

UNDERSTANDING FATIGUE:  
AN EXPLORATORY STUDY OF THE ROLE OF PSYCHOSOCIAL VARIABLES

BY

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for the Degree of

MASTER OF ARTS

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**Understanding Fatigue: An Exploratory Study of the Role of Psychosocial Variables**

**BY**

**Chantal Annette Arpin-Cribbie**

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University  
of Manitoba in partial fulfillment of the requirements of the degree**

**of**

**MASTER OF ARTS**

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## Abstract

Fatigue is a widespread symptom which has been linked with many illnesses, both chronic and acute, as well as with the more normal functioning of a person's regular or daily life. Although fatigue is acknowledged as a frequent complaint for many individuals, it remains one of the human responses to be least researched, and as such least explained and understood. Three hundred undergraduate students from the University of Manitoba completed 14 measures assessing fatigue, cognitive distortions, depression, stress, perceived social support, and coping. The present study attempted to advance our understanding of the experience of fatigue by aiming to clarify both the variables increasing one's susceptibility to fatigue, and the processes by which these variables may interact. This was accomplished by: (a) establishing a plausible and well fitting measurement model of the constructs evaluated in this study; and (b) exploring theoretical models of interest specifying particular causal relationships among the constructs. Of the five exogenous variables, only Cognitive Distortions was significantly predictive of Fatigue, with higher levels of Cognitive Distortions predicting greater levels of Fatigue. Further, the Cognitive Distortions construct was found to mediate the relationship between Depression and Fatigue. Results suggested that cognitive patterns significantly impact on one's vulnerability to experience fatigue. Given these findings, it is important to note that results of previous studies have shown that cognitive behavior therapy can improve symptoms in patients whose perceptions of their illness and whose coping behaviors may inhibit their recovery. Furthermore, given the preponderance of health-related concerns in the general population for which psychological interventions

may be of benefit, further research should be done in examining more closely how various psychosocial variables may impact on health-related action patterns that could significantly effect the health status of individuals. A greater understanding of the processes by which these variables interacted would allow for the development of effective treatment strategies to be used in treating populations with various health-related concerns.



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## Understanding Fatigue:

## An Exploratory Study of the Role of Psychosocial Variables

Fatigue can be conceptualized as being on a continuum. On one end of the spectrum one can find the more mundane experience of fatigue as defined by the common, almost daily experience of it in most peoples lives. Moving along this continuum, it can be noted that recent epidemiological data has suggested that fatigue is experienced problematically in the lives of a high percentage of people in the general population, as exemplified by the fact that a recent study found that twenty percent of British people describe themselves as having been extremely tired all of the time over the last month. Fatigue is also recognized as one of the primary presenting symptoms of individuals seeking help from a medical professional (Komaroff & Fagioli, 1996). In addition, on the furthest end of the spectrum are the more extreme forms of fatigue as experienced, for example, in chronic fatigue syndrome whereby an individual can be completely debilitated by fatigue. Despite the preponderance of people experiencing fatigue, it is extremely disconcerting to note how little fatigue, in all its forms, has been studied, consequently resulting in significant limitations of our understanding of such an obviously important phenomenon.

Fatigue is a widespread symptom which has been linked with many illnesses, both chronic and acute, as well as with the more normal functioning of a person's regular or daily life. Fatigue is also one of the primary presenting symptoms of individuals seeking help from a medical professional (Aaronson et al., 1999). Several authors have noted that although fatigue is acknowledged as a significant problem for individuals, it remains one

of the human responses to be least researched, and as such least explained and understood (Friedman & Friedman, 1993; Lee, Lentz, Taylor, Mitchell, & Fugate Woods, 1994; McDonald, Pelosi, & Mann, 1993; Potempa, 1989; Ridsdale et al., 1993; Winningham et al., 1994). Possible reasons for this lack of research into, and knowledge of fatigue as a symptom include:

(a) absence of a clear and well-defined theoretical framework, (b) absence of a widely accepted definition of fatigue, (c) complexity of the defining characteristics of fatigue, (d) the nonspecific character of fatigue, and (e) difficulty in objectively diagnosing and treating. (Tiesinga, Dassen, & Halfens, 1996, p. 51)

The concept of fatigue has many dimensions. Three of the most prominent in addressing the conceptualization of fatigue are the psychological dimension, the physical dimension, and the social dimension, each of these varying in their degree of subjectivity. It is in fact the more subjective dimensions of mental and physical fatigue of which individuals complain and consequently these that provide a greater understanding of how individuals experience fatigue. For the purpose of the present study, the subjective dimension (hence an individual's perception) of fatigue will be emphasized and explored.

An overview of the published literature on fatigue as a concept indicates that various terms seem to overlap with what is often referred to as fatigue. A few of those most frequently overlapping with fatigue are presented below.

#### Related Concepts

Tiredness is generally referred to when addressing the subjective experience or dimension of fatigue (Montgomery, 1983). "The intensity of fatigue is shown in the

literature as a continuum from tiredness, advancing to fatigue, and at last a state of exhaustion” (Tiesinga et al., 1996, p. 57). Tiredness differentiates itself from fatigue primarily in both the duration and intensity of the symptoms experienced (Piper, 1993). The term malaise has been described as “the general feeling of being ill” (Hürny et al., 1993, p. 316). This particular concept is differentiated from those of fatigue and tiredness in so far as malaise is often encountered within the medical conceptualization of illness. Weakness, on the other hand, is described as a state of lacking much energy or physical strength, for example as a result of being old, ill, malnourished. This particular term implies a direct link between one’s physical body and the experienced weakness (Tiesinga et al.). “Weariness unrelated to activity” (Elnicki, Shockor, Brick, & Beyon, 1992, p. 303), however, is often labeled lassitude. Within this particular conceptualization, fatigue is viewed as “the state following a period of mental or bodily activity characterized by a lessened capacity for work” (Elnicki et al., p. 303).

As exemplified in the discussion of terms often presented in the literature as overlapping with the concept of fatigue, one can note that the definition of fatigue often varies in terms of the different aspects of the concept that are emphasized (subjective, objective, psychological, physical, etc.) and in terms of different views with respect to causal and related factors, as well as qualitative differences in terms of the levels of intensity of fatigue experienced.

#### Fatigue as a Symptom

Komaroff, a physician at Harvard medical school and an expert on chronic fatigue, identified fatigue as one of the primary presenting symptoms of individuals

seeking help from a medical professional; in a great majority of cases, no physical basis for the fatigue can be found. Komaroff feels that he and most other physicians believe that the fatigue can be attributed to being overworked or depressed (Komaroff & Fagioli, 1996). Furthermore, a recent British epidemiological survey found that twenty percent of British people describe themselves as having been extremely tired all of the time over the last month (Demitrack & Abbey, 1996). Moreover, "fatigue is not just a frequent complaint in primary care, it is also an important public health problem, associated with disability comparable to that found in chronic medical patients" (Fuhrer & Wessely, 1995, p. 896). In addition to its impact on any given individual person, fatigue can also be an economic, financial, and sociological problem for our society (Tiesinga et al., 1996). Findings of this nature bolster the argument for more thoroughly examining fatigue and its correlates. Fatigue is evidently a widespread problem and there is a lack of research being conducted in this particular area.

The central importance of fatigue as a symptom cannot be overlooked, particularly in cases such as CFS where it is a necessary characteristic required for diagnosis. One cannot escape the inherent problems associated with fatigue as a symptom. The central symptom in CFS, fatigue, is a nonspecific complaint which has been alluded to by many in the general population, as well as by the majority of individuals seeking help from primary caregivers. Fatigue is recognized as a symptom for a diversity of both psychiatric and physical illnesses. To further complicate the matter, a review of the literature on fatigue appears to indicate that "the status of fatigue as a physiological response, psychological perception, or symptom of physical and psychiatric diseases remains



unclear” (Vercoulen et al., 1994, p. 383).

### Defining and Measuring Fatigue

What, one may wonder, makes fatigue such a difficult symptom to accurately assess. The answer may in part stem from the fact that fatigue is a common human experience, “and at any one time is regarded as a problem by as many as a quarter of the adult population” (Sharpe, 1996, p. 382). Berrios (1990) identifies fatigue as a ‘subjective feeling’ characterized by a lack of energy, exhaustion, and weariness that usually worsens following periods of minor exertion. It is in situations where the fatigue becomes disproportionate in severity to what one might expect under normal circumstances that fatigue may begin to be examined as an illness. Fatigue, however, is difficult to operationalize. To date, there does not appear to be one clear definition of fatigue in existence in the literature (Vercoulen et al., 1994). It is a complex psychological state which is generally assessed using self-report measures, with all the biases to which these measures are subject. Consequently, there are resulting problems in measurement, and these problems become even more significant in the case of CFS where the ability to accurately assess the level of experienced fatigue is central in terms of diagnostic purposes.

The subjectivity of fatigue as a symptom increases measurement difficulties with respect to this particular symptom. Furthermore, these difficulties significantly impact on the ability of correctly assessing both incidence and prevalence rates for fatigue given the variations in assumptions of what exactly is to be included in one’s conceptualization of fatigue as a symptom. In a review of the fatigue literature, Tiesinga et al. (1996) note that

“this review makes clear that fatigue is a nonspecific phenomenon, related to different medical diagnoses, in particular, chronic diseases and their treatments” (p. 52).

The Center for Biobehavioral Studies of Fatigue Management at the University of Kansas School of Nursing has identified the following salient characteristics to examine when attempting to measure fatigue. These are:

- (a) subjective quantification of fatigue, (b) subjective distress because of fatigue,
- (c) subjective assessment of the impact of fatigue on activities of daily living, (d) certain widely recognized correlates of fatigue, and (e) key biological parameters.

(Aaronson et al., 1999, p. 47)

Various approaches have been taken with respect to the study of fatigue, and differences across disciplines in the conceptualization of fatigue may vary according to the different factors. Tiesinga et al. (1996) proposed that some of the reasons for the diversity of definitions for the concept of fatigue may include (a) variations across disciplines in terms of the object and scope of study (e.g., neurology vs. psychology), (b) differences in the postulated correlated and causal factors related to fatigue, and (c) discrepancies in the traits considered to be defining characteristics of fatigue. Tiesinga et al. state the following:

A concept will have an increasing number of definitions as the number of disciplines investigating the problem also increases, and as the degree of consensus about the concept between and within the disciplines decreases. Fatigue is an example of a complex phenomenon that is studied by many disciplines and that has no widely accepted definition. (p. 54)

One of the most important aspects in attempting to operationalize fatigue is the ability to adequately translate the theoretical conceptualization of fatigue into specific empirical indicators capable of representing fatigue, both quantitatively and qualitatively. Tiesinga et al. (1996) identify two main types of indicators; these are indicators of content of fatigue, and indicators of forms of fatigue. A more specific breakdown of these indicators as discussed by Tiesinga et al. (pp. 57-58) is presented in Tables 1 and 2.

Studies of fatigue can be complicated by the fact that within the literature dealing with fatigue, this concept has been used on different levels and served many functions. More specifically, fatigue has been described as either a syndrome, a symptom, or a diagnosis. For example, fatigue can be described as a syndrome as in CFS, or as a symptom in diagnoses such as depression as detailed in the DSM-IV. On the other hand, persons suffering from CFS can also exhibit comorbid depressive symptomatology.

“Fatigue is a complex, multicausal, multidimensional, nonspecific, and subjective phenomenon for which no one definition is widely accepted” (Tiesinga et al., 1996, p. 51). Having examined more closely the conceptualization of fatigue within the literature, it becomes apparent that, to date, there exists no widely accepted definition of fatigue. Consequently, fatigue is presented, explored, and interpreted several different ways in various studies rendering a clear understanding of the concept, and the experience of it difficult.

#### Factors Related to Fatigue

From a psychological perspective, fatigue has been described as “a state of weariness related to reduced motivation” (Lee, Hicks, & Nino-Murcia in Aaronson et al.,

Table 1

Indicators that Refer to Content of Fatigue

- 
- Verbalization of an unremitting and overwhelming lack of energy
  - Inability to maintain usual routine
  - Increase in rest requirements
  - Inability to restore energy, even after sleeping
  - Decreased performance
  - Lethargy or listlessness
  - Disinterest in surroundings
  - Impaired ability to concentrate
  - Noninvolvement in social activities
  - Decreased libido
  - Perceived need for additional energy to finish required tasks
  - Feelings of guilt for not keeping up with responsibilities
-

Table 2

Indicators and Specifications that Refer to Forms of Fatigue

Indicators	Specifications
• Intensity	Tiredness Fatigue Exhaustion
• Duration	Less than 1 month Between 1 and 3 months Between 3 and 6 months More than 6 months
• Pattern	Constant Intermittent
• Domination	Dominant Subordinate
• Specificity	Generalized Specific
• Explicability	Explicable Inexplicable

1999, p. 46). Stress as well as other intense emotional reactions have been linked to psychological fatigue. This type of fatigue has also been found to accompany anxiety and depression (Aaronson et al.). Psychological fatigue can be viewed as resulting from the feeling that one's perceived demands, be they internal or external, exceed one's perceived available resources.

In his 1983 article "Uncommon tiredness among college undergraduates", Montgomery examined fatigue as both "a cause and a consequence of emotional disturbance". In his study, he defined fatigue as "a condition of reduced functional capacity that occurs as a consequence of work and dissipates with rest. When reference is to a subjective experience the term tiredness is employed" (p. 517). Results of this study seemed to indicate that higher levels of emotional disturbance were positively correlated with uncommon levels of tiredness. Results also supported a relationship between fatigue and depression. Furthermore, findings indicate that tiredness is related to anxiety, more specifically components of anxiety related to insecurity, worry and other related cognitive components. These results are consistent with those of subsequent studies positing a comorbid relationship between anxiety, depression, and fatigue.

Although depressive symptomatology may result from periods of prolonged stress, depression may also "add to the stress experience, fatigue state, reactive anxiety, and so on, by contributing to the perception of ineffectiveness. Viewed in this circular fashion, fatigue may be seen both as following from anxiety and depression, and contributing to these conditions" (Montgomery, 1983, p. 523).

Fatigue, from a psychological perspective, has generally been studied within the

context of CFS. Consequently, in the attempt of the present study to develop a multifactorial model of the psychosocial variables increasing vulnerability to fatigue, the researcher will examine more closely the relationships that exist between fatigue and its correlates as it has generally been studied in the context of CFS. Hence, the theoretical framework for the present study will be based on previous research examining CFS and its correlates.

### CFS: An Overview

Chronic fatigue syndrome (CFS) has received very little attention in the psychological literature. The etiology of CFS is as yet uncertain. Physical explanations of CFS have included attempts to classify the illness as biological, identifying persistent infection with viruses such as the Epstein-Barr virus, herpes, and Coxsackie A and B. "However, there is no evidence of a single virus present in all sufferers and not in the general population, and as not all sufferers report an acute viral infection prior to the onset of illness the direction of causality is unclear" (Lewis, 1996, p. 234). Physicians have to date been unable to identify the presence of a given immune dysfunction characteristic of individuals diagnosed with CFS. Consequently, there is currently no particular diagnostic test available to detect the presence of CFS, nor are there any specific forms of therapy available to individuals suffering from this illness (Fukuda et al., 1994).

A more specific definition of CFS, as defined by its diagnostic criteria, was recently adopted by the Centers for Disease Control (Fukuda et al., 1994). An outline of the diagnostic criteria for CFS (Friedberg, 1996) can be found in Appendix A; however, it

is important to note that the primary criterion that is required for a diagnosis of CFS is the onset of a new and an unexplained fatigue that persists for at least six months (Friedberg; Jason et al., 1997; Vercoulen et al., 1994). Although it has been recognized that the course of CFS can extend over long periods of time, longitudinal studies indicate that CFS does not appear to be a progressive illness. The symptoms the afflicted individuals report most often tend to be more severe in the first two years, yet after two years there is often a stabilization of symptom severity (Fukuda et al.).

Women appear to be afflicted with CFS more than are men. The typical profile of individuals seeking professional medical care for CFS is that of clients ranging in age from their mid-twenties to their late-forties, Caucasian, fairly well-educated, and who are classified as members of the upper income echelons (Klonoff, 1992). It is important to note, however, that individuals of both sexes, of different racial groups, of varying ages, and of a range of socioeconomic statuses are afflicted with CFS. Other studies (Buchwald et al., 1995; Lloyd, Hickie, Boughton, Spencer, & Wakefield, 1990) have reported no over representation of women or of members of higher socioeconomic groups in CFS. Furthermore, data reflecting such over representations in the diagnosis of CFS may be looking at both cultural and social differences with respect to one's access to the medical care system (Fukuda et al., 1994).

#### Comorbidity of CFS with psychiatric diagnoses

Recent studies conducted on CFS have found that the majority of individuals presenting themselves to a physician or a specialist with chronic fatigue as their primary complaint often fulfill the operational criteria required for diagnosis of a psychiatric



disorder. The psychiatric diagnoses that are reported often vary; however, depression has been reported to be the most common psychiatric diagnosis linked to chronic fatigue (Buckley et al., 1999; Surawy, Hackmann, Hawton, & Sharpe, 1995; Vercoulen et al., 1994; Wessely, 1996). Further studies (Fukuda et al., 1994) have also reported that anxious or depressive symptoms ranging from mild to moderate in nature, have been reported by the majority of chronic fatigue sufferers. The rates of coexisting psychiatric diagnoses are significantly higher for patients suffering from CFS than they are for clients with various other debilitating medical conditions such as rheumatoid arthritis, multiple sclerosis, and neuromuscular disease (Fukuda et al.). It is important to recognize that not all CFS patients suffer from depression or other psychiatric illnesses, and that approximately 20 to 40 percent of chronic fatigue sufferers do not meet the criteria for other psychiatric diagnoses (Fukuda et al.).

Given the absence of identifiable physical causes, researchers have begun exploring correlations that may exist between psychological factors, such as one's cognitions, and the development, the perpetuation, or both, of illnesses such as CFS. This conceptual framework, recently reviewed by Abbey (1993), has led to the examination of personality characteristics and cognitive patterns that may act as vulnerabilities to the development of CFS. There exist to date very few studies that have examined this area extensively. Wessely (1996) noted the following:

The typical case history of sufferers (of CFS) frequently fulfills the image of the conscientious, successful, and dedicated person with high standards and responsibilities. Advocates of CFS frequently attribute the illness to the pressure

of life, the stresses under which people labor, and the pressure of deadlines, which affects people who refuse to rest. (p. 217)

Maros (1991) summarizes the profile of chronic fatigue sufferers by characterizing them as do-ers. The profile that often emerges of individuals suffering from CFS is one of capable, active, energetic, and competent persons (Eland, 1988). The question that remains is one of assessing the validity of these stereotypes. Ware and Kleinman (1992), in a study that closely examined individuals suffering from CFS, found that these individuals displayed a heightened desire for success and accomplishments that was founded on exceedingly high standards against which they gaged their personal performance. These expectations and desires pushed these individuals to constantly strive to reach the expectations that they had set for themselves. Interviews with CFS sufferers indicated that they used words such as hyper, always on the go, and workaholic to a greater extent than would non-sufferers (Ware, 1993; Ware & Kleinman).

#### Cognitive approach to CFS

Surawy et al. (1995) proposed a cognitive approach to CFS. Results from their research identify what they labeled a pre-morbid personality that is usually characterized by "a marked achievement orientation, perfectionism, and high standards for work performance, responsibility and personal conduct" (p. 537). Surawy et al. further noted that CFS patients tend to make statements indicative of a repression of emotion as well as a strong desire to avoid showing signs of weakness. The onset of the CFS could be linked to major difficulties and psychosocial stressors in the individual's life. Assumptions underlying the cognitive characteristics of CFS sufferers were further explored and two

major assumptions were recognized. The first theme dealt with issues related to high standards, and to how these particular individuals tended to perceive their inability to meet standards as an indication of the failure of oneself as a person. The standards to which the individuals adhered often reflected an all or none quality. The second assumption that was identified pertained to the importance ascribed to psychological strength, and more specifically to the need to avoid expressing signs of negative feelings or weaknesses at all costs. Surawy et al. concluded that the sense of self-worth of CFS sufferers is often judged in relation to their ability or inability to achieve high standards in most areas of their life. More recent studies have also supported the notion that achievement and activity may be central components to the self-identity of CFS sufferers (Buckley et al., 1999). It has been proposed by Surawy et al. that such cognitive patterns may have arisen as a result of childhood experiences where "recognition, acceptance and affection were contingent on meeting high standards and parental expectations, and where the admission of difficulty or the expression of negative emotion produced an unsympathetic response" (p. 538).

Perfectionism, as one form of dysfunctional cognitions, has been linked to adjustment and achievement but it has also been tied to what has been characterized as a pervasive neurotic style (Hewitt & Flett, 1991). Perfectionism has been correlated to a variety of negative outcomes such as feelings of failure, guilt, or shame, as well as having been linked to more serious forms of psychopathology such as in depression, alcoholism, and personality disorders (Hewitt & Flett). A perfectionist's tendency to engage in behavior or to adopt cognitive frameworks such as setting and striving toward extremely

high standards, critically evaluating themselves in a harsh manner, overgeneralizing failure, and adhering to all-or-none patterns of thought has been found to foster adjustment difficulties. The cognitions and behavior patterns that typify the perfectionist individual tie closely with the pre-morbid personality profile described by Surawy et al. (1995), which has been linked to CFS.

The characteristics that have been described appear to reflect the personality and cognitive profile of many CFS sufferers. The cognitions held by such individuals may help them in attaining success but also serve as a vulnerability in situations where one's emotional control or competency are threatened. The coping mechanisms used by individuals attempting to deal with this could perpetuate behaviors that lead to exhaustion or chronic fatigue (see Figure 1).

#### Psychosocial factors and the development and/or maintenance of illness

Stress. An examination of past studies examining CFS seems to indicate a focus on both pathological factors and various psychiatric disorders, consequently, the role of psychological processes in CFS appears to have been largely overlooked. Given, for example, that many CFS sufferers often attribute the onset of their illness to stressful life events (Lewis, 1996; Ray, 1992; Sharpe, Hawton, Seagroatt, & Pasvol, 1992), there is reason to examine more closely the relationship between stress and chronic fatigue. More specifically, as noted in Lewis, there is a view arising in the literature that psychosocial factors, such as stress, may render one more susceptible to illness and consequently play a role in the etiology of CFS.

## Chronic Fatigue Syndrome

### Dysfunctional Assumptions

If I am to be acceptable to myself and to others I must:

(a) achieve high standards of performance and responsibility

(b) be in control of my emotions and not display weakness



Premorbid behaviour

Strive for high standards. Do not complain or admit to any weakness. Neglect own needs.



Critical Incidents

Excessive demands (eg prolonged work stress) or reduced ability to meet demands

(eg emotional consequences of life events, viral illness) leading to failure to meet

requirements of assumptions.



**Behaviour**

**Emotion**

**Symptoms**

**Thoughts**

Try harder

Frustration

Fatigue

Why am I not coping?

Do not complain

Distress

Autonomic arousal

I must be physically ill

The symptomatology associated with CFS could potentially be viewed as stress related. In examining the three stages of Selye's model of the stress process, it is possible to view chronic fatigue as a form of exhaustion similar to what Selye describes in his third stage, following reactions of alarm and resistance to constant stressors. The usefulness and appropriateness of the stress model in attempting to further understand CFS should not be overlooked, as it allows for a more comprehensive approach to chronic fatigue by taking into account the dynamic interaction of psychological, social, and physical factors (Lewis, 1996). The effect of stress on our health is not new to researchers. Stress can heighten our vulnerability to infectious or other illnesses by causing distress and emotional upsets which can weaken our immune system (Solomon, 1987). The results of previous studies indicate that stressful life events have been associated with an increased vulnerability to several medical illnesses (Adler, 1994) as well as with the onset of depression and anxiety disorders (Brown, 1993); two diagnoses often found to be comorbid with CFS.

Some of the characteristics from the typical profile of CFS sufferers, such as being perfectionistic, achievement-oriented, and hard driving, suggests possible similarities to burnout as they have been tied to a relentless pursuit of success (Lewis, Cooper, & Bennett, 1994; Surawy et al., 1995; Ware, 1993; Wheeler, 1992). It is noteworthy to mention, however, that not all persons suffering from CFS associate stress with the onset of their illness. Often, sufferers will mention viral infections as the precipitating agent of their chronic fatigue, ignoring the fact that these infections may themselves result from stress having caused a subsequent diminished resistance to pathogens (Lewis, 1996).

Previous studies examining CFS patients indicate that, in general, when questioned about the cause of onset of their illness, sufferers often tend to report an association with some form of viral illness. However, researchers have found that upon further questioning, sufferers tended to identify a major psychosocial stressor occurring prior to the onset of their illness. Common stressors identified included difficulty adapting to life changes, long-standing work or relationship difficulties, grief and bereavement (Surawy et al.).

The potential contribution of the experience of stressful life events in the development of CFS has been identified in a previous studies (Lewis et al., 1994; Ware, 1993). It is important to note that such findings however are not entirely consistent across studies of CFS sufferers. Findings of this nature seem to indicate that further research needs to be done examining the ways in which one attaches meaning to various stressors in one's life, and consequently how the impact of various life stresses on an individual varies according to individual differences (Lewis, 1996). As an example, an individual who adheres to high standards and expectations with respect to their work, will experience significantly greater stress as a result of work difficulties than an individual who does not adhere to such standards.

Ways of coping. The ways in which an individual copes with stressors needs to be examined more closely with respect to the role it may play in the onset of illness, and more specifically in this case, to the onset of fatigue. Results of various studies examining the ways in which CFS sufferers cope with the stresses they experienced prior to the onset of their illness seem to consistently identify highly demanding, hard-driving strategies of coping. More specifically, examples of such styles have been identified as including

putting on a brace face, repressing feelings or emotions, working even harder to meet demands or role expansions (Surawy et al., 1995; Ware, 1993).

Research by Lewis et al. (as cited in Lewis, 1996) found that CFS sufferers tended to use more problem-focused strategies than patients suffering from irritable bowel syndrome. As noted by Roth and Cohen (1986), the efficiency of problem-focused strategies depends to some extent on the degree to which one has control over the situation. Evidence exists suggesting that the ongoing use of problem-focused strategies can predict how often one will become ill (Nowak, 1991). In contrast to emotion-focused strategies that can decrease one's level of stress and arousal by focusing attention on something else, problem-focused strategies necessitate that individuals dwell on problems.

If problem-focused strategies are used consistently, the effort involved and the associated appraisals of stressful situations as problems to be solved, together with the hard-driving perfectionistic behavior may thus have harmful consequences in terms of sustained arousal, distress, and associated physiological processes. (Lewis, p. 239)

Perceived control in any given situation is a central aspect to the decision to adopt problem-focused coping strategies. Research has also indicated that lowered stress levels can often be associated with perceptions of control (Israel, House, Schurman, Heaney, & Mero, 1989; Spector, 1986). Findings examining more closely the effect of negative emotion-focused coping (self-blame, wishful thinking) indicate that it is often associated with greater levels of psychological distress (Greenglass, 1993), while further studies



examining positive emotion-focused strategies seem to indicate that these are healthful ways in which to deal with stressful events in one's life (Dunkel-Schetter, Feinstein, Taylor, & Falke, 1992). Although research on coping has traditionally distinguished between emotion-focused and problem-focused coping strategies, more recent studies have noted that this distinction has not sufficiently allowed for a more comprehensive evaluation of coping (Greenglass, Schwarzer, Jakubiec, Fiksenbaum, & Taubert, 1999).

In their article, Greenglass et al., 1999, identify coping as a multidimensional construct which occurs simultaneously on several different levels including emotional, behavioral, attitudinal and cognitive-reflective levels. Their development of the Proactive Coping Inventory is consistent with the notion that the effectiveness of any given coping strategy is maximized when emotions, behavior, attitudes and cognitions are congruous within a given context. Whereas coping can often be viewed as a single response to a stressor, coping for the proactive person is viewed not as a single response but rather as an approach to life, reflected in one's beliefs and views of the world. This type of coping, as discussed by Greenglass et al., distinguishes itself from other approaches to coping in that it amalgamates and makes use of non-social as well as social resources, it will employ positive emotional strategies, and will also employ beliefs that one can succeed. It is this more comprehensive approach to coping that will be explored as a psychosocial variable impacting on the experience of fatigue.

Social Support. Very little attention has been paid to the possible effects of social support prior to the inception of CFS. However, research has identified that CFS sufferers generally tended to report lower levels of perceived social support both prior to and after

the onset of their illness (Lewis et al., 1994). Furthermore, findings seemed to indicate that social support was desired, yet not experienced as forthcoming, when social support seeking was used by CFS sufferers as a way to cope with stressful life events. This perceived inability to receive support may in fact bolster the negative impact of life situations already perceived as stressful (Lewis, 1996).

A link between the development of fatigue and low levels of perceived social support may add to an understanding of both the immunological changes and the depressive symptomatology often associated with CFS. It has been argued in the literature that "...the emotional states associated with low levels of perceived support may be linked with specific disease-producing physiological responses through emotionally induced effects on neuroendocrine or immune system functioning" (Jemmott & Locke, as cited in Lewis, 1996, p. 240). Hence, it could be hypothesized that the lower one's level of perceived social support, the greater one's vulnerability to fatigue, either directly or indirectly by heightening stress.

Social support, within the context of the present study, will be examined as a subjective entity. As stated in McNally and Newman (1999) the importance of an individual's perception of support, and how this perception impacts on one's health and behavior has been well documented. The focus on the subjective rather than objective entity of social support can be justified by two primary findings. The first of these are research findings indicating that there is a weak link between measures of received and perceived social support (McNally & Newman). Newcomb (1990) identifies the correlation between these two to be approximately 0.35, suggesting a rather weak

correlation between measures of both objective and subjective social support. Secondly, as stated in McNally and Newman, "the current focus on perceived social support is that it is this conceptualization of support that has been found to be most closely related to health and well-being" (p. 311).

### Summary

Given the associations discovered between cognitions, personality characteristics, and other psychosocial variables on the development, the perpetuation, or both, of illnesses such as CFS, it is reasonable for psychologists to move away from the traditional medical model framework of CFS and instead examine alternatives that may better address the psychosocial components of such illnesses. Cognitive behavioral models are based on the assumption that there are interacting processes occurring and assume that cognitions impact on one's emotions, physiological processes, and behavior, and in turn contribute to CFS (Deale, Chalder, Marks, & Wessely, 1997). According to a cognitive behavioral view of illness, the way one interprets one's symptoms can play an important role in the extent to which the symptoms perpetuate themselves. This perpetuation can happen in three main ways, (a) catastrophic interpretations can cause emotional reactions that are excessive in nature, (b) poor coping on the part of an individual may be attributed to a belief that symptoms are beyond one's control, and lastly (c) maladaptive coping and irrational emotional responses could enhance the physiological abnormalities that may be responsible for the symptoms (Sharpe, 1996). The model of illness from a cognitive behavioral perspective is different from other models in that it views the patient's beliefs as not only the result of an underlying physiological cause, but also as possible important

etiological factors in and of themselves (Sharpe). Cognitive behavioral therapies often alter both the cognitions and the behaviors of a given individual, the dysfunctional cognitions serving to prolong and maintain both the symptoms and the illness itself (Deale et al.). Studies have shown that cognitive behavior therapy can improve symptoms in patients whose perceptions of their illness and whose coping behaviors may inhibit their recovery (Butler, Chalder, Ron, & Wessely, 1991; Deale et al.; Friedberg, 1996; Friedberg & Krupp, 1994; Fukuda et al., 1994; Sharpe).

Studies conducted thus far have reported an existing comorbidity between depression and fatigue (Buckley et al., 1999; Fukuda et al., 1994; Surawy et al., 1995; Vercoulen et al., 1994; Wessely, 1996). Further studies have also demonstrated that there are particular cognitive distortions that characterize individuals suffering from depression (Deale et al., 1997; Hewitt & Flett, 1991; Surawy et al.). However, research examining more thoroughly the links that may exist between fatigue, depression, and various cognitive attitudinal distortions is scarce. The basis for the proposed research project comes from research that has related particular cognitive distortions to extreme forms of fatigue, as in CFS. In examining more thoroughly the current findings being reported in the CFS literature, there is a reasonable basis on which to test whether an attributional pattern of cognitive distortions to fatigue could be evident in less extreme cases of fatigue, as would be exhibited in the general population.

In addition, studies conducted thus far have also reported links between various psychosocial variables such as stress, ways of coping, and social support and the development of, or maintenance of chronic fatigue (Lewis et al., 1994; Lewis, 1996; Ray,

1992; Sharpe et al., 1992; Surawy et al., 1995; Ware, 1993). However, research examining more closely the way in which these variables interact with others and with each other to impact on the experience of fatigue in a normal (not clinically diagnosed) population is scarce. It seems apparent that the complexities of the experience of fatigue cannot be adequately explained by exclusively physical or psychological explanations. Consequently, the value of developing a multifactorial model of factors increasing the vulnerability to fatigue is heightened. In attempting to clarify both the variables increasing one's susceptibility to fatigue and the processes by which these variables interact one would allow for the possibility of using cognitive behavioral techniques and stress management training as preventative measures for populations at risk of developing chronic fatigue.

The goal of the present study is twofold. The first goal will be to establish a plausible and well fitting measurement model of the constructs evaluated in this study, and secondly to explore theoretical models of interest specifying particular causal relationships among the constructs, in an attempt to develop a tentative multifactorial model of the psychosocial variables increasing vulnerability to fatigue. This methodology, that is the exploratory use of structural equation modeling, has been recommended as a useful tool for developing an empirically supported theoretical model (Hair, Anderson, Tatham, & Black, 1998; Hoyle, 1995; Tabachnick & Fidell, 1996).

## Method

### Participants

Participants ( $N = 300$ ) were enrolled in an undergraduate introductory psychology

class at the University of Manitoba. The undergraduate psychology students who participated in the study were volunteers and they received partial course credit for their participation. There were no restrictions for participation in the study. Participants ranged between 17 and 43 years of age, with a mean age of 19.52 years. Altogether, 120 males and 180 females participated in the study.

### Materials

Demographic Information. Subjects were asked to complete a demographics information sheet to be used for statistical purposes in the study (Appendix B).

Automatic Thoughts Questionnaire (ATQ). The ATQ (Hollon & Kendall, 1987) is a 30-item questionnaire used to assess automatic negative statements about the self by measuring the cognitive self-statements of an individual (see Appendix C). The ATQ examines four aspects of automatic thoughts: these are (a) personal maladjustment and desire for change (PMDC), (b) negative self-concepts and negative expectations (NSNE), (c) low self-esteem (LSE), and (d) helplessness. The ATQ was normed on an undergraduate sample of 312 students. The mean age of this sample was 20.22 with a standard deviation of 4.34 years. This scale demonstrated high internal consistency with an alpha coefficient of .97. This instrument has shown good concurrent validity as it has been found to correlate well with both the MMPI depression subscale (Hollon & Kendall) and the Beck Depression Inventory with an  $r = .78$  (Burgess & Haaga, 1994). Participants are asked to rate the frequency of a given thought during the previous week on a 5-point Likert scale. The responses choices range from 1 to 5 with 1 being (not at all) and 5 being (all the time). Total scores are obtained by summing the scores on all thirty items in the

questionnaire.

Center for Epidemiologic Studies-Depressed Mood Scale (CES-D). The CES-D (Radloff, 1987) is a 20-item questionnaire used to assess depressive symptomatology (see Appendix D). The scale was initially normed on 3,574 Caucasian respondents of both sexes from a sample of the general population. An unspecified number of Black respondents were also involved in the norming. Means on this scale for the Caucasian respondents ranged from 7.94 to 9.25. Furthermore, results involving the reliability and the validity of the CES-D were confirmed for various subgroups: Blacks and Caucasians, males and females, and three differing levels of education. Alpha values of 0.85 for the general population, and 0.90 for psychiatric populations are indicative of the good internal consistency of the scale. Split-half and Spearman-Brown reliability coefficients range from 0.77 to 0.92. The test-retest stability of the CES-D is fair with correlations ranging from 0.51 to 0.67 when tested over two weeks, and of 0.32 to 0.54 when tested at intervals ranging from three months to a year. The concurrent validity of the CES-D is excellent; it correlates significantly with various depression and mood scales. It also has good known-groups validity. There is however a slight link to the social desirability response bias, but it does not in general appear to impact significantly on the utility of the CES-D (Radloff). Participants are asked to indicate the number that best describes the way they have felt on the given items in the past week on a 4-point scale. The response choices range from 0 to 3 with 0 being (rarely or none of the time) and 3 being (most or all of the time). The scoring on the CES-D is simple and is done by first reverse scoring items number 4, 8, 12, and 16 and then summing the scores on all the items. The higher

the total score, the greater the level of depression.

College Undergraduate Stress Scale (CUSS). The CUSS (Renner & Mackin, 1998) is a 51-item inventory used to assess an individual's overall stress level over the last year based on both the number and degree of stressful events experienced (see Appendix E). The CUSS was normed on 257 students enrolled in an undergraduate introductory psychology course. The mean age of the sample was 19.75, with ages ranging from 17 to 45. Approximately two-thirds of the respondents in the normative sample were female. The mean total stress rating is 1247 ( $SD = 441$ ), with scores in the normative sample ranging between 182 and 2571. Participants are asked to indicate whether or not they have experienced a given event in the past year. Scoring is done by ascribing a predetermined stress rating to each event experienced in the past year and then summing these ratings to obtain an overall stress rating.

Dysfunctional Attitude Scale (DAS). The DAS (Weissman, 1987) is a 40-item questionnaire used to assess cognitive distortions, more specifically those cognitive distortions that could underlie or even be a causal factor in depression (see Appendix F). The DAS examines seven major areas with respect to one's value system: (a) approval, (b) love, (c) achievement, (d) perfectionism, (e) entitlement, (f) omnipotence, and (g) autonomy. The DAS was normed on predominantly white undergraduate students, 216 of whom were male and 485 of whom were female. The mean score on the scale for nonclinical respondents is about 113. This scale demonstrates excellent internal consistency with alpha coefficients that range between .84 and .92. The DAS also demonstrates very high stability with values of .80 to .84 in test-retest correlations over an



eight week period. The concurrent validity of the DAS is excellent. Scores on the questionnaire are significantly correlated to various other measures of depression and of depressive cognitive distortions as measured by the Beck Depression Inventory, the Profile of Mood States, and the Story Completion Test (Weissman). Furthermore, it has been recognized that the DAS has high known-groups validity, due to its ability to accurately differentiate between groups diagnosed with depression and those not diagnosed according to the Beck Depression Inventory. Participants are asked to rate whether a given attitude is characteristic of their perception of things most of the time using a 7-point Likert scale. The response choices ranged from 1 to 7 with 1 being (totally agree) and 5 being (totally disagree). The DAS is scored by assigning a value of zero to all items left blank, giving a score of 1 (on the 7-point scale) to the adaptive end of the scale, and then summing the scores from all the items. The lower the total scale scores, the fewer cognitive distortions experienced by a given individual.

Fatigue Scale (FS). The FS (Chalder et al., 1993) is a 14-item questionnaire used to assess an individual's level of physical and mental fatigue (see Appendix G). The scale has two subscales, one measuring physical fatigue (items 1-8) and one measuring mental fatigue (items 9-14). The alpha coefficient for the total FS scale score was .89. The alpha coefficients for the FS subscales were .845 for the physical fatigue subscale and .821 for the mental fatigue subscale. Results of analyses indicate that the FS also has good validity. Participants are asked to indicate their response to a given statement on a 4-point Likert scale. The response choices ranged from 1 to 4 with 1 being (better than usual) and 4 being (much worse than usual).

Fatigue Impact Scale (FIS). The FIS (Fisk et al., 1994) is a 40-item questionnaire used to assess an individual's perceptions of the level in which fatigue has impacted on their level of functioning over the past month (see Appendix H). The three dimensions impacted by fatigue which are assessed by the FIS are (a) cognitive (items 1, 5, 6, 11, 18, 21, 26, 30, 34, 35), (b) physical (items 10, 13, 14, 17, 23, 24, 31, 32, 37, 38), and (c) psychosocial (items 2, 3, 4, 7, 8, 12, 15, 19, 20, 22, 25, 27, 28, 29, 33, 36). The alpha coefficient for the total FIS scale score was .98. The alpha coefficients for the FIS subscales were all greater than .87. Participants are asked to indicate to what extent they feel a given statement has been a problem in the last month on a 5-point Likert scale. The response choices ranged from 0 to 4 with 0 being (no problem) and 4 being (extreme problem).

Multidimensional Perfectionism Scale (MPS). The MPS (Hewitt & Flett, 1987) is a 45-item questionnaire used to assess three dimensions of perfectionist behavior (see Appendix I). The three subscales assessed by the MPS are (a) self-oriented perfectionism, (b) other-oriented perfectionism, and (c) socially prescribed perfectionism. The alpha coefficients for the MPS subscales were .86 for the self-oriented perfectionism, .82 for other-oriented perfectionism, and .87 for socially-prescribed perfectionism. Furthermore, results indicate that there was no significant correlation between self-oriented perfectionism and social desirability (Hewitt & Flett). Participants are asked to indicate to what extent they agree or disagree with a number of statements on a 7-point Likert scale. The response choices ranged from 1 to 7 with 1 being (disagree) and 7 being (agree).

Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS

(Zimet, Dahlem, Zimet, & Farley, 1988) is a 12-item questionnaire used to assess the level of perceived social support experienced by an individual (see Appendix J). The MSPSS examines three sources of perceived social support: these are (a) family (items 3, 4, 8, 11), (b) friends (items 1, 2, 5, 6, 7, 9, 12), and (c) significant other (1, 2, 5, 10). The MSPSS has been studied in several different samples. The MSPSS was normed on an undergraduate sample of students on a large urban campus. The mean age of this sample was 26.5, with ages ranging between 18 and 51. The mean for the aforementioned normative sample was 5.58 ( $SD = 1.07$ ) for the total scale score. This scale demonstrated excellent internal consistency with an alpha coefficient of .91 for the total scale score. This instrument has shown good concurrent validity as it has been found to negatively correlate well with both depression and degree of coronary artery disease in Type A patients. Participants are asked to indicate to what extent they agree or disagree with a number of statements on a 7-point Likert scale. The response choices ranged from 1 to 7 with 1 being (very strongly disagree) and 7 being (very strongly agree).

Proactive Coping Inventory (PCI). The PCI (Greenglass et al., 1999) is a 55-item scale which has been developed in such a way that it examines an individual's approach to coping from a multidimensional perspective (see Appendix K). The seven subscales that are assessed in the PCI are (a) proactive coping scale (items 1-14), (b) reflective coping scale (items 15-25), (c) strategic planning (items 26-29), (d) preventive coping (items 30-39), (e) instrumental support seeking (items 40-47), (f) emotional support seeking (items 48-52), and (g) avoidance coping (items 53-55). The PCI was developed on a Canadian college student population having a mean age of 21.74 years, with ages

ranging between 17 and 60. The scale was validated using a Polish-Canadian adult and student population having a mean age of 38.93 years, with ages ranging between 16 and 60. The mean for the aforementioned normative sample was 5.58 ( $SD = 1.07$ ) for the total scale score. This scale has demonstrated good construct validity, acceptable reliabilities, and good homogeneity (Greenglass et al.). Participants are asked to indicate how true a statement is based on how they feel about the situation on a 4-point Likert scale. The response choices ranged from 1 to 4 with 1 being (not at all true), and 4 being (completely true).

Profile of Fatigue-Related Symptoms (PFRS). The PFRS (Ray, Weir, Phillips & Cullen, 1992) is a 54-item scale used to assess four major factors (see Appendix L). The four factors that are assessed by the PFRS are (a) emotional distress, (b) cognitive difficulty, (c) fatigue, and (d) somatic symptoms. The PFRS demonstrates high internal consistencies with alpha coefficients ranging from 0.88 to 0.96. The test-retest reliability of the scale ranged from 0.86 and 0.97. Furthermore the PFRS scales had good convergence with various other measures such as the Brief Symptom Inventory and the Profile of Mood States, as well as with the Fatigue Severity Scale and the Modified Somatic Perception Questionnaire (Ray et al.). Participants are asked to indicate the extent to which they have experienced the given symptoms during the previous week on a 7-point Likert scale. The response choices ranged from 0 to 6 with 0 being (not at all), 3 being (moderately), and 6 being (extremely). The scoring of the scale is done for each of the four subscales in the same way, that is by calculating the mean ratings for all items included in any given scale.

Rational Behavior Inventory (RBI). The RBI (Shorkey & Whiteman, 1987) is a 37-item questionnaire used to measure both irrational and absolutist beliefs (see Appendix M). The RBI examines eleven factors; these are (a) catastrophizing, (b) guilt, (c) perfectionism, (d) need for approval, (e) caring and helping, (f) blame and punishment, (g) inertia and avoidance, (h) independence, (i) self-downing, (j) projected misfortune, and (k) control of emotions. The RBI has been assessed on a variety of both clinical and non-clinical populations. The first studies were conducted using 414 undergraduate students, for whom the mean total rationality score was 26.35. The RBI has good internal consistency and homogeneity. The split-half reliability for the total RBI scale is .73. It also has good test-retest reliability with a coefficient of .82 after 3 days and .71 after ten days. It has been found to correlate significantly with various personality measures, such as anomie, authoritarianism, dogmatism, self-esteem, as well as to measures of psychiatric symptomatology. The RBI appears to be unaffected by social desirability (Shorkey & Whiteman). Participants are asked to indicate to which extent a given statement most closely reflects their opinion on a 5-point Likert scale. The response choices range from 1 to 5 with 1 being (strongly disagree) and 5 being (strongly agree). Higher scores on this scale are indicative of higher irrationality.

Social Support Appraisals Scale (SSA). The SSA (Vaux et al., 1986) is a 23-item questionnaire used to assess one's level of perceived social support. More specifically, the scale measures the extent to which an individual believes he or she is loved, involved with others, and esteemed (see Appendix N). The SSA was studied and normed on 10 undergraduate and community samples of 979 respondents. The mean age of these

samples ranged from mid-teens to 48 years of age. This scale demonstrated good internal consistency with alpha coefficients that range from .81 to .90. This instrument has shown very good concurrent, construct, and predictive validity as it has been found to correlate well in predicted ways with several measures of psychological well-being and social support. Participants are asked to indicate to what extent they agree or disagree with a number of statements on a 4-point Likert scale. The response choices ranged from 1 to 4 with 1 being (strongly agree) and 4 being (strongly disagree).

Social Support Questionnaire (SSQ6). The SSQ6 (Sarason, Sarason, Shearin, & Pierce, 1987) is a 6-item questionnaire used to assess an individual's perceived availability of, and satisfaction with, social support (see Appendix O). The SSQ6 was developed and normed on an undergraduate university level student population consisting of 545 respondents. This scale demonstrated very good internal consistency with alpha coefficients that range from .90 to .93. This instrument also reports very good test-retest reliability. The SSQ6 appears to be very similar to the full 27-item version SSQ in both its relationship with several measures of social competence and measures of various personality variables. Participants are asked, for the first part, to list all people they can count on for support in the manner identified in the item. In the second part, participants are asked to indicate to what extent they feel satisfied with the overall support they have on a 6-point Likert scale. The response choices ranged from 1 to 6 with 1 being (very dissatisfied) and 6 being (very satisfied).

Stress Self-Report. Participants are asked to indicate to what extent they feel they have been stressed over the past year on a scale ranging from 1 to 100 with 1 being (not at

all stressed) and 100 being (very stressed all the time). This item (see Appendix P) will be used to assess an individual's perception of their felt level of stress and will also be correlated with scores on the CUSS to verify that no significant discrepancies exist between the two measures of stress used, given that no reliability or validity data is reported for the CUSS.

### Procedure

Following informed consent, participants were tested in a classroom at the University of Manitoba. Testing was conducted in groups of approximately sixty participants. Participants were randomly assigned one of five orders of the questionnaire package. It is important to note that in all the questionnaire packages, the demographic information was collected first. A random number generator was used to determine the ordering of the questionnaires in each of the five questionnaire packages (see Appendix Q). This counterbalancing procedure was used in order to control for fatigue effects. It will not, however, control for a differential order effect. Upon completion of the questionnaire package, participants were given a debriefing sheet explaining the purpose of the study, the reasons why such a study is valuable, the expected results, and furthermore, thanked them for their participation (see Appendix R).

### Results

The means and standard deviations on each of the fourteen scales are presented in Table 3.

Table 3

Mean and Standard Deviation Scores on the Fourteen Total Scale Scores

Scale	Mean	Standard Deviation
ATQ	54.2	23.2
CESD	17.84	10.96
CUSS	1348.99	372.65
DAS	127	26.76
FIS	42.97	28.72
FS	31.32	6.53
MPS	181.89	31.21
MSPSS	67.09	13.99
PCI	163.18	19.06
PFRS	101.35	58.39
RBI	111.02	15.97
SSA	38.56	10.52
SSQ	54.78	15.89
SSR-1	64.1	24.28

Note. ATQ= Automatic Thoughts Questionnaire; CESD=Center for Epidemiologic Studies-Depressed Mood Scale; CUSS=College Undergraduate Stress Scale; DAS=Dysfunctional Attitude Scale; FIS=Fatigue Impact Scale; FS=Fatigue Scale; MPS=Multidimensional Perfectionism Scale; MSPSS=Multidimensional Scale of Perceived Social Support; PCI= Proactive Coping Inventory; PFRS=Profile of Fatigue-Related Symptoms; RBI=Rational Behavior Inventory; SSA=Social Support Appraisals Scale; SSQ=Social Support Questionnaire; SSR-1=Stress Self Report.



### Order Effects

A MANOVA was computed to determine if there were any significant differences in scores across all scales for the five different orderings of the 14 scales. Using Wilks criterion no significant order effects were found, approximate  $F(56, 1099) = .9370, p > .05$ .

### Structural Equation Modeling

Exploratory structural equation modeling (SEM) analyses were performed using AMOS 4.0. The exploratory use of SEM, has been recommended as a useful tool for developing an empirically supported theoretical model (Hair, Anderson, Tatham, & Black, 1998; Hoyle, 1995; Tabachnick & Fidell, 1996). The approach utilized in this study involved two steps: (a) to establish a plausible and well fitting measurement model of the constructs evaluated in this study; (b) to explore a few particular theoretical models of interest specifying particular causal relationships among the constructs. The fit of the models were tested using maximum likelihood estimation with the following fit indices (and cutoffs for satisfactory fit suggested by Tabachnick & Fidell, 1996): (a) comparative fit index (CFI)  $> .90$ ; (b) normed fit index (NFI)  $> .90$ ; and (c) root mean square error of approximation (RMSEA)  $< .08$  (cutoff suggested by Hair et al., 1998). Given the effects of extremely unequal variances on SEM (Bentler, 1993), the observed variables were rescaled to have a ratio of largest to smallest variance less than ten to one. While the SEMs were performed on these adjusted covariances, the correlation matrix of these variables is shown in Table 4. Within the SEM figures, ovals represent latent variables,

Table 4

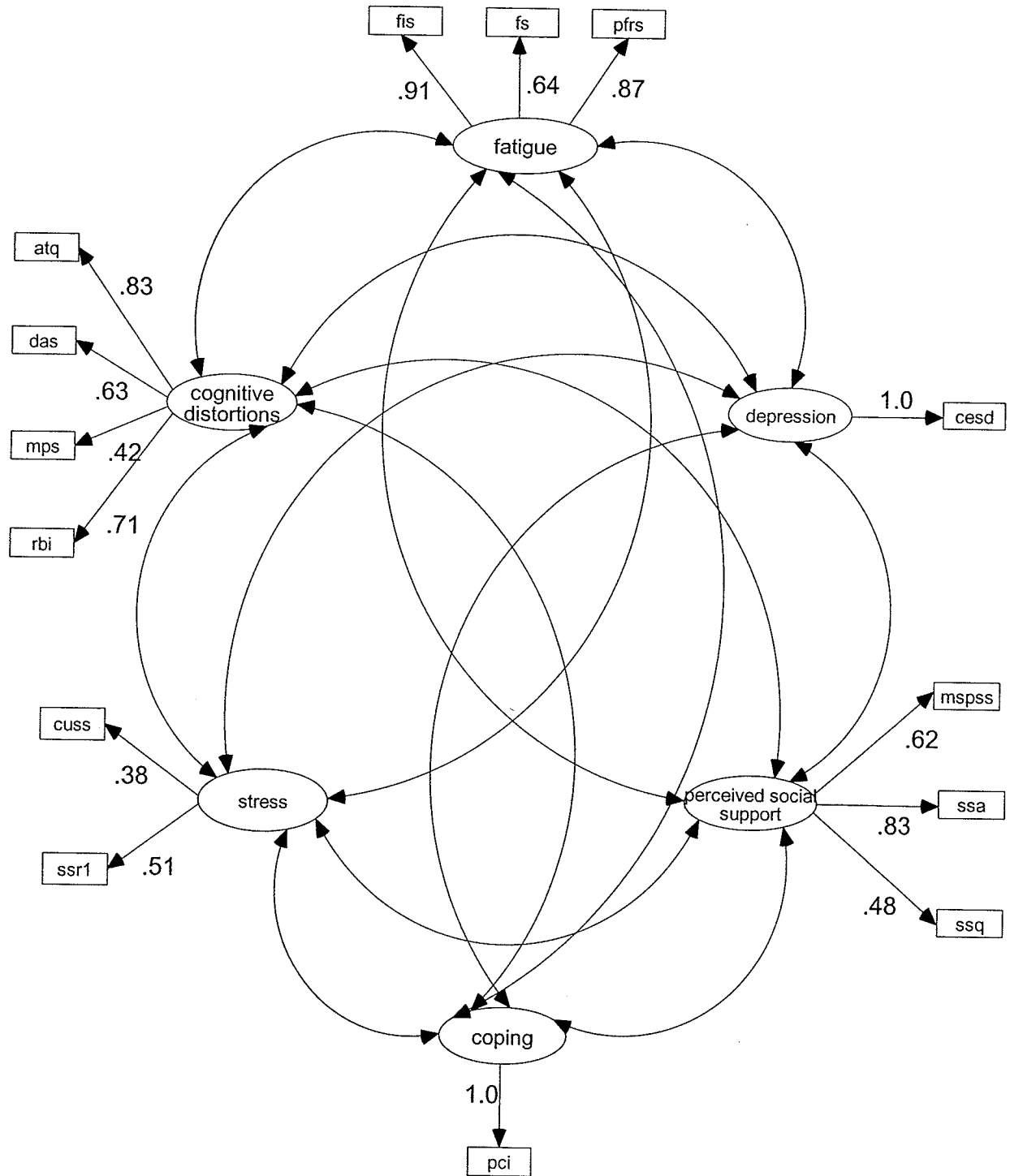
Correlation Matrix of the Fourteen Total Scale Scores

	a t q	c e s d	c u s s	d a s	f i s	f s	m p s	m s p s	p c i	p f r s	r b i	s s a	s s q	s s r l
cesd	.75													
cuss	.28	.28												
das	.48	.47	.19											
fis	.69	.69	.24	.49										
fs	.42	.44	.14	.26	.59									
mps	.28	.31	.27	.42	.32	.24								
mssps	-.26	-.21	-.00	-.31	-.19	-.08	-.09							
pci	-.32	-.26	.01	-.30	-.32	-.14	.14	.40						
pfrs	.63	.69	.32	.42	.78	.59	.31	-.15	-.26					
rbi	.55	.57	.29	.58	.56	.37	.41	-.14	-.15	.53				
ssa	-.39	-.40	-.11	-.41	-.36	-.08	-.17	.51	.44	-.32	-.32			
ssq	-.22	-.22	-.11	-.30	-.18	-.02	-.20	.29	.20	-.18	-.22	.41		
ssrl	.37	.40	.20	.24	.38	.25	.27	-.10	-.22	.40	.31	-.20	-.07	

rectangles represent measured variables or indicators. Absence of a line connecting variables implies lack of a hypothesized direct effect.

The Measurement Model. The initial measurement model proposed and tested was comprised of six latent variables. The Fatigue latent variable specified three indicators (Fatigue Impact scale, Fatigue scale, and Profile of Fatigue Related Symptoms scale). The Cognitive Distortions latent variable specified four indicators (Automatic Thoughts Questionnaire, Dysfunctional Attitudes scale, Multidimensional Perfectionism scale, and the Rational Behavior Inventory). The Depression latent variable specified one indicator (the Center for Epidemiologic Studies Depressed Mood scale). The Stress latent variable specified two indicators (College Undergraduate Stress scale, and Stress Self Report). The Perceived Social Support latent variable specified three indicators (Multidimensional Scale of Perceived Social Support, Social Support Appraisals scale, and Social Support Questionnaire). The Coping latent variable specified one indicator (the Proactive Coping Inventory). The results for this initial measurement model allowing the latent variables to be freely intercorrelated are presented in Figure 2.

While the goodness-of-fit indices suggest a satisfactory overall fit [ $\chi^2$  (64,  $N$  = 300) = 214.582,  $p$  < .01, CFI = .92, NFI = .88, and RMSEA = .09] of the initial measurement model, several considerations suggested that some revisions be made to the measurement model. Based on the desirability of nearly equivalent weightings for measures on their respective latent variables (Nunnally, 1978), and on standardized indicator loadings exceeding a threshold of .40 (Tabachnick & Fidell, 1996) the following indicators were dropped from their respective latent variables; Fatigue scale,



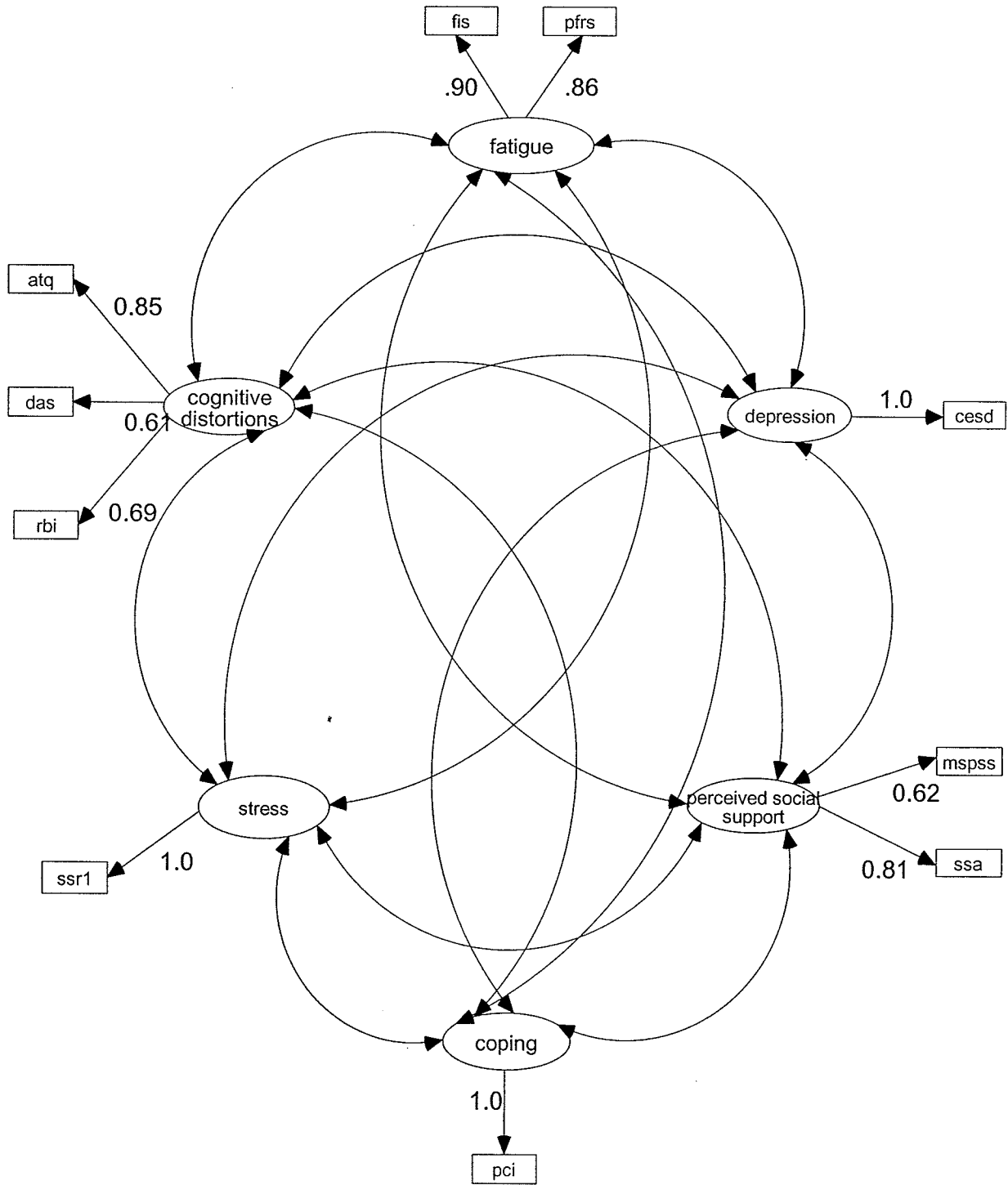
Multidimensional Perfectionism scale, College Undergraduate Stress scale, and the Social Support Questionnaire. The final measurement model is displayed in Figure 3.

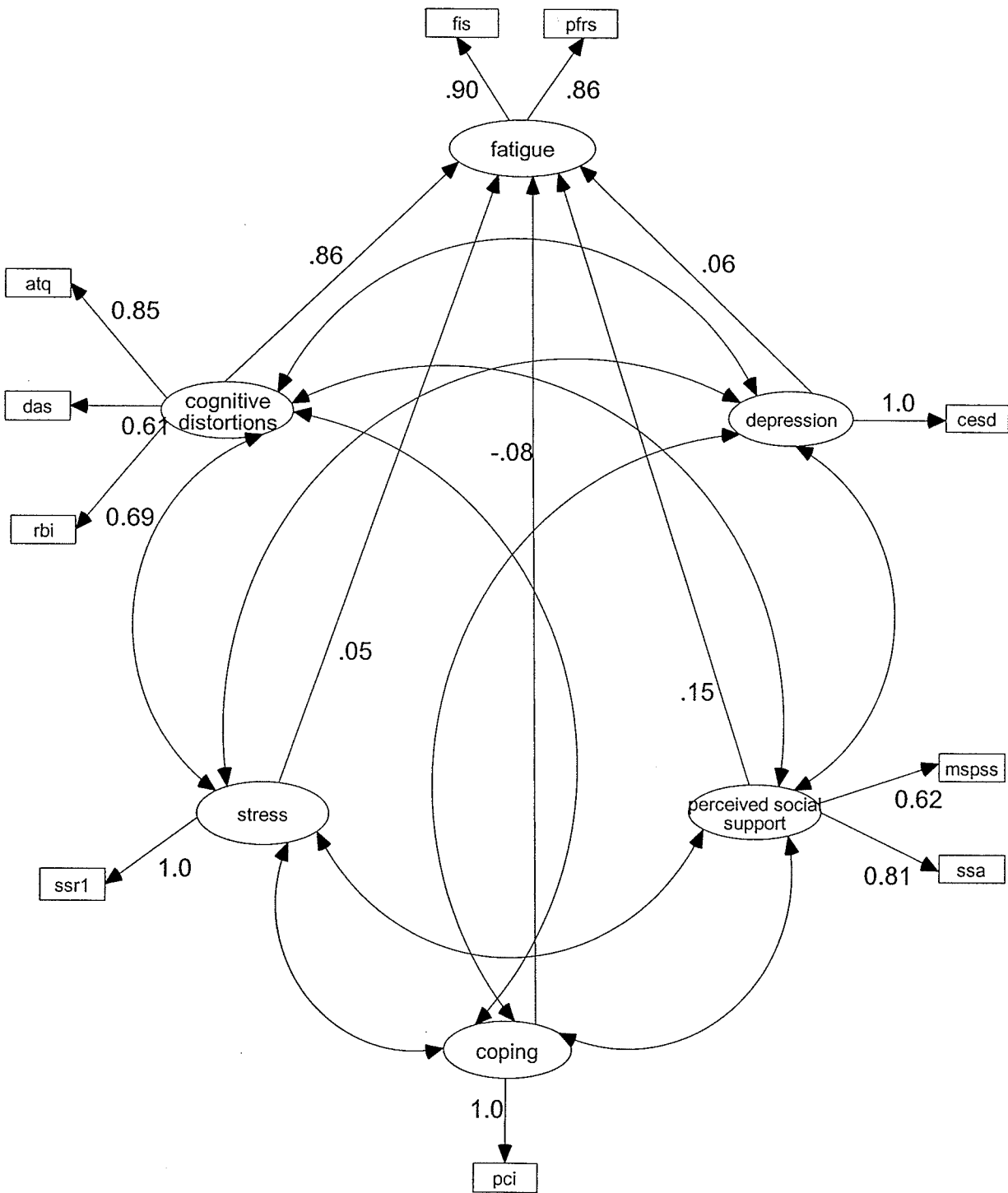
The Preliminary Structural Model. A preliminary structural model was set up to investigate the relationships among the latent variables. The initial structural model examines the hypothesis that Fatigue, as the sole endogenous latent variable, was caused by direct influences from the exogenous latent variables of Cognitive Distortions, Depression, Stress, Perceived Social Support, and Coping, which were allowed to be freely intercorrelated.

The preliminary structural model was tested. The fit of the model to the data was good,  $\chi^2 (23, N = 300) = 78.627, p < .01, CFI = .96, NFI = .95,$  and  $RMSEA = .09.$

The preliminary structural model with coefficients presented in standardized form is illustrated in Figure 4. Of the five exogenous variables, only Cognitive Distortions was significantly predictive of Fatigue (standardized coefficient = .86), with higher levels of Cognitive Distortions predicting greater levels of Fatigue.

The Mediational Model. According to the criteria for a mediational model outlined by Baron and Kenny (1986), structural models were set up to explore the hypothesis that Cognitive Distortions acts as a mediator between Fatigue and the other exogenous constructs (Depression, Stress, Perceived Social Support, and Coping). Initially, the effect of each of the remaining latent constructs on Fatigue was assessed with Cognitive Distortions removed from the model. The goal of this analysis was to establish which of the latent constructs is significantly related to Fatigue without the respective mediator (i.e., Cognitive Distortions) present in the model.



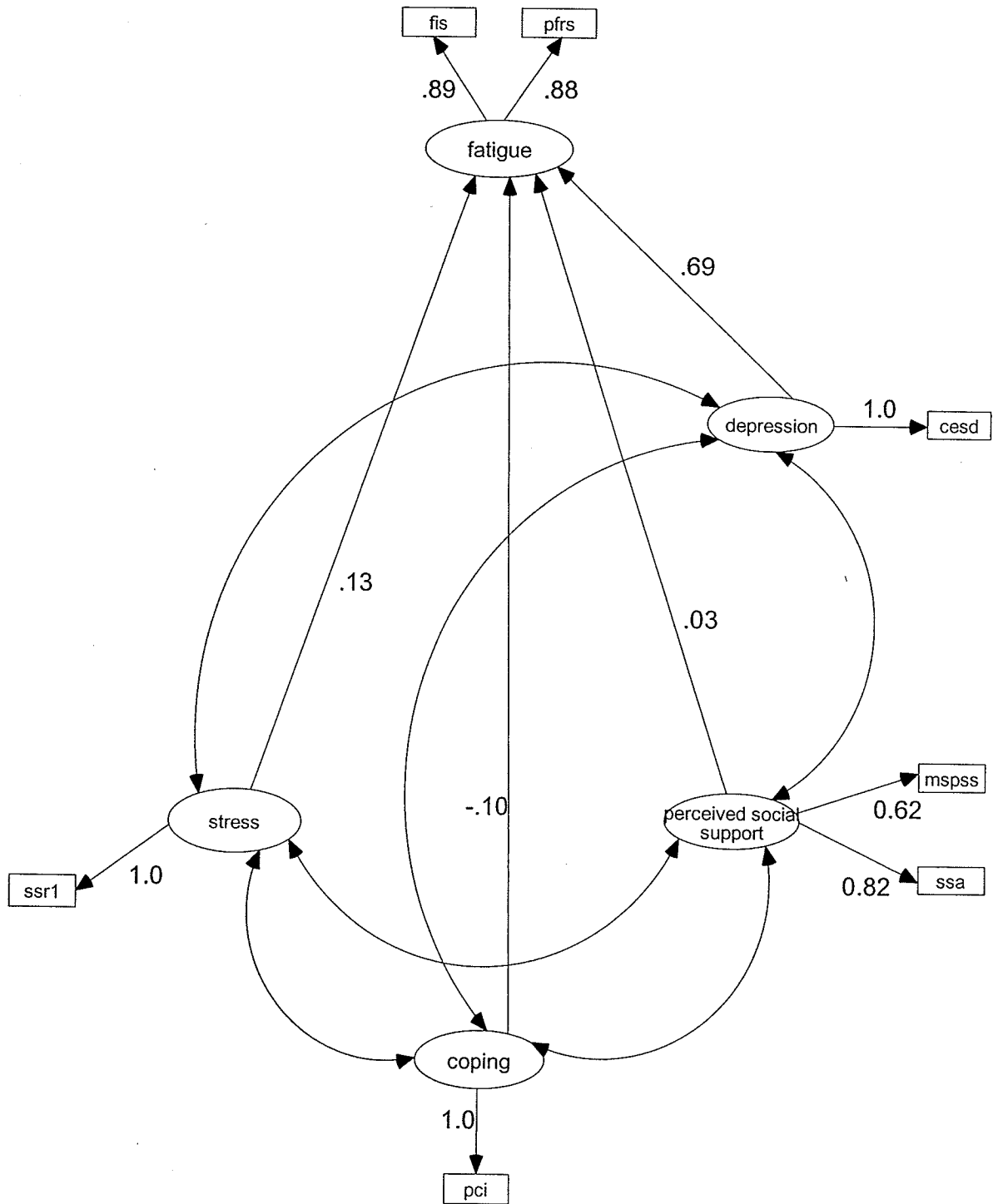


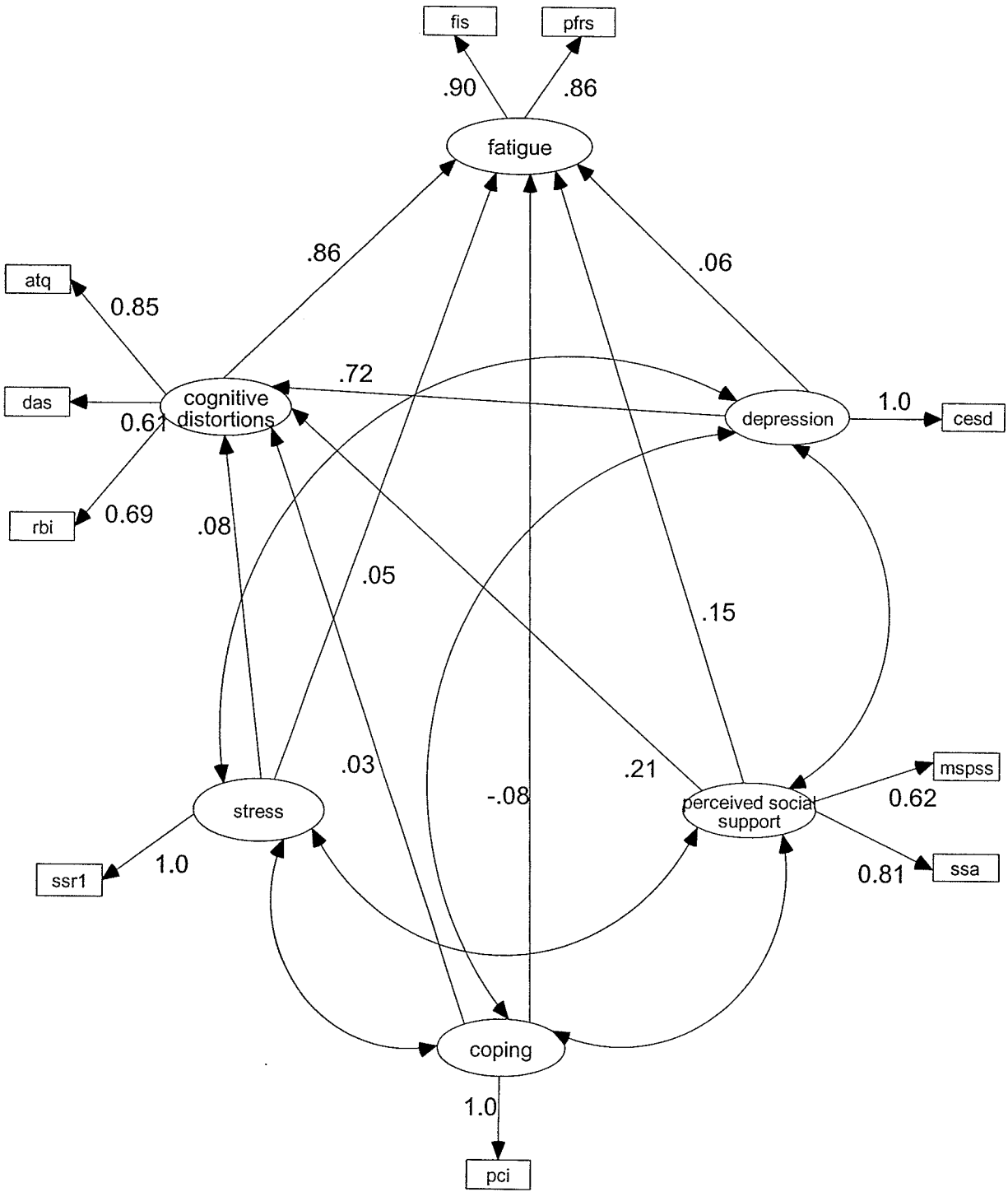
The fit of the baseline model to the data was good,  $\chi^2 (7, N = 300) = 11.387, p > .05$ , CFI = .96, NFI = .95, and RMSEA = .09.

The baseline model with coefficients presented in standardized form is illustrated in Figure 5. Of the four exogenous variables, only Depression (standardized coefficient = .69) and Stress (standardized coefficient = .13) were significant predictors of Fatigue, with higher levels of each predicting greater levels of Fatigue.

A mediational model was then set up (see Figure 6) in order to determine if Cognitive Distortions acts as a mediator between Fatigue and the remaining latent variables. Cognitive Distortions was found to mediate the relationship between Depression and Fatigue. Specifically, in the mediational model, Depression was found to be significantly related to Cognitive Distortions ( $p < .05$ ) and Cognitive Distortions was found to be significantly related to Fatigue ( $p < .05$ ). Further, the previously significant relationship directly between Depression and Fatigue was found to be nonsignificant ( $p > .05$ ) in the mediational model. The relationship between Fatigue and the remaining exogenous variables (Stress, Coping, and Perceived Social Support) was not found to be mediated by Cognitive Distortions. Specifically, the relationship between Perceived Social Support and Fatigue, as well as between Coping and Fatigue was not previously found to be significant in the baseline model. In addition, although Stress had a significant path to Fatigue in the baseline model without Cognitive Distortions, it no longer had a significant path to Fatigue when Cognitive Distortions was introduced as a mediator.







As another plausible mediational alternative it was also tested whether or not Depression acts as a mediator between Fatigue and the remaining latent constructs (Cognitive Distortions, Stress, Coping, and Perceived Social Support). When depression was added to the model in a possibly mediational role, the path from Cognitive Distortions to Fatigue is minimally reduced and remains statistically significant (going from .93 to .68). Furthermore, other than Cognitive Distortions, none of the more exogenous variables have significant direct paths to Depression. In addition, Depression itself is not found to have a significant direct path to Fatigue. Consequently, it was found that the relationship between Fatigue and the remaining exogenous variables was not found to be mediated by Depression.

### Discussion

The present study attempted to advance our understanding of the experience of fatigue by aiming to clarify both the variables increasing one's susceptibility to fatigue, and the processes by which these variables may interact. This was accomplished by: (a) establishing a plausible and well fitting measurement model of the constructs evaluated in this study; and (b) exploring a few theoretical models of interest specifying particular causal relationships among the constructs. The purpose of the latter was to develop a tentative multifactorial model of the psychosocial variables impacting on an individual's vulnerability to fatigue. Results of the study will be discussed in terms of the development of a measurement model, plausible structural models, implications, limitations of the study, and directions for future research.

Fatigue, from a psychological perspective, has generally been studied within the context of CFS. The present study examined fatigue as it occurs and is experienced within a non-clinical general adult population. However, given that no literature currently exists examining fatigue in a non-clinical population, in the attempt of the present study to develop a multifactorial model of the psychosocial variables increasing vulnerability to fatigue, relationships that may exist between fatigue and its correlates were postulated on the basis of previous findings on fatigue that have been reported in the context of research on CFS.

Previous studies have reported an existing comorbidity between depression and fatigue (Buckley et al., 1999; Fukuda et al., 1994; Surawy et al., 1995; Vercoulen et al., 1994; Wessely, 1996). Further studies have also demonstrated that there are particular cognitive distortions that characterize individuals suffering from depression (Deale et al., 1997; Hewitt & Flett, 1991; Surawy et al.). The central importance of cognitive distortions with respect to their impact on the experience of fatigue should not be overlooked. The results of previous research identified what has been labeled a pre-morbid personality which reportedly is closely linked with an increased experience of fatigue. This profile is usually characterized by cognitive distortions centering around an exceedingly high achievement orientation, perfectionism, and all-or-nothing ways of thinking. In addition, these individuals frequently adopted a cognitive framework that tended to cluster around repression of emotion as well as a strong desire to avoid showing signs of weakness (Surawy et al.; Ware & Kleinman, 1992). Furthermore, it was also found that cognitions and behavior patterns that typify the perfectionist individual tie

closely with the pre-morbid personality profile described above and which has been linked with heightened experience of fatigue (Surawy et al.).

The aforementioned characteristics appear to reflect the personality and cognitive profile of many CFS sufferers. The cognitions held by such individuals may help them in attaining success but also serve as a vulnerability in situations where one's emotional control or competency are threatened. The coping mechanisms used by individuals attempting to deal with this could perpetuate behaviors that lead to exhaustion or chronic fatigue. Studies have identified links between various psychosocial variables such as stress, ways of coping, and social support and the development of, or maintenance of chronic fatigue (Lewis et al., 1994; Lewis, 1996; Ray, 1992; Sharpe et al., 1992; Surawy et al., 1995; Ware, 1993). However, research examining more closely the way in which all these variables interacted with others, and with each other, to impact on the experience of fatigue was nonexistent.

#### The Measurement Model

The measurement model included six latent variables, each representing a different psychosocial component or construct. The six constructs included: (a) fatigue, (b) cognitive distortions, (c) depression, (d) stress, (e) perceived social support, and (f) coping. The fatigue construct consisted of items related to the impact of fatigue on one's quality of life as experienced in the physical, cognitive and social realms. The cognitive distortions construct related primarily to items assessing an individual's adherence to various cognitive distortions and affiliated attitudinal patterns that may result in emotional distress. The depression construct assessed depressive symptomatology in an

individual. The stress construct was an individual's self-report of their perceived degree of stress experienced. The perceived social support construct assessed an individual's perception of available social support. The coping factor consisted of items tapping into various forms of coping which an individual could espouse in dealing with difficulties. The six latent variables represented each of the psychosocial constructs which were discussed in the introduction to the present study as those believed to be significant constructs in the experience of fatigue from a multifactorial perspective.

The Measurement of Fatigue. A multi measure operationalization of the construct of fatigue was adopted in the present study. The measurement of the fatigue construct was obtained using various self-report measures. Consequently, the meaning of fatigue was defined as a measure of the impact that one's perceived level of fatigue had on an individual's quality of life as experienced in the cognitive, physical, and psychosocial realms.

It was found that two of the three measures of fatigue (FIS and PFRS) defined fatigue in a similar manner whereas the third measure (FS, which was excluded from the SEM analyses) was found to not define fatigue in the same fashion. In other words, the two remaining measures (FIS and PFRS) may, by their loadings, be considered to be measuring more or less equivalent notions of fatigue and have stronger bivariate relations to the measure of depression. As expected, scores on both fatigue measures were lower in the current non-clinical sample than in the clinical populations examined in the development of these scales (see Tables 5 and 6).

Table 5

Comparison Table of Mean Fatigue Scores on FIS

	Total Scale	Cognitive	Physical	Psychosocial
	Score	Subscale	Subscale	Subscale
Study Sample	43	11	10	22
CFS*	96	25	27	50
MS*	63	13	20	32
HT*	32	8	11	18

Note. \*Clinical sample scores taken from Fisk et al., 1994. CFS = Chronic Fatigue Syndrome; MS = Multiple Sclerosis; HT = Hypertension.

Table 6

Comparison Table of Mean (Standard Deviation) Fatigue Scores on PFRS

	Emotional Distress Subscale	Cognitive Difficulty Subscale	Fatigue Subscale	Somatic Symptoms Subscale
Study Sample	2.32 (1.37)	1.97 (1.30)	1.87 (1.31)	1.40 (1.07)
CFS*	2.58 (1.63)	2.85 (1.53)	3.80 (1.42)	2.11 (1.33)
Student* Population	1.44 (1.15)	1.21 (1.08)	1.09 (1.33)	0.65 (0.63)

Note. \*Sample scores taken from Ray et al., 1992. CFS = Chronic Fatigue Syndrome.



The Measurement of Depression. Only one measure, the CES-D, was used to assess the level of depressive symptomatology defining the depression construct. Given the stronger bivariate relationships of the remaining measures of fatigue to the measure of depression, as opposed to that of the dropped measure, this may be demonstrating that fatigue and depression are both considering impacts on an individual's quality of life. In other words, the effects exerted by both fatigue and depression on one's functioning may in fact be similar in nature though originating from slightly different experiences.

Although depression scores in this sample were lower relative to the range of possible scores, depression levels in this study were slightly higher than the standardization sample compiled by Radloff (1987), potentially a function of the stresses experienced by students who were tested at the beginning of their first year of university studies .

The Measurement of Cognitive Distortions. The Cognitive Distortions construct was defined by the ATQ, the DAS, and the RBI, with the ATQ being the most defining measure of the construct. Further, the MPS was not found to define Cognitive Distortions in the same manner. In addition, the three remaining measures were found to have stronger bivariate relationships (relative to the MPS) to measures of fatigue and depression.

The Measurement of Stress. Only one measure, the SSR-1, was used to assess the level of stress experienced by individuals. Given their loadings, the CUSS and the SSR-1 could be considered to be measuring differing notions of the stress construct and so in order to maintain as homogenous a measure of the construct as possible, the CUSS (with

its lower loading) was dropped. Even though it was measured by only the SSR-1, the stress scores in this sample were moderate relative to the range of possible scores, and there was significant variability in the levels of stress that were reported.

The Measurement of Social Support. It was found that two of the three measures of perceived social support (MSPSS and SSA) defined social support in a similar manner whereas the third measure (SSQ, which was excluded from the SEM analyses) was found to not define the perceived social support construct in the same fashion. In other words, the two remaining measures (MSPSS and SSA) may, by their loadings, be considered to be measuring more or less equivalent notions of social support, that is a perception of social support that is closely linked with one's belief of being loved, esteemed and involved with close others. Perceived social support scores in this sample were very comparable to those of the standardization sample compiled by Zimet et al. (1988), and seem to indicate an overall satisfaction with the levels of perceived social support.

The Measurement of Coping. Only one measure, the PCI, was used to assess coping. The coping construct examines an individual's approach to coping from a multidimensional perspective, viewing coping not as a single response but rather as an approach to life, as reflected in one's beliefs and views of the world. Coping scores in this sample were moderate relative to the range of possible scores, with moderate variability in the scores obtained.

### Structural Models

Using exploratory SEM, a structural model examining the hypothesis that Fatigue could be predicted by direct influences from the remaining constructs (Cognitive

Distortions, Depression, Stress, Perceived Social Support, and Coping) was tested. Although this model fit the data well, it was found that only Cognitive Distortions significantly and strongly ( $r^2 = .61$ ) predicted Fatigue, with higher levels of Cognitive Distortions being predictive of greater levels of Fatigue. The fact that the Cognitive Distortions construct was a significant predictor of an individual's level of experienced fatigue is supported by previous studies which have found that high levels of emotional and psychological distress are often found in persons diagnosed with chronic fatigue syndrome (Buckley et al., 1999; Fukuda et al., 1994; Surawy et al., 1995; Vercoulen et al., 1994; Wessely, 1996). Hence, it is not surprising to find that the results of the present study identified a strong positive relationship between the constructs of Fatigue and Cognitive Distortions.

One of the advantages of using SEM is its ability to investigate complex relationships between variables. For example, in this investigation we explored the hypothesis that the relationship between Fatigue and other latent constructs could be mediated by Cognitive Distortions. Results of the analyses were consistent with the mediational hypothesis that a relationship between Depression and Fatigue is mediated through its association with the Cognitive Distortions latent variable. On the other hand, the relationships between Stress and Fatigue, Perceived Social Support and Fatigue, and Coping and Fatigue were not found to be mediated by Cognitive Distortions. Although these results could be of particular relevance with respect to approaches taken in the treatment of individuals suffering from both depression and fatigue, further studies would need to replicate this finding given the exploratory approach taken in the present study.

### Implications

The structural and mediational models derived from the present study can have significant practical and theoretical relevance for future research. This is particularly true with respect to the support it lends for the adoption of a more multifactorial and holistic approach to the experience of fatigue. Consequently, there are significant implications for psychologists in dealing with clients who present with health related concerns, and more specifically in the context of the present study, with fatigue related complaints. As an example, individual beliefs and cognitions can be viewed not only as the result of physiological processes, but also as possible important etiological factors in and of themselves (Sharpe, 1996). This statement is consistent with the results of the present study which identified cognitive distortions as important predictors of an individual's level of experienced fatigue.

The aforementioned conceptual framework supports the argument that personality characteristics and cognitive patterns may act as vulnerabilities to the development of illnesses, and more specifically, that cognitions appear to impact significantly on the development, the perpetuation, or both, of health related complaints such as fatigue. The results of the present study suggest that psychologists could significantly further their understanding of what often appear to be complaints of a more physical nature in clients if they were to adopt a more holistic and multidimensional approach to the understanding of such constructs. Given the preponderance of health-related concerns in the general population for which psychological interventions may be of benefit, research should be done in more closely examining how various psychosocial variables may impact on

health-related actions patterns that could significantly effect the health status of individuals. With respect to the study at hand particular attention should be paid to the cognitive frameworks of individuals, as these have been found to significantly impact on one's level of reported fatigue, by more closely examining the way in which these impact on the health-related action patterns of individuals, in addition to studying the extent to which these individuals are successful or unsuccessful in alleviating their experience of fatigue.

If psychology as a discipline is to take a greater role in the treatment of health-related concerns, such as complaints of chronic fatigue for example, then it becomes imperative that we acquire as thorough an understanding as possible of the various factors that can affect a person's health status. Having identified for any given complaint, such as chronic fatigue, some of the key factors that impact on one's experience of fatigue, it then becomes imperative to develop measures capable of treating and addressing the factors that negatively impact on the health status of an individual. With respect to fatigue-related complaints that are becoming increasingly common in the general population, results of the present study suggest that cognitive patterns can impact on one's vulnerability to experience fatigue. Given these findings, it is important to note that results of previous studies have shown that cognitive behavior therapy can improve symptoms in patients whose perceptions of their illness and whose coping behaviors may inhibit their recovery (Butler et al., 1991; Deale et al., 1997; Friedberg, 1996; Friedberg & Krupp, 1994; Fukuda et al., 1994; Sharpe, 1996). Consequently, cognitive behaviour

therapy may be viewed as a viable form of treatment for individuals suffering from various forms of fatigue.

### Limitations of the Study

It is believed that the primary limitation to the present study is the fact that it utilized correlational data to make interpretations about possible theoretical relationships. Although it is recognized that this method is not optimal, at the first stages of understanding of any given construct, such as fatigue in this case, the exploratory approach used in the present study may offer insight with respect to particular patterns that could subsequently be tested in a confirmatory manner. It is important to note that alternative models to the ones presented in the present study might exist that may fit as well, or better, than the ones presented here.

Another possible limitation of the present study is the fact that all data was collected from an undergraduate student population. One possible difficulty with this rests in the fact that such a database may not allow for the collection of data on as full a range of the experience of fatigue along its continuum from mild, to chronic and debilitating. Consequently, this may render the results of the present study less generalizable to populations suffering from more extreme forms of fatigue. As a result, it is possible that the model derived in the present may be more representative of the interactions between psychosocial variables that are found in more normal levels of fatigue as opposed to being representative of the more acute types of fatigue found in clinical populations. It would be interesting to research whether the structural

relationships found in the present study would hold true across populations experiencing both qualitative and quantitative differences in the experience of fatigue.

Lastly, one of the shortcomings of the present study, as well as of the current literature in the area of fatigue research, was its failure to examine whether or not there exist quantitative or qualitative differences in the experience of fatigue in individuals. A greater understanding of this particular question would significantly further our understanding of the construct of fatigue as experienced in various populations.

#### Directions for Future Research

Future studies examining the experience of fatigue in individuals could use the multifactorial model of the psychosocial variables impacting on the experience of fatigue developed in the present study as a means of empirically testing hypotheses directly related to the construct of fatigue. The model developed in the present study could be used in future studies to assist in furthering our understanding of the way in which various psychosocial variables may impact on the experience of fatigue based on differences between populations regarding the nature of the fatigue experienced. One such study could, for example, pit two differing populations against each other while intervening on some identical dimension in both to see what effect, if any, this may have on the experience of fatigue. An example of two possible groups could be the following:

- a) a group where the onset of fatigue stems from a more evolutionary background, versus
- b) a group where the onset of fatigue is related to an identifiable specific event (such as in the case of bone marrow transplant or congenitive heart failure patients).

From a health psychology perspective, it is with future attempts to more clearly decipher both the variables increasing one's susceptibility to health-related concerns such as fatigue, and the processes by which these variables interact, that one would allow for the development of effective treatment strategies to be used in treating populations which may all be suffering from fatigue, but whose experience of it may vary greatly.



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## Appendix A

Diagnostic Criteria for Chronic Fatigue Syndrome (Friedberg, 1996)

The Centers for Disease Control now defines chronic fatigue syndrome by two criteria. The first criterion is the new onset of persistent unexplained fatigue that is not the result of ongoing exertion, is not alleviated by rest, and results in substantial reduction in previous levels of work, study, social, or personal activities. The persistent fatigue is not attributable to any identifiable medical condition. The second criterion is the occurrence of four of the following symptoms that have persisted over 6 or more months: (a) impairment in short-term memory or concentration resulting in substantial reduction in previous levels of work, study, social, or personal activities; (b) sore throat; (c) tender neck or axillary lymph nodes; (d) muscle pain; (e) multi-joint pain; (f) headache of a new type, pattern, or severity; (g) unrefreshing sleep; and (h) post-exertional malaise lasting more than 24 hours. The case definition excludes a diagnosis of CFS if a diagnosis of major depression with melancholic or psychotic features was present at any time in the patient's life. Also, alcohol or other substance abuse within two years prior to the onset of chronic fatigue and any time afterward is an exclusion criterion. Concurrent diagnosis of anxiety disorder, somatoform disorder, nonmelancholic depression, or panic disorder does not preclude a diagnosis of CFS.

Appendix B

ID: \_\_\_\_\_

Code: \_\_\_\_\_

**Demographic Information**

(Demographic information is collected for statistical purposes only.)

1 - Age \_\_\_\_\_

2 - Sex:    \_\_\_ Male       \_\_\_ Female

3 - Marital Status:    \_\_\_ single  
                           \_\_\_ married or living as married  
                           \_\_\_ separated or divorced  
                           \_\_\_ widowed  
                           \_\_\_ other (please specify) \_\_\_\_\_

4 - Year in program at university:    \_\_\_ 1    \_\_\_ 2    \_\_\_ 3    \_\_\_ 4

5 - Living arrangements:    \_\_\_ with parents  
                                   \_\_\_ alone  
                                   \_\_\_ with friends or other family  
                                   \_\_\_ with spouse or partner  
                                   \_\_\_ residence  
                                   \_\_\_ with roommate(s)

6 - In your family, are you:  
       \_\_\_ the only child    \_\_\_ the youngest child    \_\_\_ in the middle    \_\_\_ the oldest child

7 - Estimated yearly income (or family income if you live with others) \_\_\_\_\_ \$ / year

8 - How many times a week do you exercise \_\_\_\_\_

9 - Are you a \_\_\_\_\_ smoker or a \_\_\_\_\_ non-smoker

10 - Have you been hospitalized for any illness in the last 6 months    \_\_\_ Yes    \_\_\_ No

11 - On a scale ranging from 1 (not at all healthy) to 100 (exceptionally healthy), please rate how healthy you feel you are \_\_\_\_\_

12 - On a scale ranging from 1 (not at all tired or fatigued) to 100 (exceptionally tired or fatigued), please rate how tired you feel on the following levels

- \_\_\_\_\_ Physical fatigue
- \_\_\_\_\_ Mental fatigue
- \_\_\_\_\_ Emotional fatigue
- \_\_\_\_\_ Overall fatigue

## Appendix C

## Automatic Thoughts Questionnaire

Listed below are a variety of thoughts that pop into people's heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you over the last week. Please read each item carefully and fill in the blank with the appropriate number, using the following scale:

- 1=Not at all  
 2=Sometimes  
 3=Moderately often  
 4=Often  
 5=All the time

- |     |           |   |
|-----|-----------|---|
| 1.  | 1 2 3 4 5 | I feel like I'm up against the world.     |
| 2.  | 1 2 3 4 5 | I'm no good.                              |
| 3.  | 1 2 3 4 5 | Why can't I ever succeed?                 |
| 4.  | 1 2 3 4 5 | No one ever understands me.               |
| 5.  | 1 2 3 4 5 | I've let people down.                     |
| 6.  | 1 2 3 4 5 | I don't think I can go on.                |
| 7.  | 1 2 3 4 5 | I wish I were a better person.            |
| 8.  | 1 2 3 4 5 | I'm so weak.                              |
| 9.  | 1 2 3 4 5 | My life's not going the way I want it to. |
| 10. | 1 2 3 4 5 | I'm so disappointed in myself.            |
| 11. | 1 2 3 4 5 | Nothing feels good anymore.               |
| 12. | 1 2 3 4 5 | I can't stand this anymore.               |
| 13. | 1 2 3 4 5 | I can't get started.                      |
| 14. | 1 2 3 4 5 | What's wrong with me.                     |
| 15. | 1 2 3 4 5 | I wish I were somewhere else.             |
| 16. | 1 2 3 4 5 | I can't get things together.              |
| 17. | 1 2 3 4 5 | I hate myself.                            |
| 18. | 1 2 3 4 5 | I'm worthless.                            |
| 19. | 1 2 3 4 5 | Wish I could just disappear.              |
| 20. | 1 2 3 4 5 | What's the matter with me.                |

- 21. 1 2 3 4 5 I'm a loser.
- 22. 1 2 3 4 5 My life is a mess.
- 23. 1 2 3 4 5 I'm a failure.
- 24. 1 2 3 4 5 I'll never make it.
- 25. 1 2 3 4 5 I feel so helpless.
- 26. 1 2 3 4 5 Something has to change.
- 27. 1 2 3 4 5 There must be something wrong with me.
- 28. 1 2 3 4 5 My future is bleak.
- 29. 1 2 3 4 5 It's just not worth it.
- 30. 1 2 3 4 5 I can't finish anything.

## Appendix D

## Center For Epidemiologic Studies - Depressed Mood Scale

Using the scale below, circle the number which best describes how often you felt or behaved this way – DURING THE PAST WEEK.

**0=Rarely or none of the time (less than 1 day)**

**1=Some or a little of the time (1-2 days)**

**2=Occasionally or a moderate amount of the time (3-4 days)**

**3=Most or all of the time (5-7 days)**

1. 1 2 3 4 I was bothered by things that usually don't bother me.
2. 1 2 3 4 I did not feel like eating; my appetite was poor.
3. 1 2 3 4 I felt that I could not shake off the blues even with help from my family or friends.
4. 1 2 3 4 I felt that I was just as good as other people.
5. 1 2 3 4 I had trouble keeping my mind on what I was doing.
6. 1 2 3 4 I felt depressed.
7. 1 2 3 4 I felt that everything I did was an effort.
8. 1 2 3 4 I felt hopeful about the future.
9. 1 2 3 4 I thought my life had been a failure.
10. 1 2 3 4 I felt fearful.
11. 1 2 3 4 My sleep was restless.
12. 1 2 3 4 I was happy.
13. 1 2 3 4 I talked less than usual.
14. 1 2 3 4 I felt lonely.
15. 1 2 3 4 People were unfriendly.
16. 1 2 3 4 I enjoyed life.
17. 1 2 3 4 I had crying spells.
18. 1 2 3 4 I felt sad.
19. 1 2 3 4 I felt that people disliked me.
20. 1 2 3 4 I could not get "going."

Appendix E

College Undergraduate Stress Scale

PLEASE PLACE AN "X" IN THE APPROPRIATE COLUMN TO INDICATE WHETHER OR NOT YOU HAVE EXPERIENCED THE GIVEN EVENT IN THE LAST YEAR.		
Event	Experienced	NOT Experienced
Being raped		
Finding out that you are HIV - positive		
Being accused of rape		
Death of a close friend		
Death of a close family member		
Contracting a sexually transmitted disease (other than AIDS)		
Concerns about being pregnant		
Finals week		
Concerns about your partner being pregnant		
Oversleeping for an exam		
Flunking a class		
Having a boyfriend or girlfriend cheat on you		
Ending a steady dating relationship		
Serious illness in a close friend or family member		
Financial difficulties		
Writing a major term paper		
Being caught cheating on a test		
Drunk driving		
Sense of overload in school or work		
Two exams in one day		
Cheating on your boyfriend or girlfriend		
Getting married		
Negative consequences of drinking or drug use		
Depression or crisis in your best friend		



PLEASE PLACE AN "X" IN THE APPROPRIATE COLUMN TO INDICATE WHETHER OR NOT YOU HAVE EXPERIENCED THE GIVEN EVENT IN THE LAST YEAR.		
Difficulties with parents		
Talking in front of a class		
Lack of sleep		
Change in housing situation (hassles, moves)		
Competing or performing in public		
Getting in a physical fight		
Difficulties with a roommate		
Job changes (applying, new job, work hassles)		
Declaring a major or concerns about future plans		
A class you hate		
Drinking or use of drugs		
Confrontations with professors		
Starting a new semester		
Going on a first date		
Registration		
Maintaining a steady dating relationship		
Commuting to campus or work, or both		
Peer Pressures		
Being away from home for the first time		
Getting sick		
Concerns about your appearance		
Getting straight A's		
A difficult class that you love		
Making new friends; getting along with friends		
Fraternity or sorority rush		
Falling asleep in class		
Attending an athletic event (e.g. football game)		

## Appendix F

## Dysfunctional Attitude Scale

People hold different attitudes or beliefs. For each of the attitudes, circle the number that best describes how you think. Be sure to choose only one answer for each attitude. Because people are different, there is no right answer or wrong answer to these statements. To decide whether a given attitude is typical of your way of looking at things, simply keep in mind what you are like most of the time. Please do not leave any blanks.

1=Totally agree    2=Agree very much    3=Agree slightly    4=Neutral  
5=Disagree slightly    6=Disagree very much    7=Totally disagree

1. 1 2 3 4 5 6 7    It is difficult to be happy unless one is good looking, intelligent, rich, & creative.
2. 1 2 3 4 5 6 7    Happiness is more a matter of my attitude towards myself than the way other people feel about me.
3. 1 2 3 4 5 6 7    People will probably think less of me if I make a mistake.
4. 1 2 3 4 5 6 7    If I do not do well all the time, people will not respect me.
5. 1 2 3 4 5 6 7    Taking even a small risk is foolish because the loss is likely to be a disaster.
6. 1 2 3 4 5 6 7    It is possible to gain another person's respect without being especially talented at anything.
7. 1 2 3 4 5 6 7    I cannot be happy unless most people I know admire me.
8. 1 2 3 4 5 6 7    If a person asks for help, it is a sign of weakness.
9. 1 2 3 4 5 6 7    If I do not do as well as other people, it means I am a weak person.
10. 1 2 3 4 5 6 7    If I fail at my work, then I am a failure as a person.
11. 1 2 3 4 5 6 7    If you cannot do something well, there is little point in doing it at all.
12. 1 2 3 4 5 6 7    Making mistakes is fine because I can learn from them.
13. 1 2 3 4 5 6 7    If someone disagrees with me, it probably indicates he or she does not like me.
14. 1 2 3 4 5 6 7    If I fail partly, it is as bad as being a complete failure.

15. 1 2 3 4 5 6 7 If other people know what you are really like, they will think less of you.
16. 1 2 3 4 5 6 7 I am nothing if a person I love doesn't love me.
17. 1 2 3 4 5 6 7 One can get pleasure from an activity regardless of the end result.
18. 1 2 3 4 5 6 7 People should have a chance to succeed before doing anything.
19. 1 2 3 4 5 6 7 My value as a person depends greatly on what others think of me.
20. 1 2 3 4 5 6 7 If I don't set the highest standards for myself, I am likely to end up a second-rate person.
21. 1 2 3 4 5 6 7 If I am to be a worthwhile person, I must be the best in at least one way.
22. 1 2 3 4 5 6 7 People who have good ideas are better than those who do not.
23. 1 2 3 4 5 6 7 I should be upset if I make a mistake.
24. 1 2 3 4 5 6 7 My own opinions of myself are more important than others' opinions of me.
25. 1 2 3 4 5 6 7 To be a good, moral, worthwhile person I must help everyone who needs it.
26. 1 2 3 4 5 6 7 If I ask a question, it makes me look stupid.
27. 1 2 3 4 5 6 7 It is awful to be put down by people important to you.
28. 1 2 3 4 5 6 7 If you don't have other people to lean on, you are going to be sad.
29. 1 2 3 4 5 6 7 I can reach important goals without pushing myself.
30. 1 2 3 4 5 6 7 It is possible for a person to be scolded and not get upset.
31. 1 2 3 4 5 6 7 I cannot trust other people because they might be cruel to me.
32. 1 2 3 4 5 6 7 If others dislike you, you cannot be happy.
33. 1 2 3 4 5 6 7 It is best to give up your own interests in order to please other people.
34. 1 2 3 4 5 6 7 My happiness depends more on other people than it does on me.

35. 1 2 3 4 5 6 7 I do not need the approval of other people in order to be happy.
36. 1 2 3 4 5 6 7 If a person avoids problems, the problems tend to go away.
37. 1 2 3 4 5 6 7 I can be happy even if I miss out on many of the good things in life.
38. 1 2 3 4 5 6 7 What other people think about me is very important.
39. 1 2 3 4 5 6 7 Being alone leads to unhappiness.
40. 1 2 3 4 5 6 7 I can find happiness without being loved by another person.

## Appendix G

## Fatigue Scale

Listed below are a variety of statements. Please read each statement and indicate your response to it keeping in mind your experience over the past month. Please read each item carefully and circle the appropriate number, using the following scale:

- 1=Better than usual  
2=No more than usual  
3=Worse than usual  
4=Much worse than usual

1. 1 2 3 4 Do you have problems with tiredness?
2. 1 2 3 4 Do you need to rest more?
3. 1 2 3 4 Do you feel sleepy or drowsy?
4. 1 2 3 4 Do you have problems starting things?
5. 1 2 3 4 Do you start things without difficulty but get weak as you go on?
6. 1 2 3 4 Are you lacking in energy?
7. 1 2 3 4 Do you have less strength in your muscles?
8. 1 2 3 4 Do you feel weak?
9. 1 2 3 4 Do you have difficulty concentrating?
10. 1 2 3 4 Do you have problems thinking clearly?
11. 1 2 3 4 Do you make slips of the tongue when speaking?
12. 1 2 3 4 Do you find it more difficult to find the correct word?
13. 1 2 3 4 How is your memory?
14. 1 2 3 4 Have you lost interest in the things you used to do?

## Appendix H

## Fatigue Impact Scale

Listed below are a variety of statements. Please read each statement and indicate to what extent each has been a problem during the past month. Please read each item carefully and circle the appropriate number, using the following scale:

- 0 = No problem  
 1 = Small problem  
 2 = Moderate problem  
 3 = Big problem  
 4 = Extreme problem

- |     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| 1.  | 1 | 2 | 3 | 4 | 5 | I feel less alert.  |
| 2.  | 1 | 2 | 3 | 4 | 5 | I feel I am more isolated from social contact.                    |
| 3.  | 1 | 2 | 3 | 4 | 5 | I have to reduce my workload or responsibilities.                 |
| 4.  | 1 | 2 | 3 | 4 | 5 | I am more moody   |
| 5.  | 1 | 2 | 3 | 4 | 5 | I have difficulty paying attention for a long period.             |
| 6.  | 1 | 2 | 3 | 4 | 5 | I feel like I cannot think clearly.                               |
| 7.  | 1 | 2 | 3 | 4 | 5 | I work less effectively (inside or outside home).                 |
| 8.  | 1 | 2 | 3 | 4 | 5 | I have to rely more on others to help me or do things for me.     |
| 9.  | 1 | 2 | 3 | 4 | 5 | I have difficulty planning things ahead of time.                  |
| 10. | 1 | 2 | 3 | 4 | 5 | I am more clumsy and uncoordinated.                               |
| 11. | 1 | 2 | 3 | 4 | 5 | I find that I am more forgetful.                                  |
| 12. | 1 | 2 | 3 | 4 | 5 | I am more irritable and more easily angered.                      |
| 13. | 1 | 2 | 3 | 4 | 5 | I have to be more careful about pacing my physical activities.    |
| 14. | 1 | 2 | 3 | 4 | 5 | I am less motivated to do anything that requires physical effort. |
| 15. | 1 | 2 | 3 | 4 | 5 | I am less motivated to engage in social activities.               |
| 16. | 1 | 2 | 3 | 4 | 5 | My ability to travel outside my home is limited.                  |
| 17. | 1 | 2 | 3 | 4 | 5 | I have trouble maintaining physical effort for long periods.      |
| 18. | 1 | 2 | 3 | 4 | 5 | I find it difficult to make decisions.                            |
| 19. | 1 | 2 | 3 | 4 | 5 | I have few social contacts outside my home.                       |
| 20. | 1 | 2 | 3 | 4 | 5 | Normal day-to-day events are stressful for me.                    |

- 21. 1 2 3 4 5 I am less motivated to do anything that requires thinking.
- 22. 1 2 3 4 5 I avoid situations that are stressful to me.
- 23. 1 2 3 4 5 My muscles feel much weaker than they should.
- 24. 1 2 3 4 5 My physical discomfort is increased.
- 25. 1 2 3 4 5 I have difficulty dealing with anything new.
- 26. 1 2 3 4 5 I am less able to finish tasks that require thinking.
- 27. 1 2 3 4 5 I feel unable to meet the demands that people place on me.
- 28. 1 2 3 4 5 I am less able to provide financial support for myself (and my family).
- 29. 1 2 3 4 5 I engage in less sexual activity.
- 30. 1 2 3 4 5 I find it difficult to organize my thoughts when I am doing things at home or at work.
- 31. 1 2 3 4 5 I am less able to complete tasks that require physical effort.
- 32. 1 2 3 4 5 I worry about how I look to other people.
- 33. 1 2 3 4 5 I am less able to deal with emotional issues.
- 34. 1 2 3 4 5 I feel slowed down in my thinking.
- 35. 1 2 3 4 5 I find it hard to concentrate.
- 36. 1 2 3 4 5 I have difficulty participating fully in family activities.
- 37. 1 2 3 4 5 I have to limit my physical activities.
- 38. 1 2 3 4 5 I require more frequent or longer periods of rest.
- 39. 1 2 3 4 5 I am not able to provide as much emotional support to my family or friends as I should.
- 40. 1 2 3 4 5 Minor difficulties seem like major difficulties.

## Appendix I

## Multidimensional Perfectionism Scale

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you *strongly agree*, circle 7; if you *strongly disagree*, circle 1; if you feel somewhere in between, circle any one of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4. Please do not leave any blanks.

1=Strongly disagree

7=Strongly agree

- |     |               |   |
|-----|---------------|---|
| 1.  | 1 2 3 4 5 6 7 | When I am working on something, I cannot relax until it is perfect.                     |
| 2.  | 1 2 3 4 5 6 7 | I am not likely to criticize someone for giving up too easily.                          |
| 3.  | 1 2 3 4 5 6 7 | It is not important that the people I am close to are successful.                       |
| 4.  | 1 2 3 4 5 6 7 | I seldom criticize my friends for accepting second best.                                |
| 5.  | 1 2 3 4 5 6 7 | I find it difficult to meet others' expectations of me.                                 |
| 6.  | 1 2 3 4 5 6 7 | One of my goals is to be perfect in everything I do.                                    |
| 7.  | 1 2 3 4 5 6 7 | Everything that others do must be of top-notch quality.                                 |
| 8.  | 1 2 3 4 5 6 7 | I never aim for perfectionism in my work.   |
| 9.  | 1 2 3 4 5 6 7 | Those around me readily accept that I can make mistakes too.                            |
| 10. | 1 2 3 4 5 6 7 | It doesn't matter when someone close to me does not do their absolute best.             |
| 11. | 1 2 3 4 5 6 7 | The better I do, the better I am expected to do.  |
| 12. | 1 2 3 4 5 6 7 | I seldom feel the need to be perfect.   |
| 13. | 1 2 3 4 5 6 7 | Anything I do that is less than excellent will be seen as poor work by those around me. |
| 14. | 1 2 3 4 5 6 7 | I strive to be as perfect as I can be.  |
| 15. | 1 2 3 4 5 6 7 | It is very important that I am perfect in everything I attempt.                         |
| 16. | 1 2 3 4 5 6 7 | I have high expectations for the people who are important to me.                        |
| 17. | 1 2 3 4 5 6 7 | I strive to be the best at everything I do.   |
| 18. | 1 2 3 4 5 6 7 | The people around me expect me to succeed at everything I do.                           |



19. 1 2 3 4 5 6 7 I do not have very high standards for those around me.
20. 1 2 3 4 5 6 7 I demand nothing less than perfection of myself.
21. 1 2 3 4 5 6 7 Others will like me even if I don't excel at everything.
22. 1 2 3 4 5 6 7 I can't be bothered with people who won't strive to better themselves.
23. 1 2 3 4 5 6 7 It makes me uneasy to see an error in my work.
24. 1 2 3 4 5 6 7 I do not expect a lot from my friends.
25. 1 2 3 4 5 6 7 Success means that I must work even harder to please others.
26. 1 2 3 4 5 6 7 If I ask someone to do something, I expect it to be done flawlessly.
27. 1 2 3 4 5 6 7 I cannot stand to see people close to me make mistakes.
28. 1 2 3 4 5 6 7 I am perfectionistic in setting my goals.
29. 1 2 3 4 5 6 7 The people who matter to me should never let me down.
30. 1 2 3 4 5 6 7 Others thinks I am okay, even when I do not succeed.
31. 1 2 3 4 5 6 7 I feel that people are too demanding of me.
32. 1 2 3 4 5 6 7 I must work to my full potential at all times.
33. 1 2 3 4 5 6 7 Although they may not show it, other people ger very upset with me when I slip up.
34. 1 2 3 4 5 6 7 I do not have to be the best at whatever I am doing.
35. 1 2 3 4 5 6 7 My family expects me to be perfect.
36. 1 2 3 4 5 6 7 I do not have very high goals for myself.
37. 1 2 3 4 5 6 7 My parents rarely expected me to excel in all aspects of my life.
38. 1 2 3 4 5 6 7 I respect people who are average.
39. 1 2 3 4 5 6 7 People expect nothing less than perfection from me.
40. 1 2 3 4 5 6 7 I set very high standards for myself.
41. 1 2 3 4 5 6 7 People expect more from me than I am capable of giving.
42. 1 2 3 4 5 6 7 I must always be successful at school or work.
43. 1 2 3 4 5 6 7 It does not matter to me when a close friend does not try their hardest.
44. 1 2 3 4 5 6 7 People around me think I am still competent even if I make a mistake.
45. 1 2 3 4 5 6 7 I seldom expect others to excel at whatever they do.

## Appendix J

## Multidimensional Scale of Perceived Social Support

**We are interested in how you feel about the following statements. Read each statement carefully. Please indicate how you feel about each statement by circling the appropriate number using the following scale:**

- 1 = Very strongly disagree**
- 2 = Strongly disagree**
- 3 = Mildly disagree**
- 4 = Neutral**
- 5 = Mildly agree**
- 6 = Strongly agree**
- 7 = Very strongly agree**

1. 1 2 3 4 5 6 7      There is a special person who is around when I am in need.
2. 1 2 3 4 5 6 7      There is a special person with whom I can share joys and sorrows.
3. 1 2 3 4 5 6 7      My family really tries to help me.
4. 1 2 3 4 5 6 7      I get the emotional help and support I need from my family.
5. 1 2 3 4 5 6 7      I have a special person who is a real source of comfort to me.
6. 1 2 3 4 5 6 7      My friends really try to help me.
7. 1 2 3 4 5 6 7      I can count on my friends when things go wrong.
8. 1 2 3 4 5 6 7      I can talk about my problems with my family.
9. 1 2 3 4 5 6 7      I have friends with whom I can share my joys and sorrows.
10. 1 2 3 4 5 6 7      There is a special person in my life who cares about my feelings.
11. 1 2 3 4 5 6 7      My family is willing to help me make decisions.
12. 1 2 3 4 5 6 7      I can talk about my problems with my friends.

## Appendix K

## Proactive Coping Inventory

The following statements deal with reactions you may have to various situations. Indicate how true each of these statements is depending on how you feel about the situation. Please read each item carefully and circle the most appropriate number, using the following scale:

1 = Not at all true    2 = Barely true    3 = Somewhat true    4 = Completely true

- |     |   |   |   |   |   |
|-----|---|---|---|---|---|
| 1.  | 1 | 2 | 3 | 4 | I am a take charge person.  |
| 2.  | 1 | 2 | 3 | 4 | I try to let things work out on their own.  |
| 3.  | 1 | 2 | 3 | 4 | After attaining a goal, I look for another, more challenging one.                                   |
| 4.  | 1 | 2 | 3 | 4 | I like the challenges and beating the odds.   |
| 5.  | 1 | 2 | 3 | 4 | I visualize my dreams and try to achieve them.  |
| 6.  | 1 | 2 | 3 | 4 | Despite numerous setbacks, I usually succeed in getting what I want.                                |
| 7.  | 1 | 2 | 3 | 4 | I try to pinpoint what I need to succeed.   |
| 8.  | 1 | 2 | 3 | 4 | I always try to find a way to work around obstacles; nothing really stops me.                       |
| 9.  | 1 | 2 | 3 | 4 | I often see myself failing so I don't get my hopes up too high.                                     |
| 10. | 1 | 2 | 3 | 4 | When I apply for a position, I imagine myself filling it.   |
| 11. | 1 | 2 | 3 | 4 | I turn obstacles into positive experiences.   |
| 12. | 1 | 2 | 3 | 4 | If someone tells me I can't do something, you can be sure I will do it.                             |
| 13. | 1 | 2 | 3 | 4 | When I experience a problem, I take the initiative in resolving it.                                 |
| 14. | 1 | 2 | 3 | 4 | When I have a problem, I usually see myself in a no-win situation.                                  |
| 15. | 1 | 2 | 3 | 4 | I imagine myself solving difficult problems.  |
| 16. | 1 | 2 | 3 | 4 | Rather than acting impulsively, I usually think of various ways to solve a problem.                 |
| 17. | 1 | 2 | 3 | 4 | In my mind I go through many different scenarios in order to prepare myself for different outcomes. |
| 18. | 1 | 2 | 3 | 4 | I tackle a problem by thinking about realistic alternatives.  |

19. 1 2 3 4 When I have a problem with my co-workers, friends, or family, I imagine beforehand how I will deal with them successfully.
20. 1 2 3 4 Before tackling a difficult task I imagine success scenarios.
21. 1 2 3 4 I take action only after thinking carefully about a problem.
22. 1 2 3 4 I imagine myself solving a difficult problem before I actually have to face it.
23. 1 2 3 4 I address a problem from various angles until I find the appropriate action.
24. 1 2 3 4 When there are serious misunderstandings with co-workers, family members or friends, I practice before how I will deal with them.
25. 1 2 3 4 I think about every possible outcome to a problem before tackling it.
26. 1 2 3 4 I often find ways to break down difficult problems into manageable components.
27. 1 2 3 4 I make a plan and follow it.
28. 1 2 3 4 I break down a problem into smaller parts and do one part at a time.
29. 1 2 3 4 I make lists and try to focus on the most important things first.
30. 1 2 3 4 I plan for future eventualities.
31. 1 2 3 4 Rather than spending every cent I make, I like to save it for a rainy day.
32. 1 2 3 4 I prepare for adverse events.
33. 1 2 3 4 Before disaster strikes I am well-prepared for its consequences.
34. 1 2 3 4 I plan my strategies to change a situation before I act.
35. 1 2 3 4 I develop my job skills to protect myself against unemployment.
36. 1 2 3 4 I make sure my family is well taken care of to protect them from adversity in the future.
37. 1 2 3 4 I think ahead to avoid dangerous situations.
38. 1 2 3 4 I plan strategies for what I hope will be the best possible outcome.
39. 1 2 3 4 I try to manage my money well in order to avoid being destitute in old age.
40. 1 2 3 4 When solving my own problems other people's advice can be helpful.

41. 1 2 3 4 I try to talk and explain my stress in order to get feedback from my friends.
42. 1 2 3 4 Information I get from others has often helped me deal with my problems.
43. 1 2 3 4 I can usually identify people who can help me develop my own solutions to problems.
44. 1 2 3 4 I ask others what they would do in my situation.
45. 1 2 3 4 Talking to others can be really useful because it provides another perspective on the problem.
46. 1 2 3 4 Before getting messed up with a problem I'll call a friend to talk about it.
47. 1 2 3 4 When I am in trouble I can usually work out something with the help of others.
48. 1 2 3 4 If I am depressed I know who I can call to help me feel better.
49. 1 2 3 4 Others help me feel cared for.
50. 1 2 3 4 I know who can be counted on when the chips are down.
51. 1 2 3 4 When I'm depressed I get out and talk to others.
52. 1 2 3 4 I confide my feelings in others to build up and maintain close relationships.
53. 1 2 3 4 When I have a problem I like to sleep on it.
54. 1 2 3 4 If I find a problem too difficult sometimes I put it aside until I'm ready to deal with it.
55. 1 2 3 4 When I have a problem I usually let it simmer on the back burner for a while.

## Appendix L

## Profile of Fatigue-Related Symptoms Scale

**Below is a list of problems which may or may not apply to you. For each problem, please say to what extent you have experienced this during the PAST WEEK (including today). Do not think for too long before answering but give your immediate reaction. Please answer all of the items. Give your answer by circling any number from 0 to 6, where:**

0=Not at all

3=Moderately

6=Extremely

- |     |               |  |
|-----|---------------|--|
| 1.  | 1 2 3 4 5 6 7 | Feeling physically tired even when taking things easy. |
| 2.  | 1 2 3 4 5 6 7 | Your limbs feeling heavy.                              |
| 3.  | 1 2 3 4 5 6 7 | Getting easily upset by things.                        |
| 4.  | 1 2 3 4 5 6 7 | Difficulty concentrating.                              |
| 5.  | 1 2 3 4 5 6 7 | Stomach pain.  |
| 6.  | 1 2 3 4 5 6 7 | Not having the physical energy to do anything.         |
| 7.  | 1 2 3 4 5 6 7 | Difficulty standing for long.                          |
| 8.  | 1 2 3 4 5 6 7 | Losing your temper easily.                             |
| 9.  | 1 2 3 4 5 6 7 | Difficulty remembering things.                         |
| 10. | 1 2 3 4 5 6 7 | Muscles feeling weak even after resting.               |
| 11. | 1 2 3 4 5 6 7 | Feeling depressed.                                     |
| 12. | 1 2 3 4 5 6 7 | Muscles tender to touch.                               |
| 13. | 1 2 3 4 5 6 7 | Slowness of thought.                                   |
| 14. | 1 2 3 4 5 6 7 | Tremor or twitching.                                   |
| 15. | 1 2 3 4 5 6 7 | The slightest exercise making you physically tired.    |
| 16. | 1 2 3 4 5 6 7 | Being irritable.                                       |
| 17. | 1 2 3 4 5 6 7 | Difficulty reasoning things out.                       |
| 18. | 1 2 3 4 5 6 7 | Burning, tingling or crawling sensations.              |
| 19. | 1 2 3 4 5 6 7 | Numbness in some part of your body.                    |
| 20. | 1 2 3 4 5 6 7 | Back pain.   |
| 21. | 1 2 3 4 5 6 7 | Feeling anxious.                                       |

22. 1 2 3 4 5 6 7 A feeling of confusion (“mental fog”)
23. 1 2 3 4 5 6 7 Bouts of sweating (day or night)
24. 1 2 3 4 5 6 7 Feeling physically drained.
25. 1 2 3 4 5 6 7 Dizziness or giddiness.
26. 1 2 3 4 5 6 7 Absent-mindedness.
27. 1 2 3 4 5 6 7 Worrying about things that do not matter.
28. 1 2 3 4 5 6 7 Feeling physically tired after a good night’s sleep.
29. 1 2 3 4 5 6 7 Difficulty understanding e.g. what someone was saying to you.
30. 1 2 3 4 5 6 7 Feeling pessimistic about the future.
31. 1 2 3 4 5 6 7 Cold hands or feet.
32. 1 2 3 4 5 6 7 Having to stop doing something, that was easy in itself, because it made you tired.
33. 1 2 3 4 5 6 7 Muscles feeling weak after slight exercise.
34. 1 2 3 4 5 6 7 Difficulty following things e.g. a simple plot on TV
35. 1 2 3 4 5 6 7 Hot or cold spells.
36. 1 2 3 4 5 6 7 Feeling tense.
37. 1 2 3 4 5 6 7 Feeling faint.
38. 1 2 3 4 5 6 7 Difficulty finding the right word.
39. 1 2 3 4 5 6 7 Feeling chilled or shivery.
40. 1 2 3 4 5 6 7 Tearfulness.
41. 1 2 3 4 5 6 7 Irregular or rapid heart beats.
42. 1 2 3 4 5 6 7 Feeling worthless.
43. 1 2 3 4 5 6 7 Forgetting what you were trying to say.
44. 1 2 3 4 5 6 7 Being easily angered when things went wrong.
45. 1 2 3 4 5 6 7 Feeling mentally tired even after a good night’s sleep.
46. 1 2 3 4 5 6 7 Diarrhea or constipation.
47. 1 2 3 4 5 6 7 Feeling nervous.
48. 1 2 3 4 5 6 7 Feeling sad.
49. 1 2 3 4 5 6 7 The slightest effort making you physically tired.
50. 1 2 3 4 5 6 7 Feeling like you had a temperature.

- 51. 1 2 3 4 5 6 7 Other people annoying you.
- 52. 1 2 3 4 5 6 7 A sore throat.
- 53. 1 2 3 4 5 6 7 Feelings or resentment.
- 54. 1 2 3 4 5 6 7 Being slow to react.



## Appendix M

## Rational Behavior Inventory

**For each of the following questions, please follow the scale and circle the response that most clearly reflects your opinion. Work quickly and please answer each question.**

**1=Strongly disagree    2=Disagree    3=Neutral    4=Agree    5=Strongly agree**

1. 1 2 3 4 5      Helping others is the very basis of life.
2. 1 2 3 4 5      It is necessary to be especially friendly to new colleagues and neighbors.
3. 1 2 3 4 5      People should observe moral laws more strictly than they do.
4. 1 2 3 4 5      I find it difficult to take criticism without feeling hurt.
5. 1 2 3 4 5      I often spend more time trying to think of ways of getting out of things than it would take me to do them.
6. 1 2 3 4 5      I tend to become terribly upset and miserable when things are not the way I would like them to be.
7. 1 2 3 4 5      It is impossible at any given time to change one's emotions.
8. 1 2 3 4 5      It is sinful to doubt the Bible.
9. 1 2 3 4 5      Sympathy is the most beautiful human emotion.
10. 1 2 3 4 5      I shrink from facing a crisis or difficulty.
11. 1 2 3 4 5      I often get excited or upset when things go wrong.
12. 1 2 3 4 5      One should rebel against doing unpleasant things, however necessary, if doing them is unpleasant.
13. 1 2 3 4 5      I get upset when neighbors are very harsh with their little children.
14. 1 2 3 4 5      It is realistic to expect that there should be no incompatibility in marriage.
15. 1 2 3 4 5      I frequently feel unhappy with my appearance.
16. 1 2 3 4 5      A person should be thoroughly competent, adequate, talented, and intelligent in all possible respects.
17. 1 2 3 4 5      What others think of you is most important.
18. 1 2 3 4 5      Other people should make things easier for us, and help with life's difficulties.
19. 1 2 3 4 5      I tend to look to others for the kind of behavior they approve as right or wrong.

20. 1 2 3 4 5 I find that my occupation and social life tend to make me unhappy.
21. 1 2 3 4 5 I usually try to avoid doing chores which I dislike doing.
22. 1 2 3 4 5 Some of my family and/or friends have habits that bother and annoy me very much.
23. 1 2 3 4 5 I tend to worry about possible accidents and disasters.
24. 1 2 3 4 5 I like to bear responsibility alone.
25. 1 2 3 4 5 I get terribly upset and miserable when things are not the way I like them to be.
26. 1 2 3 4 5 I worry quite a bit over possible misfortunes.
27. 1 2 3 4 5 Punishing oneself for all errors will prevent future mistakes.
28. 1 2 3 4 5 One can best help others by criticizing them and sharply pointing out the error of their ways.
29. 1 2 3 4 5 Worrying about a possible danger will help ward it off or decrease its effects.
30. 1 2 3 4 5 I worry about little things.
31. 1 2 3 4 5 Certain people are bad, wicked, villainous and should be severely blamed and punished for their sins.
32. 1 2 3 4 5 A large number of people are guilty of bad sexual conduct.
33. 1 2 3 4 5 One should blame oneself severely for all mistakes and wrongdoings.
34. 1 2 3 4 5 It makes me very uncomfortable to be different.
35. 1 2 3 4 5 I worry over possible misfortunes.
36. 1 2 3 4 5 I prefer to be independent of others in making decisions.
37. 1 2 3 4 5 Because a certain thing once strongly affected one's life, it should indefinitely affect it.

## Appendix N

## Social Support Appraisals Scale

**Below is a list of statements about your relationships with family and friends. Please indicate how much you agree or disagree with each statement as being true.**

**1 = Strongly agree    2 = Agree    3 = Disagree    4 = Strongly disagree**

- |     |   |   |   |   |  |
|-----|---|---|---|---|--|
| 1.  | 1 | 2 | 3 | 4 | My friends respect me.                               |
| 2.  | 1 | 2 | 3 | 4 | My family cares for me very much.                    |
| 3.  | 1 | 2 | 3 | 4 | I am not important to others.                        |
| 4.  | 1 | 2 | 3 | 4 | My family holds me in high esteem.                   |
| 5.  | 1 | 2 | 3 | 4 | I am well liked.                                     |
| 6.  | 1 | 2 | 3 | 4 | I can rely on my friends.                            |
| 7.  | 1 | 2 | 3 | 4 | I am really admired by my family.                    |
| 8.  | 1 | 2 | 3 | 4 | I am respected by other people.                      |
| 9.  | 1 | 2 | 3 | 4 | I am loved dearly by my family.                      |
| 10. | 1 | 2 | 3 | 4 | My friends don't care about my welfare.              |
| 11. | 1 | 2 | 3 | 4 | Members of my family rely on me.                     |
| 12. | 1 | 2 | 3 | 4 | I am held in high esteem.                            |
| 13. | 1 | 2 | 3 | 4 | I can't rely on my family for support.               |
| 14. | 1 | 2 | 3 | 4 | People admire me.                                    |
| 15. | 1 | 2 | 3 | 4 | I feel a strong bond with my friends.                |
| 16. | 1 | 2 | 3 | 4 | My friends look out for me.                          |
| 17. | 1 | 2 | 3 | 4 | I feel valued by other people.                       |
| 18. | 1 | 2 | 3 | 4 | My family really respects me.                        |
| 19. | 1 | 2 | 3 | 4 | My friends and I are really important to each other. |
| 20. | 1 | 2 | 3 | 4 | I feel like I belong.                                |
| 21. | 1 | 2 | 3 | 4 | If I died tomorrow, very few people would miss me.   |
| 22. | 1 | 2 | 3 | 4 | I don't feel close to members of my family.          |
| 23. | 1 | 2 | 3 | 4 | My friends and I have done a lot for one another.    |

Appendix 0

Social Support Questionnaire

The following questions ask about people in your environment who provide you with help or support. Each question has two parts. For the first part, list all the people you know, excluding yourself, whom you can count on for help or support in the manner described. Give the persons' initials, their relationship to you (see example). Do not list more than one person next to each of the numbers beneath the question.

For the second part, circle how satisfied you are with the overall support you have.

If you have no support for a question, circle the words "No one" but still rate your level of satisfaction. Do not list more than nine persons per question.

Please answer all questions as best you can. All your responses will be kept confidential.

**EXAMPLE:**

Who do you know whom you can trust with information that could get you in trouble?

- |        |                    |                     |    |
|--------|--------------------|---------------------|----|
| No one | 1) T. N. (brother) | 4) T. N. (father)   | 7) |
|        | 2) L. M. (friend)  | 5) L. M. (employer) | 8) |
|        | 3) R. S. (friend)  | 6)                  | 9) |

**How satisfied?**

- |                    |                      |                        |                           |                         |                       |
|--------------------|----------------------|------------------------|---------------------------|-------------------------|-----------------------|
| 6 - very satisfied | 5 - fairly satisfied | 4 - a little satisfied | 3 - a little dissatisfied | 2 - fairly dissatisfied | 1 - very dissatisfied |
|--------------------|----------------------|------------------------|---------------------------|-------------------------|-----------------------|
- 

**1. Whom can you really count on to be dependable when you need help?**

- |        |    |    |    |
|--------|----|----|----|
| No one | 1) | 4) | 7) |
|        | 2) | 5) | 8) |
|        | 3) | 6) | 9) |

**2. How satisfied?**

- |                    |                      |                        |                           |                         |                       |
|--------------------|----------------------|------------------------|---------------------------|-------------------------|-----------------------|
| 6 - very satisfied | 5 - fairly satisfied | 4 - a little satisfied | 3 - a little dissatisfied | 2 - fairly dissatisfied | 1 - very dissatisfied |
|--------------------|----------------------|------------------------|---------------------------|-------------------------|-----------------------|

**3. Whom can you really count on to help you feel more relaxed when you are under pressure or tense?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**4. How satisfied?**

6 - very satisfied	5 - fairly satisfied	4 - a little satisfied	3 - a little dissatisfied	2 - fairly dissatisfied	1 - very dissatisfied
--------------------	----------------------	------------------------	---------------------------	-------------------------	-----------------------

**5. Who accepts you totally, including both your worst and your best points?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**6. How satisfied?**

6 - very satisfied	5 - fairly satisfied	4 - a little satisfied	3 - a little dissatisfied	2 - fairly dissatisfied	1 - very dissatisfied
--------------------	----------------------	------------------------	---------------------------	-------------------------	-----------------------

**7. Whom can you really count on to care about you, regardless of what is happening to you?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**8. How satisfied?**

6 - very satisfied	5 - fairly satisfied	4 - a little satisfied	3 - a little dissatisfied	2 - fairly dissatisfied	1 - very dissatisfied
--------------------	----------------------	------------------------	---------------------------	-------------------------	-----------------------

**9. Whom can you really count on to help you feel better when you are feeling generally down-in-the dumps?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**10. How satisfied?**

6 - very satisfied	5 - fairly satisfied	4 - a little satisfied	3 - a little dissatisfied	2 - fairly dissatisfied	1 - very dissatisfied
-----------------------	-------------------------	---------------------------	------------------------------	----------------------------	--------------------------

**11. Whom can you count on to console you when you are very upset?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**12. How satisfied?**

6 - very satisfied	5 - fairly satisfied	4 - a little satisfied	3 - a little dissatisfied	2 - fairly dissatisfied	1 - very dissatisfied
-----------------------	-------------------------	---------------------------	------------------------------	----------------------------	--------------------------

Appendix P

Stress Self-Report

**Please indicate, on the line below, to what degree you feel you have been stressed over the past year on a scale ranging from 1 to 100 with 1 being (not at all stressed) and 100 being (very stressed all the time).**

**Indicate your perceived stress rating here \_\_\_\_\_**

## Appendix Q

Five Random Questionnaire Package Orders (as identified by codes 1-5)

<b>Code 1</b>	<b>Code 2</b>	<b>Code 3</b>	<b>Code 4</b>	<b>Code 5</b>
PFRS	CUSS	FS	PFRS	MPS
CUSS	MSPSS	RBI	MSPSS	SSA
SSQ6	ATQ	ATQ	CESD	PFRS
FIS	FIS	CESD	CUSS	DAS
MPS	FS	CUSS	ATQ	RBI
RBI	MPS	DAS	SSA	FS
ATQ	SSQ6	PFRS	SSQ6	SSQ6
DAS	SSA	SSA	FIS	CESD
CESD	RBI	MPS	DAS	MSPSS
MSPSS	PCI	MSPSS	FS	PCI
SSA	DAS	SSQ6	PCI	CUSS
FS	CESD	PCI	RBI	FIS
PCI	PFRS	FIS	MPS	ATQ



## Appendix R

**Understanding Fatigue:  
An Exploratory Study of the Role of Psychosocial Variables**

Fatigue is a widespread symptom which has been linked with many illnesses, both chronic and acute, as well as with the more normal functioning of a person's regular or daily life. Although fatigue is acknowledged as a significant problem for individuals, it remains one of the human responses to be least researched, and as such least explained and understood.

Komaroff, a physician at Harvard medical school and an expert on chronic fatigue, states that the primary presenting symptom of individuals seeking help from a medical professional is fatigue. He notes that, in a great majority of cases, no physical basis for the fatigue can be found. The most general interpretation is that the fatigue can be attributed to being overworked or depressed. Furthermore, a recent British epidemiological survey found that twenty percent of British people describe themselves as having been extremely tired all of the time over the last month. Findings of this nature bolster the argument for examining more thoroughly fatigue and its correlates. Fatigue is evidently a widespread problem and there is a lack of research being conducted in this particular area.

Studies conducted thus far have reported an existing comorbidity between depression and fatigue. Further studies have also demonstrated that there are particular cognitive distortions that characterize individuals suffering from depression. However, research examining more thoroughly the links that may exist between fatigue, depression, and various cognitive attitudinal distortions is scarce. The basis for the proposed research project comes from research that has related particular cognitive distortions to extreme forms of fatigue, as in CFS. In examining more thoroughly the current findings being reported in the CFS literature, there is a reasonable basis on which to test whether an attributional pattern of cognitive distortions to fatigue could be evident in less extreme cases of fatigue, as would be exhibited in the general population.

In addition, studies conducted thus far have also reported links between various psychosocial variables such as stress, ways of coping, and social support and the development of or maintenance of chronic fatigue. However, research examining more closely the way in which these variables interact with others and with each other to impact on the experience of fatigue in a normal (not clinically diagnosed) population is scarce. It seems apparent that the complexities of the experience of fatigue cannot be adequately explained by exclusively physical or psychological explanations. Consequently, the value of developing a multifactorial model of factors increasing the vulnerability to fatigue is heightened. In attempting to clarify both the variables increasing one's susceptibility to fatigue and the processes by which these variables interact one would allow for the possibility of using cognitive behavioral techniques and stress management training as preventative measures for populations at risk of developing chronic fatigue.

The primary goal of the present study is to do an exploratory study of the way in which various factors (fatigue, depression, perceived social support, cognitive distortions, coping, and stress) relate to one another, in an attempt to develop a tentative multifactorial model of the psychosocial variables increasing vulnerability to fatigue.

**YOUR PARTICIPATION IN THIS STUDY IS VERY MUCH APPRECIATED.**

**THANK YOU FOR YOUR TIME.**