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**The Role of Severe Life Stress,  
Social Support, and Attachment in the Onset  
of Chronic Fatigue Syndrome**

by

**Melissa Isabella Mayer**

A thesis submitted in conformity with the requirements  
for the Degree of Doctor of Education  
Department of Adult Education, Community Development, and Counselling Psychology,  
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University of Toronto

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**THE ROLE OF SEVERE LIFE STRESS,  
SOCIAL SUPPORT, AND ATTACHMENT IN THE ONSET  
OF CHRONIC FATIGUE SYNDROME**

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Department of Adult Education, Community Development, and Counselling  
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**ABSTRACT**

At present there is no known cure for chronic fatigue syndrome (CFS). Also, neither medical nor psychological models have been able to discover the cause of CFS. The present study investigates four psychosocial variables (life stress, social support, adult attachment, and parental bonding) that are hypothesized to predispose individuals to this illness. Twenty-two participants (5 men and 17 women) diagnosed with CFS were recruited from support and education groups in the Metropolitan Toronto area. They were compared to 24 healthy control participants (6 men and 18 women) recruited from the Graduate Department of Education at the University of Toronto. Each participant completed the Short Life Events and Difficulties Interview, a social support interview, the Beck Depression Inventory (BDI), the Relationship Questionnaire (RQ), the Relationship Scales Questionnaire (RSQ), the Revised Adult Attachment Scale (RAAS), and the Parental Bonding Inventory (PBI). Significant differences were found between groups on the BDI, RAAS, and PBI questionnaires. In addition, interview data revealed that in the year prior to the onset of their illness, CFS participants experienced significantly more stress and less support than healthy control participants. A hierarchical logistic regression analysis was conducted to investigate which of the variables in the present study were most predictive of CFS. Severe life stress was the

only predictor variable that significantly distinguished between the two groups (Wald (1) = 4.84,  $p = .028$ ), with the social support variable approaching significance in the equation (Wald (1) = 3.28,  $p = .070$ ). Overall, the resulting regression equation correctly classified 78.3% of the participants in the present study. A multifactorial model of CFS based on the findings of this study is presented.

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## **Organization of the Paper**

The following paper is divided into the standard sections found in most scientific papers (i.e., introduction, method, results, and discussion). Each section is further divided into subsections. Generally, each of these subsections focuses on one of the independent variables of interest in the present study (i.e., stress, social support, adult attachment and parental bonding). Each subsection is usually followed by a review or summary.

## **Introduction**

**Chronic fatigue syndrome (CFS) is a debilitating illness characterized by fatigue and other persistent symptoms. Holmes, Kaplan, Gantz, Komaroff, and Schonberger (1988) proposed the following case definition of CFS for research purposes. There are two major criteria that must be fulfilled for a diagnosis of CFS. First, there must be persistent or relapsing fatigue that does not improve with bed rest, impairs daily functioning to at least 50% below the individual's previous level, and persists for a period of at least six months; and second, other medical or clinical conditions that cause similar fatigue must be ruled out. The minor criteria of CFS can be met in two ways. The patient must have at least 6 of the 11 symptom criteria and at least 2 physical criteria, or at least 8 of the 11 symptom criteria. The symptom criteria include mild fever (37.5°C to 38.6°C) or chills, sore throat, muscle discomfort or myalgia, unexplained or generalized muscle weakness, painful lymph nodes, prolonged generalized fatigue after exercise (at least 24 hours), migratory joint pain without joint swelling or redness, neuropsychological complaints (at least one of the following: forgetfulness, excessive irritability, confusion, difficulty thinking, inability to concentrate, depression, sensitivity to light, temporary visual blind or dark spots), sleep disturbance (hypersomnia or insomnia), generalized headaches, and/or initial symptoms that developed over a few hours or a few days. The physical criteria include low-grade fever, sore throat with no exudate, and palpable or tender anterior or posterior cervical or axillary (i.e., arm pit) lymph nodes.**

### Current Approaches to CFS

At present there is no known cure for CFS. Similarly, neither medical nor psychological models have been able to discover the cause of CFS. Initially, the search for causes focused on organic factors. The onset of CFS was suspected to be linked with the Epstein-Barr virus (EBV) (Jones, Ray, & Minnich, 1985; Straus, Tosato, & Armstrong, 1985). Later, it was discovered that CFS occurred after flu-like symptoms resulting from viruses other than EBV (Salit, 1985). To date, no single strain of virus or bacteria has been found to cause CFS and there are no blood tests to identify this illness.

Other researchers suspected that CFS was closely linked to psychological functioning. Taerk, Toner, Salit, Garfinkel, and Ozersky (1987) conducted one of the first studies that systematically assessed the psychological functioning of individuals with CFS. Results from the Diagnostic Interview (i.e., DSM-III R) suggested that 54% of the CFS group had experienced at least one episode of major depression following the onset of CFS. Even more surprising was the finding that 50% of CFS sufferers reported a major depression prior to the onset of the CFS. In comparison, 12% of the control group had experienced a major depression prior to the study.

Ware and Kleinman (1992) reviewed the literature on depression and CFS. According to the studies they reviewed, between 46% and 73% of CFS participants reported a major depression during their lifetime (including during the time period that they had CFS). The literature also revealed that between 7% and 50% of CFS sufferers had experienced a major depressive disorder prior to the onset of their CFS. Note, however, that a minimum of 27% of CFS sufferers did not report a major

depression during their lifetime.

To date it appears that neither medical nor psychological explanations alone can fully incorporate all the factors involved with the onset of CFS. More recently, multifactorial models have emerged that combine medical, psychological, and social explanations for CFS (e.g., David, 1991; Ray, Weir, Cullen, & Phillips, 1992; Ware & Kleinman, 1992). One hypothesis is that the organic illness is triggered in psychologically vulnerable individuals (Taerk et al., 1987). It has also been suggested that stress may be a contributing factor in the expression of CFS (Salit, Abbey, Moldofsky, Ichise, & Garfinkel, 1989).

### Life Stress

Life stress in CFS sufferers has been investigated, with inconsistent results to date. For example, some researchers have found that CFS participants experienced significantly more life stressors in the year prior to the illness onset (Salit, 1997); other researchers have not found this (MacDonald, Osterholm, & LeDell, 1996).

Salit (1997) recruited 134 CFS patients and 35 healthy controls. He found through the use of a standardized questionnaire that the CFS group had experienced significantly more stressful events in the year prior to their illness than the control group. In contrast to these findings, MacDonald et al. (1996) compared 47 CFS sufferers with 47 matched controls and found no significant differences between the two groups in the number of "major life events". They gathered information about major life events through a brief standardized telephone interview that inquired about areas such as "death of a relative or close friend, severe illness, move, job change, marriage, birth of a

child, or other major life change" (MacDonald et al., 1996, p. 550). However, these authors did find that CFS sufferers were more likely to have exercised regularly before their illness than the healthy controls.

Stricklin, Sewell, and Austad (1990) compared 25 CFS sufferers with 25 non-patient controls who were matched by age, sex, and socio-economic status. CFS sufferers reported experiencing more loss-related life events in 12 months prior to the onset of CFS than healthy controls. Loss-related events included death of a spouse, death of a close family member, or death of a close friend. Sufferers also reported eating and sleeping less prior to illness onset. No significant differences between other stress-producing incidents (e.g., illness, or changes in recreation, work, residence, or social activities) were found between the two groups as measured by the Holmes and Rahe Social Readjustment Scale (Holmes & Rahe, 1967).

Ware and Kleinman (1992) conducted in-depth interviews and found that many CFS sufferers attributed the onset of their illness to stressful lifestyles. In addition, sufferers reported negative life events (e.g., divorce, job loss, death of someone close) prior to the onset of their CFS. At the time of interview, many participants reported ongoing stressors in their lives such as serious illness, work difficulties, and marriage problems. When asked the cause of the CFS, a large proportion of CFS sufferers responded, "Stress". Approximately half felt that it was a contributing factor or the most probable cause of their illness. When asked to clarify what stress meant for them, respondents commented, "worry, the feeling of having too much to do, experiences of loss, feeling alone and incurring the displeasure of others" (Ware & Kleinman, 1992, p. 552).

Lewis, Cooper, and Bennett (1994) compared 47 irritable bowel syndrome patients, 47 CFS sufferers, and 30 healthy controls, using a stressful life events checklist developed by Cooper, Cooper, and Faragher (1989). Only one significant difference in 42 stressful life events was discovered: CFS sufferers reported "buying house" and "moving house", in the two years prior to becoming ill, more often than either of the other two groups. The authors commented that the retrospective reporting of events and their severity is of questionable validity when self-report checklists are utilized. "Other techniques including interviews are more effective for placing events in context and assessing the meanings attached to them" (p. 668). The authors suggest that future research could employ more sophisticated measures of life events, such as the Life Events and Difficulties Schedule (LEDS)(Brown & Harris, 1989), which produces both quantitative and qualitative data about life events and their meanings. I adopted a short form of the LEDS in the present study.

Lewis (1996) reviewed the literature on stress and the onset of CFS and concluded that even though some researchers have found that a large proportion of their participants report stressors prior to their illness onset (e.g., Ware, 1993, Wood, Bentall, Gopfert, & Edwards, 1991), results from these studies are weak due to the lack of a control or comparison group. Lewis comments, "The research has used the Holmes and Rahe scale or modifications of this or simply asked one question to avoid expanding already long interviews ... the limitations of these approaches are well documented (Brown & Harris, 1989)" (Lewis, 1996, p. 236).

One of the major criticisms of the checklist questionnaires is that there is as much variability within a particular event category as there is between categories

(Brown & Harris, 1989). Brown and Harris discuss the category “move to a new house”. They explain that this type of category can mean many things and have many contexts: “Is the moved planned or enforced, or to a more or less desirable house? Does it mean losing friends? Does it involve financial problems? Is it associated with difficulties in a marriage?” (Brown & Harris, 1989, p. 12).

As suggested by past CFS researchers (Lewis, 1996; Lewis et al., 1994), the present study will employ a shortened version of the Brown and Harris (1978) Life Events and Difficulties Schedule to investigate stress in the year prior to illness onset in CFS sufferers.

### Social Support

Lewis, Cooper, and Bennett (1994) compared the perceived levels of social support of 47 CFS patients, 47 irritable bowel syndrome patients, and 30 healthy controls. Participants were asked to rate on a 5-point Likert scale how much support they had received in coping with crises or personal problems from 10 different sources. These sources included spouse, mother, father, sister(s), brother(s), son(s), daughter(s), other relatives, friends, colleagues, and others. The ill groups were asked to complete these scales for the two years prior to their illness (and again for perceived support in coping with their illness). In contrast, healthy controls completed the scales for the previous two years of their lives. Lewis et al. found that CFS participants perceived significantly less overall social support prior to illness onset when compared to IBS patients and the healthy controls. More specifically, the CFS group perceived significantly less support from certain family members (i.e., mother, father, brothers,

sons, daughters, other relatives), from colleagues and from other acquaintances than did both the IBS and control groups.

When present levels (i.e., after illness onset) of perceived social support were compared between CFS, IBS and healthy participants, the CFS participants still reported significantly less social support from sisters and friends than did either of the other two groups.

Ware and Kleinman (1992) report that CFS sufferers were expressing "self-effacement", having difficulty saying "no" to the demands of other people and always helping people out. As a result they were run down and had little time for themselves. From this ethnographic study it appears that CFS sufferers were more often women caregivers and less likely to be the recipients of care and social support. Ware (1993) supports this hypothesis with data from in-depth interviews with CFS sufferers, during which they describe their perceived lack of social support from family, friends and colleagues.

### Attachment During Childhood

John Bowlby (1969; 1973; 1980) was one of the first theorists to explore human relationships as attachments. His theory is based on both ethology and psychoanalytic thought. He believed that infants and caregivers develop attachments to each other when the infants are young. These bonds increase the infant's proximity to caregivers, thus protecting them from danger. He believed that all infants are born with instinctual behaviours such as clinging, sucking, and following, all of which serve to keep the mother nearby, responsive, and protective.

Building on Bowlby's work, Mary Ainsworth developed the Strange Situation as a way of studying objectively the relationships and attachment styles between mothers and children (Ainsworth, 1978). Mothers and their 12-month-old children were invited to a laboratory, and the baby's behaviours were observed with mother, with a stranger, and by themselves. The reunion of mother and child after the child was left in a strange room alone was carefully observed for behaviours that would indicate what type of relationship existed between the dyad. Through this research, Ainsworth discovered that children developed three different styles of attachment as a response to mother's responsiveness to them. "Secure" babies were visibly upset and cried when their mothers left the room, and greeted her warmly when she returned. They held their arms up to be picked up by her and were quickly and easily consoled. "Anxious-avoidant" children gave the impression of independence and did not seem concerned if mother was in the room or if she left. However, when she returned the child would actively avoid her. In contrast, "anxious/ambivalent" children tended to be clingy and would not explore the room even if mother was present. When mother left the room, they were very upset; and when she returned, these children could not easily be soothed, often arching away from her when they were held. From this research grew the idea that mothers can provide a secure base from which children can explore and learn about their environment. A secure relationship allows a child to go into the world, feeling comfort in the fact that he or she may return to her if "disaster, intense anxiety or severe illness" is encountered (Ainsworth, 1978, p. 14). Recently, attachment theory and related psychoanalytic theories have been used to hypothesize about the cause of CFS.

Taerk and Gnam (1994) presented a psychodynamic view of CFS. They hypothesized that "physiological vulnerability exists in CFS patients as a result of problems in early object relations which contribute to the clinical expression of the syndrome ... vulnerability results from poorly developed capacity for regulating internal states in response to certain types of stressors, namely disturbances in object relations" (p. 321). Taerk and Gnam presented two case studies to support these hypotheses. They speculate that poor "object relations" result from a relationship between a caregiver and infant, where the infant does not learn from the caregiver how to self-regulate his or her internal psychological and physiological processes (Taerk & Gnam, 1994). This child thus becomes dependent on the caregiver and others for this regulation. Taerk and Gnam hypothesize that CFS develops after a disturbance or loss of an individual who has been aiding the predisposed individual in their regulation.

A review of the current literature (using the PsycLit Silverplatter software) found only one quantitative research study that assessed early attachment between CFS sufferers and their parents. Ten CFS adolescent girls were compared to 10 adolescents with cancer in remission and 10 healthy controls (Pelcovitz et al., 1995), using the Parental Bonding Inventory (PBI) (Parker, Tupling, & Brown, 1979). The PBI consists of two subscales that measure parental care and protection. Participants in this study were asked to rate their perceptions of their mothers and fathers with the PBI. No significant differences between groups were found for maternal or paternal care or protection. Pelcovitz et al. critique their study, commenting that the number of subjects in their study was too small to yield statistical significance on the PBI. They had hypothesized that CFS families would describe themselves as more enmeshed, rigid,

and dysfunctional than families whose children had cancer or were healthy. These authors did report that the children with cancer or CFS had mean scores on the paternal overprotection subscale that were almost double those of normal controls, even though they were not significant. They interpret this finding as suggesting that fathers of children with chronic illnesses are more protective of their children as a result of the illness. However, this finding could also be interpreted as suggesting that fathers of children with chronic illness exhibited more parental overprotection, which may have caused stress and thus contributed to the onset of their child's illness. Similarly, high levels of overprotection may impede these children's ability to acquire regulatory skills, as suggested by Taerk et al. (1994). In other words, they did not learn from their fathers how to self-regulate. The original authors of the PBI (Parker et al., 1979) describe "overprotection" as a negative parenting behaviour consisting of control, intrusion, excessive contact, infantilization and prevention of independent behaviours by the child. It is unclear from the above study whether differences in parental bonding contribute to the onset of the chronic illness or are a result of it. The present study will help answer this question, as only individuals who contracted CFS during adulthood will be recruited for this study.

Ware and Kleinman (1992) asked participants with CFS to give a narrative of their childhood. Approximately half of the participants reported negative events and traumas during their childhood, including physical violence, physical abuse, sexual abuse, verbal abuse, alcohol/drug abuse, and tension and fighting in the family. It is clear that many CFS participants experienced a difficult childhood that may have contributed to later susceptibility to this illness. To date, little research has been

undertaken to investigate adult CFS sufferers' perceptions of their relationships with their parents during childhood.

### Adult Attachment

Researchers such Hazan and Shaver (1987), through the use of questionnaires and checklists, have recently attempted to measure attachment in adults based on the original categories defined by Ainsworth (Hazan & Shaver, 1987). Similarly, Mary Main and her colleagues (George, Kaplan, & Main, 1985) have developed the in-depth Adult Attachment Interview to assess attachment styles in adults based on the interviewees' memories and narratives of their relationships with their parents.

Through the use of these measures of adult attachment, two lines of research have emerged that are relevant to the present study. First, Bowlby (1973) theorized that all humans have internal "working models", which are mental representations that individuals develop of themselves, of significant others, and of the world around them. These internal mental representations are based on initially the relationship with the primary caregiver. Infants develop expectations about how responsive, loving, and consistent others will be, and how secure they feel in relation to others (Collins & Read, 1994). They also develop models or perceptions about themselves. Research on "working models" and the resultant attachment styles has found that a person's attachment style is influenced by the responsiveness of his or her caretakers. It follows that the attachment style formed in childhood can affect adult attachments (Goldberg, 1991; Main, Kaplan, & Cassidy, 1985; Steele & Steele, 1994). Therefore, it is hypothesized that the relationships CFS sufferers experienced with their parents during

childhood affect the relationships they have during adulthood and may in fact predispose them to their illness. However, attachment learned from parents is not “written in stone”: it can change during adulthood as a result of life experience and therapy (Bowlby, 1988).

The second line of research relevant to the present study focuses on how attachment style affects an individual's response to stress. Bowlby commented that, “each person's resilience or vulnerability to stressful life events is determined to a very significant degree by the pattern of attachment he or she develops during the early years” (Bowlby, 1988 , p.8). As of yet, comparatively little research exists on human attachment and physiological responses to stress (Dozier & Kobak, 1992; Spangler & Grossmann, 1993). However, the nonhuman primate research is growing rapidly, and a smaller number of studies with human participants support this animal literature (for literature reviews, see (Kraemer, 1992; McGuire & Troisi, 1987; Reite & Boccia, 1994)). McGuire and Troisi (1987) reviewed both the animal and human literature and presented a theory of physiological regulation/deregulation (RDT). The central assumptions of this theory are these: (1) physiological function is influenced by social interactions; (2) certain frequencies and types of social interaction are necessary to maintain normal physical function; and (3) changes in normal physiological function result in unpleasant symptoms, and if these are not altered (e.g., through social interaction) they result in psychiatric disorders (McGuire & Troisi, 1987). To extrapolate to the present study, this theory postulates that when humans experience stress, their bodies react to this stress through physiological deregulation. Social interactions and attachments to others can be used to regain a level of homeostasis in the body, more

rapidly and with less impact on the body than if this interaction was not present. McGuire and Troisi (1987) hypothesize that in vulnerable individuals, a state of continued deregulation results in a psychiatric illness. The authors explain that vulnerable individuals are genetically and/or behaviourally predisposed to illness. Behaviourally predisposed individuals "have reduced behavioural capacities, which limit their ability to engage others in ways that result in physiological regulation; and, behaviours of others that normally regulate may be less effective" (McGuire & Troisi, 1987, p. 11).

In the present study, it is hypothesized that CFS participants experienced less secure relationships with their primary caregivers than did healthy controls. These early relationships became the foundation for the CFS sufferers' internal working models of the world, themselves, and others. These internal models were then carried into adulthood, where CFS sufferers feel less secure depending on others for support and physiological regulation. In times of high stress, these individuals are particularly vulnerable, as they do not have the positive internal working models or the behaviours necessary to elicit support from others to help them self-regulate. This vulnerability may be compounded by the fact that CFS sufferers were not given the opportunity through their relationships with their caregivers, to internalize self-regulatory behaviours. As a result, physiological deregulation continues to negatively affect the body and eventually results in the onset of CFS.

### Rationale

At present, there is a mind-versus-body debate about the factors that trigger CFS. The direction of causality is still unclear. More recently, researchers have attempted to combine the two sides of the debate to arrive at a multifactorial explanation for the cause(s) of CFS. For example, CFS may be the result of an organic illness in individuals who are psychologically vulnerable. Stress may be one factor that increases vulnerability to this illness. The present study attempts to explore the role of life stress in the onset of CFS.

To date, little attention has been paid to psychosocial factors such as life stressors, attachment styles, and social support of CFS sufferers prior to illness onset. Through the investigation of these areas, factors predisposing CFS sufferers to this illness may be discovered. Similarly, findings from this research may provide insight into how to help CFS sufferers cope more effectively with present life stressors and relationships. Through the exploration of social support, adult attachment, and early relationships with parents, effective forms of therapy for CFS sufferers may be suggested.

## Research Questions

### Stressful Life Events

- 1) Is CFS triggered by stressful life events? Do CFS sufferers report more stressful life events and difficulties during the 12 months prior to illness onset, than healthy controls (who report stressful events for the 12 months prior to the interview)?

### Social Support

- 2) Do CFS sufferers report lower levels of social support during the year prior to contracting the illness when compared to non-ill control subjects?

### Attachment

- 3) Do CFS sufferers have less secure attachment styles than people who do not suffer from this illness? Are they comfortable being close to others and depending on others for social support?

### Parental Bonding

- 4) Do CFS sufferers have different bonding patterns with parents than non-sufferers?

## **Method**

### **Study Design**

The present study was designed to investigate the psychosocial factors associated with chronic fatigue syndrome. More specifically, this study attempts to assess the following: (1) life stress prior to illness onset; (2) social support prior to illness onset; (3) parental attachment; and (4) adult attachment in a group of CFS sufferers and a group of non-sufferers.

### **Participants**

#### **CFS Group**

Twenty-two participants (5 men and 17 women) were recruited through CFS support and education groups in the Metropolitan Toronto area. Participants ranged in age from 31 to 59, with a mean age of 46 years ( $SD = 7.28$ ). On average, the members of the group first became ill when they were 36 years old ( $SD = 6.60$ ). The youngest age reported was 17, and the oldest 52. At the time of the interview those in the CFS group had been ill for a mean of 10 years, 4 months ( $SD = 5.86$ ). On average, participants were diagnosed 2 years and 11 months after they first became ill ( $SD = 4.26$ ). The CFS participants were not ethnically diverse: all the participants in this group were White.

Volunteers were included in the study only if they had received a diagnosis of CFS and/or ME from a medical doctor or specialist and therefore all other causes of fatigue had been ruled out. Fourteen of the 22 sufferers had received a diagnosis of CFS from their family doctor or another MD, 14 had received a diagnosis from a

medical specialist, and three had been diagnosed by other medical professionals or organizations (e.g., Division of Infectious Diseases, University of Alberta). Thirteen participants had received their diagnosis from one organization or professional, while 9 participants had been diagnosed by more than one source.

Of the diagnoses received, 21 participants were labelled with CFS, 4 with myalgic encephalomyelitis, 5 with Epstein-Barr virus, 3 with prolonged viral syndrome, and 2 with neurasthenia; 4 participants reported other related medical conditions (e.g., fibromyalgia). Eleven participants had received a single diagnosis, 7 had received two diagnoses, and 3 had received three diagnoses. One had received 5 diagnoses of CFS and/or related illnesses.

Participants were recruited in one of two ways. Either they were informed of the study while attending an education or support group meeting in the Toronto area, or they learned about the study when they telephoned the CFS Information Hotline.

When participants were recruited through education and support group meetings, the investigator explained her study and what participation was to involve. The groups were also told that interested individuals would be called to arrange a time and a place convenient for them.

It is true that there would have been fewer potential confounding variables if participants had all been interviewed in the same environment; however, this consideration was outweighed by the fact that many CFS participants might not have considered participating if they had had to travel long distances. Similarly, the travelling would have increased fatigue and decreased the energy and concentration available for the interview. As a result, the CFS participants were interviewed in their homes (n = 6),

in quiet (and confidential) coffee shops (n = 3) or restaurants (n = 1) near their homes, my home (n = 7), one of my offices (n = 6) or in their office (n = 1).

When participants were recruited through the CFS Hotline, they heard a message explaining that I was a doctoral student at the University of Toronto conducting a research study on CFS. They were informed that I needed participants and that I could be reached by phone if they were interested or wanted more information. Three participants recruited through the CFS Hotline were eligible to participate, and were included in this study.

In both types of recruitment, participants were asked to participate in an "in - person" interview, which typically took less than an hour to complete. The interview would focus on stressful life events, difficulties, and support they may have experienced in the year before they became ill with CFS. They were also informed that they would be asked to complete some questionnaires relating to basic information about themselves (i.e., demographics) and how they were feeling at the time of testing (i.e., Beck Depression Inventory). In addition, they were informed that they could either complete the questionnaire package at the time of the interview, or take it home with them and return it to me in a stamped envelope which was supplied.

Before beginning the interview, each participant was asked to sign a consent form (Appendix A). Each was also asked to complete the demographic information sheet (Appendix B). After the interview, each participant completed the BDI; this was to avoid negatively priming or affecting the mood of the participants (Bower, 1981; Mayer, 1986; Teasdale, 1979). After completion of the interviews and the questionnaires, the participants were given a letter of explanation (Appendix E) and asked if they had any

further questions or concerns about the study. For participants who completed the questionnaire package at home, the letter of explanation was found at the end of the package, with my phone number in case they had any further questions or concerns.

### Inclusion Criteria for CFS Group

All participants needed to be able to read, write, and understand English in order to be included in the study. In one case, it was discovered only after the interview that a participant had been diagnosed with CFS and then subsequently diagnosed with hereditary haemochromatosis ("iron overload"), which also causes fatigue. This participant's data were not included in the present study. Similarly, two men who were interested in the study were not included as they had both self-diagnosed and had not been given a diagnosis by a medical doctor. Finally, the father of a boy who had CFS wanted to participate in the study on his son's behalf. The father informed me that his son was so weak he could not even be interviewed from his bedside. I told the father that I was sorry but this study was set up to interview people who had CFS. I told him I would keep his name on file in case I ever did a study on parents whose children had CFS.

In addition, one participant withdrew her consent to participate after her data had been collected, rated, and entered. She did not wish to participate as she felt the questionnaires were psychological in nature, which contradicted her view that CFS was a physical illness. Her data were withdrawn from the study.

### Comparison Group

Twenty-four participants (6 men and 18 women) were recruited from night school graduate-level courses at the University of Toronto. Participants in this group ranged in age from 25 to 58, with a mean age of 38 years (SD = 10.10). This group's mean age did not differ significantly from that of the CFS group at the time of illness onset ( $t(44) = -.45, p = .655$ ). In addition, this group was not ethnically diverse with 87.5% (n = 21) White, 8.3% (n = 2) Black, and 4.2% (n = 1) Asian participants. Similarly, this comparison group was closely matched for gender with the CFS group.

These students were chosen as a comparison group because it was thought that as mature students, they were leading lifestyles similar to those that CFS sufferers led prior to becoming ill. Ware and Kleinman (1992) comment that, "CFS sufferers ... were leading lives of intense activity and involvement before their illnesses began. Believing in the value of hard work, those who were employed devoted 60, 70, or even 80 hours a week to their jobs. Employment was combined with major responsibilities in other domains such as child-rearing, graduate study and/or attending to the needs of an aging or ill parent." (p. 551). Therefore, night school graduate students were chosen for the comparison group because they were more likely to be employed full-time, to be of the same age as CFS sufferers at the time of illness onset (i.e., over 30), and to have other major responsibilities which included graduate school.

The investigator attended evening classes taught by her thesis supervisor. These courses focused on depression, creativity, and/or wellness. I was introduced to the class as a doctoral student conducting my thesis who was looking for participants for this study. I briefly reviewed my dissertation and what participation would entail. The same procedure and information I used to recruit CFS participants was used for

the comparison group. Questions about the study and CFS were welcomed. I asked interested individuals to sign up on a sheet that was passed around the room. The interested individuals were told they would be called to arrange a time and a place convenient for them. These participants were interviewed in their home ( $n = 1$ ), or at my office at the university ( $n = 9$ ), or at their office ( $n = 13$ ), and or on campus ( $n = 1$ ).

#### Inclusion Criteria for the Comparison Group

There were no specific inclusion criteria for the comparison group, except that they needed to be students at the university and needed to be able to read, write, and understand English. All participants who signed up for the study were included.

#### Materials

All participants completed the following questionnaires, which were randomized using a random numbers table (except for the BDI). Three attachment questionnaires were included in the present study. This was done to ensure that the different dimensions of attachment were measured for each participant. For example, the Relationship Questionnaire is designed to assess close relationships, while the Revised Adult Attachment Questionnaire assesses romantic relationships.

In addition, both the Relationship Scales Questionnaire and the Relationship Questionnaire were included in the present study, even though they are designed to measure similar attachment dimensions. Both were included in an attempt to confirm and cross-validate the attachment category suggested by the other scale for each participant. There is presently a debate in the literature as to whether questionnaires

are as effective as interviews at correctly classifying participants into attachment categories (Bartholomew, 1991). In addition, adult attachment has not yet been investigated in CFS sufferers, which means that no research exists to cross-validate the results from the present study. Therefore, two scales that measure the same attachment categories were included in the present study. (The interested reader can refer to Feeney, Noller, & Hanrahan, 1994 for an overview of the attachment measurement literature.)

*The Relationship Questionnaire (RQ)* (Bartholomew & Horowitz, 1991).

The Relationship Questionnaire asks participants to read descriptions of four different relationship styles, and then choose the relationship style that best describes their own style in "close" relationships. These four relationship styles are based on Bartholomew's theoretical argument that attachment styles are determined by a person's perceptions of oneself (positive or negative) and others (positive or negative). The four categories measured by this scale are "secure" (positive perceptions of self and others), "preoccupied" (negative self-perception and positive other), "dismissing" (positive self and negative other), and "fearful" (negative perceptions of both self and others). Bartholomew and Horowitz gathered a comprehensive data set to validate this measure. Included in these data are intercorrelations between this measure and attachment interviews which suggest that this four-category model of attachment is valid.

*The Relationship Scales Questionnaire (RSQ)* (Griffin & Bartholomew, 1994).

This 30-item questionnaire asks participants to rate self-statements about their close relationships (both past and present) on a 5-point Likert scale. Ratings range from "not at all like me" to "very much like me". This scale was designed in response to the critique of Bartholomew's four-category Relationship Questionnaire. The participant's choice of self-descriptive category on the RQ is highly dependent on the words presented to describe each of the four attachment categories.

Griffin and Bartholomew (1994) calculated convergent validity coefficients between the RQ and RSQ to support their hypothesis that there are four attachment categories (i.e., secure, preoccupied, dismissive, and fearful) that can be assessed using these scales. These coefficients ranged from .22 to .50 for each corresponding attachment category. Interestingly, the convergent validity between the two scales for the "secure" attachment category was the lowest relative to the other three categories. This suggests that the security of attachment may be especially susceptible to self-report biases.

*Revised Adult Attachment Scale (RAAS)*(Collins & Read, 1990).

This 18-item scale was designed to measure adult attachment style in romantic relationships. The three subscales of this questionnaire are "Close" (the extent to which an individual is comfortable with closeness), "Depend" (the amount a participant feels that he or she can depend on others), and "Anxious" (the degree to which the participant is fearful about such things as abandonment or being unloved). Reasonable internal consistency was measured using Cronback's Alpha for the subscales (Depend .75.; Anxiety .72; Close; .69). Test-retest reliability conducted two months apart was

stable (Close subscale .68; Depend .71; Anxiety .52).

*Beck Depression Inventory (BDI)* (Beck, Ward, Mendelson, Mock, & Erbaugh, 196).

This is the most commonly used self-report measure of depression. Previous investigators have reported high levels of internal consistency for this scale (e.g., Strober, Green, & Carlson, 1981). Split-half reliability coefficients average approximately 0.85 (Gotlib & Cane, 1989). Furthermore, the BDI has reasonable levels of validity when compared with convergent other self-report measures and clinicians' ratings of severity of depression (Gotlib & Cane, 1989). This measure was included in the present study to investigate current levels of depression in both groups.

Mood and depression have been shown to affect memory and recall (Bower, 1981; Mayer, 1986 ; Teasdale & Fogarty, 1979). High levels of depression in either group may call into question the accuracy of recalled events and difficulties. However, Brown and Harris (1978) argue that depression does not affect accuracy of recalled events when the Life Events and Difficulties Schedule (LEDS) is used.

The BDI was also included to investigate current levels of depression in the comparison group, since life stress and depression are related (Brown & Harris, 1978). Severe depression would call into question the adequacy of the present comparison group.

*Parental Bonding Instrument (PBI)* (Parker et al., 1979)

The PBI is a 25-item self-report measure of parental bonding. Respondents were asked to rate the perceptions of their mother and father during their childhood

(i.e., during their first 16 years). The questionnaire yields two different subscales of parental bonding: "care" and "overprotection". The "care" scale has a range of 0 to 36, with higher scores indicating more parental caring. Similarly, the "overprotection" subscale has a range of 0 to 39, with higher scores indicating higher levels of parental overprotection. This scale has shown acceptable levels of reliability and validity (Parker, Tupling & Brown, 1979). Additionally, it has been reported that the scale measures not only perceived, but actual parental bonding behaviours (Parker, 1981).

*The Short Life Events and Difficulties Schedule (SLEDS)*(Smith & Oatley, 1998, Appendix C).

An in-depth interview using a shorter version of the Life Events and Difficulties Schedule (LEDS, Brown & Harris, 1989), titled the Short Life Events and Difficulties Schedule (SLEDS, Smith & Oatley, 1998), was employed. When contrasted with the original LEDS, the SLEDS compared favourably in the measurement of severe life stress. In 82% of the cases, the LEDS and SLEDS agreed on ratings of major stress levels prior to the onset of major depression (Smith & Oatley, 1998). The original LEDS, which measures vulnerability factors, major life events, and difficulties, has been shown to explain 89% of onsets of major depression in a community sample (Brown & Harris, 1989).

Since it has been hypothesized that vulnerability to CFS and depression are closely linked, and since past research has demonstrated higher rates of clinical depression prior to illness onset in CFS sufferers compared to non-suffers (see Salit et al., 1989, for a review), it was reasoned that the SLEDS methodology would be

appropriate for investigating life events and difficulties of CFS sufferers in the year before they became ill. The SLEDS uses exactly the same rating and scoring system as the original LEDDS, but focuses only on severe stressors and difficulties that have been found to evoke major depression.

CFS participants were asked to recall events and difficulties from the year preceding the onset of their illness. Illness onset was defined as the time when CFS participants experienced a “crash” and could no longer function at previous levels (both physically and mentally). In most cases this “crash” coincided with a virus, infection, or illness from which they never fully recovered. First, participants were asked to tell the interviewer about this experience and to describe their lifestyle at the time. This exercise was meant to orient both interviewer and participant to the context (Brown & Harris, 1989) of the participant’s life at the time of illness onset. Next, a date of illness onset was established (usually the month but often the exact date); the participant was then reminded that the interview would focus on the year prior to this date. The comparison group was simply asked to recall events from the past year (i.e., the year before the date of the interview, to the day). Participants who experienced difficulty remembering whether a specific event occurred within the given time frame, were asked to recall whether the event occurred around the time of other salient personal dates (e.g., Christmas, birthday). In some cases a written time line was created during the interview to help orient both the participant and the interviewer. Also, some CFS participants consulted their personal records, income tax returns, and date books to compile a more accurate account of when events occurred.

The interviewer and raters in the present study were trained to administer and

score the SLEDS by T. Smith and K. Oatley, the original authors of the SLEDS. These authors had been trained by G. Brown and T. Harris to use their standardized methods in the administration and scoring of the LEDS. Brown and Harris (1989) suggest that interviewers “show curiosity” and “respond as much as possible” to the story that is being told to them (p. 24). They also comment that interviewing for an event or difficulty is complete when the interviewer has “the feeling that the material makes sense or hangs together” (Brown & Harris, 1989, p. 24). These guidelines were adhered to as closely as possible in the present study. In addition, all interviews were tape-recorded (with the permission of the participant), so that the interviewer could listen to the tape if any confusion arose during the transcribing of her written notes taken during the interview. Written notes were transcribed in order to present case vignettes of the events and difficulties to the rating team, which consisted of two to four raters who were blind to the group membership (i.e., CFS vs. comparison group) of the participant.

The following procedure was followed at the rating meetings. A brief biography of each participant was read to the team to give basic demographic information, such as gender, age, marital status, number of children, occupation, annual income, and living conditions. Any information that would identify group membership was not presented. For example, the fact that a comparison group member attended graduate school was not included during the introduction if possible. Similarly, when a CFS participant’s interview focused on events of many years ago, demographic information such as income was either excluded or brought up to levels that were consistent with present-day wages.

Next, the interviewer would read an account of the event or difficulty to be rated.

Only the event/difficulty and surrounding circumstances were presented. An attempt was made to exclude information about the reaction of the participant and the outcome of the stressor. Instead, the rating team considered what most people would feel given this set of circumstances. Each team member would offer opinions on the vignette, and a discussion would follow to produce a consensus rating. Often the event and difficulties dictionaries (created by Brown and Harris) were consulted as a guideline for rating the vignettes. These dictionaries consist of rated vignettes. If a vignette was found that was similar to a vignette in the dictionary, the dictionary vignette was read to the team and discussed (i.e., Is the dictionary vignette similar to the presented vignette?). These dictionaries provided a standardized way of rating certain events, such as childbirth. If a disagreement arose concerning a rating, the interviewer did not take part in the final decision-making process as she was not blind to the group membership of the participant.

Events were rated for severity on a 4-point scale, and difficulties were rated on a 6-point scale. Lower numbers indicate more severe stressors. For additional information about the history, interview process, rating process, and/or scoring of the SLEDS, the interested reader can refer to Brown and Harris (1978) and/or Smith and Oatley (1998).

*Support Interview* (Ail, Oatley, & Toner, 1997, Appendix D).

Originally designed to explore social support in depressed women, this structured interview generates both qualitative and quantitative data about participants'

perceptions of their social supports and their satisfaction with that support. This interview also explores how individuals cope with stressful events and difficult situations in their lives.

Table 1 presents a description of each of the variables in the present study. Also included are their ranges and how they were calculated.

Table 1.  
Study Variables

Variable Name	Description	Range	Derivation
High/Low Stress	Dichotomous variable representing stress. For control participants stress is rated for the year prior to the interview, and for CFS participants the year prior to illness onset.	"Low stress" = no reported events or difficulties that were rated severe. "High stress" = at least one event or difficulty rated as severe.	Team ratings of the SLEDS interview where a severe event received a 1 or 2 on the 4-point scale and severe difficulty a 1, 2, or 3 on the 6-point scale.
Total Stress	Continuous variable representing stress.	0 to 12, with higher values indicating more stress throughout the year.	All stressors rated severe were reverse scored and summed for each participant.
Support	Continuous variable representing participants' satisfaction with social support.	0 to 10, with higher values indicating higher satisfaction with social support.	Participant's rating of most supportive person in their life (from support interview)
Stress x Support	Dichotomous variable of the interaction between "total stress" and "support". (The support variable was reverse scored for this calculation.)	"Low stress x high support" = combination of low stress and low support. "High stress x low support" = combination of high stress and low support.	Based on a median split of all stress x support variable between all participants in the present study.
RSQ Subscales Secure	- continuous variable - degree to which participant values and feels secure in close relationships	0 to 25, with higher values representing increased security in relationships.	Sum of RSQ items for secure subscale.
Dismissing	- continuous variable - degree to which importance of close relationships is devalued	0 to 25, with higher values representing increased devaluing of relationships.	Sum of RSQ items for dismissing subscale.
Preoccupied	- continuous variable - measure of overinvolvement in close relationships, dependence on others for sense of well-being	0 to 20, with higher values representing increased preoccupation with relationships.	Sum of RSQ items for preoccupied subscale.
Fearful	- continuous variable - measure of avoidance of close relationships, due to fear of rejection, insecurity and distrust of other.	0 to 20, with higher values representing increased fear of relationships.	Sum of RSQ items for fearful subscale.

<b>RSQ Insecure/ Secure</b>	- dichotomous variable representing level of security - those who rated themselves as secure vs. those who rated themselves as insecure on the RSQ	0 and 1, with 0 representing insecure participants and 1 representing secure participants	- each participant was placed into a category by selecting their highest RSQ subscale score - individuals who rated themselves as dismissive, fearful, or preoccupied were then labelled "insecure" - those who rated themselves as secure were labelled secure
<b>RQ Variable</b>	- a four-category discrete variable, where each category represents one of the attachment styles (i.e., fearful, preoccupied, dismissive, secure)	1 to 4, with each number representing one attachment style	- participant's self-rating of which category is closest to their own attachment style in close relationships
<b>RQ Insecure/ Secure</b>	- dichotomous variable representing level of security - those who rated themselves as secure vs. those who rated themselves as insecure on the RQ	0 and 1, with 0 representing insecure participants and 1 representing secure participants	- individuals who rated themselves as dismissive, fearful, or preoccupied were labelled "insecure" - those who rated themselves as secure were labelled secure
<b>RAAS Total</b>	- continuous variable - the amount a participant feels comfortable with closeness, depending on others, and lacks fears of abandonment or being unloved	18 to 90, with higher scores indicating more comfort in intimate/close relationships	The Anxiety scale was recoded to represent less anxiety, and then summed with the Close and Depend subscale scores. (see below)
<b>RAAS Subscales Depend</b>	- continuous variable - amount a participant feels he or she can depend on romantic partners	6 to 30, with higher scores indicating more comfort depending on others	Sum of RAAS items for Depend subscale.
<b>Anxiety</b>	- continuous variable - degree to which participant is fearful about abandonment or being unloved by partner	6 to 30, with higher scores indicating more anxiety about being abandoned or unloved	Sum of RAAS items for Anxiety subscale.
<b>Close</b>	- continuous variable - the extent to which and individual is comfortable with closeness in romantic relationships	6 to 30, with higher scores indicating more comfort with closeness	Sum of RAAS items for Close subscale.

<p style="text-align: center;">Mother Overprotection</p> <p style="text-align: center;">Father Overprotection</p>	<p>- continuous variable - the extent to which participants found this parent controlling, intrusive, and overprotective</p>	<p>0 to 39, with higher scores indicating more overprotective behaviours</p>	<p>- participants completed a PBI for both their mother and father - PBI Overprotection subscale items were summed for each parent</p>
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### Ethical Considerations

The present study was submitted to and approved by an ethical review committee at the University of Toronto. The ethical standards used to evaluate the present study are in accordance with the ethical standards of the American Psychological Association (APA, 1982). In addition, if at any time during an interview it became apparent that the participant was in distress and possibly in need of continued psychological help, the interviewer would investigate the distress, and refer to an appropriate outside agency. As a result, one participant was referred to a psychiatrist, and another to a mental health centre, and another was given information about home care services available in her community.

## **Quantitative Results**

The following section will present results from the quantitative data analysis. These results will be presented in subsections that relate back to the original study questions and hypotheses.

### **Sample Characteristics**

The following section will compare the demographics of control group (in the year prior to their interviews) to the demographics of the CFS group (in the year prior to their illness onset). This comparison between the two groups will explore factors that may have contributed to the onset of CFS and investigate the comparability of the two groups in the present study.

#### **Employment**

At the time of their illness onset, 90.9% (n = 20) of the CFS group were employed. The two participants who were not employed were students in high school or university. In comparison, 87.5% (n = 21) of the control group were employed. Of the individuals in this group who were not employed (n = 3) one was a full-time master's student, one was a stay-at-home mother, and the third had an illness (multiple sclerosis) that precluded full-time work. A chi-squared analysis found no significant differences in employment status between the two groups (chi-square(1, N = 46) = .138; p = .711).

CFS participants reported working a mean of 47.25 hours (SD = 20.57) per week at their jobs. One participant, who was employed as a medical secretary, reported

working 115 hours per week. Similarly, a freelance costume designer and a systems analyst reported working 80- and 72-hour weeks, respectively. These three participants were considered outliers when the SPSS Explore command was used to examine the data.

Control participants reported working a mean of 32.5 hours (SD = 14.85). One participant, who was a consultant and therapist reported working 60 hours per week. This was the maximum number of hours reported by any control group participant.

A *t* test for hours worked per week revealed a significant difference between the two groups ( $t(38) = 2.60, p = .013$ ). Next, the outlying values (found only in the CFS group) were recoded to the closest value within normal range, as recommended by Tukey (1977). A significant difference between the two groups was still found ( $t(38) = 2.60; p = .013$ ) for the numbers of hours worked per week.

Most CFS participants reported that at the time of illness onset, they were earning \$46,000 to \$50,000 per year. In comparison, those in the control group reported earning between \$60,000 and \$65,000 per year. It should be kept in mind that CFS participants were reporting income from an average of ten years ago. Therefore, these income figures are not comparable to those of the control group. The Consumer Price Index (CPI) was used to update CFS sufferers' incomes to present-day dollar values. Statistics Canada explains that the CPI is a widely used measure of inflation, and recommends that it be used to adjust income values (StatsCan, 1998). Statistics Canada guidelines for adjusting income (StatsCan, 1996) were used in the present study. CFS incomes were multiplied by the CPI inflation rate over the last 10 years (i.e., 35.4%) and then compared to the present-day incomes of the control group.

After these adjustments, an independent samples *t* test found no significant differences in income between the two groups ( $t(44) = -.24$ ;  $p = .813$ ).

### Education Level

Table 2 summarizes the highest level of education attained for the participants in the two groups.

Table 2

#### Highest Level of Education Attained for Groups

	<u>% of Group (Frequency)</u>	
	CFS	Control
High school	18.2%* (n = 4)	0%
College degree	13.6% (n = 3)	0%
University undergraduate	54.5% (n = 12)	25% (n = 6)
University graduate	13.6% (n = 3)	75% (n = 18)

\*Percentage of group that fell into this category

As can be seen from the table, more control participants held undergraduate and graduate degrees from universities than did CFS participants. This is not surprising, given that the control group was recruited from graduate-level courses. As expected, a chi-square analysis revealed a significant effect for education level between the two groups ( $\chi^2(3, N = 46) = 19.66$ ,  $p = .001$ ).

### Marital Status and Children

Table 3 presents the marital status of the two groups.

Table 3

#### Marital Status of the CFS and Control Groups

	<u>% of Group (Frequency)</u>	
	CFS	Control
Married	27.3%* (n = 6)	58.3% (n = 14)
Single	68.2% (n = 15)	37.5% (n = 9)
Cohabiting	4.5% (n = 1)	4.2% (n = 1)

\* Percentage of group that fell into this category.

More control participants than CFS participants (at the time of illness onset) reported being married. A chi-square analysis conducted on the marital status of the participants yielded non significant effects for group ( $\chi^2(2, N = 46) = 4.62, p = .099$ ).

Thirty-six-point-four percent (n = 8) of the CFS group, and 41.7% (n = 10) reported having children.

Table 4

Number of Children of the CFS and Control Groups

	<u>% of Group (Frequency)</u>	
	CFS	Control
No children	63.6%* (n = 14)	58.3% (n = 14)
One child	18.2% (n = 4)	4.2% (n = 1)
Two children	13.6% (n = 3)	29.2% (n = 7)
Three children	4.5% (n = 1)	8.3% (n = 2)

\* Percentage of group that fell into this category.

Table 4 summarizes the number of children reported by participants in each of the groups. More CFS participants reported having one child, whereas control participants more frequently reported having two children. A chi-square analysis revealed no significant differences in the number of children between the two groups ( $\chi^2(3, N = 46) = 3.65, p = .301$ ).

When asked if their children required special care, 27.3% (n = 6) of the CFS and 4.2% (n = 1) of the control group said "yes". In addition, four participants in the CFS group (18.25%) and one participant in the control group (4.2%) reported being single parents.

Other Illnesses

To assess the comparability of the two groups, participants in the control group were asked to report any mental or physical illnesses they suffered from. Six

participants (25% of the group) reported illnesses. These included allergies (n = 2), multiple sclerosis (mild, relapsing/remitting form)(n = 1), depression (n = 1), Crohn's disease (n = 1), and obsessive compulsive disorder (n = 1). A decision to include the participants with serious illnesses (e.g., multiple sclerosis, Crohn's disease) was made, as it was hypothesized that these illnesses would make the control participants more similar to the CFS group, and therefore not magnify differences between the two groups. Instead, these participants might decrease differences between the groups. For example, for the SLEDS ratings of stress, these participants would have more stress in their lives as a result of their illnesses, making them more similar to the CFS participants.

### Depression

The Beck Depression Inventory (BDI) was included in the present study to compare the number of reported depressive symptoms between the two groups. It was also included to assess depression in the control group, as high levels of depression have been shown to follow stressful life events, thus decreasing expected differences between the control and CFS groups (Brown & Harris, 1989). An independent samples *t* test was conducted, and a significant difference was revealed between the two groups ( $t(44) = 4.45, p = .001$ ). It should be noted that the BDI reflected CFS participants' depressive symptomatology at the time of interview, and not at the beginning of their illness.

Table 5 summarizes the number of participants who scored in the varying ranges of depression. The scoring guidelines for these ranges of depression are

recommended by Beck and his colleagues (Beck et al., 1961).

**Table 5**

**Comparison Between the CFS and Control Group BDI Scores**

Level of Depression (BDI Score)	Frequency (% of group)	
	CFS	Control
Normal range (0-9)	6 (27.3% <sup>a</sup> )	20 (83.3%)
Mild (10-15)	8 (36.4%)	3 (12.5%)
Mild to moderate (16-19)	3 (13.6%)	0
Moderate to severe (20-30)	5 (22.7%)	1 (4.2%)
Severe (30-63)	0	0

<sup>a</sup> Percentage of group that fell into this category.

Results outlined in Table 5 suggest that more CFS participants reported mild, mild to moderate, and moderate to severe levels of depressive symptoms. Only four control participants reported symptoms at these levels. The Explore command in SPSS revealed one outlier in the control group whose score fell in the moderate to severe depression range. Closer examination of her data revealed that her score was elevated due to the physical symptoms caused by her multiple sclerosis (MS). She commented, "Many of the answers (on the BDI) are directly related to the MS and the effect of the demands of school on the MS". A decision not to drop her data from the study was made, as her high depression score appeared to stem from a physical illness and not a cognitive depression. Similarly, her depressive symptoms would make her more similar

to the CFS group, and therefore not exaggerate the differences between the two groups.

Many of the CFS participants' scores on the BDI may also have been elevated by their physical symptoms caused by the CFS (e.g., sleep disturbances), as opposed to symptoms caused by depression. For a review of the link between depressive symptoms and CFS, the interested reader can refer to Salit, Abbey, Moldofsky, Ichise, and Garfinkel (1989).

### Stressful Life Events

The first area of interest was stressful life events and difficulties. More specifically, is CFS triggered by stress? The following section explores the stressful life events and ongoing difficulties that CFS sufferers reported for the 12 months prior to their illness onset. These reported stressors are compared to data from the control group who reported stressful events for the 12 months prior to the interview.

As mentioned earlier, the Brown and Harris (1978) methodology was utilized in the present study for gathering and rating stressful life events and difficulties. Brown and Harris also recommend guidelines for data analysis. These guidelines were used in the present study. Thus, each participant in the study was placed in one of two groups; "severe stress" or "no severe stress". Participants placed in the "severe stress" group had experienced at least one event or difficulty during the year that was rated "severe" by the rating team. Events were rated for severity on a 4-point scale, and difficulties were rated on a 6-point scale. Lower numbers indicate more severe stressors. So a participant who received a rating of 1 or 2 for an event, or 1, 2, or 3 for

a difficulty, was considered to have experienced a severe stressor and placed in the "severe stress" group.

**Table 6**

**Participants Who Experienced Severe Stress by Group**

	CFS	Comparison
No severe stress	n = 3 (13.6%)*	n = 14 (58.3%)
Severe stress	n = 19 (86.4%)	n = 10 (41.7%)

\* Percentage of group that fell into this category.

Table 6 presents the percentage of participants in each group who experienced severe stress compared to those who did not experience severe stress. Notice that more of the CFS sufferers experienced severe stress than did control participants. It is noteworthy that two of the three CFS participants who did not experience stress were men. Of these men, one said that he had experienced stress, but that it occurred two to three years prior to the onset of his illness; therefore, it was not included in the present study. A woman with CFS who did not report severe stress, was 17 at the time of illness onset. She was recalling life events from 29 years prior to the interview. In addition, she questioned the timing of the onset of her illness, which seemed to occur slowly over many years. In contrast, 41.7% of the comparison group had experienced

at least one event or difficulty rated severe in the year prior to the interview.

The next step in the data analysis was to determine whether any significant differences existed between the two groups with respect to the amount of severe stress experienced. Following the Brown and Harris (1978) guidelines, a chi-square analysis was conducted to answer this question: "Is the CFS group different from the comparison group with respect to the amount of stress they experienced?" Results for the chi-square analyses revealed a significant difference in the amount of stress experienced by the CFS group as compared to the comparison group ( $\chi^2(1, N = 46) = 9.84, p = .002$ ).

### Social Support

Social support was investigated in the present study through the use of the social support interview. All participants were asked to list and rate (on a scale of 0 to 10) people in their lives whom they considered social supports. This investigation was aimed at answering the question, "Do CFS participants report less social support in the year prior to becoming ill, than the control group who report for the year prior to the interview?" To answer this question, the rating assigned by each participant to his or her highest-rated social support was used. A participant's rating, which ranged from 1 to 10, indicated how satisfied he or she was with a specific individual's social support. Means for both the CFS ( $M = 8.3, SD = 1.3$ ) and the control group ( $M = 9.3, SD = 1.0$ ) were then calculated. An independent samples  $t$  test was then conducted to compare the mean ratings given by the two groups. A significant effect was discovered ( $t(43) = -2.76, p = .008$ ), which suggested that the control group experienced significantly better

and more supportive relationships than did individuals in the CFS group.

Participants in the present study were asked, "Is there someone in whom you can confide?" This measure of support was first used by Brown and Harris (1975). Control participants in the present study were asked this question in reference to the year prior to the interview; CFS participants were asked this for the year prior to illness onset. Regarding the CFS group, 63.6% (n = 14) reported having a confidant; in contrast 100% (n = 24) of the control group reported having someone in whom to confide. A chi-square analysis ( $\chi^2(1, N = 46) = 10.56, p = .001$ ) confirmed the hypothesis that healthy controls had more of this kind of support in an average year than CFS participants in the year prior to their illness.

During the support interview, participants were also asked, "During a crisis, are you more likely to turn to other people or to rely on yourself for help?" Table 7 presents the answers given by the two groups to this question.

Table 7

Whom the Participants Seek Help/Support from During a Crisis

	CFS	Comparison
Other people	45% <sup>a</sup> (n = 9)	20.8% (n = 5)
Self	40% (n = 8)	16.7% (n = 4)
Both self and other	15% (n = 3)	62.5% (n = 15)

<sup>a</sup> Percentage of group that fell into this category.

Notice that more control participants said they were more likely to rely on both themselves and others during a crisis; CFS sufferers preferred to depend either entirely upon themselves or entirely upon others. A chi-square analysis revealed there were significant differences between the two groups ( $\chi^2(2, N = 44) = 10.20, p = .006$ ).

Stress x Social Support

To investigate whether low social support is a vulnerability factor for the onset of CFS, a stress by social support variable was created. To create this continuous variable, stressful events and difficulties that passed the threshold for severity (i.e., event rated 1 or 2, or difficulties rated 1, 2, or 3) were reversed-scored, summed, and then multiplied by social support.

This method of summing ratings to arrive at a continuous variable that represents all events and difficulties and their rated severity was suggested by Parry and Shapiro (1986). However, in the present study only stressors rated severe by the

rating team were included. It was reasoned that CFS participants would more readily recall severe life stressors and would not as readily recall minor difficulties and stressors. The average CFS participant's interview focused on events that took place 10 years ago, with one participant recalling events from 29 years ago. Severe stressors would therefore be more salient for the CFS participants. Therefore, in order to make the continuous variable comparable for the two groups, only stressors rated severe were included.

Before the stress x social support variable was calculated, events and difficulties were recoded so that higher numbers represented more stress. Thus, the most stressful events were rated a "2" and the most stressful difficulties were rated a "3". It was reasoned that this numeric discrepancy between ratings of the most severe events and difficulties reflected the additional stress experienced during a difficulty as compared to an event. In the present study, a vignette was rated an "event" if it lasted less than 10 days; difficulties were included only if they lasted at least one year.

The social support variable was also recoded so that higher numbers meant lower social support. Therefore, for this variable higher numbers would indicate a higher vulnerability factor.

The stress by support variable and its mean were calculated ( $M = 6.7$ ,  $SD = 14.1$ ). This mean was then used to divide the entire sample into two groups: (1) high support/ low stress, and (2) low support/high stress.

**Table 8****Comparison Between Groups for the Stress x Social Support Variable**

	<b>CFS</b>	<b>Comparison</b>
<b>High support/ Low stress</b>	<b>n = 10 (47.6%)*</b>	<b>n = 23 (95.8%)</b>
<b>Low support/ High stress</b>	<b>n = 11 (52.4%)</b>	<b>n = 1 (4.2%)</b>

\* Percentage of group that fell into this category.

Table 8 presents the percentage of participants in each group who were categorized into each of the stress x social support levels. Almost all participants in the comparison group fell into the high support, low stress category, whereas only 47.6% of the CFS group did. This indicates that approximately half of the CFS group experienced high stress and low social support in the year prior to their illness onset, and this may have triggered their illness.

To further investigate the association between stress, social support, and group membership, a chi-square analysis was conducted. The results of this analysis revealed a significant relationship between the severe stress and social support interaction and the diagnosis of CFS ( $\chi^2(1, N = 45) = 13.31, p = .001$ ). The comparison group experienced less stress, and more social support, than the CFS group did in the year before illness onset.

### Adult Attachment

The analyses in the following subsection were conducted to answer the question, "Do CFS sufferers have different attachment styles than people who do not suffer from this illness?"

The Relationship Questionnaire (RQ)(Bartholomew & Horowitz, 1991), which was used in the present study, asks participants to read descriptions of four different relationship styles, and then choose the relationship style that is closest to their own style of intimate relationship.

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**Table 9**

**The RQ Attachment Style Rating by Group Membership**

	CFS	Comparison
Secure	n = 8 (36.4%*)	n = 17 (70.8%)
Fearful	n = 6 (27.3%)	n = 3 (12.5%)
Preoccupied	n = 6 (27.3%)	n = 3 (12.5%)
Dismissing	n = 2 (9.1%)	n = 1 (4.2%)

\* Percentage of group that felt into this category.

Table 9 presents the frequency and percentage of participants' self-ratings of attachment style. Notice that 70.8% of the control group, but only 36.4% of the CFS group rated themselves as having secure relationships. Similarly, CFS participants

were more likely to rate themselves as having fearful, preoccupied, or dismissing relationship styles. In the scheme provided by Bartholomew and Horowitz (1991), securely attached individuals value intimate relationships and have the capacity to maintain close relationships without losing their personal autonomy. In contrast, an individual with a dismissing attachment style downplays the importance of close relationships, has restricted emotions, and places a high value on independence and self-reliance. Preoccupied individuals are overinvolved in close relationships, depend on others for their own sense of well-being, and have a tendency to idealize others. Individuals with fearful attachment styles avoid close relationships because they fear rejection, feel insecure, and distrust others.

To further investigate the association between attachment style and group membership, a 2 x 2 chi-square analysis was conducted. Participants in both groups who rated themselves as secure were compared to participants who rated themselves as having an insecure attachment style (i.e., as fearful, preoccupied, or dismissive). Table 10 presents the comparison between groups for self-rated attachment style. A significant difference between groups was found ( $\chi^2(1, N = 46) = 5.49, p = .019$ ), suggesting that CFS participants are less likely than control participants to have secure attachment styles.

Table 10

**Comparison Between Groups for Secure vs. Insecure Attachment (RQ)**

<b>Attachment Style</b>	<b>CFS Group</b>	<b>Comparison Group</b>
Secure	n = 8 (36.4%)*	n = 17 (70.8%)
Insecure	n = 14 (63.6%)	n = 7 (29.2%)

\* Percentage of group that felt into this category.

The Relationship Scales Questionnaire (RSQ) (Griffin & Bartholomew, 1994) was used in the present study to further investigate and cross-validate the results from the RQ. The RSQ asks participants to rate 30 self-statements about their close relationships (both past and present) on a 5-point Likert scale. Item ratings are summed to create a score for each attachment style. Participants are then grouped into the four attachment categories by selecting their highest subscale score. Table 11 presents the attachment style categories by group membership.

Table 11

**The RSQ Attachment Style by Group Membership**

	<b>CFS</b>	<b>Comparison</b>
Secure	n = 8 (36.4%)*	n = 8 (33.3%)
Fearful	n = 4 (18.2%)	n = 2 (8.3%)
Preoccupied	n = 3 (13.6%)	n = 2 (8.3%)
Dismissing	n = 7 (31.8%)	n = 12 (50.0%)

\* Percentage of group that felt into this category.

Notice that among CFS participants, the largest number (36.4%) were classified as secure, while among those in the comparison group, the largest number (50.0%) were classified as dismissing. These group percentages for each attachment style are different from the percentages found when the RQ is used to classify participants into attachment categories (Table 9).

To further investigate the association between attachment style and group membership, a 2 x 2 chi-square analysis was conducted. Participants in both groups who rated themselves as secure were compared to participants who rated themselves as having an insecure attachment style (i.e., as fearful, preoccupied, or dismissive). Table 12 presents the comparison between groups for self-rated attachment style. In contrast to the findings from the RQ, no significant difference between groups was found ( $\chi^2(1, N = 46) = .05, p = .829$ ), suggesting that CFS participants and control participants do not differ with respect to attachment style.

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**Table 12**

**Comparison Between Groups for Secure vs. Insecure Attachment as Rated by the RSO**

<b>Attachment style</b>	<b>CFS Group</b>	<b>Control Group</b>
<b>Secure</b>	<b>n = 8 (36.4%*)</b>	<b>n = 8 (33.3%)</b>
<b>Insecure</b>	<b>n = 14 (63.6%)</b>	<b>n = 16 (66.7%)</b>

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\*Percentage of group that fell into this category.

A comparison with Table 10, indicates that more control participants rated

themselves as having insecure attachment styles on the RSQ than on the RQ. On both tables, 36.4% of CFS sufferers rated themselves as secure, while 63.6% rated themselves as not having secure attachment styles.

The Revised Adult Attachment Scale (RAAS) (Collins & Read, 1990) was used in this study to measure romantic adult attachment style. The three subscales of this questionnaire are "Close" (the extent to which an individual is comfortable with closeness), "Depend" (the amount a participant feels he or she can depend on others), and "Anxious" (the degree to which the participant is fearful about such things as abandonment or being unloved).

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**Table 13**

**Descriptive Statistics for RAAS**

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Subscale	<u>CFS Group</u>			<u>Control Group</u>		
	Mean	SD	N	Mean	SD	N
Depend	17.73	3.63	22	20.55	3.63	24
Anxiety	16.59	5.20	22	13.83	4.44	24
Close	21.08	6.09	22	24.17	4.53	24

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Table 13 presents the descriptive statistics for the subscales of the RAAS.

Table 14

T tests for the Subscales of the RAAS

	<i>t</i> test	df	Significance <sup>a</sup>
Depend	-2.63	44	.012
Anxiety	1.94	44	.059
Close	-1.96	44	.056

<sup>a</sup> All *p* values are for two tailed tests.

Table 14 presents the *t* tests between groups for the subscale scores on the RAAS. A significant difference was discovered between groups for the Depend subscale, suggesting that CFS participants are less likely to feel that others can be depended upon when needed. Similarly, the Anxiety and Close subscale *t* tests approached significance, suggesting that CFS participants may be less comfortable with closeness and more concerned about being abandoned or unloved.

### Parental Bonding

Do CFS sufferers have different parental bonding patterns than non-sufferers? The Parental Bonding Instrument (PBI)(Parker, 1981) was used in the present study to investigate this question. Prior to data analysis, the scores on the questionnaire subscales were examined for outliers and normal distributions using the Explore command and box plots generated by SPSS 6.1 (SPSS, 1994). All distributions were

normal, and outliers were recoded to the value of the closest score that was within normal range (Tukey, 1977). T tests were chosen to compare the differences on the subscales as the original creators of this instrument had also used *t* tests to analyse their questionnaire's subscales.

**Table 15**

**Descriptive Statistics for the PBI Subscales**

Subscale	<u>CFS Group</u>			<u>Control Group</u>		
	Mean	SD	N	Mean	SD	N
Maternal care	17.86	10.83	22	27.56	8.30	24
Paternal care	14.55	10.39	20	21.55	9.66	21
Maternal overprotection	15.53	8.83	22	13.10	9.61	24
Paternal overprotection	12.21	9.04	20	10.35	7.83	19

Table 15 presents means and standard deviations for the subscales of the PBI. Larger differences between group means appear to exist for the maternal and parental care subscales than for the maternal and paternal overprotection subscales.

Table 16

CFS and Control Group *t* tests for the PBI Subscales

Subscale	<i>t</i> test	df	Significance
Maternal care	-3.43	44	.001
Paternal care	-2.26	37	.030
Maternal overprotection	.89	44	.379
Parental overprotection	.71	37	.484

Table 16 presents the results for the independent groups *t* tests for the PBI subscales. A significant difference was found between the CFS and control groups' scores on both the maternal care and paternal care subscales. This suggests that CFS participants perceived more emotional coldness, indifference, and neglect from both their fathers and their mothers. In contrast, the control group reported more behaviours from both parents that were perceived as affectionate, emotionally warm, empathetic, and close (Parker et al., 1979).

No significant differences were found between the two groups' scores on the maternal and paternal overprotection subscales. These subscales are reported to measure parental control, intrusion, excessive contact, overprotection, infantilization, and prevention of independent behaviour (Parker et al., 1979). Parker, Tupling, and Brown (1979) suggest that the overprotection subscales are related to a lack of care by paternal figures.

### Correlation Coefficients Between Study Variables

To explore the relationship between stress, social support, adult attachment, and parental bonding, Pearson correlation coefficients were calculated between stress and support ratings and the subscales of the PBI, RSQ, and RAAS.

Table 17

### Correlations Between Stress, Social Support, Attachment, and Parental Bonding

	Support	PBI Subscales				RAAS Subscales			RSQ Subscales			
		Care (M)	Care (F)	Over Pro. (M)	Over Pro. (F)	Depend	Anxiety	Close	Fear	Diss-miss.	Secure	Preocc.
Total Stress	-.28	-.40**	-.40**	.18	.05	-.30*	.31*	-.11	.14	-.10	.07	.10
Support	1	.46**	.49**	-.50***	-.15	.29	-.52***	.45**	-.43**	.08	.39*	-.28
Care (M)		1	.51**	-.49**	-.01	.26	-.44**	.09	-.24	.22	.11	-.17
Care (F)			1	-.58***	-.45**	.37*	-.36*	.35*	-.33*	.16	.25	-.06
OverPro (M)				1	.42**	-.34*	.44**	-.45**	.34*	-.21	-.46**	.07
OverPro (F)					1	-.27	.25	-.27	.25	.07	-.15	.07
Depend						1	-.36*	.61***	-.77***	-.40**	.47**	-.11
Anxiety							1	-.47**	.53***	.17	-.54***	.67***
Close								1	-.74***	-.39**	.72***	-.17
Fear									1	.49**	-.73***	.38*
Diss										1	-.38*	.33*
Secure											1	-.40**
Preocc												1

\*p&lt;.05

\*\* p&lt;.01

\*\*\*p&lt;.001

The following discussion of Table 17 will focus only on the correlations between variables that have a significance value of less than .01 (i.e.,  $p < .01$  or  $p < .001$ ). Since this is a large correlation table with multiple comparisons, the relationships between some variables may be significant by chance alone, even though there is no association between these variables (Norusis, 1990a). Therefore, only highly significant correlations will be discussed.

### Stress Correlations

Notice that total stress levels were significantly negatively correlated with parental care during childhood. This suggests that participants who experienced severe stress in the present study, had parents who were perceived as less caring and nurturing.

### Social Support Correlations

Participants' ratings of social support were significantly related to the degree to which they were fearful about abandonment by romantic partners and close friends (Anxiety and Fearful subscales), and to the extent to which they were comfortable with closeness in romantic relationships (Close subscale). Individuals who reported high levels of support during adulthood also reported having parents who were more caring during childhood (Care subscales). Interestingly, participants who reported high levels of social support during adulthood also reported higher levels of overprotection by their mothers during childhood.

### Parental Bonding Correlations

The level of anxiety experienced in adult romantic relationships due to the fear of being abandoned or being unloved (Anxiety subscale) was significantly related to the degree to which the participant experienced his or her mother as warm, empathic, and caring (Mother Care subscale) before the age of 17.

Participants who had overprotective mothers reported less social support and were less likely to feel secure in relationships during adulthood. Similarly, overprotection by the mother during childhood was related to increased discomfort with closeness (Close subscale) and increased fears of abandonment (Anxiety subscale) during adulthood. Overprotection by the mother was also related to overprotection by the father, suggesting that parents have similar parenting styles. Subscales measuring mother and father caring behaviours were also significantly related.

### Adult Attachment Correlations

Participants who reported more preoccupation with relationships, also reported higher anxiety about being unloved and abandoned by romantic partners (Anxiety subscale). In contrast, secure individuals reported less anxiety about being unloved or abandoned and more comfort with closeness (Close subscale). Dismissive individuals were less likely to report that they could depend on romantic partners, more uncomfortable with closeness, and more fearful and avoidant of close relationships (Fearful subscale). Fearful individuals experienced higher anxiety about being unloved (Anxiety) and more discomfort with closeness in relationships (Close).

### How Predictive of CFS Are the Psychosocial Variables?

The following section is designed to explore the relationships between CFS and life stress, social support, adult attachment, parental bonding, and socio-economic status. Since the dependent variable in the present study is dichotomous (i.e., CFS group or healthy control group), and since at least one of the independent variables is continuous (e.g., social support), a logistic regression analysis was used to analyse the data (Norusis, 1990). A “theory-driven” analysis of the data was conducted using hierarchical logistic regression.

In order to control for the potential effects of socio-economic status, income was entered as the first variable in this equation. Because on average, CFS participants were reporting their household incomes from 10 years and 4 months ago (SD = 5.86), the Consumer Price Index (CPI) was used to update their incomes to present day dollar values (StatsCan, 1998). As mentioned earlier, Statistics Canada guidelines for adjusting income (StatsCan, 1996) were used in the present study.

Second, a measure of parental care was considered for entry into the analysis in order to control for the effects of family history. A decision not to include the PBI for fathers was made as some participants had not completed this questionnaire as they did not know their fathers. SPSS 6.1 excludes any cases with missing data, which would lower the power of the logistic regression analysis in the present study. In addition, the PBI subscales for mothers were highly correlated with the PBI subscales for fathers, which suggests that perceived parenting styles of both parents may be highly similar. Similarly, Table 17 above, which presents correlations between the independent variables, reveals a high correlation between maternal care and

overprotection ( $R^2 = -.49$ ,  $p = .001$ ), suggesting that these variables may be measuring the same construct. For these reasons, a decision to include only the PBI maternal care subscale was made.

Third, the total score of the RAAS was considered for entry into the analysis. This measure of adult attachment was selected because the RS and the RSQ were not able to classify participants consistently into one of the four attachment categories (i.e., fearful secure, dismissing, preoccupied). The RAAS was considered to be the more accurate and stable measure of attachment. The total RAAS was calculated by reverse-scoring the Anxiety subscale items and then adding all of the RAAS items together. Thus, higher total scores on the RAAS represented increased comfort with closeness, increased comfort depending on others, and decreased anxiety with respect to being abandoned or unloved.

Fourth, both the dichotomous and the continuous stress variables were considered for inclusion in the regression analysis. Since logistic regression can perform well with either type of variable, the dichotomous stress variable was selected for the present analysis as the continuous variable was not normally distributed.

Finally, the continuous support variable will be considered for this analysis.

### Checking for Violations of Assumptions

#### (1) Ratio of Participants to Independent Variables

If a regression analysis is to be performed correctly, there should be a ratio of at least five participants to each independent variable. This is considered the minimum requirement. More participants are desirable, as this increases the power of the

**analysis. In the present study there are 46 participants and 5 independent variables. Therefore, this requirement has been fulfilled.**

### **(2) Outliers, Normality, and Residuals**

**All variables were checked for outliers and normal distributions. Only continuous variables with normal distributions were included in the present analysis. Residuals from this hierarchical logistic regression model were plotted and examined for normal distributions and linearity. Similarly, these data were checked for outliers. None were discovered.**

### **(3) Correlations Between Variables**

**Table 18 presents a correlation matrix for all variables in the present analysis. It was computed to explore the relationship between the dependent variable and each independent variable. In addition, this matrix was examined for large intercorrelations between independent variables that could affect the results of the regression (i.e., collinearity).**

Table 18

Correlations Coefficients Between Dependent and Independent Variables

	1.	2.	3.	4.	5.	6.
1. Group (CFS, not)	—					
2. Income	.27	—				
3. Maternal Care	.46**	.05	—			
4. RAAS	.38*	.13	.32*	—		
5. Stress	-.46**	-.02	-.45**	-.24	—	
6. Support	.40**	.10	.46**	.53**	-.14	—

\*\* p < 0.1 \*p < .05

As can be seen from this chart, all the independent variables except income are correlated with the dependent variable. Income was included in the present analysis to control for socio-economic status.

There appear to be moderate correlations between all of the variables except the RAAS and the support variable. It appears that these two variables may be measuring the same construct, and therefore the RAAS was not entered into this analysis. There were also high correlations between maternal care and the stress and support variables. The maternal care subscale was included in the present analysis to control for family background and history of the two groups.

After considering the assumptions, the independent variables entered into the logistic regression equation were: income on step 1, maternal care on step 2, stress on

step 3 and support on step 4.

**Table 19**

**Improvement at Each Step of the Logistic Regression Analysis.**

Step	Variable	Beta	Improvement Chi-square (df)	p	% of subjects correctly classified
1.	Income	.012	.059 (1)	.808	56.52% <sup>a</sup>
2.	Maternal care	.102	10.41 (1)	.001	71.74% <sup>a</sup>
3.	Stress	-1.617	4.48 (1)	.034	76.09% <sup>a</sup>
4.	Support	.629	3.59 (1)	.058	78.26% <sup>a</sup>

<sup>a</sup> Constant is included in this model.

Table 19 presents the improvement statistics for each step of the logistic regression analysis. The chi-square statistic tests the null hypothesis that the coefficient of the variable added for a specific step in the equation is equal to zero. This improvement statistic is comparable to the F-change statistic in multiple regression. As can be seen from the table, all the variables in the equation except income had significant coefficients when they were first entered into the equation. Therefore, at the time of entry these variables significantly improved the model's ability to distinguish between CFS and control participants. Notice that the percentage of subjects correctly classified into either the CFS or the control group rose sharply after maternal care was entered into the equation. Its predictive ability continued to rise when both the stress and support variables were entered. However, the stress variable appears to improve the model's classification ability more than the support variable.

Table 20

Final Logistic Regression Equation

Step	Variable	Beta	Wald (df)	p	R <sup>2</sup>	Exp (B)
1.	Income	-.003	.002 (1)	.965	.000	.997
2.	Maternal care	.044	1.12 (1)	.289	.000	1.045
3.	Stress	-.1.960	4.84 (1)	.028	.242	.141
4.	Support	.630	3.28 (1)	.070	.162	1.876
	CONSTANT	-5.122	3.21 (1)	.073		

Table 20 presents the final regression equation with Beta, the Wald statistic, probability values, and the partial correlation coefficients for each variable. Notice that the only significant predictor variable was stress, after controlling for socio-economic status (i.e., income) and background family history (i.e., maternal care). Interestingly, the social support variable was also contributing to the ability of this model to classify participants; however, the test for predictive ability (using the Wald statistic) was only approaching significance. From this regression equation, it appears that a severe life stress strongly increases a participant's probability of being classified into the CFS group.

Table 21

**Classification Results for the Logistic Regression Analysis**

	# of Cases	<u>Predicted Group Membership</u>	
		CFS Group	Control Group
<u>Actual group</u>			
CFS group	22	n = 17 (77.3%)*	n = 5 (22.7%)
Control group	24	n = 5 (20.8%)	n = 19 (79.2%)

\* Percentage of group that fell into this category.

Table 21 presents the classification results from the logistic regression analysis. Notice that 77.3% and 79.3% of CFS and control participants, respectively, were classified correctly using the logistic regression equation. Overall, 78.26% of participants in the current study were classified correctly. Five participants in each group were not classified correctly. These incorrectly classified cases were examined carefully to determine the cause of the misclassification. Of the two participants who had the largest probability of being misclassified, one was a control group women who had experienced high stress and low support in the year prior to her interview. The other participant was a man from the CFS group who reported no severe life stress and high social support in the year prior to becoming ill.

The participant who had the next-highest probability of being misclassified was a man with CFS who reported no stress and moderate social support in the year prior to his illness. The remaining seven participants who were misclassified had approximately

equal but lower probabilities of misclassification. The three CFS participants who were classified as control participants by the regression equation were all White women who reported severe life stress but also had high social support in the year prior to their illness. Of the four remaining participants who were misclassified, all of them from the control group, three reported severe stress but had high social support in the year prior to interview, and one did not report stress but had low social support. Of these four participants, two were women and two were men. Since a larger proportion of the men in the present study appeared to be misclassified, an additional logistic regression analysis was conducted in which a variable representing the sex of each participant was entered on the first step to control for gender differences.

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**Table 22**

**Final Logistic Regression Equation with Gender as a Control Variable**

Step	Variable	Beta	Wald (df)	p	R <sup>2</sup>	Exp(B)
1.	Gender	.573	.397 (1)	.529	.000	1.773
2.	Income	.008	.017 (1)	.895	.000	1.008
3.	Maternal care	.046	1.211 (1)	.271	.000	1.047
4.	Stress	-2.09	4.94 (1)	.026	.247	.124
5.	Support	.612	3.150 (1)	.076	.155	1.844
6.	CONSTANT	-6.05	3.529 (1)	.060		

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Table 22 presents a hierarchical logistic regression analysis in which gender is entered on the first step of the equation. When compared to Table 20, gender does not appear to affect the contribution of the stress and support variables to the final regression equation. Similarly, the gender variable did not make a significant contribution to the predictive ability of the equation. In fact, this new model classified 76.09% of participants into their correct group. In other words, this model misclassifies one additional participant when compared to the previous model (see Table 21). This newly misclassified participant is a White woman with CFS who experienced no severe stress but reported low social support in the year prior to her illness.

#### Validation of the Model

One final analysis was performed in an attempt to cross-validate the original regression model (Table 20). All participants were randomly placed in one of two groups using the SPSS Select Cases command (SPSS, 1994), with approximately equal numbers of CFS and control participants in each group. Then a logistic regression was performed on each group. Once again the independent variables entered into the logistic regression equations for each of these groups were, income on step 1, maternal care on step 2, stress on step 3 and support on step 4. When the results for these two analyses (Table 23 and Table 24) are compared to the first regression equation (Table 20), it is apparent that probability levels, although not significant (due to the smaller sample size), are of the same magnitude and direction as the original probability levels. More specifically, for both samples the stress variable is most predictive of classification into the correct group. However, there is one exception

to this trend: The Wald statistic for maternal care for the regression equation presented in Table 24 is closer to significance than the social support variable. Notice that for this sample, none of the variables were significant, which suggests that there may not have been enough power ( $n = 22$ ) to successfully conduct this analysis. Despite this result, it appears that the original regression model based on income, maternal care, stress, and support is valid. However, it should be kept in mind that this regression equation will most likely fit the present groups better than it will fit other samples drawn from the same populations because it is based on the present groups. It is a liberal estimate of how this equation will perform when generalized to other samples.

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**Table 23**

**Cross-Validation of the Final Logistic Regression Equation: Subgroup #1 ( $n = 24$ )**

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Step	Variable	Beta	Wald (df)	p	R <sup>2</sup>	Exp(B)
1.	Income	.055	.247 (1)	.619	.000	1.056
2.	Maternal Care	.037	.226 (1)	.635	.000	1.038
3.	Stress	-3.196	3.21 (1)	.073	.234	.041
4.	Support	.1.27	2.96 (1)	.086	.209	3.572
	CONSTANT	-10.57	3.13 (1)	.077		

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Table 24

**Cross-Validation of the Final Logistic Regression Equation: Subgroup #2 (n = 22)**

Step	Variable	Beta	Wald (df)	p	R <sup>2</sup>	Exp(B)
1.	Income	-.027	.108 (1)	.743	.000	.973
2.	Maternal Care	.049	.783 (1)	.376	.000	1.050
3.	Stress	-1.25	1.130 (1)	.288	.000	.287
4.	Support	.255	.347 (1)	.556	.000	1.291
	CONSTANT	-2.106	.343 (1)	.558		

## **Qualitative Results**

To help the reader contextualize the information presented in the preceding quantitative results section, the case histories of one CFS participant and one control participant are presented. Some of the following demographic information has been slightly altered to ensure the confidentiality of these two participants. These histories are meant to familiarize the reader with a participant from each group, and to contextualize some of the information collected about severe life stress, social support, and attachment.

### **Case Study #1: A CFS Participant**

In the year prior to her illness, Mrs. X was a woman in her early 50s who had been married for almost 20 years. Her husband was an executive in a large company, and their combined household income was approximately \$84, 000. They have no children. She had been employed as a nurse for over 20 years, but in the year prior to her illness she worked in a gift shop for 25 hours per week, creating window displays and running the shop when the owner was not present. When she was not working, she visited with an Alzheimer's patient in a local hospital (6 hours per week) and spent her time gardening (7 hours per week). She was also an executive organizer of a large wine-tasting society, which took up much of her spare time. In addition to these responsibilities, she took continuing education courses at a local community college.

Mrs. X began the interview by giving an in-depth account of her childhood, even though I had not asked for this information. She explained that from the time she was conceived she was not wanted:

I was conceived five months after my big brother (the first-born child) and at the time there was a horrible disease running through the maternity wards, and my mother got it and almost died. And then five months later she is pregnant again and was just beside herself, and wept almost through her entire pregnancy ... I was born with an allergy to milk, and my mother did not bond with me ... I then caused her more grief as the baby having these terrific reactions to having a bottle and my temperature would go up to 104, and I would come very close to convulsions, and she was exhausted, and she would have to put me in mustard baths, and I knew all of this because she would recite this to me all through my childhood, and it would end up with, 'I haemorrhaged when you were born', and that is how I was raised.

She continued the interview by describing situations where she felt unwanted, unloved, and abused during her childhood:

On my fifth birthday I am sitting colouring at the kitchen table as my mother is getting ready for my birthday party, and I am thinking today is going to be OK, because it is my birthday and I am still filled with hope no matter what happens ... still filled with hope and my mother comes up to me and sees that I skipped the lines, and on my birthday, with the smell of the cake baking in the oven my mother says to me, [angry voice] 'Look at that, five years old and you are still skipping the lines, you're going to school next year, you're going to fail you know!' And I think to myself, 'And on top of all that I caused her to haemorrhage'. You know that is how I thought, all the time ..."

Later during the interview, Mrs. X drew parallels between her many sicknesses as a child and her CFS. She explained that her older brother commented that this illness (CFS) is the same illness as Mrs. X was hospitalized for when she was eight years old. She had never been told what illness she had during that time. However, she believes there is a connection.

After the description of her childhood, Mrs. X was asked to describe the year prior to her illness. During that year, she experienced four major life stressors. The most severe on-going stressor for Mrs. X was her husband, which was rated a "2" on the difficulties scale by the SLEDS rating team (please see Table 1 for an explanation of this rating). She explained that she experienced "constant unrelenting humiliation". In the past, she had consulted a divorce lawyer and had gone to support groups for women who had been abused, but she decided not to leave him because she worked so hard for her house and her beautiful garden, which she described as her "sanctuary" when he is at work. When he was home he was controlling, abusive, and condescending. She shared an example of his behaviour with me. Due to health difficulties, her husband had been advised to take daily walks. He would not go on these walks without Mrs. X. During one of their walks together, he said he was thirsty. She told him there was a store just ahead where he could buy a drink. Without any explanation he flew into one of his many rages, and began screaming obscenities at her on a busy downtown street. People on the street stopped and stared, and a group of teenage boys in front of them just began to laugh. She felt embarrassed and humiliated. She explained that in the past she thought he would kill her during one of his rages, and added that in a way she wished for it because it would have been "a way

out". In addition, she had been led to believe that they were on the brink of bankruptcy, only later to discover that they were financially secure. Her husband collected both of their incomes and would give Mrs. X 20 dollars a week for her "allowance".

The second major stressor for Mrs. X was her discovery that her husband had an affair with her friend. This was rated as a "2" on the events scale by the SLEDS rating team. This friend was going through her own separation, and Mrs. X had been emotionally supporting her, which she found very draining. The friend disclosed to Mrs. X that she had slept with her husband. Mrs. X then confronted her husband, who responded, "I didn't think you would like it". Mrs. X no longer has contact with this friend.

The third major stressor Mrs. X experienced during that year was the end of her relationship with her sister. This event was also rated a "2" by the rating team. Mrs. X explained that she had few social supports in her life at that time. Her highest-rated social support received a "6" on the Support variable (please see Table 1 for an explanation of this variable). She had received limited support from two of her siblings and one of their spouses. However, these people lived in major cities far from where Mrs. X lived. Over the past 20 years, Mrs. X's sister, who was one of these supports, had complained about her marriage to her abusive husband. Mrs. X supported her and encouraged her to get a divorce. The sister separated from her husband but then reunited, blaming the separation on Mrs. X. Apparently, the sister's church has sided with the sister's account of the separation and convinced the sister and her two boys that Mrs. X was evil and from the devil. The family no longer has contact with Mrs. X. Mrs. X is very upset, especially because she does not have children and she feels that

her nephews were like her own children.

The final stressor for Mrs. X was the death of her father, which was rated as a "2" on the event scale. She says her father "at best was a sociopath, and at worst was a psychopath". She says that as long as she was in a servile role with her father, the relationship was fine. But he became cruel and brutal if she wasn't serving him. However, she experienced guilt when he died alone in a nursing home 2500 kilometres away. Mrs. X explained that she had helped many patients to death in her role as a nurse and yet she was not there for her own father. She began to cry during the interview when she explained that after his death she had discovered she was his favourite child.

### Case Study #2: A Control Participant

Mrs. Y is a 36-year-old woman who has been married to her present partner for three years. The couple presently have no children but plan to have children in the future. They live in rental accommodation. Her husband is a contractor and in the process of building them a home.

Mrs. Y explains she runs three businesses as a consultant and a therapist. She is also pursuing a Doctor of Education degree. As mentioned earlier, her husband is a contractor and together they have a combined household income of over \$100,000 per year. In her spare time, Mrs. Y is a member of various boards of directors.

She describes many social supports in her life, including her partner, close friends, and colleagues. She has also organized an informal group of her women friends that meets once a week to provide support and encouragement to one another.

When asked how supportive the people in her life were, she rated her co-workers the lowest (i.e., a "6") and rated her close friends highest (i.e., a "10").

Childhood experiences were not routinely explored during the interview, so little information is available about Mrs. Y's early experiences. However, she explains that her father was abusive to her brothers, although not to her. She feels that the suicide of one of her brothers was a result of the abuse he experienced during his childhood. Her other brothers are now repeating the abusive patterns with their own partners and children. She says this is an ongoing stressor for her, as she wishes she could help her nieces and nephews more. Similarly, she describes her brothers as "difficult" at family functions. She did not talk about her relationship with her mother during the interview. The SLEDS rating team rated this family difficulty a "5" on the difficulty rating scale.

During the year prior to her interview, Mrs. Y experienced one severe life stressor, the death of her mother-in-law. Mrs. Y has been with her partner for eight years. During this time she grew close to her mother-in-law, who died at the age of 66. Mrs. Y explains that her husband's mother had a poor diet, smoked, and began experiencing heart problems in the month prior to her death. Her death was a result of these problems. Mrs. Y explains that she was close to both of her partner's parents. They were building their home close to their parents, as they hoped they could help them raise their children. After the death, the participant was concerned that her father-in-law would also die. At the time of the interview (four months after the death), the participant was less concerned about her father-in-law, and explained that things seemed better. The SLEDS rating team rated this event a "2" on the event rating scale.

## **Discussion**

The following sections are designed to compare the findings of the present study to past research, commenting on limitations, strengths, and directions for future research. Each section will focus on one of the independent variables investigated in the present study (i.e., stress, social support, attachment, or parental bonding). This will be followed by a general discussion and the presentation of a multifactorial model that suggests the triggering factors of CFS. A discussion of the implications of the present study, both practical and theoretical, will also be presented.

### **Stress Discussion**

The findings from the present study suggest that CFS participants experienced more stress in the year prior to illness onset than did the healthy control group in the year prior to being interviewed. The fact that stress was the only significant predictor variable in the regression equation supports the hypothesis that stress is a contributing factor in the onset of CFS.

Past research results have been inconsistent when attempting to determine whether stress plays a role in the onset of CFS. Some researchers (e.g., Stricklen et al., 1990) have found that CFS sufferers reported experiencing more stressful life events in the twelve months prior to the onset of CFS than healthy controls. In contrast, other researchers such as MacDonald et al. (1996) found no differences between groups for reports of life stress. One reason for this inconsistency between studies may be that checklists such as the Holmes and Rahe Social Readjustment Scale were used. The limitations of a checklist approach to reporting stress are well documented (Brown

**& Harris, 1989). This study, therefore, is the first to use the stress methodology that is widely regarded as the only adequate one available (Brown & Harris, 1989). However, some limitations to this approach still exist. The retrospective reporting of events (especially events that occurred up to 29 years ago in the CFS group) is problematic. Even though the Brown and Harris Schedule helps participants contextualize events and date them accurately, it can be argued that memories of past events can be inaccurate. For example, CFS participants may be looking for a cause of their illness (i.e., stress), and inadvertently recall stressful events that did not occur in the year prior to illness onset.**

**Future research could recruit CFS sufferers through medical practitioners shortly after they are diagnosed in order to get a more accurate account of the life stress that occurred in the previous year. Longitudinal and prospective studies could also be undertaken to interview individuals who are predisposed to this illness, prior to the beginning of the illness. Unfortunately, this type of research is costly and time consuming.**

**One final difficulty becomes apparent when reviewing the current literature on stress and CFS. It is difficult to compare and generalize the results of various studies because the definition of stress is inconsistent. Stress has been conceptualized in many different ways. For example, CFS sufferers in the Ware and Kleinman (1992) interviews commented that stress was “worry, the feeling of having too much to do, experiences of loss, feeling alone and incurring the displeasure of others” (Ware and Kleinman, 1992, p. 552). These sufferers highlight one difficulty in researching stress with respect to CFS. Stress can be conceptualized as an internal process (“worry”), or**

the result of an external event ("loss"), or it can result from interaction (or lack of it) with others ("feeling alone"). Only through the use of standardized methodologies and definitions such as those suggested by Brown and Harris (1989) can we begin to overcome these difficulties and fully understand what factors contribute to the onset of CFS.

### Social Support Discussion

Overall, CFS sufferers reported lower levels of social support in the year before their illness began when compared to healthy control participants. This finding from the present study supports the results of Lewis et al. (1994), who found that CFS participants perceived significantly less overall social support prior to their illness onset when compared to irritable bowel syndrome and healthy control participants. Interestingly, 100% of the control group in the present study said they had someone in whom they could confide, while only 63.6% of the CFS group reported having a confidant in the year prior to becoming ill. It appears that social support does play a role in regulating physiological stress, as suggested by McGuire and Troisi (1987). They hypothesised that when humans experience stress, their bodies react to this stress through physiological deregulation. Social interactions, support, and attachments can be used to regain a level of homeostasis in the body. McGuire and Troisi (1987) postulate that this state of continued deregulation results in a psychiatric illness in vulnerable individuals.

With the results from the present study, it can be speculated that CFS sufferers on average did experience stress that caused a physiological deregulation in their

bodies. Continued deregulation, in combination with a lack of regulating influences (i.e., social support), made them vulnerable to a physical illness (e.g., viral or bacterial) and/or psychological illness (e.g., depression). This speculation is supported by the finding that 83.3% of the control group said they rely on other people or both other people and themselves when they experience a crisis. In contrast, 40% of the CFS sufferers said they rely solely on themselves and did not turn to others for support during a crisis. The results suggest that a lack of social support combined with severe life stress triggers the onset of CFS.

The present study is the first to investigate social support in CFS sufferers in conjunction with the Brown and Harris (1978) methodology. However, this research is limited by the fact that CFS sufferers were recruited from support and education groups. Past research has shown that participation in CFS support groups is correlated with ongoing disability after two years (Sharpe, Hawton, Seagroatt, & Pasvol, 1992). This continued disability in CFS sufferers who join support groups may be a result of the fact that only the more seriously ill CFS sufferers join these groups. In addition, people may join these groups because they experience low social support in their lives.

The fact that many of the CFS participants in the current study belonged to support groups may therefore be a confounding variable. These individuals may have joined the groups as a result of realizing that social support is necessary and that the lack of it may have contributed to the onset of their illness. On the other hand, they may value interpersonal relationships and support more highly than other sufferers who do not participate in support groups. In any case, future researchers could recruit participants through medical doctors shortly after they have received a diagnosis of

CFS.

### Adult Attachment Discussion

The present study attempted to answer the question, "Do CFS sufferers have different attachment styles than people who do not suffer from this illness?" When we consider the results from the RQ and RSQ questionnaires, the answer appears to be no. However, the RAAQ subscales suggest that there are attachment differences between CFS and control group participants.

When the results from the RQ and the RSQ are compared, these scales inconsistently classify participants into one of the four attachment categories (i.e., secure, dismissing, preoccupied, and fearful). For example, one participant who was categorized as having a secure attachment style on one scale, was categorized as being dismissive on the other scale. For both the RQ and the RSQ, no differences between groups were found for the number of participants classified into each specific attachment category. However, when participants who rated themselves as secure were compared to those who rated themselves as insecure (i.e., fearful, preoccupied, or dismissive), significantly more control participants (70.8%) than CFS participants (36.4%) classified themselves as secure in their relationships on the RQ. In contrast, no differences between groups were found when comparing security and insecurity as categorized by the RSQ.

Interestingly, one of the most salient findings in the adult attachment literature is that individuals who do not have secure attachment styles also report having less satisfying relationships (Collins & Read, 1990). It has also been discovered that in

times of high stress, nonsecurely attached couples experience more difficulty with problem solving and supporting each other through the stress. During these times, nonsecure individuals may experience additional stress because they feel they are not getting what they require from their partner in terms of support (Simpson & Rholes, 1994). This may help to explain why the highest-rated social supports in the CFS group were significantly lower than those in the control group. During times of stress, partners and friends of CFS sufferers are perceived as less supportive. This may also compound stress, as interpersonal relationships become an additional source of stress.

This finding was supported by participant responses on the RAAS. The results from the Depend subscale suggest that CFS participants are less likely to feel that other people can be depended upon when needed. The other two RAAS subscales approached significance, suggesting that CFS participants may be less comfortable with closeness and more anxious about being abandoned or unloved.

Overall, CFS participants report difficulty depending on others and prefer to avoid close relationships. This helps to explain why CFS sufferers report less social support in the year prior to the beginning of their illness.

The present study is unique in that it is the first to explore adult attachment in CFS sufferers. Unfortunately, this study is limited because it used questionnaires to assess adult attachment. Currently there is a debate in the literature as to which methodology (i.e., questionnaires vs. in-depth interviews) can best assess attachment (Bartholomew & Horowitz, 1991). Similarly, self-ratings on questionnaires may be inaccurate because attachment styles affect how people perceive themselves and others. For example, dismissive individuals have very strong defences and as a result

misinterpret others and avoid situations that may threaten their positive self-concepts (Bartholomew & Horowitz, 1991; Simpson & Rholes, 1994). Hazan and Shaver (1987) suggested that it is very difficult to assess accurately the dismissive attachment style using self-report measures. Future research could explore CFS sufferers' attachment styles through the use of the Adult Attachment Interview (AAI)(George et al., 1985; Main & Goldwyn, 1994). This in-depth interview explores topics about adult attachments, as well as attachment during childhood. Interview transcripts are then coded and scored to assign each interviewee to an attachment category. The training and scoring of the AAI are time consuming and costly; however the results from these interviews with CFS sufferers may prove informative.

Another drawback to the use of attachment questionnaires in the present study is that attachment styles and perceptions of the importance of relationships may have changed for the CFS sufferers since the time of illness onset. For example, two of the CFS participants commented that therapy (since the time they had become ill) had helped them gain new perspectives and insights about themselves and others. These new insights would most likely affect their responses on the attachment questionnaires. One way to avoid this difficulty would be to ask both the participants and the people who are close to them to rate the participants' attachment styles at the time they became ill.

### Parental Bonding Discussion

Do CFS sufferers report different bonding patterns with parents than non sufferers? The results from the Parental Bonding Inventory in the present study

suggest that they do. CFS participants rated both their mothers and their fathers as less caring, more emotionally cold, and more indifferent and neglectful than did the control group participants. However, there were no significant differences found between groups for ratings of parental overcontrol, intrusion, excessive contact, infantilization, and prevention of independent behaviours. This finding contrasts with the findings of Pelcovitz et al. (1995) who reported that adolescent girls with CFS had mean scores on the paternal PBI overprotection subscale that were almost double those of normal controls. Pelcovitz et al. critique their study, commenting that the number of subjects in their study was too small to yield statistical significance. In their study, adolescents with CFS and adolescents with cancer rated their fathers as more controlling and intrusive than did the control group adolescents. They interpret this finding to suggest that fathers of children with chronic illnesses are more protective as a result of the illness. However, results from the present study would contradict this hypothesis, as all of the CFS participants contracted their illness after the age of 16. The PBI asks respondents to rate relationships with their parents during the first 16 years of their lives. Therefore, fathers could not be overprotective as a result of the illness, because their children had not yet contracted CFS, and instead may be contributing to the predisposition to the illness.

The regression analysis in the present study did not indicate that perceived maternal care (which is highly associated with perceived paternal care) significantly contributed to the ability to predict CFS vs. control group membership. The only variable that was significantly predictive of the onset of CFS was stress in the year prior to illness. However, there was a difference in levels of social support between CFS and

control group participants. Social support was correlated with maternal care which suggests that relationships with mother during infancy and childhood affect the level of social support available during adulthood. This finding is supported by the writings of Bowlby (1969; 1973) who believed that early relationships with caregivers affect the quality of relationships in adulthood.

To build on the hypotheses of Bowlby (1973) and Taerk and Gnam (1994), CFS participants may have experienced problematic early relationships with caregivers that became internalized (i.e., as internal mental representations or object relations). As a result of these early relationships, CFS sufferers developed internal working models of parents who were emotionally cold, indifferent, and neglectful. These internal working models have been carried into adulthood and are being used as a template by which to judge other people in their lives. As a result, these individuals have fewer (if any) close relationships because they fear rejection, feel insecure, and find it difficult to trust and depend on others, just as they had during childhood.

Another interesting hypothesis, suggested by Taerk and Gnam (1994), is that CFS participants did not acquire the ability to "self-regulate". It is speculated that infants learn to self-regulate internal psychological and physiological processes through their relationship with mother (Reite & Boccia, 1994). Reite and Boccia comment, "One function of maternal behaviour in primate species may be to foster the development of synchrony or concordant regulation with the developing offspring. This apparent concordant regulation between mother and offspring is an early form of physiological self-regulation, but in the context of a relationship ..." (Reite & Boccia, 1994, p. 114). Through this early relationship, the child begins to feel secure that there is another

person available to aid him or her in self-regulation. This feeling of security is internalized and carried into adulthood. In adulthood, these secure individuals are then able to use social support to regulate both psychological and physiological regulation (McGuire & Troisi, 1987).

## **General Discussion**

### **Limitations of the Present Study**

There are two major limitations of this study. First, as discussed above, the retrospective reporting by CFS sufferers of events and difficulties that occurred an average of ten years ago is problematic. Second, the comparison group and the CFS group in the current study are not well matched.

Graduate students may not have been the ideal participants to compare to CFS sufferers. Past research has shown that students exhibit more depression and psychopathology compared to the general population (Gotlib, 1984). In the present study, 42% of the comparison group had experienced at least one severe event or difficulty in the year prior to their interview. This percentage is higher than what is found in the general population. Brown and Harris (1989) reviewed 10 population studies and reported that on average, 32% of the general population experienced at least one severe event or difficulty in a given year. This percentage is lower than what was found in the current study, which suggests that the present comparison group experienced more stress than is normally experienced in the general population.

This discrepancy between graduate students and the general population adds strength to the findings. In the present study, comparison group is thought to be more

similar to the CFS group, than a random sample of people selected from the general population. Therefore, the results of the current study can be considered a conservative estimate of the difference between stress experienced by CFS sufferers in the year prior to their illness and the stress experienced by a person from the general population in a given year.

The present study could have been improved by matching CFS participants to a random sample of people drawn from the general population using such characteristics as gender, cultural background, and socio-economic status.

#### A Multifactorial Model of CFS

After reviewing the above sections, it can be speculated that CFS sufferers had parents whom they perceived as emotionally cold, indifferent, and neglectful. These relationships may have been internalized and carried with them into adulthood. In adulthood, as a result of internal models gained in childhood, they found it difficult to become close to and trust others. This resulted in a lack of social support, where people were not readily available to help these individuals regulate psychological and physiological functioning in times of stress. To compound this deregulation, the vulnerable individuals did not learn, through early relationships with caregivers, how to self-regulate. Vulnerable individuals are left feeling both psychologically and physiologically distressed, with no one to turn to (who can be trusted) to help them cope with life stress. This compounding deregulation predisposes the individual to both psychological (e.g., depression) and physical (e.g., viral, bacterial) illnesses.

**Figure 1. Hypothesized Multifactorial Model of the Precursors to CFS.**

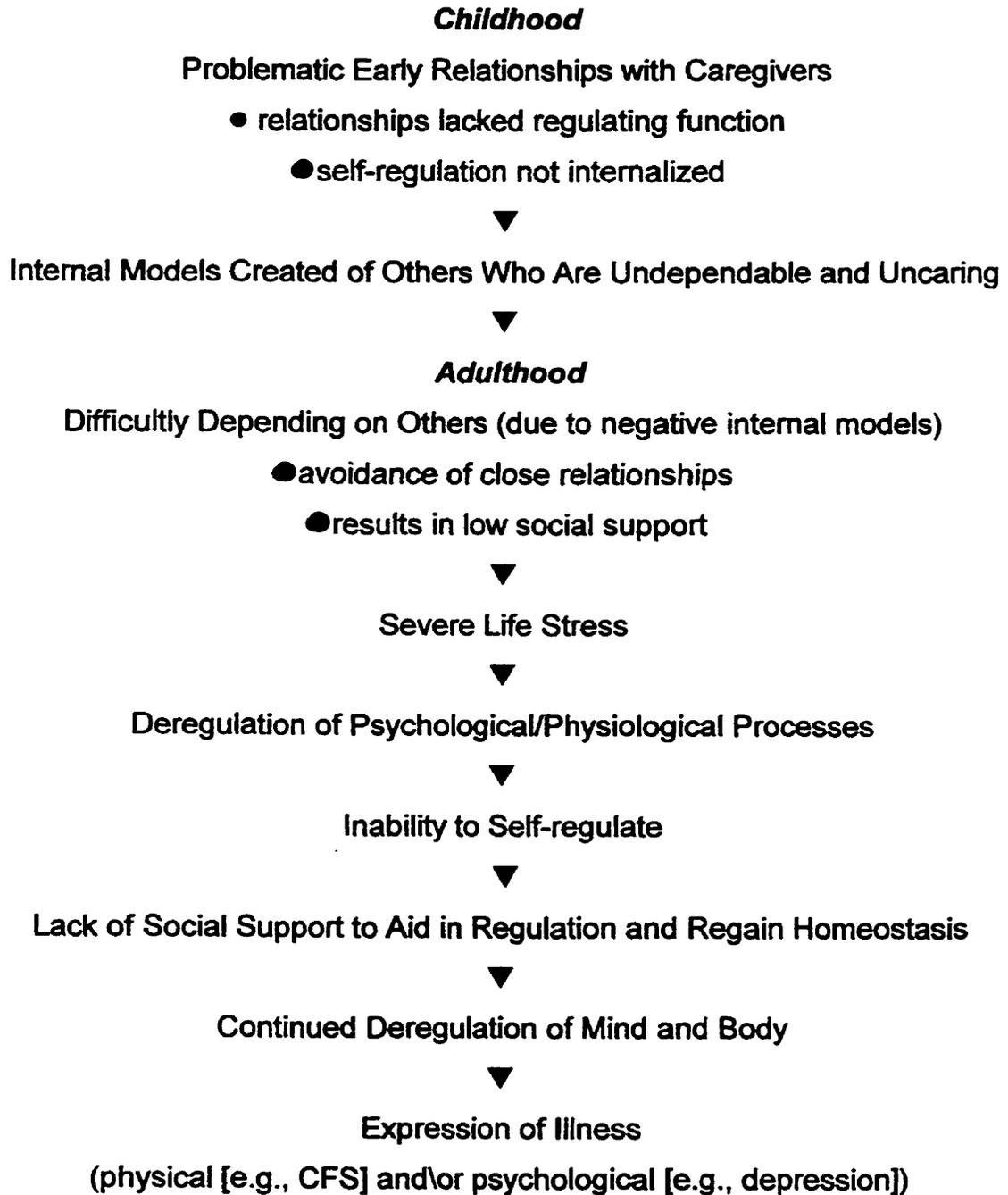


Figure 1 presents the hypothesized relationships between stress, social support, attachment, parental bonding, and regulation/deregulation. Some of the assumptions of this model are more strongly supported by findings from the present study than others. For example, there was more evidence for the idea that stress triggers CFS, while there was less empirical support for the idea that poor parental care is a vulnerability factor for this illness. However, this model is introduced in order to suggest factors that may trigger this illness, and to help guide future research.

One of the strengths of the current study was that it investigated multiple factors that may have contributed to the onset of this illness. Through investigations like this, multifactorial models can be suggested and investigated, whereby the relative contributions of each variable to the resulting model can be assessed. As mentioned earlier, future CFS participants could be recruited from medical institutions and practitioners shortly after receiving a diagnosis of CFS, to avoid the drawbacks of relying on long-term memory recall of factors that may have contributed to their illness.

One area of research that has not been investigated with CFS sufferers is their ability to self-regulate. Such an investigation could be performed through the use of physiological measurements such as heart rate, blood pressure, cortisol levels, and galvanic skin response measurements. These measurements could be taken prior to (i.e., the baseline measurement), during, and after a stressful interview, with the goal of measuring the amount of time it takes for an individual's physiological reactions to return to baseline levels after a stressful event. The interview (perhaps the Adult Attachment Interview) could be used to gather information about CFS participants' childhoods and attachment styles. To date, few researchers have asked CFS

participants about childhood abuse, parental alcoholism, and health during childhood. Together, these interviews and physiological measurements, and the resultant attachment ratings, could be compared to those of healthy control participants. Researchers in other areas have already begun using cardiac measures to investigate how individuals with different attachment styles respond to stress (Spangler & Grossmann, 1993). Since stress has been shown to trigger CFS, investigations in this area may be particularly fruitful in terms of both study findings and their implications.

### Implications

The implications of the present study are threefold. First, two of the of the psychosocial factors that trigger CFS have been identified (i.e., high stress, low social support); thus health practitioners (equipped with the results of this study) are now in a better position to identify individuals who are at high risk for this illness. Identification could be accomplished through the use of both the SLEDS interview, and one question that requires patients to rate the highest social support in their life.

Second, high-risk patients can now be educated about how to lower their risk factors. Stress management training, support groups, or therapy could be suggested as means for lowering stress and increasing social support. Stress management training could focus on teaching high-risk patients to use more emotion-focused coping methods than problem-focused methods, since problem-focused methods may perpetuate rather than relieve stress (Folkman & Lazarus, 1980). Past research has shown that CFS sufferers used predominantly problem-focused coping styles prior to their illness onset (Lewis et al., 1994).

The results from this study also highlight the importance of social support to maintain healthy functioning and to help ill individuals cope. Spiegel and others (Spiegel, 1995; Spiegel, Bloom, Kraemer, & Gottheil, 1994; Spiegel & Kato, 1996) suggest that increased social support in cancer patients is related to decreased mortality, increased adaptation to the illness, improved mood, and decreased pain. This may also hold true for CFS sufferers. CFS sufferers with low support and high-risk individuals can be encouraged to join support groups, become involved in community organizations, and/or enter therapy. Bowlby (1988) felt that attachment style, and therefore the ability to gain and use social support, was not "written in stone". This style can be changed through positive experiences with others as well as therapy. To be most beneficial, therapy might focus on the relationship between therapist and client, with special emphasis on helping the client become less fearful and more trusting of the therapist and others in their lives. Similarly, these individuals might be educated about the importance of social support in the regulation and the alleviation of stress (McGuire & Troisi, 1987).

Finally, the results from the present study contribute to our understanding of the connection between mind and body. More specifically, it is clear that psychosocial variables such as stress and social support are not only psychologically taxing, but also predispose the immune system to attack by various physical viruses and bacteria. It is clear that the mind-versus-body debate about the cause of CFS is no longer helpful in explaining the causes of this devastating illness. Only through multifactorial models, such as the one presented in this paper, can we begin to fully understand what predisposes and triggers CFS in certain people.

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## Consent Form

Dear Participant,

This study is investigating the impact of events and difficulties upon people's health. You will be asked to complete a few questionnaires concerning past life events, interpersonal relationships, and how you cope in certain situations. You will also be asked to participate in an interview which takes approximately 30 minutes to complete. The interview focuses on events that you have experienced in the past. This entire process typically takes less than one hour and you can finish the questionnaires at home if you wish. You will be offered a summary of the study results when they are available (if you are interested). Please return any questionnaires by mail in the prepaid envelope provided.

Your participation in this study is completely voluntary. You can withdraw at any time for any reason. Your responses are completely confidential. There will be no disclosure of your name and no identifying data will be released on you. I would also like to assure you that there are no known risks or discomfort associated with this kind of study. You will not receive reimbursement for your participation in this study. However, by participating and sharing your experiences, your input may increase our understanding of the impact of stressful life events, and in turn help others who face similar challenges and difficulties in the future.

If you have any questions, concerns or please feel free to contact me..

Thank You,

---

Melissa L. Mayer, Doctorate student  
OISE, University of Toronto, (416) 489-8250

Supervisor: Solvegia Miezitis, Ph.D.,  
Professor, OISE, University of Toronto  
(416) 923-6641 (ext. 2573)

Thank you again for your participation.

---

I have read the letter of explanation and agree to participate as a respondent in the study conducted by Melissa Mayer. I understand what my participation entails and that my responses are confidential. I also understand that my participation is voluntary and that I can withdraw at any time.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

(For Comparison Group)

Subject # \_\_\_\_\_

## Demographics

1) What is your gender? Male  Female 

2) When were you born? Month \_\_\_\_\_ Year \_\_\_\_\_

3) Presently, what types of responsibilities/obligations do you have? (Please check all boxes that apply):

Employment Hours per week? \_\_\_\_\_  
What is your occupation(s)? \_\_\_\_\_

Children How many? \_\_\_\_\_  
Ages? \_\_\_\_\_  
Does child(ren) have any special abilities or difficulties that require increased care?  
 yes  no

Are you a single parent?  yes  no

School What degree/diploma are you pursuing?  
\_\_\_\_\_  
What was/is your ultimate goal in regard to education? \_\_\_\_\_

Caring for parents or relatives?  
What does your care entail? \_\_\_\_\_  
Approximate hours per week? \_\_\_\_\_

Volunteer Activities (please specify) \_\_\_\_\_  
Approximate hours per week? \_\_\_\_\_

Hobbies or sports  
Approximate hours per week? \_\_\_\_\_

Other responsibilities/events in your life presently? (please specify type and number of hours per week)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## 4) Please estimate your household income:

- |   |   |
|---|---|
| <input type="checkbox"/> less than \$5000     | <input type="checkbox"/> \$51,000 to \$55,000   |
| <input type="checkbox"/> \$5000 to \$10,000   | <input type="checkbox"/> \$56,000 to \$60,000   |
| <input type="checkbox"/> \$11,000 to \$15,000 | <input type="checkbox"/> \$61,000 to \$65,000   |
| <input type="checkbox"/> \$16,000 to \$20,000 | <input type="checkbox"/> \$66,000 to \$70,000   |
| <input type="checkbox"/> \$21,000 to \$25,000 | <input type="checkbox"/> \$71,000 to \$75,000   |
| <input type="checkbox"/> \$26,000 to \$30,000 | <input type="checkbox"/> \$76,000 to \$80,000   |
| <input type="checkbox"/> \$31,000 to \$35,000 | <input type="checkbox"/> \$81,000 to \$85,000   |
| <input type="checkbox"/> \$36,000 to \$40,000 | <input type="checkbox"/> \$86,000 to \$90,000   |
| <input type="checkbox"/> \$41,000 to \$45,000 | <input type="checkbox"/> \$91,000 to \$95,000   |
| <input type="checkbox"/> \$46,000 to \$50,000 | <input type="checkbox"/> \$96,000 to \$100,000  |
|   | <input type="checkbox"/> greater than \$100,000 |

## 5) Do you presently suffer from any illnesses (physical or mental)?

yes  no

If "yes" please describe:

---



---



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## 6) Please indicate your highest level of education:

- Some high school
- Completed high school
- College degree  
please list:
- University - undergraduate degree  
please list:
- University - graduate degree  
please list:
- Other  
please list:

Subject # \_\_\_\_\_

**Demographics**  
(For CFS Group)

- 1) What is your gender? Male  Female
- 2) When were you born? Month \_\_\_\_\_ Year \_\_\_\_\_
- 3) When did you first become ill? Month \_\_\_\_\_ Year \_\_\_\_\_
- 4) When were you first diagnosed? Month \_\_\_\_\_ Year \_\_\_\_\_
- 5) Who made your diagnosis (check all that apply)?
- Self
- M.D./family doctor
- Specialist (please specify \_\_\_\_\_)
- Other (please specify \_\_\_\_\_)
- 6) What diagnosis were you given? (check all that apply)
- Myalgic Encephalomyelitis
- Chronic Fatigue Syndrome
- Epstein Barr Virus
- Prolonged Viral Syndrome
- Post-infectious Neuromyasthenia
- Others (please specify \_\_\_\_\_)
- 7) When you first became ill what types of responsibilities/ obligations did you have?  
(Please check all boxes that apply):
- Employment Hours per week? \_\_\_\_\_  
What was your occupation(s)? \_\_\_\_\_

- Children      How many? \_\_\_\_\_  
 Ages? \_\_\_\_\_  
 Did child(ren) have any special abilities or difficulties that require increased care?  
 yes    no
- Are you a single parent?  yes  no
- School      What degree/diploma were you pursuing?  
 \_\_\_\_\_  
 What was/is your ultimate goal in regard to education? \_\_\_\_\_
- Caring for parents or relatives?  
 What did your care entail? \_\_\_\_\_  
 Approximate hours per week? \_\_\_\_\_
- Volunteer Activities (please specify) \_\_\_\_\_  
 Approximate hours per week? \_\_\_\_\_
- Hobbies or sports  
 Approximate hours per week? \_\_\_\_\_
- Other responsibilities events in life at the time you became ill? (please specify type and number of hours per week)  
 \_\_\_\_\_

**(8) Please circle the number that best describes your present state?**

1	2	3	4	5
Completely well with no symptoms		equal number of "good" and "bad" days		Sick all the Time

**(9) Please circle the number that best describes how you are feeling now in comparison to when you first became ill?**

1	2	3	4	5
Completely recovered		Same as at beginning	of illness	Condition worse, sick all the time

## 10) Please estimate your household income:

- |   |   |
|---|---|
| <input type="checkbox"/> less than \$5000     | <input type="checkbox"/> \$51,000 to \$55,000   |
| <input type="checkbox"/> \$5000 to \$10,000   | <input type="checkbox"/> \$56,000 to \$60,000   |
| <input type="checkbox"/> \$11,000 to \$15,000 | <input type="checkbox"/> \$61,000 to \$65,000   |
| <input type="checkbox"/> \$16,000 to \$20,000 | <input type="checkbox"/> \$66,000 to \$70,000   |
| <input type="checkbox"/> \$21,000 to \$25,000 | <input type="checkbox"/> \$71,000 to \$75,000   |
| <input type="checkbox"/> \$26,000 to \$30,000 | <input type="checkbox"/> \$76,000 to \$80,000   |
| <input type="checkbox"/> \$31,000 to \$35,000 | <input type="checkbox"/> \$81,000 to \$85,000   |
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| <input type="checkbox"/> \$41,000 to \$45,000 | <input type="checkbox"/> \$91,000 to \$95,000   |
| <input type="checkbox"/> \$46,000 to \$50,000 | <input type="checkbox"/> \$96,000 to \$100,000  |
|   | <input type="checkbox"/> greater than \$100,000 |

11) Do you presently suffer from any<sup>other</sup> illnesses (physical or mental)?

- yes  no

If "yes" please describe:

---



---



---

## 12.) Please indicate your highest level of education:

- Some high school
- Completed high school
- College degree  
please list:
- University - undergraduate degree  
please list:
- University - graduate degree  
please list:
- Other  
please list:

**SLEDS 3.2: Life Events and Difficulties Section**

"I am<sup>now</sup> going to be asking about stress in a number of different areas of your life"

**Procedure Notes - SLEDS Interviewing:** First, begin the interview by asking about the first event, then go sequentially through the remaining stressor probes until you have collected info on two stressors.

Second, after information on two stressors has been collected (we only want information on three stressors total in the SLEDS) tell the participant you would like to collect information on one more stressor. But remember we would like to get that stressor that is the most severe of any not yet disclosed. Say something like the following,

**"You have told me about two stressful things that have happened, for this interview I would like to collect information about one more stressor, that is if anything else has happened in the last 12 months. If more than one stressor comes to mind please tell me about that one which you feel was the most stressful."**

***I: Death: Events Related to Death***

"At any time during the previous year have you experienced ..."

- E1. "... the death of a close relative." (eg. child, spouse/partner, sibling).  
E2. "... the death of any other close relative or family friend?"

***II: Money/Finances: Events Related to Money/Finances***

"At any time during the previous year ..."

- E3. "... have you experienced a major financial crisis?"  
E4. "... has something valuable been lost or stolen?"

***Difficulties Related to Money/Finances***

- D1. "Have there been any major financial problems that have lasted at least one year?"

***III: Marital/Partner Relationship: Events Related to Marital/Partner Relationship***

"At any time during the previous year have you ..."

- E5. "... had a separation due to marital difficulties?"  
E6. "... broken off a steady relationship?"

### III: *Difficulties Related to Marital/Partner*

D2. "Have you had any major problems related to your relationship with spouse/partner that have lasted at least one year? (*pause*)"  
For example have you had any ongoing difficulties involving ..."

"... violence?"

"... infidelity/extramarital affair?"

"... separation/divorce?"

"... tension/conflict/disinterest?"

### IV: Work: *Events Related to Work*

"At any time during the previous year have you been ..."

E7. "... unemployed or seeking work for more than a month?"

E8. "... laid off from a job?"

#### *Difficulties Related to Work*

D3. "Have there been any work related major problems that have lasted at least one year? (*pause for answer*)  
For example have you had any ongoing difficulties involving ..."  
(*areas worthy of probe follow*)

"... finding a job?"

"... work conditions?"

"... relationships at work?"

"... unemployment?"

### V: Crime/Legal: *Events Related to Crime/Legal*

E9. "At any time during the previous year have you experienced problems with police or had to appear in court?"

### VI: Health/Accidents: *Events Related to Health/Accidents*

"At any time during the previous year ..."

E10. "... have you had a serious illness or injury?" (*operation*).

E11. "... has a close relative had a serious illness or injury?"

#### *Difficulties Related to Health*

D4. "Have there been any problems related to your or someone else's health that have lasted at least one year? (*pause*)"  
For example have you had any ongoing difficulties involving ..."

"... your own or someone else's psychological health?"

"... someone else's old age (geriatric problems)?"

(\* Explore only those health related difficulties that have non-health components, ie. plans, actions, roles, relationships have been significantly altered.)

**VII: Other Relationships: Events Related to Other Relationships**

"At any time during the previous year have you had a ..."

E12. "... serious problem with a close friend, neighbour or relative?"

***Difficulties Related to Other Relationships***

D5. "Have you had any difficulties related to other relationships that have lasted at least one year? (*pause*)"

For example have you had any ongoing difficulties involving ..."

"... children's conduct, or care?"

"... crisis, tension in relationship?"

"... decrease in or lack of social interaction?"

"... separation/divorce of other?"

**VIII: Housing: Difficulties Related to Housing**

D6. "Have there been any major problems related to living conditions that have lasted at least one year? (*pause*)"

For example have you had any ongoing difficulties involving ..."

"... problems related to payment?"

"... living conditions?"

"... neighbours?"

**IX: Pregnancy/Birth: Difficulties Related to Pregnancy/Birth**

D7. "Have there been any major problems related to pregnancy or birth that have lasted at least one year? (*pause*)" For example have you had any ongoing difficulties involving ..."

"... infertility or sterility?"

"... postnatal problems?"

**X: Miscellaneous Stressors: Miscellaneous Events**

E13. "Thinking back over the last year, has anything else happened that was very upsetting or problematic for you? (*pause*)"

"Any upsetting events in any of the following areas that we might have missed?"

... any other deaths

... financial crises

... marital problems

... problems in other important relationships

... work related

... related to the police or court

... serious illness to self or close other

... anything lost or stolen

***Miscellaneous Difficulties***

D8. "Are there any other major difficulties/problems that have lasted for at least one year that we have not covered?"

**SLEDS 3.2: Demographic & Social Support Schedule**

IDCode \_\_\_\_\_

1) "Are you married or living with someone? Since when?"

 married     single     cohabitingIf single: "Are you romantically involved with someone?"  Yes  No

2) "Is this person someone you can confide in?"

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If No: "Is there someone in whom you can confide?"

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3) "Are you part of a group or community of people of any kind who you see at least once every week? (eg at work, friends, club)"

 YES  NO

If Yes: "What is the basis of your involvement in this (these) group(s)? Is it related to sports, work, etc.?"

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Estimate of time involved in each of these groups (hours per week):

i) \_\_\_\_\_ ii) \_\_\_\_\_

4) "Could give me an idea of the total annual income for your household. Would you say this would be below or above 20 thousand dollars?"

 less than \$20,000     greater than \$20,000

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

## Support Interview

"I am going to be asking you questions about stressful events which you have experienced in the recent past and about the sort of support you have had in dealing with these stressful events. If at any point during this interview you feel too upset or uncomfortable to continue, please tell me and we will end the interview. Also, if I ask you any questions during the interview which you do not wish to answer, please tell me and we will go on to the next question. Would you like to ask me anything before we begin?" (*pause*)

### Interview Questions:

Question #1: "Has there been anything in your life that you have found especially important to you in supporting or maintaining your sense of who you are? This can include a person or group of people or an event or activity."

**Question #2:** "Who have been the most important people in your life over the past year, in terms of the support you have received from them?"<sup>108</sup>

{**Probes:** "What about an important intimate relationship?"  
"What about a close friend or family member?"}

**Question #3:** "What have been the most enjoyable activities you have engaged in over the past year?"

**Question #4: "What do you do to cope with stressful events or difficult situations in you life ?" 109**

1. "Do you *currently* have such a source of support in your life?"

YES \_\_\_\_\_ NO \_\_\_\_\_

IF "NO": "How long has it been since you had such a source of support in your life?"

2. "Over the past year, how satisfied have you been with this support, on a scale of 0 to 10, with 0 meaning that you were completely dissatisfied with the support and 10 meaning you were completely satisfied with the support?"

SCORE (range: 0 to 10): \_\_\_\_\_

3) During a crisis are you more likely to turn to other people or rely on yourself for help?

### Explanation of Research

This study is designed to look how people with Myalgic Encephalomyelitis (ME) or Chronic Fatigue Syndrome (CFS) have been effected by stressful life events. Recently, there has been a debate about what factors predispose people to this illness. The present study investigated whether stress triggers this illness. We hope that by having a better understanding of how people respond to stressful life events, we can discover what factors contribute to the onset of ME/CFS. In turn, health professionals may be better able to help prevent CFS and similar illnesses in the future by identifying and educating individuals who are at high risk. Similarly, we may be better able to assist people who have become ill by providing information to therapists and other health care professionals about specific skills that are helpful in improving the quality of life for individuals with ME/CFS.

Thank you for your participation in this study. If you have any questions or would like to know more about the study please feel to contact me. Below are three articles that you can refer to for further information.

### References

- Lewis, S., Cooper, C., & Bennett, D. (1994). Psychosocial Factors in chronic fatigue syndrome. Psychological Medicine, 24, 661-671.
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