feelings of being under pressure of time and under the challenge of responsibility. Persons having this pattern are often so deeply committed to their vocation or profession that other aspects of their lives are relatively neglected. Not all aspects of this syndrome or pattern need be present for a person to be classified as possessing it. The pattern is neither a personality trait nor a standard reaction to a challenging situation, but rather the reaction of a characterologically predisposed person to a situation that challenges him or her. Different kinds of situations evoke maximal reactions from different persons" (Jenkins, Zyzanski, & Rosenman, 1979, p. 3).

The Type A scale was developed by use of optimal scaling, discriminant function analysis, and cross-validation procedures. The three factors Speed and Impatience (S), Job Involvement (J), and Hard-Driving and Competitive (H), were derived by use of factor analysis and further refined by use of discriminant function analysis.

The JAS, Form C, for adults uses a complex weighting system to arrive at the four scale scores: Type A, Factor S, Factor J, Factor H. The numerous internal consistency, test-retest reliability, and validity studies are summarized in the JAS manual (Jenkins, Zyzanski, & Rosenman, 1979).

Glass (1977) altered Form C in order to create a student version. He applied a unit-weighting scoring procedure for responses characteristic of Type A behavior on the 21 items of the Form C Type A scale. The median scores for males were between 7 and 8 in a number of studies. Subjects with scores greater than 7 were designated Type A. The median for female students fell between 6 and 7. He then factor analysed the male subjects. Two clear factors similar to the Form C Factors H and S emerged. These factors were defined by items with loadings greater than .35. The items and their factor loadings appear in Table 14.

TABLE 14

Jenkins Activity Survey, Student Form
Factors from Glass (1977) [a,b,c]

Hard Driving and Competitive Factor

Jenkins Activity Survey Item (abridged)	Factor Loading
Rated definitely hard driving and competitive by wife and friends	.55
Rates self definitely hard driving and competitive	.51
Considers self more responsible than the average student	.49
Gives much more effort than the average student	.46
Is stirred into action by college	.46
Considers self more precise than the average student	.45
Approaches life much more seriously than the average student	.41
Rated probably relaxed and easy going by most people	-.41
Rates self as definitely not having less energy than most people	.36
Frequently sets deadlines for self	.36
Maintains a regular study schedule during vacations	.35

Speed and Impatience Factor

Jenkins Activity Survey Item (abridged)	Factor Loading
Often hurries even when there is plenty of time	.43
Often told of eating too fast	.40
Eats more rapidly than most people	.39
Frequently hurries a speaker to a point	.38
Rated by most people as probably not doing most things in a hurry	-.38
Hurries much less than the average student	-.37

---

[a] Factors are defined by items with loadings greater than .35

[b] n = 459 male college students

[c] This table is adapted from Glass (1977), page 177.

The median Type A scale score for the current data set was 9.79 which is considerably higher than the median of 6 to 7 reported by Glass (1977). Additionally, since his factor solution was done on males only, a principle factors analysis with varimax rotation was run on these data. Question 25 on the student version was dropped since it was not on the original JAS, Form C; nor was it relevant to any of Glass's analyses. The Question 36 stem read as follows: "How often do you go the university when it is officially closed (such as nights or weekends)? If this is not possible circle Ø." The responses were (1) rarely or never, (2) occasionally (less than once a week), and (3) once or more a week. This question was also dropped from the factor analysis since 21% of the respondents marked Ø. The resulting factor solution resulted in 15 factors with eigenvalues greater than 1.00. A 9-factor solution was chosen from others run with the criteria for selection being that the items grouped in a way to form 3 theoretical factors similar to those derived from Form C. These factors accounted for 51.2% of the variance. The rotated factor loading matrix appears in Table 15.

The first three factors derived from this analysis correspond theoretically with content related to Factors H, J, and S of Form C. These factors and their scale statistics appear in Table 16.

TABLE 15

Jenkins Activity Survey, Student Form
Factor Loading Matrix
(Current Study)[a]

Item Number	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9
1	.16	-.26	-.11	.05	-.31	-.30	-.24	-.30	-.21
2	-.01	-.22	-.05	(.37)	.13	.29	-.10	.22	.39
3	.23	.13	.15	-.14	.03	.00	.03	.15	.56
4	.27	-.00	.22	.03	-.02	-.05	.46	.19	-.07
5	.12	-.00	.17	.01	.02	-.17	.56	-.18	.03
6	.18	.01	.19	.01	.09	.78	-.10	-.11	-.14
7	.07	-.06	.05	-.04	.09	.73	-.20	-.03	-.00
8	-.08	.15	.16	-.05	(.36)	.08	.37	-.17	.10
9	.07	-.06	.21	-.06	.47	.04	.04	.02	.28
10	.28	-.33	.01	.02	.56	.08	-.05	.03	-.05
11	-.11	-.26	.37	-.29	-.17	-.18	.12	.33	-.01
12	-.09	.03	-.04	.04	.42	.35	(.38)	-.02	-.23
13	.14	-.27	-.18	-.09	-.31	.25	.08	.40	.16
14	-.06	.19	-.45	.35	-.19	.30	.02	.00	.14
15	.04	-.15	-.16	-.14	-.02	.15	-.49	-.11	.04
16	.73	.15	.25	-.12	.10	.09	.05	.07	-.05
17	.79	.16	.18	-.21	.08	.14	.08	.06	-.02
18	.75	.18	.17	-.11	.11	.08	.10	.07	.17
19	-.09	-.14	-.02	.61	-.19	-.09	.09	.01	.05
20	.38	.45	-.17	-.01	.05	-.14	.01	-.05	-.14
21	-.20	.04	.18	.69	-.10	.08	.05	-.06	.10
22	.34	-.06	.66	.09	.01	-.01	.11	.16	.06
23	.05	.00	.51	-.05	.38	.07	.24	.15	-.11
24	.54	-.14	-.08	-.40	.12	.02	-.06	-.06	.03
26	.04	-.11	.66	.05	-.04	.19	.23	-.17	.31
27	.20	.09	.76	.11	.04	.14	.06	-.00	-.05
28	-.21	.07	.16	-.33	-.24	.18	.00	-.48	-.02
29	-.27	.27	-.03	-.20	.28	-.02	-.00	.49	-.27
30	.02	.00	-.01	-.11	.10	-.03	.02	-.59	-.08
31	-.21	-.09	.44	.06	-.52	.19	-.27	.00	.12
32	.05	.01	-.18	-.11	-.01	.23	.37	.02	.29
33	.24	-.16	.08	.09	-.35	.28	.25	-.03	-.43
34	-.16	-.12	.02	.09	-.47	-.13	.12	.18	-.02
35	-.07	-.14	-.03	.19	-.03	-.17	.13	-.05	.56
37	-.13	.01	-.17	.07	.06	.10	.07	-.43	-.02
38	-.22	-.20	-.01	.62	.15	-.06	-.02	.05	-.15
39	.03	-.07	.06	.29	.06	.09	-.50	.11	-.12
40	.20	.77	.01	-.10	.12	-.16	.07	.12	.00
41	-.11	.72	-.06	-.09	-.16	.06	.13	-.00	-.02
42	.16	.30	.11	-.34	.29	.02	.38	.27	.01
43	.04	.63	-.08	-.17	.17	-.01	-.04	-.05	.03
44	.20	.70	.07	.09	-.12	.11	.12	-.07	-.01

[a] Underlines identify factor on which each item has the greatest loading.

TABLE 16

Jenkins Activity Survey, Student Form
Factor Scale Item Statistics

Factor	Item Number	Item Content	Corrected Item-Total Correlation	Scale Alpha
Hard-Driving & Competetive	16	Do people consider you hard-driving and competitive?	.75	.83
	17	Do you consider yourself hard-driving and competitive?	.78	
	18	Would your closest friend consider you hard-driving and competitive?	.73	
	24	Do you enjoy competition and try hard to win?	.40	
College Involvement	20	Would people agree you take your work seriously?	.39	.74
		Compared to others:		
	40	I put forth more effort.	.63	
	41	I am more responsibile.	.56	
	43	I am more precise.	.43	
	44	I approach life more seriously	.54	
Speed and Impatience	11	How often do you arrive late?	.27	.70
	14	Do you become impatient when waiting in line?	.33	
	22	Do you get irritated easily?	.57	
	23	Do you do most things in a hurry?	.39	
	26	How was your temper when you were younger?	.48	
	27	How is your temper now?	.58	

Further analyses will utilize the Glass (1977) method of calculating Type A scale scores and a unit weighting method of calculating the three factor scores based on these data: Factor H (hard driving and competitive), Factor S (speed and impatience), and Factor C (college involvement).

Results

Demographic Data

Subjects for this study had a mean age of 19.5 years. Most of the subjects were Caucasian, single, full-time students who had completed at least one year of college. They came from either Catholic or Protestant and Social Class III or IV (Hollinghead & Redlich, 1950) family backgrounds. None of the demographic variables were significantly related to the variable of dysmenorrhea classification. Frequency data, analysis of variance, and Chi-square analyses appear in Table 17.

Table 17

Analyses of Demographic Variables

Variable	$\bar{X}$	% frequency in samples * (n=113)	F Ratio	χ^2	df	p
Age	19.5		.232		105	.79
Education				4.20	4	.38
Bachelors Degree		9				
Some College		89				
Less than 1 yr. College		2				
Religious Background				6.07	8	.64
Catholic		48				
Protestant		42				
Jewish		3				
Other		4				
None		4				
Ethnicity				.77	2	.68
Minority		12				
Black (7)						
Hispanic (1)						
Native Amer. (4)						
Asian Amer. (1)						
Caucasion		88				
Social Class				5.36	6	.50
I		--				
II		13				
III		30				
IV		53				
V		4				
Marital Status						
Single		97				
Divorced		1				
Married		1				
Cohabitating		1				

*Occasionally frequencies do not add up to 100% due to rounding error.

Hypothesis Testing

The following variables were hypothesized to significantly differentiate subjects who experience primary dysmenorrhea from those who do not: (1) Health Scale, smoking, family history of sympathetic nervous system related diseases (FH-Symp); (2) adrenergic responders as identified by the Autonomic Nervous System Questionnaire; (3) Type A Behavior as measured by the student version of the Jenkins Activity Survey; (4) Factor I (activity), Factor II (appetite), Factor VI (Dependency), and the HNT Scale, as measured by the Habits of Nervous Tension instrument; and (5) attitude toward the expression of anger (Anger Attitude) and the experience of anger scale (Anger Scale). In fact, seven of these 11 variables did predict classification of dysmenorrhea in a stepwise discriminant function analysis. Another significant predictor was the HNT Anger Factor, a new factor which emerged as a result of the factor solution on these data. Therefore, this factor was not specifically hypothesized a priori to be related to the classification. However, it was indirectly hypothesized along with the other anger variables. In addition, two unhypothesized significant

variables emerged: (a) family history of parasympathetic nervous system related diseases (FH-Para) and (b) Factor C, College Involvement, as measured by the Jenkins Activity Survey student form. Following is a discussion of the specific results of the statistical analyses of all measures.

Health Related Variables

There were 4 health-related variables: (1) the Health Scale, a measure of diet and exercise habits; (2) smoking; (3) FH-Symp, family history of sympathetic nervous system related diseases (incidence of cardiovascular disease and rheumatoid arthritis in parents' and grandparents' medical history known to subject); (4) FH-Para, family history of parasympathetic nervous system related diseases (incidence of ulcer, mucous colitis, ulcerative colitis, and asthma in parents' and grandparents' medical history that were known to subject). The first three variables were hypothesized to be related to the occurrence of primary dysmenorrhea. Of these three variables, none were statistically significant in differentiating the three dysmenorrhea groups.

ANOVA indicated, however, that the fourth variable, FH-Para, was statistically related to dysmenorrhea classification ($F=5.14$, $df=105$, $p<.01$). Scheffe's procedure for post hoc analysis identified two subsets of homogeneous groups. (The subsets were significantly different from each other, while the groups comprising each subset were not significantly different from each other.) One subset was comprised of two groups which experience pain (PD and DYS), and the other subset was comprised of the two groups not diagnosed as having primary dysmenorrhea (DYS and ND). The subset experiencing pain scored significantly higher on incidence of family history of parasympathetic diseases. (DYS and ND). The statistics for the health-related variables are summarized in Table 18 and Table 19.

Autonomic Nervous System Questionnaire

The methodology suggested by Neziroglu and Yaryura-Tobias (1977) was used to classify a person as adrenergic or cholinergic responders. That is, for example, subjects scoring above the mean on the adrenergic symptoms and below the mean on the cholinergic symptoms were classified as adrenergic responders. Subjects classified

Table 18

Analysis of Variance Summary for Three Health-Related Variables

Variable	Group Mean Values[a]						
	PD	DYS	ND	Grand Mean	F	df	p
Health Scale[b]	10.18	10.33	11.17	10.54	2.95	106	.06
Family History of Sympathitic Diseases	1.55	2.33	1.79	1.83	1.67	105	.19
Family History of Parasympathetic Diseases	.63	.33	.15	.42	5.14	105	<.01

[a] Groups which are homogenous (not significantly different) according to Scheffe's post hoc analysis are connected by an underline.

[b] High scores indicate more positive health habits.

Table 19

Chi Square Analysis for Smoking Variable

	PD	DYS	ND	Total
No	44	19	30	93
Less than ½ Pack	3	2	2	7
Half to 1 Pack	4	0	3	7
More than 1 Pack	0	0	0	0
Total	51	21	35	107

$\chi^2 = 2.12$

df = 4

p = .71

into four groups for each emotional state (anxiety and anger) included those who were (1) clear sympathetic responders (high adrenergic, low cholinergic); (2) clear parasympathetic responders (low adrenergic, high cholinergic); (3) high physical responders (high adrenergic, high cholinergic); and (4) low physical responders (low adrenergic, low cholinergic). Chi square analyses with dysmenorrhea classification as the other dependent variable were not significant for either anger or anxiety. Summary statistics appear in Table 20.

Jenkins Activity Survey

Analysis of variance tests were run on four sets of scores: Type A Behavior (Glass scoring scheme), Factors H, S, and C (using unit weighting from factor analysis on these data). Of these four dependent variables, only Factor C, college involvement, was statistically significant (F ratio=4.39, df=106, $p<.05$). Scheffe's procedure for post hoc analysis revealed two homogeneous subsets: (1) the dysmenorrheic group (DYS, mean=10.86) and (2) the primary dysmenorrheic (PD, mean=9.6) and the non-dysmenorrheic (ND, mean=9.20) groups. Summary statistics for these analyses are presented in Table 21.

Table 20

Chi Square Analyses

Autonomic Nervous System Questionnaire

Anxiety	Sympathetic Responders	Parasympathetic Responders	High Responders	Low Responders	Total
Primary Dysmenorrhea	3	7	19	17	46
Dysmenorrhea	5	2	6	8	21
No Dysmenorrhea	4	1	12	18	35
Total	12	10	37	43	102

$\chi^2 = 8.56$, df = 6, p = .20

Anger	Sympathetic Responders	Parasympathetic Responders	High Responders	Low Responders	Total
Primary Dysmenorrhea	9	5	15	17	45
Dysmenorrhea	3	2	6	9	20
No Dysmenorrhea	6	3	12	13	34
Total	18	10	33	39	100

$\chi^2 = .60$, df = 6, p = 1.00

Table 21

Analyses of Variance Results for the
Jenkins Activity Survey

	Group Mean Values[a]						
	PD	DYS	ND	Grand Mean	F	df	p
Type A Behavior	10.00	8.57	10.14	9.77	2.56	106	.08
Factor H	9.43	10.48	9.86	9.78	1.28	106	.28
Hard Driving and Competitive							
Factor C	9.16	10.86	9.20	9.50	4.30	106	.02
College involvement							
Factor S	10.16	10.81	10.66	10.45	.52	106	.60

[a] Groups which are homogenous (not significantly different) according to Scheffe's post hoc analysis are connected by an underline

Habits of Nervous Tension

ANOVA was run on each of the nine factor scores (solution from these data) and the HNT Scale (from the literature) of the Habits of Nervous Tension instrument. Of these 10 tests, none were statistically significant. Results are summarized in Table 22.

Anger Related Variables

Neither of the two analyses on attitude toward expression of anger or the Anger Scale on the experience of anger were statistically significant. Results are summarized in Table 23.

Table 22

Analyses of Variance on the
Habits of Nervous Tension
Questionnaire

Factor		Group Mean Values PD	DYS	ND	Grand Mean	F Ratio	df	p
1.	Activity	1.71	1.81	1.51	1.66	.37	106	.69
2.	Appetite	.84	1.00	.94	.91	.28	106	.76
3.	Anxiety	1.57	1.85	1.31	1.54	1.36	106	.26
4.	Low Energy	1.65	1.62	1.26	1.51	2.05	106	.13
5.	Physical Health	1.31	1.29	1.43	1.34	.18	106	.84
6.	Dependency	.55	.43	.40	.48	.47	106	.63
7.	High Energy	.67	.76	.77	.72	.30	106	.74
8.	Anger	.84	.90	.97	.90	.35	106	.71
9.	Philosophic Effort	.12	.05	.09	.09	.44	106	.65
HNT Score		2.73	3.00	2.37	2.66	.89	106	.42

Table 23a

Chi Square Analyses of

Attitude Toward Expression of Anger

Is it appropriate to express anger?	Primary Dysmenorrhea	Dysmenorrhea	No Dysmenorrhea	Total
yes	46	18	32	96
no	5	2	2	9
Total	51	20	20	105

$\chi^2 = .46$, df = 2, p = .79

Table 23b

Analysis of Variance of

Experience of Anger Scale

Group Means			Grand Mean	F Ratio	df	p
PD	DYS	ND				
7.45	8.00	8.24	7.85	.65	106	.53

Discriminant Function Analysis

A discriminant function analysis was performed using 22 dependent variables to classify the 3 independent measure groups (PD, DYS, ND). The variables are as follows.

1. Health Scale: The questions relate to diet and exercise health habits. High scores indicate positive health habits.
2. Smoking: High scores indicate smaller frequency of smoking behavior and therefore a more positive health habit.
3. FH-Symp: Family history of sympathetic nervous system related diseases.
4. FH-Para: Family history of parasympathetic nervous system related disease.
5. Adrenergic Responders to Anxiety: The categorical ANS data were recoded to create a dichotomous variable of clear adrenergic responders vs. all other classifications.
6. Adrenergic Responders to Anger: The categorical ANS data were recoded to create a dichotomous variable of clear adrenergic responders vs. all other classifications.
7. Type A Behavior (JAS).
8. Factor H (JAS): Hard driving and competitive.
9. Factor S (JAS): Speed and impatience.
10. Factor C (JAS): College involvement.
11. Factor I (HNT): Activity.

12. Factor II (HNT): Appetite.
13. Factor III (HNT): Anxiety.
14. Factor IV (HNT): Low Energy.
15. Factor V (HNT): Physical Health
16. Factor VI (HNT): Dependency
17. Factor VII (HNT): High Energy
18. Factor VIII (HNT): Anger
19. Factor IX (HNT): Philosophic Effort
20. HNT Scale
21. Anger Scale: The categorical questions on this scale were dichotomized and recoded as discussed in the measurement chapter. Low scores on this scale indicate a tendency toward predominantly having greater experiences of anger, but also toward expressing the anger.
22. Anger Attitude: Low scores indicate a positive attitude toward the expression of anger.

The SPSS stepwise discriminant function analysis (RAO method) was used, specifying group size a priori to account for unequal n's. The following ten variables, in decending order were found to significantly predict classification of the dysmenorrhea groups: FH-Para, JAS Factor C (college involvement), Adrenergic Response to Anxiety (ANS), FH-Symp, Anger Scale, HNT Factor VI (dependency), Health Scale, HNT Factor VIII (anger), Adrenergic Response to Anger (ANS), Anger Attitude. The resulting two functions correctly classified 64% of the subjects. The discriminant function

analysis is summarized in Table 24.

A summary of the means or frequencies of the variables contributing to the discriminant functions, broken down by dysmenorrhea group classification, is presented in Table 25. These data were listed in previous Tables. This is a collection of the significant function variables presented for the readers' convenience in order that the trends in the data can be more easily examined.

Table 24

Discriminant Function Analyses

Step Entered	Variable	Wilks Lambda	p	Change in V	P
1	FH - Parasympathetic	.90	<.01	10.44	.01
2	JAS - College Involvement	.81	<.01	10.39	.01
3	Sympathetic Responder to Anxiety	.77	<.01	5.70	.06
4	FH - Sympathetic	.72	<.01	7.18	.03
5	Anger Scale	.70	<.01	3.65	.16
6	HNT - Dependence	.68	<.01	3.07	.22
7	Health Scale	.66	<.01	3.31	.19
8	HNT - Anger	.65	<.01	3.24	.20
9	Sympathetic Responder to Anger	.63	<.01	3.42	.18
10	Attitude Toward Anger	.61	<.01	3.58	.17

Function	Percent of Variance	Canonical Correlation
1	.42	.54
2	.15	.37

Table 25

Summary of Mean Values or Frequencies of Variables in Discriminant Function

		PD (n=46)	DYS (n=21)	ND (n=34)	Grand Mean
1	Family History of Parasympathetic Diseases	.63	.33	.15	.42
2	Jenkins Activity Survey - College Involvement	9.16	10.86	9.20	9.50
3	ANS - Adrenergic Response to Anxiety	3 of 46	5 of 21	4 of 34	
4	Family History of Sympathetic Diseases	1.55	2.33	1.79	1.83
5	Experience of Anger Scale[a]	7.45	8.00	8.24	7.85
6	HNT - Dependency	.55	.43	.40	.48
7	Health Scale	10.18	10.33	11.17	10.54
8	HNT - Anger	.84	.90	.97	.90
9	ANS - Adrenergic Response to Anger	3 of 46	1 of 21	2 of 34	
10	Attitude Toward Expression of Anger	5 of 46	2 of 20	2 of 34	

[a] Low scores indicate increased experience of anger.

Discussion

The purpose of this study was to explore some physiological, historical and social aspects of the life experiences of women who suffer from primary dysmenorrhea and those who do not. It is known that women who suffer from primary dysmenorrhea have a higher concentration of a biochemical substance called prostaglandins in their menstrual fluids. It has also been shown that there is an associational relationship between prostaglandins and the autonomic nervous system. Levels of estrogen are at the lowest monthly level at the time of onset of menstruation. And premenopausal levels of estrogen seem to protect women from the early development of sympathetic nervous system related diseases (e.g., cardiovascular disease, rheumatoid arthritis). In addition, other relationships between the sympathetic nervous system and uterine physiology exist. Classically, sympathetic nervous system disorders have been linked with adopting the physiological stance of the fight or flight response to environmental stresses. However, in this society these responses are often not considered socially appropriate. Psychoanalytically, sympathetic nervous system

disorders have been linked with unexpressed anger (Alexander, 1968). It is generally not considered appropriate in this society to express anger, especially for women. Girls are socialized to nurture, not to be autonomous and direct in expressing their own needs. Thus, they may be less likely to experience anger or to express it when they do experience it. Thus, they may be more likely to somaticize their feelings of anger.

It was hypothesized that women who suffer from primary dysmenorrhea would have increased evidence of both (1) sympathetic nervous system related variables and also (2) difficulty with the experience and expression of anger. The goal of this research was to add to the known factors implicated in the process of primary dysmenorrhea (e.g., prostaglandins and anxiety) in order to work toward both prevention and also eventual nonpharmacological interventions for sufferers.

Overview of Results

Twenty-two variables were entered into the stepwise discriminant function analysis. All four of the variables that were related to anger (Experience of Anger Scale, HNT Anger Scale, Sympathetic Nervous System Responder to Anger,

and Attitude Toward Expression of Anger) contributed significantly to the function. In addition, all three sympathetic nervous system measures (Family History of Sympathetic Nervous System Related Diseases, and Sympathetic Nervous System Reponder to Anger and to Anxiety) were also included in the function. Of the remaining 7 variables thought to be indirectly related to sympathetic overarousal, two were significant contributors (Health Scale, HNT Dependency Factor). The remaining two variables (Family History of Parasympathetic Nervous System Related Diseases and The Jenkins Activity Survey College Involvement Factor) were the most powerful predictors but were not originally hypothesized to contribute to the function. These results will be discussed in detail below.

Measurement Issues

The Jenkins Activity Survey

For the Jenkins Activity Survey (JAS) Glass (1977) obtained two major factors based on his data set of 492 male subjects. The current data set on 113 women produced three. The new one that emerged (college involvement) was the only JAS scale that differentiated dysmenorrheic women. Therefore, without the development of a factor solution on women, an important finding would have been missed.

Habits of Nervous Tension

The HNT factor solution on the current data set was also somewhat different from the original study. Therefore, the patterns of symptoms experienced by men are likely different from those experienced by women. The results of this study indicate that women endorse significantly more symptoms on

this instrument than do men. Two previous studies conducted with both male and female physicians and medical students also found this difference (Nadelson, Salt, & Notman, 1983; Thomas, 1971). Some possible explanations for this phenomenon are (1) women have a greater tendancy to endorse items, (2) women have a greater response to stress, and (3) women are more perceptive of physical and psychological signs of stress. Given the socialization of women both to nurture and also to be passive, it makes sense that women may have both a greater response to stress and a finer awareness of themselves when under stress. It might also be argued that women first perceive the symptoms and then recognize or attribute them to stress.

Whether this differential response pattern is good, bad, or just different is an interesting health question. Anecdotally, many women state with pride their belief that women are more "in touch" with their bodies. Clearly, women are greater consumers of traditional health care for less serious physical disorders (e.g., gastrointestinal complaints, headaches), while men tend to utilize medical care less but suffer more catastrophic illness (e.g., cardiovascular diseases). Given that the HNT measure is predictive of high serum cholesterol (associated with subsequent cardiovascular disease) and given that women are less likely to suffer cardiovascular disease future

researchers may want to explore these gender response differences to instruments such as the HNT in order to identify (1) whether the women's response patterns are related to physiology (e.g., blood estrogen levels), perception, or socialization and (2) whether higher response rates are associated with lower incidence of cardiovascular disease. Thus, not exploring gender differences may obscure possible preventive lines of research as well as produce erroneous results when testing hypotheses.

Differential socialization factors may, in fact, contribute to women endorsing significantly more items on this instrument. In her theory of feminine personality development, Chodorow (1978) maintains that women are socialized to be relationship keepers and to have an identity in terms of relational bonds. The primary sociological purpose of this pattern of child rearing with mother as the primary and only caretaker is the reproduction of mothering. Speculating more on the gender differences in the HNT, women may be more likely to hold an underlying value that life should be conflict free. Therefore, they may also be socialized to heighten their response and perception in situations of stress. If this is a response associated with positive health outcomes, it may be that males should be socialized to be more nurturing, fathers providing models of male nurturance by being more actively involved in child

care.

Autonomic Nervous System Questionnaire

The Autonomic Nervous System Questionnaire (ANS) was significantly different between the 1977 and current studies in terms of mean values of adrenergic response to both anger and anxiety. Since no sex or age composition was listed for the original patient population, it is impossible to state what may have contributed to this difference.

A separate issue regarding the ANS Questionnaire is its questionable validity for differentiating adrenergic responders from cholinergic responders. The factor analysis did not produce pure adrenergic or cholinergic factors, indicating that the women did not have pure responses. This makes sense physiologically speaking, since a response of one portion of the autonomic nervous system (e.g., sympathetic) generally begets a response of the opposite system (e.g., parasympathetic) in order to rebalance the physiology. Thus, the patterns of response on this measure likely depend on when in the process the subject is tuning in to her body. Another interpretation of the lack of pure factors is related to recent findings in animal research which indicate that the nervous system may not make a generalized sympathetic nervous

system response that affects organs equally throughout the body. For instance, Weaver, Fry, and Meckler (1984) found that in cats, "sympathetic control of the kidney and spleen can be selective, illustrating significant potential discreteness of sympathetic outflow to the viscera" (p. R78). In other words the patterns may be extremely complex and/or variable in terms of how one's body responds to various stressors.

Additionally or alternatively, the high level of intercorrelations of the ANS scales indicates that there may be a general response factor operating. There are actually high responding/perceiving women and low responding/perceiving women. This finding certainly does not invalidate Wenger and Cullin's findings that there are people who have a tendency to respond predominantly with either the sympathetic or parasympathetic nervous systems. Rather, these findings cast doubt on the validity of this instrument to determine whether a person has either of these tendencies. Clearly, criterion validity research should be conducted on the ANS Questionnaire with physiological measures. Since adrenergic (sympathetic) responders were defined as being high on the adrenergic and low on the cholinergic scales, it is possible that it does identify people who are predominantly sympathetic responders. Therefore, the results with this instrument will be interpreted as if the instrument

were valid but with a cautionary note.

The psychometric analysis of these three measures (Jenkins Activity Survey, Habits of Nervous Tension, and Autonomic Nervous System Questionnaire) provide support for the notion that instruments standardized on or derived from samples of unknown or predominantly male samples should be checked psychometrically for appropriateness of fit for use on female samples. This is important not only because significant results may be obscured but also because there is valuable information in the differences and similarities of men and women.

The Three Group Classification of Subjects

Since the classification of subjects resulted in three groups (primary dysmenorrhea - PD, dysmenorrhea - DYS, and no dysmenorrhea - ND) rather than two, the primary focus of the discussion will center on (1) how the discriminating variables relate to the new classification schema and (2) what the meaning of the new group (DYS) might be. To repeat, in terms of the 10 predictors identified in the discriminant function, only Family History of Parasympathetic and Sympathetic Diseases and the Jenkins College Involvement Factor were significant predictors themselves. The seven

remaining variables contribute to the formation of a significant function which predicts dysmenorrhea group membership but are not significant when tested by themselves. To examine trends in the three groups, the comparative mean values of the variables were used to identify distinctively high or low values of the groups. Following is a discussion of findings for each of the three groups.

Primary Dysmenorrhea Group

The primary dysmenorrhea group has a higher incidence of family history of parasympathetic nervous system related diseases and the highest mean on the HNT Dependency Factor. This is interesting since Alexander's (1968) classic work connects parasympathetic diseases (e.g., ulcer, mucous colitis) with underlying dependency conflicts. The HNT Dependency Factor consists of three items, tendency to hold gripe sessions, to confide and seek advice or reassurance, and not to have an urge to be by yourself and get away from it all. To update the terminology used by Thomas and Ross (1963) when naming the factor, it might be renamed the HNT-Relational Factor. So, although these findings were not hypothesized, they do fit in with the groundwork laid in forming the hypotheses that the women who experience primary

dysmenorrhea are more relationally defined.

In examining the configuration of the anger variables, there is partial support of the original hypotheses. The women with primary dysmenorrhea score highest on the experience of anger, lowest on the expression of anger, and they are most likely to believe that it is inappropriate to express anger. Additionally, the number of ANS sympathetic responders to anger is greatest for this group. Speculating on the trends in these data, this may suggest that although these women experience anger, they may be more likely to experience conflict in expressing it and may then more readily somaticize their feelings. In addition, they may be more unable to risk the temporary severing of a relationship in order to express anger clearly and have an identity of self in the self (Chodorow, 1978) as opposed identity of self in relationship to other. These findings do relate to the study hypotheses that women who experience primary dysmenorrhea have difficulty with the expression of anger. The mixture of a parasympathetic family medical history and sympathetic response to anger is, however, confusing.

Dysmenorrhea Group

Two possible interpretations of the group labeled dysmenorrhea are (1) the definition of primary dysmenorrhea for this study is too narrow or (2) the women in this group are experiencing the pain of secondary dysmenorrhea as a result of an undiagnosed disease process (e.g., endometriosis) or anatomical problem. Examining the discriminant function data, it appears as if the latter explanation (2) is most appropriate. These women show a very different pattern from the other two groups on the more highly discriminating variables and therefore do not belong in either the primary dysmenorrhea group or the nondysmenorrhea group.

They score (significantly) highest on the Jenkins Activity Survey College Involvement Factor. The items (abridged) on this scale are: people agree you take your work seriously; and compared with others I put forth more effort, am more responsible, am more precise, and approach life more seriously. One interpretation of this finding involves the fact that the traditional label given to endometriosis is the "career woman's disease."

Endometrial tissue normally occurs on the inside of the uterus and part of it is shed monthly in the menstrual flow. In endometriosis, endometrial tissue is found on the outside of the uterus, on the fallopian tubes or ovaries, or at other locations in the abdominal cavity. Although the cause of endometriosis is unknown, it is known that full term pregnancy is an effective cure for many women and that endometriosis occurs more often among career-oriented women. Research has not been conclusive in sorting out whether endometriosis is related to the high physiological arousal or to the delay of childbirth. Both can occur when pursuing a career. Because of the young age of this sample, no statements can be made about the incidence of delayed childbirth as it relates to membership in the dysmenorrhea group. However, the other two highly discriminating variables indicate that these women have the greatest incidence of family history of sympathetic nervous system related diseases and of ANS sympathetic nervous system responders to anxiety. Therefore, they may have some evidence of sympathetic nervous system overarousal as was originally hypothesized for the primary dysmenorrhea group. This is a very interesting finding in that the previously estimated error rate of 10% inclusion of undiagnosed secondary dysmenorrhea subjects in with research on primary

dysmenorrheic subjects may be low. It is difficult to say with any certainty since the recruitment method in this study was such that no generalized statements regarding occurrence rates can be made from these data. Both previous medical and psychological research on women with primary dysmenorrhea have not used a standardized and clear definition of how they arrive at the diagnosis. It may be that some of the findings linking primary dysmenorrhea with anxiety have tapped into some subjects with early and undiagnosed endometriosis.

No Dysmenorrhea Group

The non-dysmenorrheic group (those who do not experience pain) are distinguished by having a higher Health Scale score. Three of the five items on this scale are exercise items and two are diet items. This finding may indicate that good health habits are associated with a more balanced physiology, whether one's tendancy is toward parasympathetic or sympathetic overresponse or whether one tends toward somaticization of anger or anxiety. Another interpretation of the higher reported levels of exercise in this group may be related to current research findings in physiology which posit a relationship between exercise and the enhanced ability to manufacture beta endorphins. Endorphins are an

endogenous opiod peptide which have morphine-like activities. Therefore, exercise may possibly mitigate a potential for pain or alleviate the experience of pain (Imura & Nakai, 1981). No research has been published on either opiate receptors or beta endorphin levels in the circulation of women who have dysmenorrhea (Dawood, 1981).

Relative to anger, the nondysmenorrheic group scored lowest on the Experience of Anger Scale, highest on the HNT anger factor and had the most positive attitude toward the expression of anger. Therefore, they are more likely to express anger when under stress, and to hold the attitude that it is appropriate to express anger and thus to be less conflicted about anger, in general.

Conclusions

The meaning of some discriminating variables which predict classification of primary and perhaps secondary dysmenorrhea has been clarified by this study. The two family history variables (sympathetic and parasympathetic) are both significant predictors. Those in the medical profession more often link this type of finding to hypotheses of genetic predisposition while those in the behavioral sciences would likely favor an explanation using social

learning passed down through the generations. The nature-nurture controversy goes on. What is important, however, is to recognize that the high incidence of family history of these diseases may help to identify girls at risk to develop dysmenorrhea so that prospective, longitudinal studies may be done. For instance, one might study groups of prepubertal girls at risk and not at risk, applying various intervention strategies (e.g., exercise, dietary modification programs, psychoeducational groups to enhance attitudes and skills related to expression of anger).

This study is unique in that it includes variables related to patterns of behavior (e.g., expression of anger, dependency, a high level of college involvement) and related to physical symptoms when under higher levels of stress, anger and anxiety (Habits of Nervous Tension and Autonomic Nervous System Questionnaire). Together this multidisciplinary approach, borrowing from medicine, physiology, sociology and psychology, provides evidence that developing behaviors in terms of learning good health habits and effective strategies toward dealing with anger- and anxiety-provoking situations may be helpful.

Future research indicated by this study includes physiological studies which measure whether or not a woman might have different response sensitivity of response of the autonomic nervous system (parasympathetic and/or sympathetic)

at the time of onset of menses when her monthly estrogen level is lowest. Also more elaborate scales measuring experience, expression, and attitudes toward anger would be helpful in further examining the relationship of anger, dependency, socialization toward identity of self in relationship to other, and primary dysmenorrhea. Further exploration of correlates with endometriosis is also recommended, especially since higher numbers of women are entering the work force and delaying childbirth. Last, how all of these factors fit in with those enigmatic prostaglandins, the known correlate with primary dysmenorrhea, remains a mystery. This study provides some evidence that autonomic nervous system factors are linked with both types of dysmenorrhea, primary and secondary. Since anti-prostaglandin medications are helpful for both types of dysmenorrhea, the links among prostaglandins, the autonomic nervous system, perception of experience, and behavior need to be further explored in a nondualistic and integrated way.

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APPENDIX

MICHIGAN STATE UNIVERSITY
Department of Psychology-Snyder Hall East Lansing, MI 48824

May 31, 1983

Dear Student,

Are you between the ages of 18 and 25? If so you may have a chance to WIN $20.

I am a graduate student in Clinical Psychology and am conducting a health psychology research study. Dr. Elaine Donelson, Professor of Psychology, is supervising the project.

Some behavior patterns and emotions have been linked with physical symptoms. The purpose of this study is to explore these relationships as they occur for women who have menstrual cramps and those who don't. In addition, women's responses for some parts of the questionnaire will be compared to men's to see how they are different and how they are the same. The eventual aim of this research is not to find that emotions or behavior cause pain, disease, or discomfort, but rather to make people aware of potentially health-related and disease-related signs so that they may participate more actively in maintaining health rather than recovering from or treating disease or discomfort.

One requirement for all potential WOMEN subjects is that they be between the ages of 18 and 25. In addition, women who are taking birth control pills should NOT participate since oral contraceptives are known to alter certain menstrual symptoms. Therefore, WOMEN participating in this study SHOULD NOT be taking oral contraceptives.

NOW--HOW CAN YOU WIN $20??? In order to provide an extra incen- tive for you to participate, I am conducting a drawing. For the first 150 people to respond, an independent party will draw three names. Therefore, each person will have a 1 in 50 chance of winning $20. The drawing will be held on June 10. Winners will be telephoned and/or sent their check through the mail.

The questionnaire should take approximately 1 hour to complete and all replies will be strictly confidential. If you are willing to participate, please take one of the packets marked for either FEMALE or MALE participants. Complete instructions will be inside the envelope.

Thank you very much for your time.

Sincerely,

Mary K. Roberson

PURPOSE OF STUDY

Some behavior patterns and emotions have been linked with physical symptoms. The purpose of this study is to explore these relationships as they occur for women who have menstrual cramps and those who do not. In addition, women's responses for some parts of the questionnaire will be compared to men's to see how they are different and how they are the same. The eventual aim of this research is not to find that emotions or behavior cause pain, disease, or discomfort, but rather to make people aware of potentially health-related and disease-related signs so that they may participate more actively in maintaining health rather than recovering from or treating disease or discomfort.

INSTRUCTIONS

The data collected for this study will be analyzed anonymously. However, I must have your name on the following enclosed forms:

(a) The Drawing Ticket. This is so that you can be notified if you are a winner.
(b) A Request for Results. Complete this form if you would like a one to two page abstract of the results of this study. I will mail one to you in the Fall of 1983.
(c) A research consent form. This informs you of your rights and is required by the MSU University Committee for Research on Human Subjects.

All of the above-mentioned documents will be separated from the questionnaire (also enclosed) immediately upon receipt at my office. No identifying marks will occur on the questionnaire forms themselves. Therefore, your answers will be completely anonymous.

Please complete each portion of the packet in sequence. Explicit instructions occur on each document. If at any time during or after the process of completing the survey you have any questions, feel free to call me at 353-5035 (office) or 351-1143 (home).

When you are finished, please put all materials in the return envelope and then into the campus mail. There is campus mail pick up in each departmental office and in the dorms. Just ask the secretary or receptionist where the outgoing campus mail is placed.

Thank you again for participating. Good luck in the drawing!

Mary K. Roberson

Michigan State University
Department of Psychology East Lansing, Michigan

RESEARCH CONSENT FORM

Health Psychology Study

1. I have freely consented to take part in a scientific study conducted by Mary K. Roberson under the supervision of Dr. Elaine Donelson, Professor of Psychology.

2. The study has been explained to me and I understand the explanation that has been given and what my participation will involve.

3. I understand that I am free to discontinue my participation in the study at any time without penalty.

4. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. With these restrictions, results of the study will be made available to me at my request.

5. I understand that my participation in the study does not guarantee any beneficial results to me.

6. I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

_____ _____

Signature Date

HEALTH PSYCHOLOGY RESEARCH STUDY

Please check the response that most accurately describes you or your parents.

1. How old are you? _____

2. What is your marital status?

___ 1. single
___ 2. divorced
___ 3. widowed
___ 4. separated
___ 5. married
___ 6. remarried
___ 7. cohabitating (living with a person with whom you are having a romantic relationship)

3. How much school did you and your parents complete?

You	Mother	Father	
___	___	___	1a. doctoral level degree
___	___	___	1b. masters degree
___	___	___	2. bachelors degree
___	___	___	3. some college (at least one year)
___	___	___	4. high school diploma
___	___	___	5. through the 10th grade
___	___	___	6. through the 8th grade
___	___	___	7. 7th grade or less

4. What is the ethnic or racial background of your parents.

Mother	Father	
___	___	1. Caucasian
___	___	2. Black
___	___	3. Hispanic
___	___	4. Native American
___	___	5. Asian American
___	___	6. Other (specify _____)

5. What was the religion your parents and you were brought up in?

You	Mother	Father		
___	___	___	1.	Catholic
___	___	___	2.	Protestant
___	___	___	3.	Jewish (Orthodox? ___ yes; ___ no)
___	___	___	4.	Other (specify) _____
___	___	___	5.	None

6. What is your present employment status? List all choices that apply.

___ 1. homemaker, full time
___ 2. student, part time
___ 3. student, full time
___ 4. employed, full time
___ 5. employed, part time
___ 6. unemployed, looking for work
___ 7. other (please specify _____)

7. If you are employed, what is your job title? Briefly describe your work.

_____

_____

_____

8. If your parents have been employed five years or more, what is/was his or her most advanced job title?

Mother: _____

Father: _____

9. Briefly describe what work he or she does/did.

Mother: _____

_____

Father: _____

_____

10. Check the space under "you" or your parents if you KNOW that he, she or you have had any of the following medical disorders.

Medical Disorder		You	Father	Mother
Rheumatoid Arthritis . . .	1.	___	___	___
Cardiovascular Diseases . . (e.g., hypertension, heart disease, arterio-sclerosis)	2.	___	___	___
Ulcer	3.	___	___	___
Mucous Colitis	4.	___	___	___
Ulcerative Colitis.	5.	___	___	___
Cancer	6.	___	___	___
Asthma	7.	___	___	___

11. Check the space under each of your grandparents' names if you KNOW that he or she had any of the following medical disorders.

Medical Disorder		Your Mother's Mother	Your Mother's Father	Your Father's Mother	Your Father's Father
Rheumatoid Arthritis	1.	___	___	___	___
Cardiovascular Dis. . (e.g., hypertension, heart disease, arteriosclerosis)	2.	___	___	___	___
Ulcer	3.	___	___	___	___
Mucous Colitis . . .	4.	___	___	___	___
Ulcerative Colitis .	5.	___	___	___	___
Cancer	6.	___	___	___	___
Asthma	7.	___	___	___	___

12. Do you eat breakfast regularly?

___ 1. yes
___ 2. no

13. Do you exercise regularly?

___ 1. yes
___ 2. no

14. How many days per week do you usually engage in exercise or physical activity?

___ 1. 0 days per week
___ 2. 1 or 2 days per week
___ 3. 3 to 5 days per week
___ 4. 6 or 7 days per week

15. Please specify what type of physical activities or exercise you engage in.

_____

_____

16. How would you characterize your activity level in relation to your peers?

___ 1. very minimal; sedentary
___ 2. less than average
___ 3. moderate or average
___ 4. more than average
___ 5. very active

17. Do you smoke cigarettes?

___ 1. no
___ 2. I smoke less than 1/2 pack per day.
___ 3. I smoke 1/2 to 1 pack per day.
___ 4. I smoke more than 1 pack per day.

18. Do you eat meat?

___ 1. yes, I eat all kinds of meat.
___ 2. yes, but I avoid red meat and eat mostly chicken and fish.
___ 3. no

Habits of Nervous Tension Survey

Whenever you find yourself in situations of undue pressure or stress, how do you usually react? (Underline all reactions which are characteristic of you.)

1. Exhaustion or excessive fatigue
2. Exhiliaration
3. Depressed feelings
4. Uneasy or anxious feelings (sighing, tight feelings in throat or chest, dry mouth, clammy hands, etc.)
5. General tension ("keyed up" feelings--difficulty in becoming relaxed)
6. Increased activity
7. Decreased activity
8. An increased urge to sleep
9. Increased difficulty in sleeping
10. Increased urge to eat
11. Loss of appetite
12. Nausea
13. Vomiting
14. Diarrhea
15. Constipation
16. Urinary frequency
17. Tremulousness or shakiness

18a. Anger -- expressed

18b. Anger -- concealed

19. Gripe sessions

20. Concern about your physical health

21. A tendency to check and recheck your work to assure yourself of accuracy

22. An urge to confide and seek advice or reassurance

23. An urge to be by yourself and get away from it all

24. Irritability with concern as to who is to blame

25. Thinking about the meaning of the event with no reactions out of the ordinary

Briefly describe your chief reactions to pressure or stress and the situations which they most commonly occur (competitions, examinations, family situations, etc.).

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Jenkins Activity Survey for Students

Please answer the following pages by marking the answers that are true for you. Each person is different, so there are no "right" or "wrong" answers. For each of the following items, please check the number of the one answer that best describes you.

1. Do you ever have trouble finding time to get your hair cut or styled?

___ 1. never
___ 2. occasionally
___ 3. almost always

2. Does college "stir you into action"?

___ 1. less often than most college students
___ 2. about average
___ 3. more often than most college students

3. Is your everyday life filled mostly by

___ 1. problems needing solutions.
___ 2. challenges to be met.
___ 3. a rather predictable routine of events.
___ 4. not enough things to keep me interested or busy.

4. Some people live a calm, predictable life. Others find themselves often facing unexpected changes, frequent interruptions, inconveniences or "things going wrong." How often are you faced with these minor (or major) annoyances or frustrations?

___ 1. several times a day
___ 2. about once a day
___ 3. a few times a week
___ 4. once a week
___ 5. once a month or less

5. When you are under pressure or stress, what do you usually do?

___ 1. Do something about it immediately.
___ 2. Plan carefully before taking action.

6. Ordinarily, how rapidly to you eat?

___ 1. I'm usually the first one finished.
___ 2. I eat a little faster than average.
___ 3. I eat at about the same speed as most people.
___ 4. I eat more slowly than most people.

7. Has your spouse or some friend ever told you that you eat too fast?

___ 1. yes, often
___ 2. yes, once or twice
___ 3. no, no one has told me that

8. How often do you find yourself doing more than one thing at a time, such as working while eating, reading while dressing, figuring out problems while driving?

___ 1. I do two things at once whenever practical.
___ 2. I do this only when I'm short of time.
___ 3. I rarely or never do more than once thing at a time.

9. When you listen to someone talking, and this person takes too long to come to the point, do you feel like hurrying him or her along?

___ 1. frequently
___ 2. occasionally
___ 3. almost never

10. How often do you actually "put words in his/her mouth" to speed things up?

___ 1. frequently
___ 2. occasionally
___ 3. almost never

11. If you tell your spouse or a friend that you will meet them somewhere at a definite time, how often do you arrive late?

___ 1. once in a while
___ 2. rarely
___ 3. I am never late

12. Do you find yourself hurrying to get places even when there is plenty of time?

___ 1. often
___ 2. occasionally
___ 3. rarely or never

13. Suppose you are to meet someone at a public place (street corner, building lobby, restaurant) and the other person is already 10 minutes late. Will you

___ 1. sit and wait?
___ 2. walk about while waiting?
___ 3. usually carry some reading matter or writing paper so you can get something done while waiting?

14. When you have to "wait in line," such as at a restaurant, a store, or the post office, do you

___ 1. accept it calmly.
___ 2. feel impatient but do not show it.
___ 3. feel so impatient that someone watching could tell you were restless.
___ 4. refuse to wait in line, and find ways to avoid such delays.

15. When you play games with young children about 10 years old, how often do you purposely let them win?

___ 1. most of the time
___ 2. half the time
___ 3. only occasionally
___ 4. never

16. Do most people consider yourself to be

___ 1. definitely hard driving and competitive.
___ 2. probably hard-driving and competitive.
___ 3. probably more relaxed and easy going.
___ 4. definitely more relaxed and easy going.

17. Nowadays, do you consider yourself to be

___ 1. definitely hard driving and competitive.
___ 2. probably hard-driving and competitive.
___ 3. probably more relaxed and easy going.
___ 4. definitely more relaxed and easy going.

18. How would your spouse (or closest friend) rate you?

___ 1. definitely hard driving and competitive.
___ 2. probably hard-driving and competitive.
___ 3. probably more relaxed and easy going.
___ 4. definitely more relaxed and easy going.

19. How would your spouse (or best friend) rate your general level of activity?

___ 1. Too slow. Should be more active.
___ 2. About average. Is busy most of the time.
___ 3. Too active. Needs to slow down.

20. Would people who know you well agree that you take your work seriously?

___ 1. Definitely yes.
___ 2. Probably yes.
___ 3. Probably no.
___ 4. Definitely no.

21. Would people who know you well agree that you have less energy than most people?

___ 1. Definitely yes.
___ 2. Probably yes.
___ 3. Probably no.
___ 4. Definitely no.

22. Would people who know you well agree that you tend to get irritated easily?

___ 1. Definitely yes.
___ 2. Probably yes.
___ 3. Probably no.
___ 4. Definitely no.

23. Would people who know you well agree that you tend to do most things in a hurry?

___ 1. Definitely yes.
___ 2. Probably yes.
___ 3. Probably no.
___ 4. Definitely no.

24. Would people who know you well agree that you enjoy "a contest" (competition) and try hard to win?

___ 1. Definitely yes.
___ 2. Probably yes.
___ 3. Probably no.
___ 4. Definitely no.

25. Would people who know you well agree that you get a lot of fun out of your life?

___ 1. Definitely yes.
___ 2. Probably yes.
___ 3. Probably no.
___ 4. Definitely no.

26. How was your "temper" when you were younger?

___ 1. fiery and hard to control
___ 2. strong, but controllable
___ 3. no problem
___ 4. I almost never got angry

27. How is your "temper" nowadays?

___ 1. fiery and hard to control
___ 2. strong, but controllable
___ 3. no problem
___ 4. I almost never get angry

28. When you are in the midst of studying and someone interrupts you, how do you usually feel inside?

___ 1. I feel O.K. because I work better after an occasional break.
___ 2. I feel only mildly annoyed.
___ 3. I really feel irritated because most such interruptions are unnecessary.

29. How often are there deadlines in your courses? (If deadlines occur irregularly, please circle the closest answer below.)

___ 1. daily or more often
___ 2. weekly
___ 3. monthly
___ 4. never

30. Do these deadlines usually

___ 1. carry minor pressure because of their routine nature.
___ 2. carry considerable pressure, since delay would upset things a great deal.

31. Do you ever set deadlines or quotas for yourself in courses or other things?

___ 1. no
___ 2. yes, but only occasionally
___ 3. yes, once per week or more often

32. When you have to work against a deadline, is the quality of your work

___ 1. better.
___ 2. worse.
___ 3. the same. (Pressure makes no difference.)

33. In school do you ever keep two projects moving forward at the same time by shifting back and forth rapidly from one to the other?

___ 1. no, never
___ 2. yes, but only in emergencies
___ 3. yes, regularly

34. Do you maintain a regular study schedule during vacations such as Thanksgiving, Christmas, and Easter?

___ 1. yes
___ 2. no
___ 3. sometimes

35. How often do you bring your work (or study materials related to your courses) home at night?

___ 1. rarely or never
___ 2. once a week or less often
___ 3. more than once a week

36. How often do you go to the university when it is officially closed (such as nights or weekends)? If this is not possible, circle here: 0.

___ 1. rarely or never
___ 2. occasionally (less than once a week)
___ 3. once or more a week

37. When you find yourself getting tired while studying, do you usually

___ 1. slow down for a while until your strength comes back.
___ 2. keep pushing yourself at the same pace in spite of the tiredness.

38. When you are in a group, do other people tend to look to you to provide leadership?

___ 1. rarely
___ 2. about as often as they look to others
___ 3. more often than they look to others

39. Do you make yourself written lists of "things to do" to help you remember what needs to be done?

___ 1. never
___ 2. occasionally
___ 3. frequently

IN EACH OF THE FOLLOWING QUESTIONS, PLEASE COMPARE YOURSELF WITH THE AVERAGE STUDENT AT YOUR UNIVERSITY. PLEASE CHECK THE MOST ACCURATE DESCRIPTION.

40. In the amount of effort put forth, I give

___ 1. much more effort.
___ 2. a little more effort.
___ 3. a little less effort.
___ 4. much less effort.

41. In sense of responsibility, I am

___ 1. much more responsible.
___ 2. a little more responsible.
___ 3. a little less responsible.
___ 4. much less responsible.

42. I find it necessary to hurry

___ 1. much more of the time.
___ 2. a little more of the time.
___ 3. a little less of the time.
___ 4. much less of the time.

43. In being precise (careful about detail), I am

___ 1. much more precise.
___ 2. a little more precise.
___ 3. a little less precise.
___ 4. much less precise.

44. I approach life in general

___ 1. much more seriously.
___ 2. a little more seriously.
___ 3. a little less seriously.
___ 4. much less seriously.

Autonomic Nervous System Questionnaire

Instructions: Please mark the severity of the symptoms as follows. When you feel ANXIOUS, please mark an "X"; when you feel ANGRY or AGGRESSIVE, mark an "O" under the appropiate column. For example, when you are anxious, how often do you experience heart burn? There should be both an "X" and an "O" for each symptoms when you are finished.

	Very Frequently	Often	Some-times	Rare or Never
1. heart burn				
2. diarrhea				
3. urge to frequent urination				
4. one or more muscles feel weak				
5. sleeping more than usual				
6. flushing of the face				
7. waterish mouth				
8. excessive appetite				
9. feel sexually aroused				
10. have difficulty breathing				
11. stomach growls				
12. dry palms				

	Very Frequently	Often	Some-times	Rare or Never
13. constipation				
14. one or more muscles feel tense				
15. sleeping less than usual				
16. pallor of the face				
17. cold feet				
18. wet hands				
19. wet armpits				
20. heart palpitations				
21. dry mouth				
22. goose pimples				
23. butterflies in stomach				
24. poor appetite				

Please make sure you have gone through the questionnaire marking both an "O" under the appropriate headings for when you feel angry or aggressive and an "X" for when you feel anxious.

Experience of Anger Questionnaire

Adolescence is a time when many children begin to develop a clearer sense of who they are apart from their parents. This normal developmental phase is quite often difficult for families. I would like to ask you some questions about your high school years.

1. Were you living with both of your parents during most of your high school years?

___ a. yes
___ b. no (please specify who you were living with that was responsible for you_____)

2. Who would you turn to most of the time when you had a big problem?

___ a. mother
___ b. father
___ c. sister
___ d. brother
___ e. a friend
___ f. a teacher or counselor at school
___ g. other (specify _____)
___ h. no one

2a. How many brothers and sisters do you have? _____

2b. What is your position in the birth order of your brothers and sisters if "1" is the oldest?

_____

3. During incidents when you and your mother disagreed about something that was important to you, which of the following feelings describes how you felt?

___ a. angry
___ b. hurt
___ c. afraid
___ d. sad
___ e. I did not feel any emotions.
___ f. other (please specify _____)

4. When it was your father and you disagreeing, how did you feel?

___ a. angry
___ b. hurt
___ c. afraid
___ d. sad
___ e. I did not feel any emotions.
___ f. other (please specify _____)

Think of an actual event when you were very angry with someone else (e.g., parent, friend, teacher, etc.) during high school. Answer the following questions about the event.

5. Read over the following responses and choose the one which most applies to you during the event.

___ a. I didn't ever get angry during high school.
___ b. I felt disappointed and hurt.
___ c. I felt dissatisfied with the other person.
___ d. I was irritated at the other person.
___ e. I was somewhat angry at the person.
___ f. I was very angry at the person.

6. Who was the person?

___ a. parent
___ b. other relative
___ c. person with whom you were having a romantic relationship
___ d. friend
___ e. teacher
___ f. other (specify _____)

7. What gender was the person?

___ a. male
___ b. female

8. Briefly describe what it was that you were angry about.

_____

_____

_____

_____

9. Did you let the person know you were angry?

___ a. yes. Briefly describe your interaction. _____

_____

_____

___ b. no. What were some of your thoughts during the event.

_____

_____

11. Did you feel hurt or sad, too?

___ a. yes
___ b. no

12. What did you do after the event? How did you feel? What emotions were you having?

_____

_____

_____

13. During your high school years were there any patterns to who provoked your anger and who didn't? For example, did you get angry only at one person in particular? One or more groups of people (teachers, parents, siblings, girlfriends, etc.)? Did you never get angry at any person or persons or groups of people?

_____

_____

_____

_____

_____

14. Is there a pattern to who makes you angry now? Please describe it.

_____

_____

_____

_____

_____

15. Do you think it is appropriate to express anger at someone?

___ 1. Yes. Under what circumstances? _____

_____

_____

___ 2. No. Why not? What should you do instead? _____

_____

_____

16. Do you NOT get angry when you feel you should?

___ 1. Often
___ 2. Sometimes
___ 3. Never

Menstrual Questionnaire

1. To the best of your memory, how old were you when you first menstruated?

___ 1. 10 years old or younger
___ 2. 11 years old
___ 3. 12 years old
___ 4. 13 years old
___ 5. 14 years old
___ 6. 15 years old
___ 7. 16 years or older

2. Have you had a gynecological check up within the last year?

___ 1. yes
___ 2. no (when was your last check up? _____)

3. Apart from vaginal discharges and infections, did any doctor ever mention any abnormalities in your uterus, ovaries, or fallopian tubes?

___ 1. yes (please specify _____)
___ 2. no

4. Is your cycle about the same length every month from the time of onset of one period to the time of onset of the next? In other words, do they vary in length as little as 4 days from month to month?

___ 1. yes (please specify approximate length of cycle _____)
___ 2. no (please specify range of different lengths _____)

5. Are you taking oral contraceptives (birth control pills)?

___ 1. yes
___ 2. no, but I have in the past
___ 3. no, I have never taken birth control pills

6. How many full term deliveries have you experienced?

___ 1. none
___ 2. one
___ 3. two
___ 4. three or more

6a. Do you use an intrauterine device as a method of birth control?

___ 1. yes (how long? _____)
___ 2. no

7. Premenstrual Syndrome is a set of symptoms that many women experience. The syndrome is characterized by physical symptoms such as water retention, pain, fatigue, feeling of bloatedness and weight gain and psychological or behavior changes such as feelings of depression, irritability and lack of concentration. These symptoms occur before the onset of menstrual flow. To what degree do you experience this syndrome?

___ 1. No. I don't experience Premenstrual Syndrome.
___ 2. Yes. Slightly.
___ 3. Yes. To a moderate degree.
___ 4. Yes. I experience Premenstrual Syndrome to a large degree.

8. Primary dysmenorrhea is defined as pain when having a period. It is often referred to as cramps. When you first started menstruating, were the first few periods painful (did you have cramps)?

___ 1. yes
___ 2. no
___ 3. I can't remember

9. Did you either experience pain or take medication so that you would not have pain at the time of your period last month?

___ 1. yes
___ 2. no

10. Did you experience pain and/or take medication at the time of your period two months ago?

___ 1. yes
___ 2. no

11. Did you have cramps and/or take medication to prevent cramps during most of your periods during the last year?

___ 1. yes
___ 2. no

12. Did you ever experience menstrual pain in the past?

___ 1. yes (please specify at what ages _____)
___ 2. no

If you answered "NO" to both questions 9 AND 10, please skip ahead to questions 23 and 24 on page 25.

If you answered "YES" to either questions 10 or 11, please answer the following questions numbered 13 through 24.

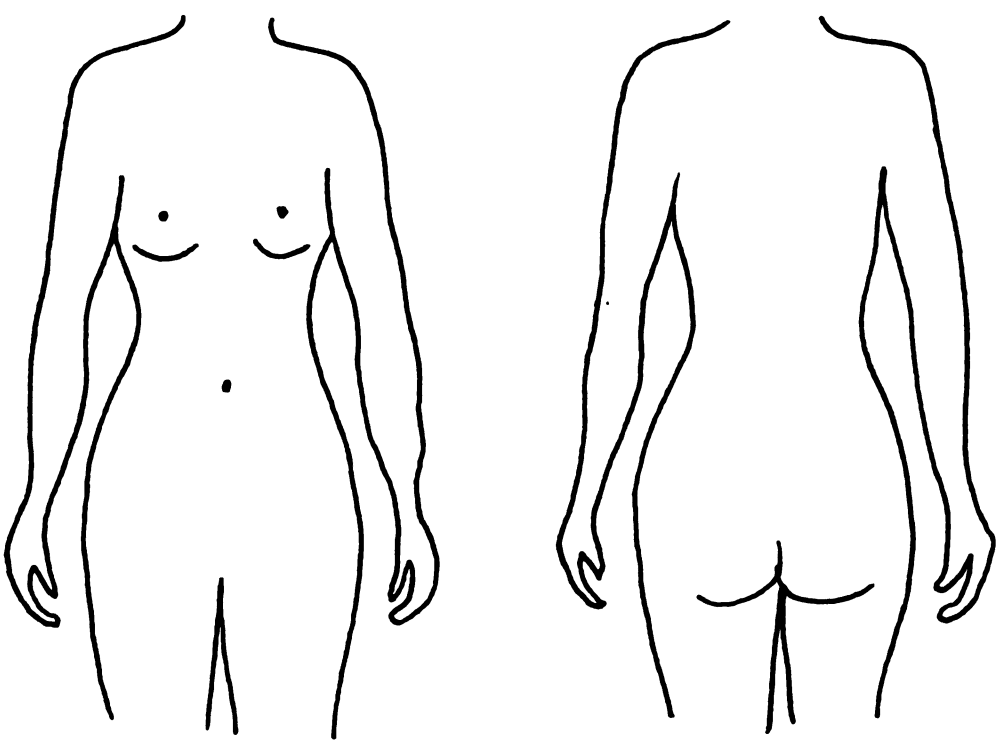
13. When does your pain begin in relation to your period?

___ 1. the day before my period begins
___ 2. the day my period begins
___ 3. the second day of my period
___ 4. none of the above

14. How long does your pain last?

___ 1. less than one day
___ 2. one day
___ 3. two days
___ 4. greater than two days

15. Where does your pain occur most? Please mark the following diagram. Shade in the area(s) where you hurt most.



16. Does the pain usually interfere with the concentration you give to your work or recreational activities? Read through the following responses and check the response that best describes you during the time that you are in pain.

___ 1. I find that my attention span increases during menstruation
___ 2. My concentration is no different.
___ 3. My attention is sometimes carried away from what I am doing.
___ 4. My attention is carried to the pain quite a lot.

17. To what extent does the pain interfere with your activities? Read through the following responses and check the response that best describes you during the time when you are in pain.

___ 1. It does not interfere.
___ 2. I must limit my physical activity.
___ 3. I would like to limit my physical activity, but I don't.
___ 4. I must lie down and rest.

18. How much time from your regular activities must you usually take because of the pain?

___ 1. It does not interfere at all with my activities.
___ 2. less than one day
___ 3. one day
___ 4. two days
___ 5. more than two days

20. What, if anything, do you take for your pain most of the time. Please read over all the responses and choose the one you take most.

___ 1. I take no medication at all.
___ 2. Aspirin
___ 3. Tylenol, or other non-aspirin preparations (e.g., Anacin-3)
___ 4. Over-the counter medications for menstrual pain/blues (e.g., Pamprin, Midol)
___ 5. Prescription medications for menstrual pain (e.g., Motrin, Naprosyn)
___ 6. Prescription medications for pain in general (e.g., Darvon, Tylenol #3)
___ 7. I'm not sure what I take.
___ 8. Other (please specify_____)

21. Does this medication relieve your pain?

___ 1. The pain goes away completely.
___ 2. The pain is still there but I don't notice it much, and it does not interfere with my activities.
___ 3. I get some relief but the pain is still quite noticeable.
___ 4. I get very little or no relief at all.

22. Do you do anything else to relieve the pain either when it is occurring or as a regular part of your health care?

___ 1. yes (please specify _____
_____

___ 2. no

23. Which of the following sentences describes your interaction with your doctor regarding the subject of your menstrual pain?

___ 1. The doctor asked me if I ever have pain with my period.
___ 2. I brought up the fact that I have pain with my period.
___ 3. The subject of painful periods was never brought up.

24. What are your ideas, attitudes, or feelings about having cramps?

_____

_____

_____

_____

_____

_____