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# Psychosocial Predictors of Physical Symptoms Reported By Patients in Primary Health Care Settings

Lydia D. McLarnon

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in

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## Abstract

### Psychosocial Predictors of Physical Symptoms Reported By Patients in Primary Health Care Settings

Lydia D. McLarnon, Ph.D.

Concordia University, 1992

Numerous psychosocial variables have been associated with the illness behavior of physical symptom reporting. Several shortcomings are noted regarding past investigations. First, considerable redundancy appears to exist among investigated variables. Second, a distinction has not been made between physical symptoms that are associated with affective disorders and symptoms that are not. Finally, previous studies have been limited in the scope of their measurement, so that only a few of the potential psychosocial influences have been examined simultaneously, making it impossible to determine the relative strength of the psychosocial variables in predicting illness behavior. The present study addresses each of these shortcomings. Patients at four primary health care clinics completed a battery of questionnaires measuring 32 psychosocial variables and a measure of the number of affect-related and nonaffect-related symptoms both experienced during the previous two weeks and reported to their physician. The psychosocial variables were subjected to a factor analytic procedure to select a smaller number of less redundant variables. Variables were chosen to represent each of the principle components and were used in regression analyses to determine their relative strength in predicting the number of affect-related and nonaffect-related symptoms experienced and reported by patients.

The main findings of the study are that, considerable redundancy exists among the psychosocial variables, and regression analyses reveal that: (1) psychosocial variables significantly increase predictability over demographic variables for all symptom criterion variables, (2) a composite measure of patients' ratings of the interference, severity, and familiarity of their symptoms is related to all symptom criterion variables except one, (3) stress ratings are related to experienced, but not to reported symptoms, and (4) neuroticism is related to affect-related but not to nonaffect-related symptoms. These finding suggest that it is important for physicians to consider patients' symptom beliefs while conducting interviews. Furthermore, stress, key components of neuroticism (e.g., medical fear, disease fear, and worry), and patients' beliefs about their symptoms are likely targets of behavioral interventions aimed at reducing symptom reporting. This could be especially important and cost-effective when increased symptom reporting occurs in the context of the overuse of medical services.

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Medicine has traditionally considered disease and illness as synonymous. Not until recently (Schwartz, 1983) has a clearer distinction been made between the two terms. On the one hand, disease can be defined as pathological or morbid physiologic functioning. On the other hand, illness is a multi-component concept including pathophysiologic functioning and associated behaviors, sometimes referred to as illness behaviors, such as making symptom complaints, using medical services, and absenteeism.

The distinction between disease and illness has been highlighted by recognition that physical disease and illness behavior are imperfectly related. Community surveys have repeatedly shown that large numbers of individuals with physical pathology are not under medical care (Commission on Chronic Illness, 1957; Kellgren, 1958; Pearse & Crocker, 1944). Conversely, repeated use of medical facilities by individuals who exhibit no demonstrable pathophysiology is a well-recognized phenomenon in medicine (Kellner, 1985; 1987). In fact, studies of primary care practice have revealed that between 68% and 92% of patients are without serious physical disease (Garfield et al., 1976; Van der Gaag & van de Ven, 1978) and that the most common single diagnosis made is nonsickness (Lamberts, 1979).

Findings of this sort are consistent with a biopsychosocial view of illness. This perspective recognizes that illness behavior, such as making physical symptom complaints or presenting oneself for medical care, is influenced by an interacting set of factors that cross traditional discipline boundaries. For example, physical sensations (biological) must be perceived and interpreted as signs of dysfunction (psychological), and a decision must be made to act on this information by seeking care in the interpersonal context of a physician's office (social). Factors from one of these domains may take precedence in any particular instance, but all are likely to have some role. Attention to only one

domain is likely to provide an overly simplistic picture of the complex set of mechanisms that underlie illness behavior.

An individual's state of health can be conceptualized within the biopsychosocial systems framework proposed by Schwartz (1981, 1983). Disregulation of the system can be produced by disruption of any one of the biological, psychological, and social factors. For example, individuals in a mild state of biological dysfunction may not engage in remedial behaviors, which could lead to further disregulation and exacerbate physiological disorder and disease (Schwartz, 1977). Conversely, overattention to bodily sensations or failure to identify the origins of some bodily sensations as primarily emotional may result in increased physical symptom reporting and the use of medical services for essentially non-medical difficulties.

The biopsychosocial perspective has encouraged recent research that has identified the role of several psychological and social variables in symptom reporting and other illness behaviors. Consistent relationships have been identified between some psychosocial variables and illness behavior, and some progress has been made toward identification of interactions among key variables. The present study is a large-scale investigation that concerns itself with the identification of redundancy among previously investigated psychosocial variables and their relationship to specific types of physical symptom complaints; those associated and those not associated with affective disorders, and those experienced by patients and those actually reported to a physician. Following is a brief summary outlining the current status of the body of research investigating the relationship between psychosocial variables and illness behavior.

## Social Variables

### Learning History

There are two interrelated learning factors that have been examined as potential contributors to illness behavior and symptom complaints: vicarious modeling and direct reinforcement of illness behavior. Retrospective investigations have consistently suggested a modeling effect whereby parents' illness behavior correlates with the behavior of their children during illness (e.g., Moss, 1986; Turkat & Noskin, 1983). Past reinforcement for illness in the form of increased attention from family members and/or the avoidance of unpleasant duties or responsibilities has also been associated with illness behavior, including increased symptom reporting (Flor, Birbaumer, & Turk, 1990; Moss, 1986; Turkat, 1982; Whitehead, Winget, Fedoravicius, Wooley, & Blackwell, 1981).

A recent study of 351 nursing students and their mothers investigated the relationship between the current reporting of physical symptoms and retrospective ratings of reinforcement and modeling of illness behavior as adolescents (Whitehead, Busch, Heller, & Costa, 1986). Correlational analyses indicated that the number of reported physical symptoms associated with menstruation and with upper respiratory infection were positively correlated with reported parental encouragement of the sick role and with parental modeling of the sick role. The findings were strengthened by evidence that the number of symptoms reported by their adult daughters was positively associated with mothers' own descriptions of the degree to which they had encouraged and modeled sick role behavior when their daughters were adolescents.

Most studies have investigated the effect of reinforcement and modeling factors on symptom reporting via retrospective self-report. However, more

direct evidence of this relationship is provided by studies in which the elimination of the contingency between illness behavior and attention from caregivers has reduced symptom reports and other expressions of medically unwarranted illness behavior (e.g., Wooley et al., 1978).

Negative Life Events

Unpleasant major life experiences (e.g., the death of a family member or being fired from a job) have been shown to influence the frequency of illness reports and health care utilization in both retrospective and prospective studies (e.g., Holmes & Masuda, 1974; Garrity & Reis, 1985; Pilisuk, Boylan, & Acredolo, 1987; Roth, Wiebe, Fillingim, & Shay, 1989; Scaloubaca, Slade, & Creed, 1988). In addition, the prospective research of Kanner et al. (1981) and DeLongis et al. (1982) demonstrates that a massing of minor unpleasant events or daily hassles, (e.g., a dispute with a neighbor) is strongly related to symptom reports and physical symptoms. This relationship remains even after the effect of major life events is statistically removed. A more recent study by Nowack (1989) has confirmed the relationship between minor stressful life events and symptom reports with a sample of 262 male and female professionals who provided 3-month retrospective reports. Multiple regression analysis indicated that number of minor life events was a significant predictor of the number of symptoms reported, as was greater use of avoidant coping strategies and less endorsement of preventative health behaviors. Further support is provided by a prospective study (Stone, Reed, & Neale, 1987) which found an increase in undesirable life events and a decrease in desirable life events three to four days prior to an episode of infectious illness. In summary, it appears that major and minor life events have partially independent, positive relationships with symptom reports.

Satisfaction with Social Support

Social support has been considered a moderator of life stresses based on evidence that increasing levels of satisfaction with social support are associated with fewer deleterious effects of stress, such as poor health status, immune system dysfunctioning, somatic complaints, the seeking of medical services, and noncompliance with treatment regimens. One example of such evidence is a comparison of young widows with either good or poor health outcomes one year following their husband's death (Kraus & Lilienfeld, 1959). A greater incidence of unsatisfied interpersonal needs was found among the women with poor health. Likewise, dissatisfaction with social support has been found to be positively related to immune system dysfunctioning (McNaughton, Smith, Patterson, & Grant, 1990). Also, significant interactions of social support and work stress have predicted somatic complaints among a sample of men in a variety of occupations (LaRocco, House, & French, 1980) and stress has been found to contribute to an increased rate of medical care unless buffered by the effects of social support (Pilisuk, Boylan, & Acredolo, 1987). Another study has found that women, but not men, with more acquaintances report fewer physical symptoms (Miller & Ingham, 1976). Finally, Kaplan and Hartwell (1987) have found that metabolic control of Type II diabetes mellitus was positively correlated with satisfaction with social support for women.

On the other hand, it is important to recognize that social relationships can themselves be a significant source of stress (Coyne & DeLongis, 1986). In fact, both family and non-family sources of social stress have been found to be positively associated with self-reported symptoms (Parkerson, Jr., Michener, Wu, Finch, Muhlbaier, Magruder-Habib, Kertesz, Clapp-Channing, Morrow, Chen, & Jokerst, 1989). Further complicating the picture are studies which found no stress-buffering effect of family support (e.g., Cronkite & Moos, 1984)

and other studies that indicate that a lack of available, satisfying social relationships can be stressful even in the absence of other stressors (Aneshensel & Stone, 1982). Moreover, social support may have detrimental effects on an individual's health if seeking medical services is delayed because of reassurance provided by friends or relatives (Rodin, 1978). Thus, it is unwarranted to adopt simplistic generalizations about the benefits of social support or to claim that the impact of social support is necessarily limited to situations in which other life stresses are prominent.

## Psychological Variables

### Psychological Factors Associated with Physiological Overreactivity

Self-identified shyness as a child and failure to confide a traumatic experience are two psychological factors associated with physiological overreactivity, which in turn is associated with increased symptom reporting. This pattern of relationships suggests that physiological overreactivity may be a mediating factor between these two psychological variables and at least one aspect of illness behavior.

The link between symptom reporting and physiological overreactivity has been established by studies which have found that symptom reporting is positively correlated with such indicators of physiological overreactivity as pronounced reactions to mildly stressful events, prolonged recovery from a stressful event, and chronically elevated arousal (e.g., Gannon, Banks, & Shelton, 1987). These indications of homeostatic dysfunction have also been associated with the presence of actual physical disorder. It should be noted, however, that this evidence is less convincing as it reflects existing conditions. For example, exaggerated blood pressure response and slow return to baseline levels following stressful stimulation has been observed in individuals with essential hypertension (e.g., White & Gildea, 1937; Brod, Fencl, Hejl &

Jerka, 1959). Ulcer patients have been found to have significantly higher rates of HCL secretion during sleep than normal controls (cited in Stoyva, 1979). Individuals suffering from chronic tension headache show frontal EMG levels approximately twice those seen in normal control subjects (Budzynski, Stoyva, Adler, & Mullaney, 1973). Even on non-headache days, migraine patients show an amplitude of pulsation in the extracranial temporal artery that is twice that of normals (Dalessio, 1972) and have greater scalp temperatures indicative of greater vasodilation (Cohen, Rickles, & McArthur, 1978).

Physiological overreactivity of the type described in the above-mentioned studies has been associated with both childhood shyness and undisclosed trauma. Following is a brief summary of the research establishing these associations.

Childhood Shyness. Inhibited or shy behavior as a child is among the psychological variables associated with a predisposition to produce greater physiological response to mild stress (Kagan, Reznick, Clarke, Snidman, & Garcia-Coll, 1984). Kagan and his colleagues have identified this relationship as early as 21 months of age (Kagan et al., 1984) and it remains fairly stable at least until age six (Kagan, Reznick, & Snidman, 1988). Kagan et al. (1984) have reasoned that behavioral inhibition is influenced by biological factors because it can be identified very early in life and remains stable.

In summary, shyness as a child is associated with chronic physiological overresponsivity, although there is no direct evidence indicating that adults who were shy as children continue to be physiologically overreactive to stress or that they also make increased symptom complaints. However, a preliminary study by Kagan et al. (1988) suggests that physiological overreactivity is a stable characteristic and Gannon et al. (1987) found that physiological reactivity is positively correlated with symptom reporting. It can therefore be expected

that individuals who were shy as children will make more symptom complaints than individuals who were not shy as children.

Undisclosed Trauma. Another psychological variable associated with physiological overreactivity is failure to confide a traumatic experience, such as a rape or a parental divorce that occurred during childhood (Pennebaker, 1985; Pennebaker & O'Heeron, 1984). Pennebaker (1985) has outlined a model in which the consequence of not confiding a trauma is cognitive rumination, which maintains chronically high levels of physiological arousal and, in turn increases the probability of stress-related disease and physical symptom complaints. In support of Pennebaker's model are findings that individuals who repress their thoughts or feelings tend to engage in cognitive rumination and have higher levels of physiological arousal as measured by blood pressure (Weinberger, Schwartz, & Davidson, 1979), skin conductance (Buck, 1984) and cardiovascular response (Notarius & Levenson, 1979). Furthermore, the health of Holocaust survivors has been found to be positively related to the degree to which they disclosed personal trauma experienced during World War II (Pennebaker, Barger, & Tiebout, 1989). Physician visits for illness have been found to be lower among freshmen who previously had disclosed their thoughts and feelings associated with entering college, as compared to those who had not done so (Pennebaker, Colder, & Sharp, 1990). A similar effect was found among undergraduates who wrote about personally traumatic events, as compared to students who wrote about trivial topics (Pennebaker & Beall, 1986).

In summary, both childhood shyness and undisclosed trauma have been associated with increased physiological arousal, which in turn, has been associated with increased symptom reporting.

Chronic Affective and Personality Factors

Neuroticism. The personality factor that has been most consistently associated with symptom reports is neuroticism. Several studies have found an association between neuroticism and excessive worrying, chronic levels of arousal, and increased symptom reporting (Costa & McCrae, 1980; Costa & McCrae, 1985; Harkins, Price, & Braith, 1989; Kellner, 1985; Mechanic, 1980; Philips & Jahanshahi, 1985). This is not surprising when one considers neuroticism as a dimension of personality that is, in part, defined by autonomic lability (Eysenck, 1983) and may reflect the degree of reactivity of various subsystems of the autonomic nervous system to stress (Wickramasekera, 1986). Individuals who score high on measures of neuroticism may do so in part because they have a tendency to be physiologically overreactive to stress. Sternbach's (1966) model of stress-related disorders suggests that if neurotic individuals experience frequent exposure to stressful events, a return to baseline levels of physiological functioning may be prevented. This may result in permanently elevated arousal levels and consequent physical sensations that are frequently available for translation into symptom reports.

Neuroticism scales are sometimes used as a measure of negative affectivity, which is conceptualized as a broad disposition to experience aversive emotional states such as guilt, fear, depression, anxiety, and anger (see Watson & Clark, 1984). While these various individual affective states have been associated with increased symptom reporting (e.g., Burchfield, Holmes, & Harrington, 1981; Linden, Paulhus, & Dobson, 1986; Robbins & Tanck, 1982; Tessler & Mechanic, 1978; Wagner & Curran, 1984), recent studies have demonstrated that generalized negative mood has a strong relationship to symptom complaints (Croyle & Uretsky, 1987; Jorgensen & Richards, 1989; Verbrugge, 1985). One hypothesis proposed to explain this

phenomenon is that a multicomponent type of distress such as neuroticism or negative affectivity may be more strongly related to symptom reporting than are isolated affective characteristics because it more fully increases the accessibility of illness-related memories (Croyle & Uretsky, 1987). Thus, multiple types of negative affect may have a synergistic effect on symptom reporting.

Another hypothesis proposes that the introspective style characteristic of individuals who score high on negative affectivity is responsible for elevated symptom reporting. Watson and Pennebaker (1989) believe that these individuals are more likely to notice and attend to normal body sensations and minor discomforts. In support of this, negative affectivity has been more strongly associated with subjective health complaints than with verifiable evidence of disease or disorder (Watson & Pennebaker, 1989). In addition, negative affectivity was unrelated to a broad array of objective health indicators such as fitness, frequency of illness, physician visits, and mortality. Watson and Pennebaker (1989) propose that the correlation between measures of negative affectivity and symptom reporting tap, in part, a common underlying dimension, with negative affectivity reflecting primarily the subjective/psychological component of symptom reporting. Their perspective on negative affectivity is supported by findings (Harkins, Price, & Braith, 1989) that the sensory pain ratings of high neurotic patients and low neurotic patients did not differ significantly from each other, but affective pain ratings were higher in high neurotic patients.

Optimism. A second potentially important affective or personality variable related to symptom complaints is dispositional optimism. Several studies suggest that optimism may counteract factors that encourage either physical symptoms or reports about them. For example, a longitudinal study of

undergraduate students has found that individuals who initially reported being highly optimistic were subsequently less likely to report being bothered by physical symptoms than individuals who initially reported being less optimistic (Scheier & Carver, 1985). Similarly, a sample of elderly individuals who were classified as optimists reported fewer symptoms at a two-year follow-up than did elderly pessimists (Reker & Wong, 1983). Scheier and Carver (1987) have proposed several reasons for the inverse relationship between optimism and symptom reports, and they present evidence suggesting that less cardiovascular reactivity to stress may be a physiological mechanism underlying optimists' better health reports. They also suggest that optimists may experience fewer physical symptoms because they believe more strongly in the benefits of positive health habits and consequently engage in more symptom-reducing behaviors (e.g., Holahan & Moos, 1985; 1987).

In a similar vein, optimism has been positively associated with such coping strategies as problem-focused coping and seeking of social support. It has been negatively associated with denial, disengagement and focusing on and expressing emotions (Scheier, Weintraub, & Carver, 1986). The coping strategies endorsed by optimists may be more effective in reducing stress, and thereby circumvent difficulties that could have a negative impact on health.

Contrary to the view of optimism as a counteracting variable in symptom reporting, Tennen and Affleck (1987) present evidence that optimists sometimes fail to engage in behaviors that would prevent future ill-health, or fail to engage in coping strategies that would result in the resolution of troublesome events. Presumably this happens because they fail to consider the cost of not engaging in preventative measures or tend to discount the probability of negative outcomes.

It is possible that dispositional optimism has two main effects on illness behavior. Optimism may predict reduced symptom reporting due to a tendency to disattend to negative events or bodily sensations. However, if this disattention is prolonged and coping strategies or preventative measures are not undertaken, optimism may also predict increases in the probability of actual illness, thereby ultimately increasing the probability of symptom complaints. Thus, the relationship between illness behavior and optimism may follow a U-shaped function. For reasons already reviewed, low levels of optimism may be strongly related to increased symptom reporting, moderate levels to decreased reports, and high levels to increased reporting.

It should also be noted that Scheier and Carver (1985) found that convergent and discriminant correlations failed to provide evidence that the Life Orientation Test (LOT), the most widely-used measure of optimism, can be distinguished from two measures of anxiety, the Taylor Manifest Anxiety Scale and the Spielberger State-Trait Anxiety Inventory (Smith, Pope, Rodewalt, Carlson, & Morrison, 1988). That is, high LOT scores were correlated with low anxiety scores and with high scores on another measure of optimism (the Generalized Expectancy for Success Scale).

Acute Affective States

Both anxiety and depression have been associated with a high rate of physical symptoms, particularly among women (e.g., Linden, Paulhus, & Dobson, 1986; Robbins & Tanck, 1982). For example, patients who report abdominal pain for which no verifiable physical pathology is found report more anxiety than patients for whom a physiological basis for their abdominal pain was identified (Joyce, Bushnell, Walshe, & Morton, 1986). A similar study produced virtually identical results in patients with upper abdominal pain (Colgan, Creed, & Klass, 1988). Furthermore, clinical intervention studies

found that there is an association between anxiety and reported symptoms such that, when anxiety about pain is reduced, the subjective experience of pain is also reduced (Bowers, 1968; Jones, Bentler, & Petry, 1966).

Depression has also been found to be related to increased symptom reporting. For example, depressed patients with colorectal cancer spontaneously report more symptoms than patients who are not depressed at the time of medical interview (Funch, 1988). Depression has also been found to be positively correlated with symptom complaints among headache sufferers (Philips & Jahanshahi, 1985). The direct relationship between depressed mood and symptom reporting holds even for individuals who do not suffer from a diagnosable affective disorder (Tessler & Mechanic, 1978). An experimental study in which a neutral, sad, or happy mood was induced in subjects with cold or flu symptoms found that subjects in the sad condition reported more physical symptoms than subjects in either of the two other conditions (Salovey & Birnbaum, 1989).

The negative affective states of worry, anger, and hostility have also been associated with symptom complaints. Generalized worry has been associated with increased physical symptom reporting (Gross & Eifert, 1990) and inappropriate use of medical services (e.g., Burchfield, Holmes, & Harrington, 1981; Wagner & Curran, 1984). Specifically, people who are rarely ill report that they seldom worry, but people who are frequently ill report chronic worry (Burchfield, Holmes, & Harrington, 1981). Worry about illness in particular, has been found to be related to reported physical symptomatology (Robbins, Kirmayer, & Kapusta, 1990). In addition, individuals who frequently respond to life stresses by becoming angry with themselves or with others are more likely to become ill than those who do not respond with anger (Miller et al., 1985). Finally, hostility has been implicated as an etiological factor in

hypochondriasis (Brown & Valliant, 1981). Thus, a constellation of negative mood states including depression, anxiety, worry, anger, and hostility have all been associated with increased symptom reporting and/or disease.

Behavioral Factors

Coping Strategies. Approach-avoidance coping strategies have been extensively investigated with regard to their relationship to physical illness and symptom reporting (e.g., Gayton, Bassett, Tavormina & Ozmon, 1978; Holahan & Moos, 1985: Moos & Schaefer, 1986; Roth & Cohen, 1986; Warrenburgh, Levine, Schwartz, Fontana, Kerns, Delaney, & Mattson, 1989). Approach coping encompasses paying attention to some aspect of a problem, to one's own feelings and cognitions, and sometimes undertaking active behavioral or cognitive strategies to deal with the problem. Information-seeking, problem-solving, and the sensitization pole of the sensitization-repression dimension are examples of approach strategies. On the other hand, avoidance strategies entail affective, behavioral, or cognitive withdrawal from the impact of stress. Denial, repression, and wishful-thinking are examples of avoidance strategies.

The chronic use of coping strategies that avoid confrontation with interpersonal or situational conflicts has been positively associated with symptom complaints. For example, patients who complain of abdominal pain without verifiable physical pathology deny problems or report fewer problems and worries than patients who have abdominal pain in the presence of physical pathology (Joyce, Bushnell, Walshe, & Morton, 1986). In addition, individuals who report becoming ill under stress are more inclined to report use of avoidance coping than individuals who report little or no illness under stress (Holahan & Moos, 1985; 1987). This has been confirmed in a study by Nowack (1989), who investigated the role of trait avoidance in symptom reporting. Multiple regression analysis indicated that avoidance coping (together with

greater stress and fewer preventative health behaviors) was a significant predictor of the number of retrospective symptoms reported by 262 male and female professionals. Likewise, avoidant coping (alone, and together with negative life events, less self-confidence, less of an easygoing disposition, and less family support) significantly predicted the physical symptoms characteristically associated with stress (Holahan & Moos, 1985).

In contrast, other studies suggest that denial or avoidance can be beneficial under certain circumstances. When a stress is uncontrollable and little can be done to actively alleviate it, denial or avoidance may be adaptive. For example, individuals who use avoidance as a primary coping strategy for dealing with the symptoms of recurrent genital herpes report fewer recurrences of the disease (McLarnon & Kaloupek, 1988). Similarly, avoidance has been found to be beneficial in the short-term to help surgical patients overcome the potentially overwhelming situation, and to allow them time to mobilize personal resources (Cohen & Lazarus, 1973; Langer, Janis, & Wolfer, 1975).

The timing of avoidant or approach coping in dealing with a stressor may also be an important variable influencing whether an individual will adapt to the stress or whether illness will result. This view is supported by the results of a meta-analysis and a review of research comparing the effects of approach and avoidant coping strategies on physical adaptation (Mullen & Suls, 1982; Roth & Cohen, 1986). Both overviews have concluded that denial is likely to be more beneficial to physical adaptation if it is used early in a stressful event when an individual may feel overwhelmed. Conversely, approach or attentive coping strategies may be more beneficial at a later point when instrumental actions can eliminate or attenuate the stressor. Unfortunately, however, the studies available for review and meta-analysis looked at coping exclusively in either the acute phase or the chronic phase of a stress, not in a longitudinal

framework. Consequently, conclusions based on this review and meta-analysis are restricted in scope and should be viewed with caution.

The interpersonal/non-interpersonal aspect of a stressor is another potentially influential dimension of coping strategies. Previous studies have found that different stressor dimensions differentially predict coping and various other outcome measures (Block & Zautra, 1981; Miller & Ingham, 1985; Ruch, 1977; Tausig, 1982). That is, partitioning of a stressful life event score into diverse life areas allows examination of potentially different effects associated with dissimilar types of stresses. These individual effects may be masked by examination of the combined life event score only. For example, one study found that among young males, negative preoccupation with (worry about) marital changes is associated with greater depression, whereas worry about work changes is associated with reduced depression (Chiriboga & Dean, 1978).

A classification system is suggested by a multidimensional scaling study of the Social Readjustment Rating Scale (SRRS; Ruch, 1977) which supports the distinction between interpersonal and non-interpersonal stressors. Specifically, life changes were found to have three dimensions: (1) the degree of change evoked, (2) the desirability of the change, and (3) the life area in which the change occurs. The third dimension was described by Rusch as differentiating personal / interpersonal stresses from financial / occupational stresses. Examination of the items falling into these two categories reveals that the two categories may be more simply labeled as interpersonal versus non-interpersonal stresses.

In summary, examination of the relationship between coping strategies and illness may require consideration of the duration of the stressor to which

the coping response is applied (either acute or chronic) and the nature of the stressor (e.g., either interpersonal or non-interpersonal).

Preventative Health Behaviors. Failure to practice preventative health behaviors, such as not exercising, not obtaining adequate sleep, not eating a balanced diet and smoking, is also associated with increased symptom complaints. For example, reports of decreased physical activity and decreased sleep have been associated with reports of decreased general physical health (Wolf & Kissling, 1984). Likewise, smoking, excessive use of alcohol, and a lack of exercise were positively associated with common physical complaints (Mechanic, 1980). Furthermore, a 25-item measure of preventative health behaviors (including exercise, rest, sleep, hygenic practices, nutrition, and eating habits) were inversely associated with the number of symptoms reported by 262 middle-aged individuals (Now: :, 1989). Mechanic (1980) speculates that negative health behaviors may either increase susceptibility to common illnesses or to unpleasant physical sensations, or may be a response to unpleasant or uncomfortable physical sensations. For example, smoking and drinking may be ways of reducing anxiety or other uncomfortable psychological states, and individuals who are feeling sluggish or unenergetic may be less motivated to exercise. In addition, smoking, drinking, and lack of exercise may focus more attention on unpleasant bodily sensations, resulting in increased monitoring of bodily sensations and heightened awareness of physical discomfort.

Although the association between preventative health behaviors and good health makes intuitive sense and has largely been supported through empirical investigation, measures of preventative health behaviors have not always been associated with improved health status or with reduced symptom reporting. For example, a study by Roth, Wiebe, Fillingim, and Shay (1989)

revealed that self-perceived physical fitness correlated negatively with a measure of self-reported illness, as would be expected. However, a self-report measure of exercise participation was not related to illness reports. Possible reasons for the difference between results of this study and that of Wolf and Kissling (1984) or Nowack (1989) are population differences and differences in measurement instruments. Most striking is the fact that Wolf and Kissling (1984) and Nowack (1989) both measured multiple components of preventative health behaviors, whereas Roth, Wiebe, Fillingim, and Shay (1989) were interested only in exercise.

Cognitive Factors

Somatic Sensitivity. Some individuals react to or cope with the emotional arousal accompanying life stresses with a heightened awareness of physiological changes. Understandably, these individuals tend to have elevated symptom reports (Ahles, Cassens, & Stalling, 1987; Barsky & Klerman, 1983; Fillingim & Fine, 1986). An experimental study by Fillingim and Fine (1986) compared the number of physical symptoms reported by undergraduates who ran one mile under one of three conditions; (1) focus externally by listening for a target word heard repeatedly over headphones, (2) focus internally by attending to breathing and heart rate, or (3) a no-instruction control condition. Consistent with the hypothesis that attention to physiological functioning increases symptom reporting, fewer physical symptoms were reported by individuals in the external focus condition than by individuals in either of the other two conditions.

Other studies have investigated this phenomenon under different conditions and with different populations with similar results. For example, Miller, Murphy, and Buss (1981) discovered that individuals who score high on a measure of private body consciousness report more somatic symptoms

associated with the ingestion of caffeine. Puente (1984) found that a measure of autonomic perception was positively correlated with a self-reported history of psychosomatic disorders among undergraduate students. Finally, body awareness was shown to be strongly related to somatic symptoms, as measured by the SCL-90, among individuals with rheumatoid arthritis (Robbins, Kirmayer, & Kapusta, 1990).

Alexithymia. Difficulty communicating about emotional experience appears to be related to physical symptom reports (e.g., Barsky & Klerman, 1983). In addition, a study by Pilowsky and Spence (1975) indicates that affective inhibition is an important aspect of illness behavior in patients with intractable psychosomatic pain. These authors speculate that unresolved anger and frustration may lead these patients to be less socially assertive so that they chronically experience frustration and the physiological arousal that accompanies it. Thus, alexithymics may make increased symptom reports because they are experiencing and recognizing chronic levels of arousal. On the other hand, it is possible that increased symptom reports reflect a developmentally-based lack of skill in communicating about emotional experience, as hypothesized by Lane and Schwartz (1987).

Symptom Specific Beliefs. Attitudes about symptoms and about the efficacy of medical services have been found to be significant predictors of health care utilization. Specifically, perceived efficacy of health care, ease of going to the doctor, and perceived seriousness of symptoms and reported disability from symptoms have all shown to be related to the use of physician services (Berkanovic, Telesky, & Reeder, 1981; Prohaska, Keller, Leventhal & Leventhal, 1987). Moreover, symptoms that are perceived as severe and those with which a patient has had little experience are more likely to be reported spontaneously in a medical interview (Funch, 1988). In addition,

Safer, Tharps, Jackson, and Leventhal (1979) report that the single best predictor of the length of time taken to decide whether or not to seek professional health care is previous personal experience with the symptoms. This evidence indicates that beliefs about symptoms and health care are related to several aspects of illness behavior, including symptom reports.

## Interactions Among Variables

Some findings suggest that increased symptom reporting occurs in the context of interactions among influences. For example, a path-analytic study suggests that sex-specific relationships exit between stressful life events, social support, and preventative health behaviors (Gottlieb & Green, 1984). For females, preventative health behaviors (e.g., not smoking, weight maintenance, exercise, and sleep) were directly related to social support and inversely related to stressful life events. In addition, stressful life events were inversely related to social support. For males, preventative health behaviors were directly related to social support, but were not associated with stressful life events. Similar to females, there was a significant inverse relationship between social support and stressful life events. Furthermore, a study by Sarason, Sarason, Potter, and Antoni (1985) suggests that the relationship between negative life events and illness is stronger among individuals with low levels as compared to high levels of social support.

Gannon, Banks, and Shelton (1987) present preliminary evidence suggesting that individuals who show greater physiological responses to laboratory stress, exhibit a stronger relationship between daily stressful events and illness than do individuals who are less physiologically reactive. They speculate that excessive physiological responses to and/or slow recovery from stress may characterize individuals with poor or limited coping strategies who experience more physical symptoms in the face of high stress levels.

More generally, depression, anxiety and hostility scores on the Multiple Affect Adjective Check List (Zuckerman & Lubin, 1965) have been found to be related to life change scores on the Life Experiences Survey (Sarason, Johnson, & Siegel, 1978; Siegel, Johnson, & Sarason, 1979). Positive life changes were related to lower levels of depression and anxiety, and negative life changes were associated with higher levels of anxiety and hostility. Furthermore, experimentally manipulated depressive mood did not affect responses on the Life Experiences Survey. This result has been interpreted as an indication that previous correlations between depressive mood and the reporting of negative life events were due to an effect of life events on mood and not simply that mood increases the probability of reporting life events (Siegel, Johnson, & Sarason, 1979).

Another approach taken in the investigation of the relationship among mood, life events, and symptom reports is to have subjects record each of these variables on a daily basis using a diary technique (Verbrugge, 1985). Results of this approach have revealed that when negative events occur on good mood days, there is an increased probability of symptom reports, lay consultation, medical drug use, and medical care. However, when they occur on bad mood days, they usually are associated with reduced probability of medical drug use, lay consultation, and physical malaise. Verbrugge (1985) suggests that bad moods are more proximal to physical symptoms than are negative life events and, thus take precedence as triggers. Negative events are more distant variables and operate as triggers in the absence of proximal variables. In fact, negative life events may sometimes act as a distraction from a negative mood state and blunt the relationship between emotional and physical distress. Given other evidence that experimental manipulation of mood does not affect responses on a life events survey, it appears that the correlation between mood

and reported negative life events is due to an effect of life events on mood and not simply a reflection of negative mood as a factor which increases the reporting of negative life events (Siegel et al., 1979). Thus the interaction between mood and life events, and their relationship with symptom reports should be an important focus for investigation.

Another potentially important interaction is one existing between mood and coping strategies. Specifically, depressed subjects have been found to use more escape-avoidance strategies in dealing with life stresses than non-depressed individuals (Folkman & Lazarus, 1986). Presumably, if depressed individuals applied avoidance coping strategies in the long-term instead of more appropriate approach strategies, the probability of physical illness could be increased (Mullen & Suls, 1982; Roth & Cohen, 1986).

## Overview and Aims of Study

In summary, numerous psychosocial variables have been positively associated with physical symptom reporting. Prominent among these variables are negative life events, dissatisfaction with social support, learning history with regard to illness behavior, shyness as a child, failure to confide a trauma, neuroticism, optimism, anxiety, depression, worry, anger, generalized negative mood, coping strategies absence of preventative health behaviors, somatic sensitivity, alexithymia, and symptom-specific beliefs. Many of these variables are in turn related to one another. For example, individuals who report more stressful life events also report fewer preventative health behaviors and less social support, and they report more anxiety and hostility. In addition, depression is directly related to the coping strategy of avoidance. Finally, increased physiological responsivity is associated with increased reports of stressful life events and is a correlate of shyness as a child, failure to confide a trauma, neuroticism, and optimism.

Several important shortcomings should be noted with regard to the previous investigations of the relationship between psychosocial variables and illness behavior. The first shortcoming is at the level of measurement of the psychosocial variables. Specifically, there appears to be some redundancy among the variables that have been investigated in relation to illness behavior. For example, neuroticism and the inverse of optimism appear to be very closely related, and may be measures of the same underlying construct (Smith, Pope, Rodewalt, Carlson, & Morrison, 1988).

The second and third shortcomings lie at the level of measurement of the symptom criterion variable. A distinction has not been made in previous studies between physical symptoms that are associated with affective disorders and physical symptoms that are not associated with affective disorders. Presumably, the psychological variables of depression and anxiety would be more closely associated with mood disorder-related physical symptoms, such as fatigue and tachycardia, than with physical symptoms not associated with mood disorder, such as toothache and earache. Also, it is possible that the psychosocial variables related to experienced symptoms may be different than those associated with symptoms actually reported to the physician. For example, some symptoms may be experienced, but perceived by the patient as irrelevant to the disease process for which help is sought. In this case, some symptoms may be present but unreported, and the psychosocial variables to which they are related may be different than those reported to the physician.

Finally, previous studies have been quite limited in the scope of their measurement, so that only a few of the potential psychosocial influences have been examined simultaneously. Thus, it has not been possible to determine the relative strength of these several psychosocial variables in predicting illness behavior.

All of these shortcomings were addressed in the present study. It was an initial attempt to examine physical symptom reports together with a large number of psychosocial variables in the context of a single assessment. The psychosocial variables were then subjected to a factor analytic procedure to examine redundancy among them. This examination allowed selection of a smaller number of variables representing each factor. The present study also attempted to examine simultaneously the representative psychosocial variables in regression analyses to determine their relative strength in predicting the number of symptoms experienced by patients and the number of symptoms reported by patients to their physician. Furthermore, symptom complaints were divided into those associated with and those not associated with mood disorders (i.e., anxiety and depression) in order to overcome the frequent confound caused by having affective disorders contribute to both predictor variables and symptom criteria.

A further aim of the study was to identify key predictor variables that can be used in future prospective longitudinal studies of illness behavior. For example, it would be desirable to examine prospectively the impact of psychosocial variables on the utilization of medical health services. However, the expense of such an investigation makes it imperative that the strongest and most independently predictive variables are selected for investigation. In addition, the findings of this study may suggest ways to identify individuals for whom the provision of mental health services can decrease inappropriate use of medical services (cf. Turkington, 1985).

## Pilot Investigation

The pilot and full-scale methodologies differed only slightly. Methodological details and assessment instruments are described later when outlining the method for the main study. The pilot study was conducted between

June and September, 1988 with the following goals: (1) to establish and exercise the patient referral procedures, (2) to determine the suitability of participant screening criteria, (3) to identify and correct difficulties with assessment instruments for both patients and physicians, (4) to gather information on return rates, and (5) to establish a data coding and management scheme in order to facilitate analysis of subsequent, larger data sets. As the the pilot study's final sample size was small (85 subjects), and therefore less reliable, results of this investigation are presented in less detail than the full-scale study.

Participants were solicited from among patients attending four outpatient medical clinics. Approximately 64% of the patients who were asked to participate agreed to complete the forms: 70% of this group actually returned the completed materials (44 males and 41 females). Principal components analysis was used as a first step to reduce the 42 psychosocial variables to a more workable subset. This analysis was used to select 21 variables which were then entered into a second principal components analysis with 16 demographic and background variables. An 8-factor solution identified clusters of variables that were tentatively labeled: (1) Neuroticism / Worry, (2) Negative Affect, (3) Social Support, (4) Denial of Distress, (5) Preventative Health Behavior, (6) Perceived Stress / Symptom Severity, (7) Analysing Events (for causes or deeper meaning), and (8) Confiding / Expressing Distress. A final set of 21 psychosocial and 4 demographic variables was identified as representative of these factors. Because inclusion of sex as a variable in the principal components analysis had only minor impact on the solution, the same set of 25 core variables was used in subsequent analyses for both males and females.

Pearson product-moment correlations confirmed reliable relationships ($r > .30$; $p < .01$) between 24 of the 25 core variables (the exception being depression) and an index of the number of symptoms either experienced and/or reported to the physician. Specifically, symptom reporting was positively associated with neuroticism, pessimism, anxiety, worry, avoidant coping, lack of preventative health behaviors, somatic sensitivity, alexithymia, confidence in the physician, symptom-specific beliefs (perceived seriousness and interference of symptoms), negative life events, dissatisfaction with social support, and reported modeling of and reinforcement for illness behavior. Some of the correlations were limited to one sex only, but several held for both sexes.

The predictive value of the 25 variables was next examined by means of 10 step-wise regression analyses (5 for each sex) aimed at the following criterion variables: (1) number of affect-related symptoms experienced during the preceding two weeks, (2) number of affect-related symptoms reported to the physician, (3) number of nonaffect-related symptoms experienced during the preceding two weeks, (4) number of nonaffect-related symptoms reported to the physician, and (5) a physician rating of the likely physiological versus psychological origins of the primary reported symptoms. The purpose of these analyses was to eliminate redundancy among the predictor variables by examining the magnitude of relationship when only independent variance was included. Accordingly, variables were entered at successive steps only if the increment in explained variance was reliable ($p < .05$). Eight of the 10 multivariate equations identified sets of predictor variables that bypassed one or more significant univariate predictors. Furthermore, 3 of the 10 equations showed a statistical suppression effect in that some of the variables entered at later steps were not significantly correlated with the criterion variable according

to the univariate analysis. Clearly, the multivariate approach contributed to a more refined picture of the predictors. Results of the multivariate regression analyses are set out in Table 1 and can be summarized as follows:

*Nonaffect-Related Symptoms*

(1) More nonaffect-related symptoms were experienced by males who indicated less satisfaction with social support and a greater impact of stress. For females, experiencing these symptoms was associated with greater confidence in their physician, greater pessimism, and greater perceived severity / interference of the symptoms (symptom-specific beliefs).

(2) More nonaffect-related symptoms were reported to a physician by males who endorsed greater modeling of and reinforcement for illness behavior, as well as less inclination to analyze events. For females, confidence in their physician and dissatisfaction with other sources of social support combined to predict their symptom reports.

*Affect-Related Symptoms*

(1) More affect-related symptoms were experienced by males who scored higher on neuroticism and worry and who were younger. Females who experienced more of these symptoms also scored higher on neuroticism, worry, and indicated greater perceived severity / interference for affect-related symptoms.

(2) More affect-related symptoms were reported to a physician by males who endorsed fewer preventative health behaviors, scored higher on worry, indicated higher perceived severity / interference for the symptoms, and denied the impact of stress. These symptoms were reported more by females who indicated higher perceived severity / interference for the symptoms, were older, and who endorsed greater modeling of and reinforcement for illness behavior.

*Physician Ratings*

Physicians rated the origin of symptom reports to be more psychological for males who reported a greater number of symptoms from the emotion-based category, were older, and denied the impact of stress. Psychological origin of symptoms was rated higher for females who endorsed greater modeling of and reinforcement for illness behavior, indicated less inclination to analyze events, and who reported fewer nonaffect-related symptoms.

Brief Discussion of Pilot Study

Several aspects of the pilot findings are noteworthy. First, even though the pattern of relationships among predictor variables (i.e., principal components factors) was highly similar for both sexes, most of the regression equations identified different predictors of symptoms for males and females. This pattern of results indicates that the regression differences are probably not an artifact of variations in the interpretation of predictor variables across sexes. Second, physician ratings of symptom origins were predicted by sets of variables that differed between the sexes. This outcome suggests that physicians may respond to different characteristics of male and female patients when making determinations of this type. Together these results highlight the importance of examining data for the two sexes separately.

Third, different sets of predictors were identified for affect-related versus nonaffect-related symptoms. Predictors for affect-related symptoms were more often neuroticism and worry and/or symptom-specific beliefs, while those for nonaffect-related symptoms were more often concerned with stress and social support. Fourth, there were different predictors for experienced versus reported symptoms. Experienced symptoms were associated with neuroticism, worry, and stress, whereas reported symptoms were associated with modeling of and reinforcement for illness behavior and less preventative health behavior.

Table 1.

Pilot Multivariate Regression Analyses with Nonaffect-Related Symptoms, Affect-Related Symptoms, and Physician Ratings as Criterion Variables

| Criterion Variable | Predictor Variables | Total $R^2$ |
|---|---|---|
| Nonaffect-Related Symptoms | | |
| Experienced by Males | Satisfaction with Social Support *<br>Stress Impact | .26 |
| Experienced by Females | Confidence in Physician<br>Optimism *<br>Severity/Interference of Nonaffect-Related Symptoms | .42 |
| Reported by Males | Modeling/Reinforcement of Illness Behavior<br>Inclination to Analyse Events * | .23 |
| Reported by Females | Confidence in Physician<br>Satisfaction with Social Support * | .60 |
| Affect-Related Symptoms | | |
| Experienced by Males | Neuroticism<br>Worry<br>Age * | .49 |
| Experienced by Females | Neuroticism<br>Worry<br>Severity/Interference of Affect-Related Symptoms | .26 |
| Reported by Males | Endorsement of Preventative Health Behaviors *<br>Worry<br>Severity/Interference of Affect-Related Symptoms<br>Endorsement of Stress Impact * | .41 |
| Reported by Females | Severity/Interference of Affect-Related Symptoms<br>Age<br>Modeling/Reinforcement of Illness Behavior | .43 |
| Physician Ratings | | |
| For Males | Number of Reported Affect-Related Symptoms<br>Age<br>Endorsement of Stress Impact * | .45 |
| For Females | Modeling/Reinforcement of Illness Behavior<br>Inclination to Analyse Events *<br>Reported Nonaffect-Related Symptoms * | .33 |

* = Negative Relationship

In summary, the pilot study suggests that redundancy exists among the measures previously used to investigate the relationship between psychosocial variables and the illness behavior of symptom reporting. Sex differences appear to be prominent and gender is suggested as a moderating variable in physician determination of symptom origin as psychological versus physiological. Finally, predictor differences suggest the importance of making a distinction between symptoms that are features of affective disorders (i.e., anxiety and depression) and those that are not features of such conditions. Similarly, support was provided for the distinction between symptoms that are reported to a physician and those that are experienced but not reported. Neither of these distinctions had been incorporated in the design of previous investigations.

## Method

### Participants and Procedure

During a six-month period between August, 1989 and February, 1990, participants were solicited from among 846 patients attending four clinics in Montreal, Canada during the hours the investigator or research assistant were present to conduct recruitment. The clinics were in the Department of Family Medicine at a general hospital (Hospital-1), the Community Clinic at another hospital (Hospital-2), and from the medical clinics of two universities (University-1 and University-2). The clinic at University-1 was frequented by staff, faculty, and students, whereas the clinic at University-2 was frequented only by students. Multiple settings were sought to increase the potential generalizability of findings. All participants were attending a clinic for problems other than (a) a check-up requested by a physician or by a third party, (b) follow-up of a previously suspected or diagnosed condition, (c) allergy shots, (d) immunization, or (e) contraception.

Patients were approached by the investigator or a research assistant after they had registered with a receptionist and were seated in a waiting area. The investigator or research assistant briefly described the nature of the study and the eligibility requirements. Eligible patients who expressed interest were asked to read the consent form which described the purpose of the study and the confidentiality of information provided. Patients who then agreed to participate were asked to sign the consent form. In addition, patients could request to receive a summary of the research results, which were provided after all data had been analysed. Once informed consent was obtained, patients were given a questionnaire package which included the Project Information Sheet, which explained again the important aspects of the study. The questionnaire package was to be completed and mailed within the 24-hour period following their visit to the physician. Pre-addressed, stamped envelopes were provided. Of the eligible patients who were approached, 675 (80%) agreed to participate in the study.

For each consenting patient, the respective physician was asked to complete the Physician Report form on which they (1) rated on a 1 to 6 likert-type scale, the degree to which the primary presenting problem was due to physiological (rating = 1) versus psychological (rating = 6) factors, (2) indicated whether the majority of symptoms reported could have been or had been confirmed by examination or further testing, (3) indicated the primary system or organ affected, and (4) reported their diagnosis or tentative diagnosis, if any. These ratings constituted some of the criterion variables and were of interest as a reflection of physician judgement, a likely mediating influence on treatment recommendations and subsequent care.

Eligible patients who did not agree to participate were asked to complete a Patient Information Form. This measure requested: (1) demographic

characteristics such as age, sex, marital status, education and occupation, (2) information regarding the frequency of previous visits to a physician, (3) the frequency of absence from work or school due to illness, and (4) the primary reason for non-participation. One hundred seventy-one eligible patients declined participation. Of these patients, 162 (95%) agreed to complete the Patient Information Form. Copies of the Consent Form, Participant Request Form, Project Information Sheet, Physician Report, and Patient Information Form are set out in Appendix A.

## Measures

The battery of questionnaires took approximately 40 minutes for each participant to complete. Copies of all questionnaires are set out in Appendix B. A symptom report, one of the key criterion variables, was presented first in the package to prevent carry-over from other more psychologically-oriented questionnaires. The remainder of the measures were arranged in counter-balanced order within the package due to concern about the effects of fatigue and sensitization. Separate sets of questionnaires were constructed for males and for females so that each order was equally presented to each sex. The following measures comprised the battery of questionnaires given to each participant.

### Symptom Questionnaire

Physical symptom reports were the primary criterion variable and were measured by the Symptom Questionnaire. This instrument was divided into two sections: the first was a measure of physical symptoms commonly associated with affective disturbances involving anxiety or depression, and the second section was a measure of physical symptoms not associated with affective conditions. The goal of this separation between symptom types was to overcome the confound between affective and disease symptoms which

otherwise complicates data interpretation. It was expected that psychosocial predictors of symptoms would be different depending on the type of symptom to be predicted.

The symptoms in Section 1 were derived primarily from the physical symptoms listed in DSM-III-R (1987) associated with mood and anxiety disorders (e.g., fatigue, pounding or racing heart). The DSM-III-R list was chosen as the most current and relevant list of physical symptoms associated with psychological distress of this type. In addition, headache, backache, ringing ears, and teeth grinding were added to the DSM-III-R list as they also are commonly associated with affective conditions (e.g., Cameron, 1944; Attanasio, Andrasik, Blanchard, & Arena, 1984). The symptoms in Section 2 were derived from the Cornell Medical Index (CMI; Brodman, Erdmann, & Wolff, 1974) excluding all symptoms listed in Section 1. An abbreviated version of the CMI was used because the full version requires lengthy administration by trained personnel, an option that was not appropriate for the current methodology. The combination of the symptom lists in the two sections of the Symptom Questionnaire constituted a relatively comprehensive measure of subjective physical symptoms.

Participants were asked to indicate which symptoms they experienced during the two-week period prior to the current clinic visit, and then to indicate the symptoms they reported to their physician at their current visit. Pilot evidence had indicated different psychosocial correlates of these two aspects of physical symptomatology.

After completing each section of the Symptom Questionnaire, participants were asked to indicate 1) their confidence before seeing the physician that s/he could treat the symptom(s) checked in that section, 2) their most serious symptom and its perceived seriousness, 3) the symptom which

most interfered with their daily routine and its degree of interference, and 4) the symptom with which they had the least previous experience and their degree of experience with it. For later statistical analyses, a composite score of ratings of symptom seriousness, interference and inexperience was calculated for each participant for both affect-related and nonaffect-related symptoms. These were termed "symptom-specific beliefs for affect-related symptoms" and "symptom-specific beliefs for nonaffect-related symptoms", respectively. Finally, as a control for the impact of stable physical problems, participants were asked to list any chronic physical conditions and to indicate symptoms they believed were caused by the chronic condition(s). Women were asked to indicate any symptoms that they attributed to their menstrual cycle or to menopause.

Background Information

Participants next completed a four-page questionnaire that began with a request for general demographic information such as age, sex, marital status, number of years of education, and occupation. This information was important for determining the characteristics of the sample and, in some instances, for creating predictor variables for entry into regression analyses. Occupations were included as a measure of socioeconomic status and were rated using the Blishen Scale (Blishen & McRoberts, 1976), where '1' indicates the highest-rated occupation in terms of socioeconomic status, and '500' represents the lowest-rated. Information also was requested regarding chronic illness as a child, family history of chronic illness, past psychiatric hospitalization, and prescribed medication use because these variables have the potential to influence symptom reporting (Mayou, 1976; Mechanic, 1979; Mechanic, 1980). As an attempt to replicate the findings of Pennebaker (1985) and Pennebaker and Susman (1988), participants were asked to indicate the degree to which they confided several types of trauma.

On the basis of past findings (Burchfield, Holmes, & Harrington, 1981; Kagan et al., 1984; Moss, 1986; Turkat, 1982), participants were asked to rate their degree of general worry, their worry about health, shyness as a young child, family and personal avoidance of responsibility when sick, personal and family attention received when sick, the frequency of their visits to a physician, and the frequency with which they didn't meet certain obligations due to illness. Four questions regarding preventative health practices also were asked. Specifically, participants rated the regularity with which they exercised, smoked cigarettes, obtained adequate sleep, and ate a balanced diet. These particular behaviors were chosen because they represent some of the most common preventative health practices previously investigated (Calnan, 1985; Kristiansen, 1985; Langlie, 1977; Lau & Hartman, 1983, Mechanic, 1980; Wolf & Kissling, 1984).

Situation / Coping / Social Support Form

The third questionnaire was a list of 23 stresses derived from two sources: (1) the Hassles Scale (HS; Kanner, Coyne, Schaefer, & Lazarus, 1981), which assesses relatively minor daily difficulties that occur with at least moderate frequency, and (2) the Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978), which assesses less frequent but potentially more disruptive major life events. Due to the independent relationships of major and minor life stresses on illness behavior, a recent common practice has been to devise measures of life stresses that combine both major and minor events. For example, Holahan and Moos (1987) have found that a 15-item measure of negative stresses that combines both major and minor events was a significant predictor of the number of stress-related physical symptoms reported by subjects.

Whereas the partial independence of major and minor events is a robust finding, Weinberger, Hiner and Tierney (1987) have provided evidence that may explain the manner in which major and minor events sometimes have an interdependent relationship with illness behavior. These authors found that major life events have weaker correlations with self-reported health status than do hassles, and that individuals reporting more major life events also report more hassles during a subsequent six-month period. They hypothesize that the influence of major life events on health may be indirect via a subsequent increase in hassles.

Complete forms of the LES and the HS were not used because of concern that the package of measures might become so large that patients would be unwilling to participate. The composite questionnaire was composed of the 10 most commonly endorsed hassles on the HS and 13 stress items derived from the LES. These later items included only predominantly negative life stresses because the negative impact of a stress, and not merely its experience, has been shown to be an important variable in the reporting of psychological symptoms (Zuckerman, Oliver, Hollingsworth, & Austrin, 1986). In addition, interrelated LES items were combined to form single items. For example, the three LES items of death of a spouse, death of a close family member, and death of a close friend were combined to make the item, "death of a friend, spouse, or family member".

The 23 items were categorized as being either of an interpersonal nature (i.e., due to interaction or loss of interaction with other people) or of a non-interpersonal nature (i.e., strictly intrapersonal, environmental, or economic) by an independent sample of 132 subjects (66 females and 66 males) solicited from undergraduate Psychology and Management classes at one of the universities.[1] Items were considered to be of an interpersonal nature if 65% or

more of the subjects categorized them as such. Likewise, items were considered to be non-interpersonal if they were so judged by 65% or more of the subjects. Remaining items were designated ambiguous. Categorizations were analysed separately for each sex, and only four stresses were classified differently by the sexes. Each of these four items were ultimately classified as ambiguous for both sexes.

On the basis of the ratings, the Situation / Coping / Social Support Form was divided into three sections; Section 1 listed the 3 items classified as interpersonal. Section 2 listed the 5 non-interpersonal items, and Section 3 listed the 15 ambiguous items. For each section, participants were asked to check all items that were of concern to them during the previous two weeks. They were then asked to (1) indicate the stress which had the most negative impact during the same period, (1) when the stress began, and (3) their satisfaction with the social support they had received with regard to that stress. Satisfaction was the only dimension of social support measured because it is apparently the most predictive of health related outcomes (Bruhn & Philips, 1984). Finally, subjects were asked to indicate the degree to which they used each of eight coping strategies in dealing with the stress which had the most negative impact. These eight coping strategies were selected either because they have been found to be predictive of symptom reporting (e.g., denial and wishful thinking) and/or because they are commonly-used cognitive and behavioral strategies which address the coping dimension of approach-avoidance (Holahan & Moos, 1985).

Eysenck Personality Inventory (EPI)

This inventory is a 57-item questionnaire that includes a reliable and valid measure of neuroticism (Eysenck & Eysenck, 1968). It has demonstrated concurrent validity with other measures of related constructs (e.g., Windle,

1989) and good test-retest reliability (e.g., Balkisson, 1988). The EPI's factor structure has been evaluated using a variety of populations in numerous countries and consistently has been found to measure the two major dimensions of neuroticism and extraversion (McCormick, Green, & Walkey, 1987; Walkey & Green, 1990; Walkey, Green, & McCormick, 1986; Walkey, Stumpf, & Green, 1988). Furthermore, the EPI has been used in previous research concerning illness behavior (e.g., Bond, 1971; Mechanic, 1980).

The EPI neuroticism score was revised for all principle analyses performed in this study. Specifically, the following four items were removed from the full-scale score because of their redundancy with the symptom criterion measures and concern about the artificial inflation of the correlation between neuroticism scores and the symptom measures: (1) Do you get palpitations or thumping in your heart?; (2) Do you get attacks of shaking or trembling?; (3) Are you troubled by aches and pains?; and (4) Do you suffer from sleeplessness?

Personal Illness Questionnaire

This 12-item measure of emotional response to health-related situations (e.g., having the flu, blood sampling) has three factors identified as bodily injury fear, disease fear, and somatic sensitivity (Kaloupek, Schwartz, & Adler, 1986). The index of somatic sensitivity was of particular interest because of its potential relationship with symptom reporting (Barsky & Klerman, 1983). The measure of disease fear was also of interest because it has been identified as being a major component of hypochondriasis, a condition marked by the over-reporting of physical symptoms (Pilowsky, 1967).

Life Orientation Test (LOT)

This 12-item scale measures dispositional optimism in terms of generalized outcome expectancies. It has shown a level of internal consistency

indicating that items are measuring the same construct but are not overly redundant. Test-retest reliability is adequate ($r$ = 0.79 over a four-week period), and the convergent and discriminant validity determined from correlations with 18 other measures is satisfactory for current purposes. For example, the correlation between Life Orientation Test scores and Beck Depression Inventory scores (Beck, 1967) was suitably high ($r$ = -. 49), and between Life Orientation Test scores and private self-consciousness was appropriately low ($r$ = -.04). Furthermore, Life Orientation Test scores have been found to be negatively related to symptom reporting (Scheier & Carver, 1985).

Toronto Alexithymia Scale (TAS)

This 26-item measure was constructed to reflect the theoretical construct, alexithymia. Factor analysis has yielded the following four factors consistent with the construct: (1) focus of attention (feelings vs. bodily sensations), (2) ability to communicate feelings, (3) daydreaming, and (4) preference for focusing on external events. The scale has demonstrated adequate split-half reliability (accounting for 45.2% of the variance) and acceptable test-retest reliability ($r$ = 0.82 over a one-week period). In addition, one study found that scores were not significantly related to age, education, or socioeconomic status (Taylor, Ryan, & Bagby, 1985). In terms of convergent and discriminant validity, the TAS has been shown to correlate strongly and positively with a measure of hypochondriasis but negatively with measures of psychological mindedness and "need for cognition". Low-magnitude correlations have been shown between the TAS and measures of self-depreciation, social introversion, persecutory ideation, and impulse expression, but there is no correlation with a measure of denial (Bagby, Taylor, & Ryan, 1986). A recent study has also confirmed the criterion validity of the TAS (Taylor, Bagby, Ryan, Parker, Doody, & Keefe, 1988) in that alexithymia scores were significantly higher for the group

of patients identified by clinicians as "alexithymic" compared to the group identified as "nonalexithymic".

Multiple Affect Adjective Check List- Revised (MAACL-R)

This 132-item checklist provides indices of anxiety, depression, hostility and positive affect. It is an extensively-used research tool that has been found to have good convergent and discriminative validity (Zuckerman & Lubin, 1985; Zuckerman, Lubin, & Rinck, 1986) and good internal reliability (e.g., Lubin, Zuckerman, Hanson, & Armstrong, 1986; Zuckerman & Lubin, 1985). Test-retest reliability for the state form of this measure, the one to be used in this study, are appropriately low (Zuckerman & Lubin, 1985). The MAACL-R has been used in previous studies to examine the relationship between affect and health (e.g., Lubin, Zuckerman, Breytspraak, & Bull, 1988) and to assess affect in medical patients (e.g., Nir & Neumann, 1990).

## Results

### Sample Characteristics

Four hundred thirteen (61%) of the patients who agreed to participate in the study returned the questionnaire packages. This rate of participation corresponds precisely with the 61% rate of return reported in a similar clinical study of symptom reporting by Funch (1988). Twenty-five patients were eliminated due to absent data on more than two measured variables, and two patients were eliminated because the Physician Report had not been returned. The data were then subjected to analysis for univariate outliers. For any one measure, an outlier was defined as a value in excess of three standard deviations above or below the sample mean for that measure. Eighty-four outlying values were removed from analysis and one entire battery was removed because of four outlying variables. As a result, statistical analyses were applied to 385 questionnaire batteries representing 57% of all patients

who originally agreed to participate in the study. This also corresponds closely with the 58% valid questionnaire batteries used for analysis in the Funch (1988) study.

Data for 152 male participants were retained in the final sample (representing 50% of males who agreed to participate), as were data for 233 female participants (representing 63% of females who agreed to participate). Two hundred fifty-nine participants (67%) were patients at university settings and 126 (33%) were from hospital settings. Table 2 provides a breakdown of participants by sex and clinic.

Separate analyses of variance were performed for each of the 9 variables listed in Table 3 in order to examine differences among the four clinics with regard to background characteristics and demographic variables. As expected, results indicated significant differences among clinics only for age, years of education, and socioeconomic status ($p < .05$). Specifically, Tukey post hoc tests ($p < .05$) indicated that: (1) University-2 participants were significantly younger than participants from all other sites and University-1 participants were significantly younger than participants at both hospital locations; (2) University-2 participants reported significantly more years of education than participants at both hospital locations, and University-1 participants reported significantly more education than participants at Hospital-1 only; and (3) participants at Hospital-2 ranked lower in terms of socioeconomic status than participants at either university location, and participants at Hospital-1 ranked lower in socioeconomic status than participants at University-2. Essentially, participants at the hospital locations were older, had fewer years of education, and were lower in socioeconomic status than participants at the university locations.

Table 2.

Number and Percentage of Valid Questionnaires Returned by Sex and Clinic.

| | | Clinic | | | |
|---|---|---|---|---|---|
| | | University 1 | University 2 | Hospital 1 | Hospital 2 |
| Sex | Male | 30 (46%) | 71 (58%) | 28 (50%) | 23 (37%) |
| | Female | 52 (64%) | 106 (69%) | 41 (62%) | 34 (50%) |

Note: Values in parentheses reflect percentages of questionnaires returned.

Table 3.
Demographic Variable Means (and standard deviations) for Each Clinic

| | Clinic | | | |
|---|---|---|---|---|
| Variable | University 1 | University 2 | Hospital 1 | Hospital 2 |
| Age | 25.96[b] | 22.21[a] | 32.16[c] | 32.68[c] |
| | (6.94) | (4.41) | (9.83) | (8.62) |
| Number of Adults in Household | 1.57 | 1.65 | 1.44 | 1.50 |
| | (1.34) | (1.12) | (1.23) | (1.24) |
| Number of Children in the Household | 0.40 | 0.44 | 0.57 | 0.51 |
| | (0.99) | (0.92) | (1.07) | (0.85) |
| Years of Education | 16.11b[ca] | 16.15[ca] | 14.97[b] | 15.04[ba] |
| | (2.42) | (2.32) | (3.12) | (3.13) |
| Socioeconomic Status | 107.80[bd] | 74.08[b] | 152.05[cd] | 155.64[ac] |
| | (97.00) | (78.46) | (120.34) | (120.99) |
| Number of Visits to MD Last 2 Weeks | 0.81 | 0.76 | 0.87 | 0.67 |
| | (0.80) | (0.66) | (0.73) | (0.73) |
| Number of Visits to MD Last Year | 3.64 | 3.42 | 3.17 | 3.18 |
| | (2.87) | (2.36) | (2.27) | (2.73) |
| Sick Days Last Two Weeks | 0.49 | 0.37 | 0.21 | 0.43 |
| | (1.07) | (0.98) | (0.67) | (0.82) |
| Sick Days Last Year | 3.32 | 3.88 | 3.91 | 3.54 |
| | (4.08) | (5.73) | (6.12) | (5.37) |

Values with different superscripts differ $p < .05$.
Standard deviations are in parentheses.

Key demographic characteristics of the participants divided by sex were as follows: for females, the mean age was 25.88 years (SD = 8.10), mean number of years of education was 15.34 (SD = 2.48), and mean socioeconomic status was 96.78 (SD = 88.26). For males, the mean age was 27.07 (SD = 8.29), mean number of years of education was 16.43 (SD = 2.82), and mean socioeconomic status was 80.67 (SD = 82.34).

Comparison of Documented Nonparticipants and Participants

Comparison of nonparticipants and participants was accomplished by means of a series of t-tests. Nonparticipants were patients who refused to participate in the study, but who agreed to complete the Patient Information Form ($n$ = 162). Participants were patients who agreed to participate in the study and returned valid questionnaire packages ($n$ = 385). The t-tests were applied separately for males and females to the nine background and demographic variables measured by the Patient Information Form completed by nonparticipants (see the listing in Table 3). For females, the only significant difference was that patients who refused to participate reported fewer visits to a physician in the previous two weeks ($M$ = .60) than did patients who participated ($M$ = .79), $t$ (301) = 1.98, $p$ < .05. For males, the only significant differences were that patients who refused participation reported fewer years of education ($M$ = 15.30) than patients who participated ($M$ = 16.43), $t$ (225) = 2.53, $p$ < .05, and they reported having spent fewer days at home during the previous two weeks because of illness ($M$ = .21) than patients who participated ($M$ = .44), $t$ (220) = 2.22, $p$ < .05.

Sex Differences

Males and females were compared with regard to differences on all measured variables previously found to be predictors of illness behavior, all criterion variables, and key demographic/background variables. Table 4

provides a detailed listing of these variables and Table 5 presents means and t values associated with each of these sex differences. Comparisons were accomplished by means of t-tests performed without adjustment of the .05 probability values, thereby providing a relatively liberal examination of the data. As compared to males, females (1) reported having experienced more affect-related and more nonaffect-related symptoms, (2) scored higher on neuroticism (original and revised scores), somatic sensitivity, and hostility, (3) reported more interpersonal and more ambiguous stresses, (4) reported more use of focusing on feelings and doing something active about feelings as a coping strategies, (5) reported less use of holding back feelings and looking on the positive side as coping strategies, and (6) reported more children in the household, more worry about things in general, and fewer years of education.

Correlations Between Predictor and Criterion Variables

Pearson product-moment correlations were performed separately for each sex to confirm previously identified relationships between key psychosocial variables and each of the following criterion variables: (a) number of affect-related symptoms experienced, (b) number of affect-related symptoms reported, (c) number of nonaffect-related symptoms experienced, and (d) number of nonaffect-related symptoms reported. Bonferroni correction for error-rate inflation was determined to be $p < .0009$, but correlations were not interpreted as reliable unless they met a more stringent threshold of $r$ in excess of .31 (approximately 10% of variance accounted for; $p < .0001$). Power calculations for a correlation of .31 with the sample sizes used in the present study were .74 and .94 for males and females, respectively. Thus, power for these calculations was moderately high to high, and only medium to high effect sizes (>.31) were interpreted. Correlation coefficients for all reliable

Table 4.

Variables Included in t-Test Analyses for Sex Differences and for Correlational Analyses Examining the Relationship Between Predictor and Criterion Variables.

*Predictor Variables*

Psychosocial Variables

1. Learning history - attention
2. Learning history - reinforcement
3. Number of interpersonal stresses
4. Number of noninterpersonal stresses
5. Number of ambiguous stresses
6. Satisfaction with social support
7. Childhood shyness
8. Undisclosed trauma
9. Neuroticism - R (or Neuroticism)
10. Optimism
11. Anxiety
12. Depression
13. General worry
14. Health worry
15. Hostility
16. Positive Affect
17. Coping: Focus on feelings
18. Coping: Think about the situation
19. Coping: Ignore the feeling
20. Coping: Wishful thinking
21. Coping: Do something about the feeling
22. Coping: Ignore the problem
23. Coping: Hold back feelings
24. Coping: See the positive
25. Preventative health behaviors
26. Somatic sensitivity
27. Disease fear
28. Medical fear
29. Alexithymia
30. Symptom-specific beliefs for affect-related symptoms
31. Symptom-specific beliefs for nonaffect-related symptoms
32. Confidence in Physician

Background/Demographic Variables

1. Number of adults in the household
2. Number of children in the household
3. Years of education
4. Socioeconomic status
5. Age

*Criterion Variables*

1. Affect-related symptoms experienced
2. Affect-related symptoms reported to MD
3. Nonaffect-related symptoms experienced
4. Nonaffect-related symptoms reported to MD
5. MD's rating of psychological/physiological origin of symptoms

Table 5.

Means, Standard Deviations, and t Values for Statistically Significant Sex Differences

| Variables | Females | Males | t |
|---|---|---|---|
| Affect-related symptoms experienced | 4.77 (3.82) | 3.59 (3.48) | 3.05 |
| Nonaffect-related symptoms experienced | 2.53 (2.15) | 2.05 (1.80) | 2.29 |
| Neuroticism (full score) | 10.19 (4.96) | 9.24 (5.04) | 1.99 |
| Hostility | 69.64 (25.84) | 57.97 (14.14) | 5.02 |
| Interpersonal stresses | 1.09 (0.96) | 0.87 (0.94) | 2.17 |
| Ambiguous stresses | 4.18 (2.11) | 3.17 (2.16) | 2.11 |
| Coping: Focus on feelings | 1.62 (0.86) | 1.30 (0.81) | 3.60 |
| Coping: Do something about the feeling | 1.81 (0.84) | 1.63 (0.87) | 1.99 |
| Coping: Hold back feelings | 0.73 (0.80) | 1.08 (0.82) | -4.09 |
| Coping: Look at the positive | 1.60 (0.83) | 1.78 (0.82) | -1.98 |
| Worry about things on general | 3.62 (1.63) | 3.27 (1.68) | 2.05 |
| Somatic sensitivity | 3.37 (2.53) | 2.77 (1.90) | 2.50 |
| Number of children in the household | 0.55 (1.03) | 0.34 (0.80) | 2.08 |
| Years of education | 15.34 (2.48) | 16.43 (2.82) | -3.98 |

Note: All df are between 373 and 383 and all $p < .05$

relationships are presented in Table 6. These findings can be summarized as follows:

*Affect-Related Symptoms*

For both males and females, experienced affect-related symptoms were reliably and positively correlated with neuroticism, symptom-specific beliefs about affect-related symptoms (a composite score based on ratings of symptom seriousness, interference and inexperience), and the number of ambiguous stressors reported. Furthermore, experienced symptoms were correlated with worry about things in general for females, and with somatic sensitivity for males. Reported affect-related symptoms were significantly correlated with symptom-specific beliefs (about affect-related symptoms) for both males and females.

*Nonaffect-Related Symptoms*

For males, experienced nonaffect-related symptoms were reliably correlated with the number of ambiguous stresses reported and with symptom-specific beliefs (about nonaffect-related symptoms). Only the number of ambiguous stresses reported was significantly correlated with nonaffect-related symptoms experienced by females. Reported nonaffect-related symptoms were correlated with both symptom-specific beliefs (about nonaffect-related symptoms) and confidence in the physician for males, but was related to only symptom-specific beliefs (about nonaffect-related symptoms) for females.

In summary, both types of reported symptoms were associated with specific beliefs about symptoms and about the physician. Symptoms experienced were associated with psychosocial variables such as stress and neuroticism. Furthermore, a greater number of psychosocial variables were associated with affect-related symptoms experienced than with nonaffect-related symptoms experienced.

Table 6.

Correlation Coefficients for Males and Females for All Statistically Significant Correlations ($p < .0001$, $r > .31$) Between Number of Symptom Reports and Psychosocial Variables

| Type of Symptom | Psychosocial Variables | | | |
|---|---|---|---|---|
| | Females | | Males | |
| Affect-related Symptoms Experienced | Neuroticism-R | (.39) | Neuroticism - R | (.39) |
| | Symptom-specific beliefs | (.37) | Symptom-specific beliefs | (.40) |
| | Ambiguous stresses | (.32) | Ambiguous stresses | (.48) |
| | General Worry | (.31) | Somatic sensitivity | (.31) |
| Affect-related Symptoms Reported | Symptom-specific beliefs | (.42) | Symptom-specific beliefs | (.42) |
| Nonaffect-related Symptoms Experienced | Ambiguous stresses | (.34) | Ambiguous stresses | (.31) |
| | | | Symptom-specific beliefs | (.31) |
| Nonaffect-related Symptoms Reported | Symptom-specific beliefs | (.42) | Symptom-specific beliefs | (.34) |
| | | | Confidence in physician | (.32) |

## Correlations Between Predictor Variables

As with the previous correlational analyses, only correlations of .31 or greater were interpreted as reliable. Fewer reliable relationships were found between predictor variables than previous findings had indicated (e.g., Gannon, Banks, & Shelton, 1987; Gottlieb & Green, 1984; Sarason, Johnson, & Siegel, 1978). In particular, correlations between stressful events, social support and preventative health behaviors were not found for either sex. With regard to the relationship between mood variables (anxiety, depression, hostility, and positive affect) and stressful events, only hostility was related to the total number of ambiguous stresses reported by males ($r$ = .39). No significant relationships were found for females.

The hypothesized direct relationship between negative mood states and avoidant coping strategies was not confirmed. However, for females, an inverse relationship was evident between MAACL-R anxiety and endorsement of "looking on the positive side" as a coping strategy ($r$ = -.34). No other reliable relationships were found between mood states (anxiety, depression, hostility, and positive affect) and any of the eight measured coping strategies.

## Selection of Representative Questionnaire Variables

One of the objectives of the present study was to determine redundancy among the full set of questionnaire variables and then to select a subset of variables that could be used as predictors in multiple regression analyses. This was accomplished through principal components analyses (unities on the diagonal; no iteration) performed separately for males and females. All analyses were subjected to varimax rotation. The principal components method was selected over other factoring methods due to its relative freedom from restrictive assumptions and the direct nature of the data transformation involved. Determination of the factor solution was based on the eigenvalue-

one criterion in combination with the Scree test (Cattell, 1966). A cutoff of 0.31 (i.e., shared variance of approximately 10% or more) was used for inclusion of a variable in a factor. This cutoff was chosen to insure that variables were at least moderately related to the factor in question (Comrey, 1973). Six factors were extracted for both males and females. The loadings of variables on each factor, communalities, and the percent of variance accounted for by each factor are shown in Table 7 for males and Table 8 for females. The six factors for males were labeled as follows: (1) Worry / Fear, (2) Negative Affect / Stress, (3) Approach / Positive Coping, (4) Avoidance, (5) Symptom Beliefs, and (6) Illness Behavior. For females, the six factors were labeled as follows: (1) Worry / Fear, (2) Negative Affect/ Dissatisfaction with Social Support, (3) Approach / Positive Coping, (4) Avoidance, (5) Illness Behavior / Symptom Beliefs, and (6) Health Behaviors / Stress.

The following 7 variables were chosen for use in subsequent analyses for both sexes: (1) neuroticism, (2) ambiguous stress, (3) coping by doing something about the feeling, (4) coping by ignoring the problem, (5) history of reinforcement for illness behavior, (6) symptom specific beliefs for affect-related symptoms or symptom-specific beliefs for nonaffect-related symptoms (depending on the type of symptom to be predicted), and (7) confidence in the physician. Neuroticism loaded highly on Factor 1 for both males and females, and ambiguous stress loaded highly on Factor 2 for males. Neuroticism and ambiguous stress were selected as representatives of Factors 1 and 2, rather than health worry and depression (which loaded most highly on the two factors for both males and females), because they had been significant predictors of the symptom criterion variables in the pilot study and were found to be significant univariate correlates of the symptom criterion variables in the full-scale study. Coping by doing something about the feeling and coping by

ignoring the problem were among the first two most highly loading variables for Factors 3 and 4, respectively, that were common to both males and females. Because the composition of Factors 5 and 6 differed somewhat for male and females, three variables were chosen to better reflect these factors than would have been possible with two variables. History of reinforcement of illness behavior loaded most highly on Factor 5 for females. Symptom-specific beliefs was the variable that loaded most highly on Factor 5 for males. Confidence in the physician had a high loading on Factor 6 for females, and additionally had been a significant predictor of the symptom criterion variables in the pilot study and was found to be a significant univariate correlate of the symptom criterion variables in the full-scale study.

## Regression Analyses

The predictive value of the 7 representative variables was examined by means of 10 regression analyses (5 for each sex) performed on the following criterion variables: (1) number of affect-related symptoms experienced during the preceding two week period, (2) number of affect-related symptoms reported to the physician, (3) number of nonaffect-related symptoms experienced during the preceding two week period, (4) number of nonaffect-related symptoms reported to the physician, and (5) the physician rating of the likely physiological versus psychological origins of the primary reported symptoms. Variables were entered into each equation in three blocks as described below.

Primary demographic variables that have been found to be related to symptom reporting are age, socioeconomic status, presence of symptoms due to chronic illness, and history of illness as a child (Mayou, 1976; Mechanic, 1979; Mechanic, 1980). The aim was to determine the predictive strength of the 7 representative psychosocial variables independent of these demographic characteristics, therefore these four variables were entered first. The variables

comprising the second block were the 7 representative variables chosen with the help of the principal components analyses. Finally, the variables in the third block were four interaction variables, based on the 7 main predictor variables[2].

The regression analyses had three goals: (1) to determine the importance of the representative psychosocial variables as a whole once important demographic/background variables had been covaried from the equations, (2) to determine which of the psychosocial variables were the most important individual predictors of the criterion variables in the context of the demographic/background and the other psychosocial variables, and (3) to determine whether the interaction variables could account for any additional variance in the criterion variables. This hierarchical regression procedure differs from the stepwise procedure applied to the pilot data for two reasons. First, stepwise regression has been criticized as capitalizing on chance, whereby misleading sets of predictor variables could be chosen by the procedure, resulting in poor replicability over samples (Tabachnick & Fidell, 1983). Second, the goal of the analyses had been refined from a simple determination of the most predictive variables in the set to the determination of the predictive value of psychosocial variables as a whole in the context of each other.

Examination of the regression analyses indicated that addition of the block of variables containing the interaction terms did not result in a significant increase in $R^2$ for any of the 10 equations. Consequently, only the results of analyses for main-effect variables will be discussed. Results of the multivariate regression analyses are set out in Tables 9 to 18 and can be summarized as follows:

(1) The block of demographic variables was a significant predictor only of affect-related symptoms experienced by males. At most, demographic variables accounted for 11% of the variance for males and 6% of the variance

for females. Once psychosocial variables were entered into the equations, individually significant demographic variables included chronic illness, socioeconomic status, and age.

(2) Psychosocial variables significantly increased predictability over demographic variables for all four symptom-based criterion variables for both sexes.

(3) Increments in the amount of variance in the symptom criterion variables accounted for by psychological variables ranged from 18 to 31%.

(4) The measure of symptom-specific beliefs was a significant predictor of all four symptom criterion variables for both males and females, with the exception of nonaffect-related symptoms experienced by males.

(5) Ambiguous stress was a significant predictor for half of the symptom criterion variables (i.e., affect-related symptoms experienced by males, nonaffect-related symptoms experienced by males and females, and nonaffect-related symptoms reported by males), but primarily of experienced symptoms.

(6) Neuroticism was a significant predictor of physician ratings for females, and of both experienced and reported affect-related symptoms, except those reported by males. Ambiguous stress ratings were primarily a significant predictor of nonaffect-related symptom variables.

(7) Ambiguous stress was primarily a significant predictor of symptom reports for males, whereas neuroticism was primarily a significant predictor for females.

(8) Confidence in the physician was a significant predictor variable only for nonaffect-related symptoms experienced and reported by males.

(9) Psychosocial variables did not produce significant increments in the amount of variance accounted for in physician ratings of symptom origin (physical vs. psychosocial) for either males or females.

Table 7.

Factor Loadings, Communalities ($h^2$) and Percent of Total Variance for Six Factor Principal Components Solution for Male Questionnaire Data

| | Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| Variables | Worry/ Fear 1 | Negative Affect/ Stress 2 | Approach/ Positive Coping 3 | Avoidance 4 | Symptom Beliefs 5 | Illness Behavior 6 | ($h^2$) |
| Health Worry | **.77** | .21 | -.09 | -.20 | -.21 | -.01 | (.72) |
| General Worry | **.75** | .22 | -.20 | -.09 | .00 | -.01 | (.66) |
| Disease Fear | **.72** | -.12 | .04 | .12 | .18 | .14 | (.61) |
| Neuroticism-R | **.64** | **.45** | -.16 | .11 | .13 | .03 | (.67) |
| Somatic Sensitivity | **.56** | .15 | .07 | .01 | **.33** | .04 | (.46) |
| Medical Fear | **.37** | -.12 | -.02 | **.36** | .27 | .04 | (.35) |
| Shyness as a child | **.35** | .11 | -.08 | .15 | -.01 | .22 | (.22) |
| Non-interpersonal Stress | **.31** | .14 | .13 | .17 | **.31** | .04 | (.26) |
| Depression | .01 | **.59** | -.10 | -.03 | .26 | .10 | (.44) |
| Positive Affect | -.11 | **-.58** | .19 | .00 | -.03 | .00 | (.38) |
| Hostility | .06 | **.56** | .06 | .16 | -.17 | -.13 | (.40) |
| Ambiguous stresses | **.41** | **.52** | .12 | .12 | .19 | .04 | (.50) |
| Anxiety | .14 | **.52** | -.05 | .07 | .27 | .04 | (.37) |
| Interpersonal stresses | .06 | **.45** | .01 | -.01 | .30 | .27 | (.37) |
| Coping: Wishful thinking | .18 | **.37** | .14 | -.14 | .07 | .28 | (.29) |
| Coping: Look on the positive side | -.05 | -.27 | **.71** | .12 | .10 | .00 | (.60) |
| Coping: Do something about the feeling | .04 | .04 | **.66** | -.15 | -.08 | -.03 | (.46) |
| Coping: Thinking about the situation | -.02 | .26 | **.62** | -.29 | .06 | .15 | (.56) |
| Optimism | **-.31** | **-.44** | **.56** | -.05 | .22 | .09 | (.66) |
| Preventative health behaviors | -.22 | -.14 | **.43** | -.28 | -.25 | -.03 | (.39) |

Table 7. continued

| Variables | Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Worry/ Fear 1 | Negative Affect/ Stress 2 | Approach/ Positive Coping 3 | Avoidance 4 | Symptom Beliefs 5 | Illness Behavior 6 | ($h^2$) |
| Coping: Ignore the feeling | -.07 | .05 | .10 | **.72** | -.15 | -.01 | (.56) |
| Coping: Ignore the problem | .13 | .10 | -.12 | **.66** | .12 | .12 | (.51) |
| Coping: Focus on feeling | .16 | .22 | **.31** | **-.54** | .04 | -.02 | (.46) |
| Alexithymia | **.40** | .10 | -.21 | **.50** | .03 | -.11 | (.48) |
| Coping: Hold back feeling | .18 | **.32** | -.19 | **.44** | -.15 | -.07 | (.39) |
| Symptom-specific beliefs for affect-related symptoms | .15 | .09 | .09 | -.03 | **.61** | -.10 | (.42) |
| Symptom-specific beliefs for nonaffect-related symptoms | -.05 | .12 | -.14 | -.04 | **.58** | .13 | (.39) |
| Satisfaction with social support | -.10 | -.14 | **.36** | .04 | **-.40** | . 0 | (.32) |
| Learning history: Attention | .07 | .04 | .07 | .15 | -.16 | **.76** | (.63) |
| Learning history: Reinforcement | .01 | .14 | .02 | -.07 | .09 | **.72** | (.55) |
| Confided traumas | .21 | -.12 | -.09 | **-.33** | -.17 | **.44** | (.39) |
| Confidence in the Physician | .08 | -.02 | .01 | .04 | .12 | .27 | (.10) |
| Percent of Variance | 16.70 | 8.50 | 5.70 | 5.40 | 4.70 | 4.50 | |

Table 8.

Factor Loadings, Communalities ($h^2$) and Percent of Total Variance for Six Factor Principal Components Solution for Female Questionnaire Data

| | Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| Variables | Worry/ Fear 1 | Negative Affect/Low Support 2 | Approach/ Positive Coping 3 | Avoidance 4 | Illness Beh/ Symptom Beliefs 5 | Health Behavior/ Stress 6 | ($h^2$) |
| Health Worry | **.76** | .17 | -.06 | .04 | .02 | .01 | (.61) |
| General Worry | **.68** | **.41** | -.12 | -.02 | -.14 | -.01 | (.67) |
| Disease fear | **.66** | .17 | .04 | .09 | .12 | -.12 | (.50) |
| Neuroticism-R | **.57** | **.48** | -.16 | .10 | -.11 | .19 | (.65) |
| Medical Fear | **.57** | -.07 | .14 | .09 | .14 | -.18 | (.41) |
| Somatic Sensitivity | **.48** | .14 | -.05 | .18 | .02 | .27 | (.36) |
| Non-interpersonal Stress | **.41** | .03 | -.15 | .08 | -.07 | .14 | (.23) |
| Confided traumas | **.34** | -.29 | .27 | **-.31** | .21 | .20 | (.46) |
| Depression | .12 | **.75** | -.04 | .07 | .02 | -.04 | (.59) |
| Anxiety | .28 | **.64** | -.15 | .03 | -.04 | -.06 | (.52) |
| Hostility | .07 | **.64** | -.04 | -.10 | .24 | .07 | (.48) |
| Satisfaction with social support | .04 | **-.51** | .06 | **-.31** | -.08 | -.12 | (.37) |
| Positive affect | -.21 | **-.48** | .00 | -.20 | .04 | -.05 | (.31) |
| Coping: Think about the situation | .01 | .03 | **.70** | -.27 | -.13 | .15 | (.60) |
| Coping: Do something about the feeling | .00 | -.04 | **.69** | .04 | -.01 | .04 | (.49) |
| Coping: Look on the positive side* | -.09 | -.30 | **.65** | -.11 | .02 | -.09 | (.54) |
| Coping: Focus on feeling | .05 | .12 | **.60** | **-.46** | .10 | .13 | (.61) |
| Optimism | **-.38** | **-.42** | **.52** | -.03 | .12 | .02 | (.60) |

Table 8 continued

| Variables | Factors | | | | | | |
|---|---|---|---|---|---|---|---|
| | Worry/ Fear 1 | Negative Affect/Low Support 2 | Approach/ Positive Coping 3 | Avoidance 4 | Illness Beh/ Symptom Beliefs 5 | Health Behavior/ Stress 6 | ($h^2$) |
| Coping: Ignore the problem | .22 | -.07 | -.06 | **.76** | -.04 | .15 | (.65) |
| Coping: Ignore the feeling | .07 | .08 | -.21 | **.75** | .10 | -.03 | (.64) |
| Coping: Hold back feelings | .08 | .28 | -.11 | **.57** | -.17 | -.10 | (.46) |
| Alexithymia | **.35** | **.34** | **-.37** | **.39** | -.05 | -.29 | (.61) |
| Coping: Wishful thinking | .23 | .20 | .21 | .30 | -.07 | .16 | (.26) |
| Learning history: Reinforcement | .19 | .04 | .11 | -.09 | **.69** | -.01 | (.54) |
| Learning history: Attention | .28 | .02 | -.07 | .09 | **.67** | .28 | (.62) |
| Symptom-specific beliefs for affect-related symptoms | .19 | .04 | .09 | .10 | **-.49** | .04 | (.30) |
| Symptom-specific beliefs for nonaffect-related symptoms | .14 | -.14 | .03 | -.10 | **-.47** | .21 | (.32) |
| Preventative health behaviors | -.26 | -.13 | **.40** | .01 | .13 | **-.51** | (.52) |
| Interpersonal stress | .14 | **.32** | -.02 | .01 | .16 | **.48** | (.38) |
| Confidence in physician | -.06 | -.01 | .23 | .11 | -.18 | **.47** | (.32) |
| Shyness as a child | .17 | .18 | -.11 | .11 | -.07 | **-.47** | (.31) |
| Ambiguous stress | **.40** | .28 | .05 | .03 | -.07 | **.42** | (.42) |
| Percent of Variance | 19.10 | 9.20 | 5.60 | 5.30 | 4.50 | 4.40 | |

Table 9.

Hierarchical Multivariate Regression Analysis with Affect-Related Symptoms Experienced by Males as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Affect-Related Symptoms | | | | |
| Experienced by Males | Demographic/Background Block: | | | |
| | Socioeconomic status | .08 | .86 | .39 |
| | Age | .04 | .41 | .69 |
| | Childhood illness | -.06 | -.60 | .55 |
| | **Chronic illness** | **.32** | **2.98** | **.00** |
| | $R^2$ = .11 | F= 3.02 | Sig. F= .02 | |
| | Predictor variable Block added: | | | |
| | Socioeconomic status | .05 | .61 | .55 |
| | Age | .07 | .82 | .42 |
| | Childhood illness | -.03 | -.35 | .73 |
| | **Chronic illness** | **.20** | **2.11** | **.04** |
| | **Symptom-specific beliefs** | **.28** | **3.38** | **.00** |
| | Coping: Ignore the problem | .04 | .50 | .62 |
| | Reinforcement of illness behavior | .07 | .86 | .39 |
| | Coping: Do something about the feeling | -.11 | -1.31 | .19 |
| | **Ambiguous stress** | **.26** | **2.70** | **.01** |
| | **Neuroticism** | **.21** | **2.34** | **.02** |
| | Confidence in physician | -.10 | -1.26 | .21 |
| | $R^2$ = .42 | F= 6.11 | Sig. F= .00 | |

Note: $\Delta R^2 = .31$, $p < .05$

Table 10.

Hierarchical Multivariate Regression Analysis with Affect-Related Symptoms Reported by Males as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Affect-Related Symptoms Reported by Males | Demographic/Background Block: | | | |
| | Socioeconomic status | -.09 | -.95 | .34 |
| | Age | .08 | .80 | .43 |
| | Childhood illness | -.12 | -1.10 | .27 |
| | Chronic illness | .10 | .90 | .37 |
| | $R^2$ = .03 | F= 0.64 | Sig. F= .64 | |
| | Predictor variable Block added: | | | |
| | Socioeconomic status | -.14 | -1.41 | .16 |
| | Age | .08 | .80 | .43 |
| | Childhood illness | -.11 | -1.05 | .30 |
| | Chronic illness | .07 | .61 | .54 |
| | **Symptom-specific beliefs** | **.34** | **3.46** | **.00** |
| | Coping: Ignore the problem | -.04 | -.39 | .69 |
| | Reinforcement of illness behavior | .01 | -.07 | .94 |
| | Coping: Do something about the feeling | -.15 | -1.52 | .13 |
| | Ambiguous stress | .09 | .76 | .45 |
| | Neuroticism | .14 | 1.30 | .20 |
| | Confidence in physician | .01 | .16 | .88 |
| | $R^2$= .21 | F= 2.20 | Sig. F= .02 | |

Note: $\Delta R^2$ = .18, $p < .05$

Table 11.

Hierarchical Multivariate Regression Analysis with Affect-Related Symptoms Experienced by Females as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Affect-Related Symptoms Experienced by Females | Demographic/Background Block: | | | |
| | Socioeconomic status | .03 | .40 | .69 |
| | Age | .13 | 1.64 | .10 |
| | **Childhood illness** | **.16** | **1.96** | **.05** |
| | Chronic illness | .09 | 1.14 | .26 |
| | $R^2$ = .06 | F= 2.29 | Sig. F= .06 | |
| | Predictor variable Block added: | | | |
| | Socioeconomic status | -.01 | -.13 | .90 |
| | **Age** | **.15** | **2.10** | **.04** |
| | **Childhood illness** | **.20** | **2.71** | **.01** |
| | Chronic illness | .07 | .93 | .35 |
| | **Symptom-specific beliefs** | **.33** | **4.58** | **.00** |
| | **Coping: Ignore the problem** | **.14** | **1.95** | **.05** |
| | Reinforcement of illness behavior | -.05 | -.73 | .47 |
| | Coping: Do something about the feeling | .06 | .83 | .41 |
| | Ambiguous stress | .03 | .40 | .69 |
| | **Neuroticism** | **.30** | **3.68** | **.00** |
| | Confidence in physician | -.01 | -.13 | .90 |
| | $R^2$= .34 | F= 6.49 | Sig. F= .00 | |
| | Note: $\Delta R^2$= .28, $p < .05$ | | | |

Table 12.

Hierarchical Multivariate Regression Analysis with Affect-Related Symptoms Reported by Females as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Affect-Related Symptoms Reported by Females | Demographic/Background Block: | | | |
| | Socioeconomic status | -.01 | -.10 | .92 |
| | **Age** | **.23** | **2.86** | **.00** |
| | Childhood illness | .08 | .96 | .34 |
| | Chronic illness | -.06 | -.71 | .48 |
| | $R^2$= .06 | F= 2.24 | Sig. F= .07 | |
| | Predictor variable Block added: | | | |
| | Socioeconomic status | -.04 | -.57 | .57 |
| | **Age** | **.25** | **3.44** | **.00** |
| | Childhood illness | .14 | 1.91 | .06 |
| | Chronic illness | -.09 | -1.19 | .23 |
| | **Symptom-specific beliefs** | **.41** | **5.67** | **.00** |
| | Coping: Ignore the problem | .05 | .72 | .47 |
| | Reinforcement of illness behavior | -.09 | -1.25 | .21 |
| | Coping: Do something about the feeling | -.08 | -1.11 | .27 |
| | Ambiguous stress | -.10 | -1.20 | .23 |
| | **Neuroticism** | **.17** | **2.00** | **.05** |
| | Confidence in physician | -.01 | -.08 | .93 |
| | $R^2$ = .30 | F= 5.56 | Sig. F= .00 | |

Note: $\Delta R^2$ = .24, $p < .05$

Table 13.

Hierarchical Multivariate Regression Analysis with Nonaffect-Related Symptoms Experienced by Males as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Nonaffect-Related Symptoms Experienced by Males | Demographic/Background Block: | | | |
| | Socioeconomic status | .02 | .20 | .84 |
| | Age | -.11 | -1.14 | .26 |
| | Childhood illness | -.12 | -1.15 | .25 |
| | **Chronic illness** | **.26** | **2.47** | **.02** |
| | $R^2$ = .08 | F= 1.97 | Sig. F= .11 | |
| | Predictor variable Block added: | | | |
| | Socioeconomic status | .02 | .20 | .84 |
| | Age | -.11 | -1.15 | .25 |
| | Childhood illness | -.12 | -1.08 | .28 |
| | **Chronic illness** | **.26** | **2.47** | **.01** |
| | Symptom-specific beliefs | .20 | 1.87 | .06 |
| | Coping: Ignore the problem | .01 | .05 | .96 |
| | Reinforcement of illness behavior | .05 | .51 | .61 |
| | Coping: Do something about the feeling | -.05 | -.53 | .60 |
| | **Ambiguous stress** | **.24** | **2.03** | **.04** |
| | Neuroticism | -.00 | -.01 | .99 |
| | **Confidence in physician** | **.28** | **2.78** | **.01** |
| | $R^2$ = .31 | F= 3.13 | Sig. F= .00 | |
| | Note: $\Delta R^2$ = .23, $p < .05$ | | | |

Table 14.

Hierarchical Multivariate Regression Analysis with Nonaffect-Related Symptoms Reported by Males as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Nonaffect-Related Symptoms Reported by Males | Demographic/Background Block: | | | |
| | Socioeconomic status | -.14 | -1.30 | .20 |
| | Age | -.10 | -.99 | .32 |
| | Childhood illness | -.16 | -1.43 | .16 |
| | Chronic illness | -.09 | -.84 | .40 |
| | $R^2$ = .07 | F= 1.63 | Sig. F= .17 | |
| | Predictor variable Block added: | | | |
| | Socioeconomic status | -.18 | -1.81 | .07 |
| | Age | -.03 | -.33 | .74 |
| | Childhood illness | -.17 | -1.56 | .12 |
| | Chronic illness | -.07 | -.69 | .49 |
| | **Symptom-specific beliefs** | **.25** | **2.32** | **.02** |
| | Coping: Ignore the problem | -.09 | -.81 | .42 |
| | Reinforcement of illness behavior | -.07 | -.71 | .48 |
| | Coping: Do something about the feeling | -.08 | -.76 | .45 |
| | **Ambiguous stress** | **.32** | **2.71** | **.01** |
| | Neuroticism | -.12 | -1.02 | .31 |
| | **Confidence in physician** | **.22** | **2.19** | **.03** |
| | $R^2$ = .29 | F= 2.84 | Sig. F= .00 | |
| | Note: $\Delta R^2$ = .22, $p < .05$ | | | |

Table 15.

Hierarchical Multivariate Regression Analysis with Nonaffect-Related Symptoms Experienced by Females as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Nonaffect-Related Symptoms Experienced by Females | Demographic/Background Block: | | | |
| | Socioeconomic status | .05 | .63 | .53 |
| | Age | .04 | .41 | .68 |
| | Childhood illness | .11 | 1.30 | .19 |
| | Chronic illness | .06 | .71 | .48 |
| | $R^2$ = .02 | F= 0.86 | Sig. F= .49 | |
| | Predictor variable Block added: | | | |
| | Socioeconomic status | .04 | .56 | .57 |
| | Age | .09 | 1.08 | .28 |
| | Childhood illness | .04 | .43 | .66 |
| | Chronic illness | .05 | .67 | .50 |
| | **Symptom-specific beliefs** | **.21** | **2.49** | **.01** |
| | Coping: Ignore the problem | .04 | .44 | .66 |
| | Reinforcement of illness behavior | .06 | .74 | .46 |
| | Coping: Do something about the feeling | -.06 | -.69 | .49 |
| | **Ambiguous stress** | **.33** | **3.44** | **.00** |
| | Neuroticism | .10 | 1.09 | .28 |
| | Confidence in physician | -.03 | -.42 | .68 |
| | $R^2$ = .23 | F= 3.43 | Sig. F= .00 | |
| | Note: $\Delta R^2$ = .21, $p < .05$ | | | |

Table 16.

Hierarchical Multivariate Regression Analysis with Nonaffect-Related Symptoms Reported by Females as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Nonaffect-Related Symptoms Reported by Females | Demographic/Background Block: | | | |
| | Socioeconomic status | .13 | 1.54 | .12 |
| | Age | -.06 | -.67 | .50 |
| | Childhood illness | .05 | .54 | .59 |
| | Chronic illness | -.13 | -1.50 | .14 |
| | $R^2$ = .04 | F= 1.23 | Sig. F= .30 | |
| | Predictor variable Block added: | | | |
| | **Socioeconomic status** | **.17** | **2.04** | **.04** |
| | Age | .00 | .01 | .99 |
| | Childhood illness | .06 | .71 | .48 |
| | Chronic illness | -.11 | -1.35 | .18 |
| | **Symptom-specific beliefs** | **.38** | **4.54** | **.00** |
| | Coping: Ignore the problem | -.06 | -.78 | .44 |
| | Reinforcement of illness behavior | -.10 | -1.31 | .19 |
| | Coping: Do something about the feeling | .05 | .55 | .58 |
| | Ambiguous stress | .04 | .46 | .65 |
| | Neuroticism | -.06 | -.69 | .49 |
| | Confidence in physician | .05 | .60 | .55 |
| | $R^2$ = .22 | F= 3.22 | Sig. F= .00 | |
| | Note: $\Delta R^2$ = .18, $p < .05$ | | | |

Table 17.

Hierarchical Multivariate Regression Analysis with Physician Ratings of the Origin of Physical Symptoms for Males as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Physician Rating Males | Demographic/Background Block: | | | |
| | Socioeconomic status | .18 | 1.68 | .10 |
| | Age | .14 | 1.31 | .19 |
| | **Childhood illness** | **.45** | **3.85** | **.00** |
| | Chronic illness | -.13 | -1.14 | .26 |
| | $R^2$ = .21 | F= 4.74 | Sig. F= .00 | |
| | Symptoms Reported Block added: | | | |
| | Socioeconomic status | .18 | 1.61 | .11 |
| | Age | .13 | 1.18 | .24 |
| | **Childhood illness** | **.43** | **3.58** | **.00** |
| | Chronic illness | -.15 | -1.25 | .21 |
| | Affect-related symptoms reported | .09 | .76 | .45 |
| | Nonaffect-related symptoms reported | -.13 | -1.07 | .29 |
| | $R^2$ = .23 | F= 3.34 | Sig. F= .01 | |
| | Note: $\Delta R^2$ = .02, n.s. | | | |
| | Predictor Variable Block added: | | | |
| | Socioeconomic status | .14 | 1.23 | .22 |
| | Age | .10 | .96 | .34 |
| | **Childhood illness** | **.37** | **3.06** | **.00** |
| | Chronic illness | -.10 | -.81 | .42 |
| | Affect-related symptoms reported | .00 | .03 | .98 |
| | Nonaffect-related symptoms reported | -.02 | -.13 | .89 |
| | Symptom-specific beliefs (affect related) | .15 | 1.19 | .24 |
| | **Symptom-specific beliefs (nonaffect-related)** | **-.28** | **-2.16** | **.03** |
| | Coping: Ignore the problem | .09 | .80 | .43 |
| | Reinforcement of illness behavior | .11 | .98 | .33 |
| | Coping: Do something about the feeling | -.20 | -1.67 | .10 |
| | Ambiguous stress | -.11 | -.76 | .45 |
| | Neuroticism | .18 | 1.37 | .18 |
| | Confidence in physician | .01 | .06 | .95 |
| | $R^2$ = .34 | F= 2.18 | Sig. F= .02 | |
| | Note: $\Delta R^2$ from last equation = .11, n.s. $\Delta R^2$ from first equation = .13, n.s. Higher physician ratings indicate greater endorsement of psychological origin of symptoms. | | | |

Table 18.

Hierarchical Multivariate Regression Analysis with Physician Ratings of the Origin of Physical Symptoms for Females as the Criterion Variable

| Criterion Variable | Predictor Variables | ß | t | Sig. |
|---|---|---|---|---|
| Phsician Rating Females | Demographic/Background Block: | | | |
| | Socioeconomic status | -.14 | -1.52 | .13 |
| | **Age** | **.26** | **2.85** | **.00** |
| | Childhood illness | .05 | .58 | .56 |
| | Chronic illness | .10 | 1.09 | .28 |
| | $R^2$ = .09 | F= 2.73 | Sig. F= .03 | |
| | Symptoms Reported Block added: | | | |
| | Socioeconomic status | -.12 | -1.34 | .18 |
| | **Age** | **.22** | **2.29** | **.02** |
| | Childhood illness | .05 | .57 | .57 |
| | Chronic illness | .10 | 1.10 | .28 |
| | Affect-related symptoms reported | .14 | 1.55 | .12 |
| | Nonaffect-related symptoms reported | -.12 | -1.38 | .17 |
| | $R^2$ = .12 | F= 2.49 | Sig. F= .03 | |
| | Note: $\Delta R^2$ = .03, n.s. | | | |
| | Predictor Variable Block added: | | | |
| | Socioeconomic status | -.13 | -1.40 | .16 |
| | **Age** | **.23** | **2.25** | **.03** |
| | Childhood illness | .09 | .97 | .33 |
| | Chronic illness | .09 | .96 | .34 |
| | Affect-related symptoms reported | .09 | .77 | .44 |
| | Nonaffect-related symptoms reported | -.08 | -.79 | .43 |
| | Symptom-specific beliefs (affect-related) | .03 | .29 | .77 |
| | Symptom-specific beliefs (nonaffect-related) | -.06 | -.53 | .60 |
| | Coping: Ignore the problem | -.04 | -.42 | .68 |
| | Reinforcement of illness behavior | -.00 | -.03 | .98 |
| | Coping: Do something about the feeling | -.06 | -.65 | .52 |
| | Ambiguous stress | -.21 | -1.93 | .06 |
| | **Neuroticism** | **.24** | **2.22** | **.03** |
| | Confidence in physician | -.02 | -.25 | .80 |
| | $R^2$ = .17 | F= 1.54 | Sig. F= .11 | |
| | Note: $\Delta R^2$ from last equation = .05, n.s. $\Delta R^2$ from first equation = .08, n.s. Higher physician ratings indicate greater endorsement of psychological origin of symptoms. | | | |

## Discussion

The main findings of this study can be summarized as follows:

(1) principal components analysis indicated considerable redundancy among the dependent variables;

(2) univariate correlational analyses indicated that symptom-specific beliefs were related to all symptom criterion variables except one (nonaffect-related symptoms experienced by females) and that psychosocial variables, such as stress and neuroticism, were associated with experienced symptoms; and

(3) regression analyses revealed that: (i) psychosocial variables significantly increased predictability over demographic variables for all symptom criterion variables; (ii) symptom-specific beliefs were related to all symptom criterion variables except one (nonaffect-related symptoms experienced by males); (iii) in general, stress ratings were related to experienced, but not to reported symptoms; (iv) neuroticism was related to affect-related symptoms, whereas stress ratings were primmarily related to nonaffect-related symptoms, (v) stress was primarily a significant predictor of symptom reports for males, whereas neuroticism was primarily a significant predictor for females.

One of the most important findings among the preceding set is that symptom-specific beliefs (a composite of ratings for symptom inexperience, severity, and interference) was a predictor of 7 of the 8 symptom criterion variables. Furthermore,univariate correlational analyses were very similar to the regression analysis results with regard to symptom-specific beliefs. This outcome is consistent with recent models which propose that patients evaluate experienced symptoms as being indicative of some physical disorder by comparing them with their implicit models or schemata of illness based on prior

experience, societal beliefs and folklore (e.g., Ben-Sira, 1977; Pennebaker, 1982; Turk, Rudy, & Salovey, 1986). A number of studies have confirmed that people use several dimensions to organize the information that constitutes their illness representations (Jones, Wiese, Moore, & Haley,1981; Lau & Hartman, 1983; Leventhal, Meyer, & Nerenz, 1980; Meyer, Leventhal, & Gutmann, 1985; Turk, Rudy, & Salovey, 1986).

Although these studies suggest that patients' perceptions about the disruption, seriousness, and familiarity of symptoms are important dimensions of lay illness representations or schemata, they have not often addressed the manner in which lay organization of symptom information affects illness behavior, including the kinds of reports patients make to physicians. Patients' schemata or prototypes may not contain appropriate organizing principles or accurate information regarding the relationship of symptoms to various diseases. Therefore, they may fail to spontaneously report relevant symptoms during medical interviews. In fact, patients can be particularly poor at recognizing some symptoms as being of a serious nature (e.g., Bishop, 1984; Koos, 1954; Smith & Kane, 1970). In support of this, Bishop (1987) found that heart attack symptoms (pain over the heart, shortness of breath, and irregular heartbeat) and cancer symptoms (bleeding mole, lump in breast, change in warts) were only moderately associated with seeking medical attention and were less likely to lead to professional care than swollen ankles or nosebleeds. Bishop (1987) also has used multidimensional scaling and cluster analysis to determine the dimensions used by lay people to cognitively organize physical symptoms and then to examine how these dimensions relate to seeking medical advice. He has found that the perception of a symptom as being psychologically caused (e.g., loss of memory, dizziness, and inability to stay awake) is negatively associated with seeking medical services. This

association may extend to patients who seek medical attention for problems they view as physically caused. That is, they may fail to report the subset of their experienced symptoms which they believe to be irrelevant to their present physical illness based on their attribution of psychological causation.

Conversely, medically benign symptoms may be perceived by patients as being important in the etiology of their condition or as indicators of illness. Stoeckle and Barsky (1980) provide a vivid example of the kind of lay schema that can lead to improper illness attributions. They describe a patient with chronic obstructive lung disease who believed that the bubbles in his expectorant were the cause of dyspnea, which he described as a sensation of bubbles in his lower chest. Clearly, this patient had attended to two pieces of information which he tried to connect in a schematic fashion to form a causal explanation. This example also illustrates the prominent role schemata can play when symptoms are ambiguous, vague and/or diffuse. Under these circumstances, individuals are more likely to use their available illness schema to select out information that will be labeled as relevant, and then to fill in information that is necessary to understand the meaning of the symptoms and what caused them (Pennebaker, 1982; Rodin, 1978).

The findings regarding perceived interference, severity and familiarity of symptoms are also consistent with the Health Belief Model (cf. Becker, 1974; Kirscht, Becker, & Eveland, 1976) which addresses both the schemata that people have about illness and the behaviors that ensue from them. This model proposes that health behaviors are influenced by such factors as perceived seriousness of symptoms, perceived vulnerability to disease, the efficacy of available medical care, the accessibility of medical treatment, and the cost of medical care. It has had some success in predicting compliance and the

seeking of medical services (see Berkanovic, Telesky, and Reeder, 1981; Janz & Becker, 1984; Masur, 1981; Jones, Jones, & Katz, 1988).

It is important for physicians to be aware of a patient's schemata regarding present illness, including his/her perception of the severity, interference, and unusualness of symptoms, and related information such as the patient's self-diagnosis, and his/her etiological explanations. Awareness of these factors better enables the physician to generate hypotheses about the kinds of symptoms that a patient may not have recognized as important and those which were reported, but are likely to be irrelevant. It is noteworthy that the univariate analysis indicated that for both males and females experienced symptoms, but not reported symptoms, were related to stress. This finding suggests that patients may recognize some symptoms as stress-related and selectively not report them, or these symptoms may not be viewed by the patient as sufficiently important to actually report to the physician.

Physician awareness of patient schemata may be especially important in cases where reported symptoms are more vague and diffuse (e.g., weakness, nausea, minor aches and pains). Such symptoms are not good cues for the presence of actual disease and are more subject to social, cultural, and personal influences than are symptoms that are severe and disabling where interpretation through cultural, social or personally idiosyncratic schemata is less likely (Mechanic, 1972). Furthermore, equipped with the knowledge about the patient's schemata, the physician is in a better position to evaluate and test the validity of symptom details and disease etiology as presented by the patient. That is, this knowledge can help the physician to determine which details about symptoms and preceding conditions may be reconstructed elements that are inaccurate, but were reported, because they are congruent with the patient's personal schemata. Although a thorough understanding of a

patient's schemata may not be possible, questions such as, "What do you think is wrong?, What do you think caused this problem?", and "What do you think needs to be done to fix this problem?" may elicit much of the required information. Alternately, the strength of a patient's schema may be diluted by the completion of an experienced symptom checklist similar to the one used in this study. The organization of symptoms provided by the checklist may override some of the organization provided by the patient's schema.

The findings of this study are correlational and so cannot address the issue of causality. However, patients' perceptions of their symptoms are a likely influence on decisions about when to complain to others about their symptoms, when to seek medical services, what symptoms to report, and whether to follow medical advice and take prescribed medication. Clinically, patients' symptom-specific beliefs may be the single best variable to target in individuals who overuse the medical system by overreporting symptoms. In fact, Hellman, Budd, Borysenko, McClelland, and Benson (1990) have examined the effect of behavioral medicine interventions (that included relaxation training and cognitive restructuring of the meaning of stress and illness) on eighty patients identified by a Health Maintenance Organization (HMO) health care provider as having psychosocial factors play a major role in generating presenting symptoms. Results indicated that the cognitive-behavioral intervention significantly decreased the number of physician visits as compared to a placebo intervention. In fact, the patients in the cognitive-behavioral intervention made a mean of two fewer visits to the HMO over a subsequent 6-month period. This represented a savings of $150 per patient for the six months. The cognitive-behavioral intervention also was effective in reducing psychological distress (as measured by the Bipolar Profile of Mood States) and reported discomfort from physical symptoms. These changes were not found in

the placebo control intervention. While these are encouraging results, unfortunately, changes in symptom perceptions or symptom specific beliefs were not measured, and it is unclear whether the reduction in physician visits was related to such cognitive changes, or to other changes brought about by the behavioral medicine interventions.

Barrett, Wisotzek, Abel, Wilmer, Cohen-Cole, and Wenger (1989) provide further evidence that patients' misperceptions of their physical symptoms can be related to the misuse of the medical system. They studied chest pain patients who had undergone cardiac catheterization and coronary arteriography and been found to have normal heart functioning. Ten percent of their subjects were certain that they had heart disease and 36% were unsure. During the six-month period prior to the study, 24% had gone to an emergency room or physician for perceived heart difficulties and 6% had been hospitalized for chest pain. In a similar study, Ockene, Shay, Alpert, Weiner, and Dalen (1980) reported that 16 months after cardiac angiography, 51% of patients with normal results remained unable to work because of chest pain, 47% described their activity as limited, and 44% continued to believe that they had a heart disease. Many of these patients continue to utilize medical services without resulting symptom relief for years at high personal and social costs. There is growing evidence (Eifert, 1991) that such patients would greatly benefit from psychosocial interventions focusing on anxiety reduction, pain management, and appropriate reassurance that provides a psychophysiological explanation of their symptoms. The present study suggests that patients' perceptions of the seriousness of their symptoms and realistic expectations about the interference of these symptoms with their daily lives are a potential target for intervention. Cognitive restructuring of these perceptions should enhance the effectiveness of any therapy provided to such patients.

In summary, the finding that symptom-specific beliefs is an important variable in the prediction of the number of symptoms experienced and reported to a physician suggests that it is important that physicians consider their patients' illness schemata while conducting the medical interview and that correction of faulty illness perceptions may be an important target of therapeutic intervention for individuals who overuse the medical system by overreporting symptoms.

Other major findings of the regression analyses concern the relationship of stress and neuroticism to symptom reporting. Symptoms were divided into those experienced within the previous two weeks and those reported to the physician. Examination of predictor variables in terms of this division indicated that ambiguous stress was primarily a significant predictor of experienced as compared to reported symtpoms. This finding suggestes that stress may increase experienced symptoms and that these symptoms may be recognized as stress-related and are not as likely to be reported to a physician.

The symptom criterion variables in the present study were also divided into those that are associated with affective conditions and those that are not. It had been hypothesized that psychosocial variables, especially stress and negative affect variables, would be more strongly associated with the former than with the latter type of symptom. In fact, ambiguous stress was found to be a significant predictor primarily of nonaffect-related symptoms, whereas neuroticism was found to predict affect-related symptoms only. This pattern of findings is consistent with the hypothesis that stress has a direct influence on illness (e.g., DeLongis et al., 1982; Kanner et al., 1981; Stone, Reed, & Neale, 1987), and that affect-related symptoms associated with neuroticism are reported in the medical context and may complicate diagnosis. The findings suggest that a follow-up study might investigate differential illness expression in

terms of affect and nonaffect-related symptoms among stressed individuals low in neuroticism versus those high in neuroticism. Another follow-up study might investigate the various aspects of neuroticism that are especially important in the relationship between this variable and symptom reporting. Neuroticism is a vague, multi-faceted, and general concept. Neurotic individuals have been described as worrying, nervous, emotional, insecure, inadequate, and hypochondriacal (Costa & McCrae, 1985). Furthermore, neuroticism is directly correlated with the following Minnesota Multiphasic Personality Inventory factor scales identified by Johnson, Butcher, Null, and Johnson (1984): phobias, somatization, depression, psychotic paranoia, somatization, lack of well-being, cynicism, aggressive hostility, and family detachment (Costa, Busch, Zonderman, & McCrae, 1886). Many of these dimensions of personality resemble variables measured in the present study which load highly on the same factor as neuroticism (disease fear, medical fear, somatic sensitivity, health worry, and general worry) and they may, in fact, be facets of the more general neuroticism variable. It is likely that neuroticism has several important components. It will be important in the future to delineate these components and to investigate them separately so that treatment programs aimed at reducing inappropriate symptom complaining can target more specific variables.

Similar to the regression analyses, univariate correlational analyses indicated that neuroticism and worry (in the case of females) and neuroticism and somatic sensitivity (in the case of males) were only correlated with the affect-related symptoms experienced by patients. This finding is consistent with the notion that the symptoms assigned to this category include an additional affective component. The lack of correlation with affect-related symptoms that

were reported to the physician again suggests that patients may recognize some symptoms as emotionally-based and selectively not report them.

Two important sex differences were noted in the pattern of predictor variables identified by the regression analyses. First, ambiguous stress was found to be a significant predictor of symptom reports primarily for males as compared to females, and neuroticism was a significant predictor primarily for females. In fact, neuroticism was consistently associated with affect-related symptoms for females, and ambiguous stress was consistently associated with nonaffect-related symptoms for males. These findings suggest the importance of future investigation of the sex-specific roles of stress and neuroticism in the reporting of physical symptoms and the manner in which they interact with the type of symptom reported.

Regression analysis results of secondary importance included the finding that interaction terms did not result in a significant increase in $R^2$ for any of the 10 equations. This suggests that the relationship of predictor variables to a criterion variable is rather straightforward and relatively uncomplicated by interactions between predictors. Furthermore, the block of demographic variables was a significant predictor in only one of the regression equations. This indicates that the observed patterns of symptom experience and reporting are relatively unrelated to age, socioeconomic status, history of chronic illness as a child, and current chronic illness.

The psychosocial block of variables was not a significant predictor of the physician ratings of symptom origin (i.e., physiological versus psychological). Furthermore, the only significant individual predictor of physician ratings were childhood illness and fewer reported nonaffect-related symptoms for males, and age and neuroticism for females. These variables were associated with ratings indicative of greater psychological influence on symptoms. It should be

noted, however, that the type of data collected in this study does not allow a determination of the accuracy of the physicians' ratings.

In contrast to previous studies, only a fraction of the tested relationships between predictor variables were found to be significant. Unlike the findings of Gotlieb and Green (1984), correlations between stressful life events, social support, and preventative health behaviors were not statistically significant for either sex. The four affective variables (i.e., anxiety, depression, hostility, and positive affect) were largely unrelated to stress. These findings are contrary to those found in several other studies of the relationship between mood and illness behavior (e.g., Brown & Valliant, 1981; Croyle & Uretsky, 1987; Funch, 1988; Linden, Paulhus, & Dobson, 1986, Robbins & Tanck, 1982). In part, this can be accounted for by the fact that previous studies generally adopted lower thresholds for significance and the power of their analyses was generally lower (e.g., Costa & McCrae, 1987; Pennebaker, Colder, & Sharp, 1990; Philips & Jahanshahi,1985).[3] In addition, measurement instruments differed across studies and may also partially account for differential findings.

As expected, there was considerable redundancy among the measured variables. For example, disease fear, medical fear, health worry, general worry, and neuroticism all loaded highly on the same factor for both males and females, suggesting that these variables are, to a considerable degree, measuring one underlying construct. Similarly, all the measures of affect (depression, anxiety, hostility and positive affect) loaded highly on the second factor, approach or positive coping strategies and optimism loaded highly on the third factor, and avoidant coping strategies loaded highly on the fourth factor. Variables which loaded on the final two factors were less strongly and less clearly related to each other, but for the most part, included measures of illness beliefs and behaviors. This redundancy suggests that a subset of the

measures would be sufficient to cover key constructs in future studies of this type.

Finally, additional results of importance concerned return rates, comparison of patients who did and did not agree to participate in the study, and differences among the locations at which the study was conducted. The overall return rate of 57% corresponds well with a response rate found in a similar mail-based study with medical patients (Funch, 1988). Comparison of participants and patients who refused to participate, indicated that there were few differences between them, the primary differences being that participants reported more recent visits to a physician and more frequent absenteeism due to illness in the previous two weeks. Differences between settings where the study was conducted were as expected. Specifically, participants at the hospital locations were older, had fewer years of education, and were lower in socioeconomic status than participants at the university locations. In fact, the generalizability of the present study is strengthened by its having multiple and diverse settings with both male and female participants covering a large age-range.

In summary, the major findings of the present study indicate that redundancy exists among the variables measured in previous studies to examine the relationship between psychosocial factors and symptom reporting. The findings also indicate that symptom-specific beliefs, stress, and neuroticism are among the most important predictors of increased symptom reporting. Measures of these variables are recommended for future investigations of the relationship between psychosocial factors and other illness behaviors, such as seeking medical care and compliance with medical treatment plans. Furthermore, symptom-specific beliefs, stress, and components of neuroticism (such as disease fear, medical fear, and worry) are likely targets of behavioral

interventions aimed at reducing symptom reporting. This could be especially important and cost-effective when increased symptom reporting occurs in the context of the overuse of medical services.

## Endnotes

1. The original sample was composed of 66 males and 114 females. Forty-eight females were randomly eliminated from the sample in order to equalize the number of subjects for both sexes.

2. The interaction format was used to reflect the potential importance of considering the effect of one variable in the context of another. For example, depression may have a stronger relationship to reported symptoms in the context of coping by ignoring the problem, than in the context of coping by thinking about the situation. The interaction variables created were: (1) depression X coping by ignoring the problem, (2) worry about health X symptom-specific beliefs, (3) worry about health X history of reinforcement for illness behavior, and (4) coping by doing something about the feeling X engaging in preventative health behaviors.

3. For example, Costa and McCrae (1987) report a sample size of 95 and significant correlations as low as .20 and .24. Power values for these correlations are only .50 and .66, respectively. Pennebaker, Colder, and Sharp (1990) report sample sizes of 74 to 84 and correlations as low as .20. The power associated with this correlation is .41. Philips and Jahanshahi (1985) report a sample size of 360 and correlations as low as .07 and .13. Power values for these correlations are .26 and .70, respectively With regard to the present study, power calculations for a correlation of .31 with the current sample sizes were .74 and .94 for males and females, respectively. Thus, power for these calculations was moderately high to high.

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# Appendix A

## Non-Questionnaire Battery Forms

## 1989-1990 Assessment Project Consent Form

Dr. Danny Kaloupek and Ph.D. student Lydia McLarnon from the Psychology Department of Concordia University are conducting a project to examine the attitudes and feelings of people who seek medical services. This information will be gathered from a set of questionnaires completed by people who are making a visit to their physician for any reason other than the follow-up of a previously suspected or diagnosed condition.

Please note the following:

(1) You are free to examine the set of questionnaires before signing this form. If you decide to participate and later change your mind, you are free to withdraw from the project at any time. The quality of medical services you receive will not be affected if you decide that you don't want to participate.

(2) All information from this project is confidential. Your identity is protected by a numerical coding system. Your name will not appear on any of the questionnaires and the Physician Report Form will be detached from this consent form in order to preserve confidentiality.

(3) Your doctor will be asked to provide information about the diagnosis for your current problem.

(4) The success of this project depends on your completion of all questionnaires in full within 24 hours after you receive them. It will take you approximately 40 minutes to complete all the questionnaires.

(5) Please return the entire questionnaire package by mail within 24 hours of your doctor's visit. A pre-addressed, pre-stamped envelope has been provided for this purpose.

If you understand the terms outlined above and agree to participate, please sign below.

_____ _____

Participant Signature Witness

_____ _____

Participant Name (Please Print) Date

## Participant Request Form

Request for Project Result Summary

If you wish to receive a summary of this project's findings, please provide your name and address below. You will receive a brief description of our results as soon as the data from all participants have been collected and analysed.

_____

Name (Please Print)

_____

Street No. Street Apt. No.

_____

City Province

_____

Postal Code

# Project Information Sheet

Please read this carefully before you complete the questionnaires.

1. It is important that you complete this set of questionnaires within 24 hours after your visit with the doctor. It will be easier for you to answer our questions if the information is still fresh in your mind.

2. The completion of all questionnaires in this package will take you approximately 40 minutes. Please work quickly and don't spend too much time on any question; we want your first reaction, not your answer after you have thought about it for awhile. For example, some of the questions may seem difficult to answer because you will be asked your "usual" way of thinking, feeling or acting. Please answer with your first reaction, rather than spending a lot of time thinking about the different ways you might think, feel or act under various circumstances.

3. Please answer all questions. Also, please do NOT circle or check more than one answer per question. If you do this or if you do not answer a question, we may not be able to use your entire set of questionnaires for our study.

4. Please answer all questions as honestly as you can. There are no right or wrong answers for any of the questions we are asking you. Honest answers will help us to understand the attitudes and feelings of people who use medical services.

5. If you have any difficulty completing the questionnaire package, please call Lydia McLarnon at 933-4985. Leave a message on the telephone answering machine and your call will be returned as soon as possible.

6. When you have finished all the questionnaires, please briefly review each form to make sure that you have answered each question. Once you have done this, place the complete set of questionnaires in the pre-addressed, stamped envelope we have provided. Please mail the sealed envelope within 24 hours of your visit to the doctor.

7. For your information, the consent form that you signed for this study is reproduced on the reverse side of this form.

Again, if you have any questions about the questionnaires or about the project, please call Lydia McLarnon at 933-4985.

Thank you for your participation in this project.

## PHYSICIAN REPORT

Participant's I.D. #: _____ Physician's Name: _____

(A) Based on the information available to you at the time of this interview and examination, please indicate the likely origin of this patient's primary problem. Please circle the appropriate number.

| Group A Factors | 1 | 2 | 3 | 4 | 5 | 6 | Group B Factors |
|---|---|---|---|---|---|---|---|
| Biochemical | Very Much Group A | Mostly Group A | A Little More Group A | A Little More Group B | Mostly Group B | Very Much Group B | Psycho-Emotional |
| Anatomical | | | | | | | Social-Interpersonal |
| Physiological | | | | | | | Environmental |

(B) The majority of the symptoms reported by this patient (please check only ONE below):

- ❑ were confirmed upon examination.
- ❑ are expected to be confirmed by further tests or examination.
- ❑ are able to be confirmed by further tests or examination, but are not expected to be confirmed.
- ❑ are of a type not able to be confirmed by further tests or examination.

(C) Please indicate this patient's primary system or organ affected by checking ONE below:

- ❑ Eyes or Ears
- ❑ Respiratory System
- ❑ Cardiovascular System
- ❑ Teeth, Gums or Mouth
- ❑ Gastrointestinal, Liver or Gall Bladder
- ❑ Endocrine System
- ❑ Psychiatric
- ❑ Musculoskeletal System
- ❑ Skin
- ❑ Nervous System
- ❑ Reproductive System
- ❑ Urinary Tract
- ❑ Lymphatic System
- ❑ Other ..... please specify _____

(D) Please specify your diagnosis or tentative diagnosis (Please print) _____

_____

Please check here if there is no diagnosis ❑

THIS IS THE ONLY INFORMATION ABOUT YOU THAT WE ARE REQUESTING FROM YOUR DOCTOR.

IN ORDER TO PRESERVE CONFIDENTIALITY, THIS FORM WILL BE DETACHED FROM THE CONSENT FORM.

Location _____

## Patient Information Form

1. Age:_____ years
2. Sex: ❑ Female ❑ Male
3. Marital Status: ❑ Never Married ❑ Widowed ❑ Divorced ❑ Separated ❑ Married
4. Other than yourself, how many adults are there in your household? _____ adults
5. How many children are there in your household? _____ children
6. Your number of years of education: _____ years
7. Your occupation (or former occupation if retired or unemployed)

   Title: _____ Type of business _____

   Your spouse's occupation: Title: _____ Type of business _____

   Your mother's occupation: Title: _____ Type of business _____

   Your father's occupation: Title: _____ Type of business _____

8. Including this visit, how many times have you been to a physician:
   a) during the past year? _____ times
   b) during the past two weeks? _____ times

9. How many days have you stayed home from work, school, or other obligations due to illness:
   a) during the past year? _____ days
   b) during the past two weeks? _____ days

10. Please indicate the <u>most important</u> factor preventing you from participating in this research project:

    ❑ I do not have the time to complete the questionnaires within the next 24 hours.

    ❑ The problem that I am seeing my doctor about is too private.

    ❑ I dislike completing questionnaires.

    ❑ I am concerned that the information I provide may not be kept confidential.

    ❑ I don't understand what the project is about.

    ❑ Other ... please specify _____

# Appendix B

## Questionnaire Battery

ID# _____

## Symptom Questionnaire

**Section 1**: Please complete Column 1 rating before starting with Column 2.

| Symptom | Column 1<br>Check here if you experienced this symptom during the two weeks before your visit with the doctor | Column 2<br>Check here if you reported this symptom to your doctor |
|---|---|---|
| 1. Weight loss or weight gain when not dieting | _____ | _____ |
| 2. Trouble sleeping or sleeping too much | _____ | _____ |
| 3. Low energy or fatigue | _____ | _____ |
| 4. Shortness of breath or smothering sensations | _____ | _____ |
| 5. Pounding or racing heart | _____ | _____ |
| 6. Chest pain or discomfort | _____ | _____ |
| 7. Choking | _____ | _____ |
| 8. Dizziness, unsteady feelings, or faintness | _____ | _____ |
| 9. Tingling in your hands or feet | _____ | _____ |
| 10. Hot and cold spells or chills | _____ | _____ |
| 11. Sweating | _____ | _____ |
| 12. Trembling, twitching, or feeling shaky | _____ | _____ |
| 13. Muscle tension, aches, or soreness | _____ | _____ |
| 14. Facial tics (e.g., of eye, nose, etc.) | _____ | _____ |
| 15. Restlessness | _____ | _____ |
| 16. Easily startled | _____ | _____ |
| 17. Sweating , or cold clamy hands | _____ | _____ |
| 18. Dry mouth | _____ | _____ |
| 19. Nausea or upset stomach | _____ | _____ |
| 20. Diarrhea or constipation | _____ | _____ |
| 21. Trouble swallowing or lump in your throat | _____ | _____ |
| 22. Headache | _____ | _____ |
| 23. Backache | _____ | _____ |
| 24. Ringing ears | _____ | _____ |
| 25. Teeth grinding | _____ | _____ |
| | Please go back to the top of the page and complete Column 2. | Check here if you did not report any of the above symptoms to your doctor. ..... ☐ |

For questions A to D below, please mark a √ in one of the four spaces:
(If you did not check any symptoms in Section 1, go to Section 2 at the bottom of this page)

A. Which single Section 1 symptom that you experienced or reported to your doctor do you consider the most serious? Please write the item number here. _____

How serious do you feel this symptom was?

| Extremely Serious | Moderately Serious | Mildly Serious | Not at all Serious |
|---|---|---|---|

B. Which single Section 1 symptom that you experienced or reported to your doctor interfered the most with your daily routine or activities? Please write the item number here. _____

How interfering was this symptom?

| Extremely Interfering | Moderately Interfering | Mildly Interfering | Not at all Interfering |
|---|---|---|---|

C. Which single Section 1 symptom that you experienced or reported to your doctor did you have the least previous experience with? Please write the item number here. _____

How frequent has been your experience with this symptom?

| Extremely Frequent | Moderately Frequent | Mildly Frequent | Not at all Frequent |
|---|---|---|---|

D Before you saw you doctor, how confident were you that he or she would be able to help you with the symptom(s) that you reported in Section 1?

| Extremely Confident | Moderately Confident | Mildly Confident | Not at all Confident |
|---|---|---|---|

**Section 2**: Please complete Column 1 rating before starting with Column 2.

| Symptom | Column 1 Check here if you experienced this symptom during the two weeks before your visit with the doctor | Column 2 Check here if you reported this symptom to your doctor |
|---|---|---|
| 26. Trouble seeing | ____ | ____ |
| 27. Eyesight blacked out completely | ____ | ____ |
| 28. Eyes continually blink or water | ____ | ____ |
| 29. Red, inflamed, or painful eyes | ____ | ____ |
| 30. Trouble hearing | ____ | ____ |
| 31. Earache or running ear | ____ | ____ |
| 32. Sneezing, stuffy nose, or runny nose | ____ | ____ |
| 33. Bad nose bleeds | ____ | ____ |
| 34. Cough | ____ | ____ |

| Symptom | Column 1<br>Check here if you experienced this symptom during the two weeks before your visit with the doctor | Column 2<br>Check here if you reported this symptom to your doctor |
|---|---|---|
| 35. Coughing up blood | ____ | ____ |
| 36. Severe soaking sweats at night | ____ | ____ |
| 37. Swollen ankles | ____ | ____ |
| 38. Leg cramps | ____ | ____ |
| 39. Bleeding gums | ____ | ____ |
| 40. Toothache | ____ | ____ |
| 41. Blood in your stool | ____ | ____ |
| 42. Intestinal worms | ____ | ____ |
| 43. Feeling bloated after eating | ____ | ____ |
| 44. Belching alot after eating | ____ | ____ |
| 45. Severe pains in your stomach | ____ | ____ |
| 46. Piles (hemorrhoids) | ____ | ____ |
| 47. Yellow eyes and skin (jaundice) | ____ | ____ |
| 48. Painful, swollen, or stiff joints | ____ | ____ |
| 49. Severe pain in your arms or legs | ____ | ____ |
| 50. Painful feet | ____ | ____ |
| 51. Very sensitive or tender skin | ____ | ____ |
| 52. Cut(s) that stay open a long time | ____ | ____ |
| 53. Itching | ____ | ____ |
| 54. Skin rash | ____ | ____ |
| 55. Boils | ____ | ____ |
| 56. Numbness or tingling in parts of your body other than in your hands or feet | ____ | ____ |
| 57. Paralysis in some part of your body | ____ | ____ |
| 58. Convulsions | ____ | ____ |
| 59. Sore on your genitals | ____ | ____ |
| 60. Blood in your urine | ____ | ____ |
| 61. Painful urination | ____ | ____ |
| 62. Frequent urination | ____ | ____ |
| 63. Occasional loss of bladder control | ____ | ____ |
| | Please go back to page 2 and begin completing Column 2 of this Section. | Check here if you did not report any of the above symptoms to your doctor. ..... ☐ |

For questions E to H below, please mark a √ in one of the four spaces:
(If you did not check any symptoms in Section 2, go to questions J and K on page 4)

E. Which single Section 2 symptom that you experienced or reported to your doctor do you consider the most serious? Please write the item number here. _____

How serious do you feel this symptom was?

| Extremely Serious | Moderately Serious | Mildly Serious | Not at all Serious |
|---|---|---|---|

F. Which single Section 2 symptom that you experienced or reported to your doctor interfered the most with your daily routine or activities? Please write the item number here. _____

How interfering was this symptom?

| Extremely Interfering | Moderately Interfering | Mildly Interfering | Not at all Interfering |
|---|---|---|---|

G. Which single Section 2 symptom that you experienced or reported to your doctor did you have the least previous experience with? Please write the item number here. _____

How frequent has been your experience with this symptom?

| Extremely Frequent | Moderately Frequent | Mildly Frequent | Not at all Frequent |
|---|---|---|---|

H. Before you saw you doctor, how confident were you that he or she would be able to help you with the symptom(s) that you reported in Section 2?

| Extremely Confident | Moderately Confident | Mildly Confident | Not at all Confident |
|---|---|---|---|

J. If you have a chronic physical condition that produces any of the symptoms listed in either Section 1 or Section 2, please name the condition here_____
and list the item number for each symptom that this condition has caused for you during the past two weeks _____.

L. For women only:
Please list here the item number for any symptom(s) from either Section 1 or Section 2 that you experienced during the past two weeks due to your menstrual cycle or because you are going through menopause ("change of life"). _____

ID#_____

## Background Information Form

1. Age:_____ years  2. Sex: ❑ Female ❑ Male

3. Marital Status: ❑ Never Married ❑ Widowed ❑ Divorced ❑ Separated ❑ Married

4. Other than yourself, how many adults are there in your household? _____ adults

5. How many children are there in your household? _____ children

6. Your number of years of education: _____ years

7. Your occupation (or former occupation if retired or unemployed)

   Title: _____ Type of business _____

   Your spouse's occupation: Title: _____ Type of business _____

   Your mother's occupation: Title: _____ Type of business _____

   Your father's occupation: Title: _____ Type of business _____

8. As a child, did you have a chronic illness or recurring medical condition (e.g., asthma, allergies, colitis)

   ❑ No ❑ Yes . . . If so, what chronic medical condition did you have? _____

   _____

9. When you were a child, did anyone in your immediate family have a chronic or recurring medical condition (e.g., heart problems, ulcers, allergies, headaches)? ❑ No ❑ Yes ..... If so, what relationship did they have to you (e.g., brother, mother, etc.)? _____
   What chronic medical condition(s) did they have?_____

   _____

10. Have you ever been hospitalized for psychiatric reasons? ❑ No ❑ Yes..... If so, how long ago? _____ years ago

11. In the past 2 weeks, have you taken any prescribed medication? ❑ No ❑ Yes ... If so, what medication are you taking and for what problem or condition?

| Medication | Problem or Condition |
|---|---|
| _____ | for: _____ |
| _____ | for: _____ |
| _____ | for: _____ |

For each of the following questions, please mark in one of the six spaces to indicate the degree to which you agree or disagree with it.

12. When I was a child, I received more attention than usual from my family or friends when I was sick.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

13. When I was a child, I didn't have to do chores, go to school or participate in activities when I was sick.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

14. When I was a child, other members in my family didn't have to go to work, do chores, go to school or participate in activities when they were sick.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

15. When I was a child, members of my family other than myself received more attention than usual when they were sick.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

16. When I was a young child, I was very shy.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

17. At the present time, I don't have to go to work, do chores, go to school or participate in activities when I am sick.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

18. At the present time, I receive more attention than usual from my family and friends when I am sick.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

19. I wish I could stop worrying so much about the things that have happened to me.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

20. I wish I could stop worrying so much about my health.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

21. I exercise regularly.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

22. I smoke cigarettes regularly.

| Strongly Agree | Most Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

23. I regularly get enough sleep.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

24. I regularly eat a balanced diet.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

25. (a) I have experienced the death of a close friend or family member. ☐ No ☐ Yes ... if so, please answer question (b) below:

(b) I have confided a great deal in others about the death of a close friend or family member.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

26. (a) My parents divorced or separated before I was 17 years old. ☐ No ☐ Yes ... if so, please answer question (b) below:

(b) I have confided a great deal in others about my parents' divorce or separation before I was 17 years old.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

27. (a) I have been the victim of violence. ☐ No ☐ Yes ...if so, please answer question (b) below:

(b) I have confided a great deal in others about my experience as a victim of violence.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

28. (a) I have been divorced or separated from my spouse. ☐ No ☐ Yes ...if so, please answer question (b) below:

(b) I have confided a great deal in others about my divorce or separation from my spouse.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

29. (a) I have had a traumatic sexual experience. ☐ No ☐ Yes ...if so, please answer question (b) below:

(b) I have confided a great deal in others about my traumatic sexual experience.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

30. (a) I have experienced other traumas. ☐ No ☐ Yes ...if so, please answer question (b) below:

(b) I have confided a great deal in others about these traumas.

| Strongly Agree | Mostly Agree | Somewhat Agree | Somewhat Disagree | Mostly Disagree | Strongly Disagree |
|---|---|---|---|---|---|

31. Including this visit, how many times have you been to a physician:

a) during the past year? _____ times

b) during the past two weeks? _____ times

32. How many days have you stayed home from work, school, or other obligations due to illness:

a) during the past year? _____ days

b) during the past two weeks? _____ days

ID#_____

## Situation / Coping / Social Support Form

### Section 1

Listed in Section 1 are a number of problems, concerns, and events that many people find stressful. Please check all of the items that have been of concern to you during the past 2 weeks.

1. Concerns about the health of a family member ..... _____
2. Decrease in the closseness of your relationship with a friend, your spouse, or a family member ..... _____
3. Trouble with friends, neighbors, or relatives..... ..... _____

If none of these stresses were of concern to you during the past two weeks, please check here ☐, and then turn to page 3 of this form.....

A) Which of the above stresses (item #'s 1 - 3) has had the most negative impact on your life during the past two weeks? Please write the item number of the stress here _____.

B) Please make a check in the appropriate space below to indicate when this stress began:

| Within the last 2 weeks | Between 2 weeks and 2 months ago | Between 2 months and 1 year ago | More than 1 year ago |
|---|---|---|---|

Please turn to page 2.....

C) Please circle the appropriate number to indicate the degree to which each of the following statements applies to you during the past two weeks in dealing with the stress you named in question A on the previous page. Please answer all questions.

| | Not at all like me | Somewhat like me | Much like me | Completely like me |
|---|---|---|---|---|
| 1. I try to focus on how I am feeling. | 0 | 1 | 2 | 3 |
| 2. I think about ways to make this situation better. | 0 | 1 | 2 | 3 |
| 3. I try to ignore how I am feeling. | 0 | 1 | 2 | 3 |
| 4. I wish that this situation would get better or that it had never happened. | 0 | 1 | 2 | 3 |
| 5. I try to do something active to make myself feel better. | 0 | 1 | 2 | 3 |
| 6. I leave the situation or otherwise ignore the problem. | 0 | 1 | 2 | 3 |
| 7. I hold back my feelings. | 0 | 1 | 2 | 3 |
| 8. I try to see the positive side. | 0 | 1 | 2 | 3 |

D) How satisfied are you with the support that you have received during the past two weeks from your family and friends for the stress you named in question A. Please mark the appropriate space below:

| Completely Dissatisfied | Mostly Dissatisfied | Somewhat Dissatisfied | Somewhat Satisfied | Mostly Satisfied | Completely Satisfied |
|---|---|---|---|---|---|

If you did not want support from you family or friends for this stress, please check here. ☐

Please turn to page 3.....

## Section 2

Listed in Section 2 are a number of problems, concerns, and events that many people find stressful. Please check all of the items that have been of concern to you during the past 2 weeks.

4. Rising prices of common goods ..... _____

5. Misplacing or losing things ..... _____

6. Concerns about property, investment, or taxes ..... _____

7. Concerns about job security ..... _____

8. Legal problems ..... _____

If none of these stresses were of concern to you during the past two weeks, please check here ☐, and then turn to page 5 of this form.....

E) Which of the above stresses (item #'s 4 - 8) has had the most negative impact on your life during the past two weeks? Please write the item number of the stress here _____.

F) Please make a check in the appropriate space below to indicate when this stress began:

| Within the last 2 weeks | Between 2 weeks and 2 months ago | Between 2 months and 1 year ago | More than 1 year ago |
|---|---|---|---|

Please turn to page 4.....

G) Please circle the appropriate number to indicate the degree to which each of the following statements applies to you during the past two weeks in dealing with the stress you named in question E on the previous page. Please answer all questions.

| | Not at all like me | Somewhat like me | Much like me | Completely like me |
|---|---|---|---|---|
| 1. I try to focus on how I am feeling. | 0 | 1 | 2 | 3 |
| 2. I think about ways to make this situation better. | 0 | 1 | 2 | 3 |
| 3. I try to ignore how I am feeling. | 0 | 1 | 2 | 3 |
| 4. I wish that this situation would get better or that it had never happened. | 0 | 1 | 2 | 3 |
| 5. I try to do something active to make myself feel better. | 0 | 1 | 2 | 3 |
| 6. I leave the situation or otherwise ignore the problem. | 0 | 1 | 2 | 3 |
| 7. I hold back my feelings. | 0 | 1 | 2 | 3 |
| 8. I try to see the positive side. | 0 | 1 | 2 | 3 |

H) How satisfied are you with the support that you have received during the past two weeks from your family and friends for the stress you named in question E. Please mark the appropriate space below:

| Completely Dissatisfied | Mostly Dissatisfied | Somewhat Dissatisfied | Somewhat Satisfied | Mostly Satisfied | Completely Satisfied |
|---|---|---|---|---|---|

If you did not want support from you family or friends for this stress, please check here. ☐

Please turn to page 5.....

## Section 3

Listed in Section 3 are a number of problems, concerns, and events that many people find stressful. Please check all of the items that have been of concern to you during the past 2 weeks.

9. Home maintenance ..... _____
10. Too many things to do ..... _____
11. Yard work or outside maintenance ..... _____
12. Concerns about your weight ..... _____
13. Concerns about crime ..... _____
14. Concerns about your physical appearance ..... _____
15. Death of a friend, spouse, or family member ..... _____
16. Financial difficulties ..... _____
17. Separation from your spouse, or a family member ..... _____
18. Being fired or laid off from your job ..... _____
19. Experiencing a decrease in pleasant activities outside of work or school ..... _____
20. Problems with certain aspects of school or work ..... _____
21. Sexual difficulties ..... _____
22. Male: Wife/Girlfriend having an abortion
    Female: Having an abortion ..... _____
23. Personal health concerns, illness, or injury ..... _____

If none of these stresses were of concern to you during the past two weeks, please check here ☐, and then turn to the next form contained in this package .....

J ) Which of the above stresses (item #'s 9 - 23) has had the most negative impact on your life during the past two weeks? Please write the item number of the stress here _____.

Please turn to page 6 .....

K) Please make a check in the appropriate space below to indicate when this stress began:

| Within the last 2 weeks | Between 2 weeks and 2 months ago | Between 2 months and 1 year ago | More than 1 year ago |
|---|---|---|---|

L) Please circle the appropriate number to indicate the degree to which each of the following statements applies to you during the past two weeks in dealing with the stress you named in question J on page 5. Please answer all questions.

| | Not at all like me | Somewhat like me | Much like me | Completely like me |
|---|---|---|---|---|
| 1. I try to focus on how I am feeling. | 0 | 1 | 2 | 3 |
| 2. I think about ways to make this situation better. | 0 | 1 | 2 | 3 |
| 3. I try to ignore how I am feeling. | 0 | 1 | 2 | 3 |
| 4. I wish that this situation would get better or that it had never happened. | 0 | 1 | 2 | 3 |
| 5. I try to do something active to make myself feel better. | 0 | 1 | 2 | 3 |
| 6. I leave the situation or otherwise ignore the problem. | 0 | 1 | 2 | 3 |
| 7. I hold back my feelings. | 0 | 1 | 2 | 3 |
| 8. I try to see the positive side. | 0 | 1 | 2 | 3 |

M) How satisfied are you with the support that you have received during the past two weeks from your family and friends for the stress you named in question J. Please mark the appropriate space below:

| Completely Dissatisfied | Mostly Dissatisfied | Somewhat Dissatisfied | Somewhat Satisfied | Mostly Satisfied | Completely Satisfied |
|---|---|---|---|---|---|

If you did not want support from you family or friends for this stress, please check here. ☐

ID# _____

# EPI

Below are some questions regarding the way you behave, feel and act. For each question, try to decide whether "Yes" or "No" represents your usual way of acting or feeling. Then circle either "Yes" or "No".

| | | | |
|---|---|---|---|
| 1. | Do you often long for excitement? | Yes | No |
| 2. | Do you often need understanding friends to cheer you up? | Yes | No |
| 3. | Are you usually carefree? | Yes | No |
| 4. | Do you find it very hard to take no for an answer? | Yes | No |
| 5. | Do you stop and think things over before doing anything? | Yes | No |
| 6. | If you say you will do something do you always keep your promise, no matter how inconvenient it might be to do so? | Yes | No |
| 7. | Does your mood often go up and down? | Yes | No |
| 8. | Do you generally do and say things quickly without stopping to think? | Yes | No |
| 9. | Do you ever feel "just miserable" for no good reason? | Yes | No |
| 10. | Would you do almost anything for a dare? | Yes | No |
| 11. | Do you suddenly feel shy when you want to talk to an attractive stranger? | Yes | No |
| 12. | Once in awhile do you lose your temper and get angry? | Yes | No |
| 13. | Do you often do things on the spur of the moment? | Yes | No |
| 14. | Do you often worry about things you should not have done or said? | Yes | No |
| 15. | Generally, do you prefer reading to meeting people? | Yes | No |
| 16. | Are your feelings rather easily hurt? | Yes | No |
| 17. | Do you like going out a lot? | Yes | No |
| 18. | Do you occasionally have thoughts and ideas that you would not like other people to know about? | Yes | No |
| 19. | Are you sometimes bubbling over with energy and sometimes very sluggish? | Yes | No |

| | | | |
|---|---|---|---|
| 20. | Do you prefer to have few but special friends? | Yes | No |
| 21. | Do you daydream a lot? | Yes | No |
| 22. | When people shout at you, do you shout back? | Yes | No |
| 23. | Are you often troubled about feelings of guilt? | Yes | No |
| 24. | Are all your habits good and desirable ones? | Yes | No |
| 25. | Can you usually let yourself go and enjoy yourself a lot at a party? | Yes | No |
| 26. | Would you call yourself tense or "highly-strung"? | Yes | No |
| 27. | Do other people think of you as being very lively? | Yes | No |
| 28. | After you have done something important, do you often come away feeling you could have done better? | Yes | No |
| 29. | Are you mostly quiet when you are with other people? | Yes | No |
| 30. | Do you sometimes gossip? | Yes | No |
| 31. | Do ideas run through your head so that you cannot sleep? | Yes | No |
| 32. | If there is something you want to know about, would you rather look it up in a book than talk to someone about it? | Yes | No |
| 33. | Do you get palpitations or thumping in your heart? | Yes | No |
| 34. | Do you like the kind of work that you need to pay close attention to? | Yes | No |
| 35. | Do you get attacks of shaking or trembling? | Yes | No |
| 36. | Would you always declare everything at the customs, even if you knew that you could never be found out? | Yes | No |
| 37. | Do you hate being with a crowd who play jokes on one another? | Yes | No |
| 38. | Are you an irritable person? | Yes | No |
| 39. | Do you like doing things in which you have to act quickly? | Yes | No |
| 40. | Do you worry about awful things that might happen? | Yes | No |
| 41. | Are you slow and unhurried in the way you move? | Yes | No |

| | | |
|---|---|---|
| 42. Have you ever been late for an appointment or work? ..... | Yes | No |
| 43. Do you have many nightmares? ..... | Yes | No |
| 44. Do you like talking to people so much that you would never miss a chance of talking to a stranger? ..... | Yes | No |
| 45. Are you troubled by aches and pains? ..... | Yes | No |
| 46. Would you be very unhappy if you could not see lots of people most of the time?..... | Yes | No |
| 47. Would you call yourself a nervous person? ..... | Yes | No |
| 48. Of all the people you know are there some whom you definitely do not like? ..... | Yes | No |
| 49. Would you say you are fairly self-confident? ..... | Yes | No |
| 50. Are you easily hurt when people find fault with you or your work? ..... | Yes | No |
| 51. Do you find it hard to really enjoy yourself at a lively party? | Yes | No |
| 52. Are you troubled with feelings of inferiority? ..... | Yes | No |
| 53. Can you easily get some life into a rather dull party? ..... | Yes | No |
| 54. Do you sometimes talk about things you know nothing about? .... | Yes | No |
| 55. Do you worry about your health? ..... | Yes | No |
| 56. Do you like playing pranks on others? ..... | Yes | No |
| 57. Do you suffer from sleeplessness? ..... | Yes | No |

ID # _____

# PERSONAL ILLNESS QUESTIONNAIRE

Instructions: Please read each statement and mark in one of the four adjacent spaces to indicate the degree to which it applies to you.

| | Not like me | Somewhat like me | Much like me | Completely like me |
|---|---|---|---|---|
| 1. I tend to get upset and anxious about the prospect of receiving an injection. | | | | |
| 2. When I am ill with a cold or flu, it seems that I take longer than my friends to recover and get back to work or school. | | | | |
| 3. When things are not going well in my life, I tend to feel physically upset or ill. | | | | |
| 4. It often makes me uncomfortable when someone gives a detailed description of a serious injury or major medical procedure. | | | | |
| 5. I find that when a doctor talks to me after an examination I am tense because I am anticipating the discovery of a serious disorder. | | | | |
| 6. I often have minor illnesses or small physical upsets. | | | | |
| 7. It troubles me to have a blood sample drawn. | | | | |
| 8. My strongest fears involve the prospect of me having a serious disorder such as a heart attack or cancer. | | | | |
| 9. Sometimes I have to make myself stop thinking about or imagining things which might be wrong with me. | | | | |
| 10. If I really think about or imagine the physical process involved in a disorder such as a brain tumor, my heart races and my palms sweat. | | | | |
| 11. In medical situations I often have to take deep breaths to calm myself. | | | | |
| 12. When I don't eat well or sleep enough, my body feels like it does during the early stages of the flu. | | | | |

ID# _____

## Life Orientation Questionnaire

Please circle the number that represents the extent to which you disagree or agree with each of the statements below. Please circle only one number for each statement.

| | | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| | | strongly disagree | disagree | neutral | agree | strongly agree |
| 1. | In uncertain times, I usually expect the best. | 0 | 1 | 2 | 3 | 4 |
| 2. | It's easy for me to relax. | 0 | 1 | 2 | 3 | 4 |
| 3. | If something can go wrong for me, it will. | 0 | 1 | 2 | 3 | 4 |
| 4. | I always look on the bright side of things. | 0 | | 2 | 3 | 4 |
| 5. | I'm always optimistic about my future. | 0 | 1 | 2 | 3 | 4 |
| 6. | I enjoy my friends a lot. | 0 | 1 | 2 | 3 | 4 |
| 7. | It's important for me to keep busy. | 0 | 1 | 2 | 3 | 4 |
| 8. | I hardly ever expect things to go my way. | 0 | 1 | 2 | 3 | 4 |
| 9. | Things never work out the way I want them to. | 0 | 1 | 2 | 3 | 4 |
| 10. | I don't get upset too easily. | 0 | 1 | 2 | 3 | 4 |
| 11. | I'm a believer in the idea that "every cloud has a silver lining". | 0 | 1 | 2 | 3 | 4 |
| 12. | I rarely count on good things happening to me. | 0 | 1 | 2 | 3 | 4 |

ID# _____

## TAS

Please circle the number that represents the extent to which you disagree or agree with each of the statements below. Please circle only one number for each statement.

| | strongly disagree | moderately disagree | neither disagree nor agree | moderately agree | strongly agree |
|---|---|---|---|---|---|
| 1. When I cry I always know why. ..... | 1 | 2 | 3 | 4 | 5 |
| 2. Daydreaming is a waste of time. ..... | 1 | 2 | 3 | 4 | 5 |
| 3. I wish I were not so shy. ..... | 1 | 2 | 3 | 4 | 5 |
| 4. I am often confused about what emotion I am feeling. ..... | 1 | 2 | 3 | 4 | 5 |
| 5. I often daydream about the future. ..... | 1 | 2 | 3 | 4 | 5 |
| 6. I seem to make friends as easily as others do. ..... | 1 | 2 | 3 | 4 | 5 |
| 7. Knowing the answers to problems is more important than knowing the reasons for the answers. ..... | 1 | 2 | 3 | 4 | 5 |
| 8. It is difficult for me to find the right words for my feelings. ..... | 1 | 2 | 3 | 4 | 5 |
| 9. I like to let people know where I stand on things. ..... | 1 | 2 | 3 | 4 | 5 |
| 10. I have physical sensations that even doctors don't understand. ..... | 1 | 2 | 3 | 4 | 5 |
| 11. It's not enough for me that something gets the job done; I need to know how and why it works. ..... | 1 | 2 | 3 | 4 | 5 |
| 12. I am able to describe my feelings easily. ... | 1 | 2 | 3 | 4 | 5 |

| | strongly disagree | moderately disagree | neither disagree nor agree | moderately agree | strongly agree |
|---|---|---|---|---|---|
| 13. I prefer to analyse problems rather than just to describe them. | 1 | 2 | 3 | 4 | 5 |
| 14. When I am upset, I don't know if I am sad, frieghtened, or angry. | 1 | 2 | 3 | 4 | 5 |
| 15. I use my imagination a great deal. | 1 | 2 | 3 | 4 | 5 |
| 16. I spend much time daydreaming whenever I have nothing to do. | 1 | 2 | 3 | 4 | 5 |
| 17. I am often puzzled by sensations in my body. | 1 | 2 | 3 | 4 | 5 |
| 18. I daydream rarely. | 1 | 2 | 3 | 4 | 5 |
| 19. I prefer to just let things happen rather than to understand why they turned out that way. | 1 | 2 | 3 | 4 | 5 |
| 20. I have feelings that I can't quite identify. | 1 | 2 | 3 | 4 | 5 |
| 21. Being in touch with emotions is essential. | 1 | 2 | 3 | 4 | 5 |
| 22. I find it hard to describe how I feel about people. | 1 | 2 | 3 | 4 | 5 |
| 23. People tell me to describe my feelings more. | 1 | 2 | 3 | 4 | 5 |
| 24. One should look for deeper explanations. | 1 | 2 | 3 | 4 | 5 |
| 25. I don't know what's going on inside me. | 1 | 2 | 3 | 4 | 5 |
| 26. I often don't know when I am angry. | 1 | 2 | 3 | 4 | 5 |

ID# _____

## MAACL-R

Please check the box beside ALL words that describe how you have been feeling about your life situation during the past two weeks.

1. ❑ active
2. ❑ adventurous
3. ❑ affectionate
4. ❑ afraid
5. ❑ agitated
6. ❑ agreeable
7. ❑ aggressive
8. ❑ alive
9. ❑ alone
10. ❑ amiable
11. ❑ amused
12. ❑ angry
13. ❑ annoyed
14. ❑ awful
15. ❑ bashful
16. ❑ bitter
17. ❑ blue
18. ❑ bored
19. ❑ calm
20. ❑ cautious
21. ❑ cheerful
22. ❑ clean
23. ❑ complaining
24. ❑ contented
25. ❑ contrary
26. ❑ cool
27. ❑ cooperative
28. ❑ critical
29. ❑ cross
30. ❑ cruel
31. ❑ daring
32. ❑ desperate
33. ❑ destroyed
34. ❑ devoted
35. ❑ disagreeable
36. ❑ discontented
37. ❑ discouraged
38. ❑ disgusted
39. ❑ displeased
40. ❑ energetic
41. ❑ enraged
42. ❑ enthusiastic
43. ❑ fearful
44. ❑ fine
45. ❑ fit
46. ❑ forlorn
47. ❑ frank
48. ❑ free
49. ❑ friendly
50. ❑ frightened
51. ❑ furious
52. ❑ lively
53. ❑ gentle
54. ❑ glad
55. ❑ gloomy
56. ❑ good
57. ❑ good-natured
58. ❑ grim
59. ❑ happy
60. ❑ healthy
61. ❑ hopeless
62. ❑ hostile
63. ❑ impatient
64. ❑ incensed
65. ❑ indignant
66. ❑ inspired
67. ❑ interested
68. ❑ irritated
69. ❑ jealous

70. ❑ joyful
71. ❑ kindly
72. ❑ lonely
73. ❑ lost
74. ❑ loving
75. ❑ low
76. ❑ lucky
77. ❑ mad
78. ❑ mean
79. ❑ meek
80. ❑ merry
81. ❑ mild
82. ❑ miserable
83. ❑ nervous
84. ❑ obliging
85. ❑ offended
86. ❑ outraged
87. ❑ panicky
88. ❑ patient
89. ❑ peaceful
90. ❑ pleased
91. ❑ pleasant
92. ❑ polite
93. ❑ powerful
94. ❑ quiet
95. ❑ reckless
96. ❑ rejected
97. ❑ rough
98. ❑ sad
99. ❑ safe
100. ❑ satisfied
101. ❑ secure
102. ❑ shaky
103. ❑ shy
104. ❑ soothed
105. ❑ steady
106. ❑ stubborn
107. ❑ stormy
108. ❑ strong
109. ❑ suffering
110. ❑ sullen
111. ❑ sunk
112. ❑ sympathetic
113. ❑ tame
114. ❑ tender
115. ❑ tense
116. ❑ terrible
117. ❑ terrified
118. ❑ thoughtful
119. ❑ timid
120. ❑ tormented
121. ❑ understanding
122. ❑ unhappy
123. ❑ unsociable
124. ❑ upset
125. ❑ vexed
126. ❑ warm
127. ❑ whole
128. ❑ wild
129. ❑ willful
130. ❑ wilted
131. ❑ worrying
132. ❑ young

Now that you have finished the list, please go back and circle the 3 words that best summarize your feelings about your life situation during the past two weeks.