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To the Graduate Council:

I am submitting herewith a dissertation written by Donna L. Kennedy entitled "Testing the Spousal Model of Stress in Healthy Controls, Persons with Multiple Sclerosis and their Spousal Caregivers." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

Debora Baldwin, Major Professor

We have read this dissertation and recommend its acceptance:

Warren Jones, Derek Hopko, Priscilla Blanton

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

To the Graduate Council:

I am submitting herewith a dissertation written by Donna LeAnn Kennedy entitled "Testing the Spousal Model of Stress in Healthy Controls, Persons with Multiple Sclerosis and their Spousal Caregivers." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

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Acceptance for the Council:

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Carolyn R. Hodges,
Vice Provost and Dean of
Graduate School

Testing the Spousal Model of Stress in Healthy Controls, Persons with Multiple Sclerosis and their Spousal Caregivers

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Donna LeAnn Kennedy
December 2008

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Acknowledgments

I wish to thank all those who helped me complete my Doctorate degree in Experimental Psychology. First I would like to thank my major advisor, Dr. Debora Baldwin for her guidance and for teaching me valuable lab skills. I would also like to thank Dr. Warren Jones, Dr. Derek Hopko, and Dr. Priscilla Blanton for serving on my committee and for providing great feedback. Recruiting participants with multiple sclerosis would not have been possible without the help of Beth Smith, Vice President of Programs of the MidSouth Chapter of the National Multiple Sclerosis Society, and A.D. Basser and Dr. Randall Trudell at Cole Neuroscience Center. This study was made possible by an award from the Department of Psychology and a grant from Sigma Xi.

I would like to give special thanks to my wonderful husband Justin whose support and love through the years has kept me grounded and made completion of the program possible. I would also like to thank my parents for their continued support through my many years in school.

Abstract

The current study examined the Spousal Model of Stress in a sample of healthy, married controls (n=52) and a sample of persons with multiple sclerosis and their spousal caregivers (n=51). The Spousal Model of Stress was created by joining together Ruben Hill's (1958) ABCX Model of Stress and Karney & Bradbury's (1995) Vulnerability-Stress-Adaptation Model of Marriage. Factors in the Spousal Model include stress, resources/vulnerabilities, perceptions/adaptive processes, and outcomes (marital satisfaction, marital quality, life satisfaction, and depression). The new model revealed that spousal attributions were an important factor in predicting marital quality and marital satisfaction in a group of healthy spouses. Life satisfaction and depression in this group was predicted by amount of perceived stress. The Model also revealed that social support was an important factor in predicting marital quality, marital satisfaction, and life satisfaction in a group of persons with MS and their spousal caregivers. Limitations and future directions are discussed.

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I. Introduction

Recently, increased attention has been drawn to the role of caregivers in research and in the media. Part of this attention is due to the disproportionate growth in the oldest–old population and the associated increase in risk of experiencing chronic illness, disease, or disability. The National Family Caregiving Association (2003) reports that there are over twenty-seven million caregivers in the United States who provide over 29 billion hours of care, and have an annual market value of over 257 billion dollars. The majority of caregivers are middle-aged adult children and older spouses who care for a parent or spouse (Schulz & Beach, 1999). However, spousal caregiving is the most common type (Feld, Dunkle, & Schroepfer, 2005; Glozman, 2001). Spouses provide more hours of care, more personal care, a wider range of care than other caregivers, and provide care for longer periods of time. However, they are the least likely to receive help from secondary caregivers such as respite care or other family members (Chappell & Kuehne, 1998). These issues give rise to concerns about how families will fulfill the caregiving needs and what the effects (i.e., financial, psychological, and relational) on the family will be (Glozman). In fact, the effects on the family may have something to do with the gender of the caregiver/care receiver.

Gender Differences in Caregiving

One area of interest in caregiving concerns gender differences. It has been found that when women are caregivers, they often do not continue working. However, when men are caregivers, they often remain at work and can afford to seek outside help (Brodie & Gadling-Cole, 2003). Additionally, women caregivers are found to report higher levels of burden (Hooker, Manoogian-O'Dell, Monahan, Frazier, & Shifren, 2000;

Kosmala & Kloszewska, 2004), higher role overload, more loneliness, less satisfaction with life (Gordon & Perrone, 2004), more strain, stress, and burnout (Houde, 2002), more depression, and greater excess psychiatric morbidity than their male counterparts (Hooker et al). This may be due to the fact that female caregivers believe themselves to have less effective coping strategies and are more fearful of receiving criticism about their effectiveness of providing adequate care (Gordon & Perrone). Because women, in general, spend more time than males doing housework and providing childcare even when both spouses work, this greatly influences the perception of role overload (Gray, 2003; Hagedoorn, Sanderman, Buunk, & Wobbes, 2002). Similarly, females have reported feeling more captive in their roles and trapped in caregiving responsibilities and therefore become at risk for experiencing more emotional burdens than men (Gaugler et al., 2003). Overall, Chappell and Kuehne (1998) found that when the husband was the caregiver, 86.4% of the sample showed that both spouses expressed positive affect whereas only 56.7% did so when the wife was the caregiver. In addition, it has been found that people outside of the dyad are more likely to give psychological and social support to a caregiving husband than a wife (Chappell & Kuehne).

Gender Differences in Care Receiving

Gender differences are also evident in those who receive care. In relation to gender differences and seeking social support, it has been found that women report having friends, family, and professional resources they use for support whereas men report that they rely almost solely on their ill spouse for support, especially emotional support. In fact, Feld et al. (2005) found that male care receivers were three times more likely to rely only on their wives than female care receivers were to rely only on their husbands. This

may be because men do not generally talk to others about their issues and therefore have fewer persons they share intimate details with (Gordon & Perrone, 2004). Therefore they may have less experience with asking for help.

Multiple Sclerosis

Multiple Sclerosis (MS) is the most common neurological illness among young adults, affecting an estimated 350,000 to 400,000 Americans (Demetriou, 2006; NMSS, 2006). The National Multiple Sclerosis Society (NMSS, 2006) has reported that, every week, about 200 people are diagnosed and that worldwide, MS may affect 2.5 million individuals. The majority of persons with MS are Caucasian women diagnosed between the ages of 20 and 50. The exact cause of MS is unknown, but most feel that damage to the myelin and nerve fibers results from the immune system reacting abnormally to the body's own antigens (i.e. as if the antigens were foreign; Foley, 1998; Mohr & Cox, 2001; NMSS, 2006). MS is a chronic, progressive disease that typically involves exacerbations and remissions (Lowis, 1990; Mohr & Cox). There is currently no cure for MS (Crawford & Melvor, 1987; Rao, 1992).

Because sclerosis can form anywhere in the central nervous system, those with MS can have a variety of symptoms. These symptoms include, bladder dysfunction, bowel dysfunction, changes in cognitive functioning (including problems with memory, attention, and problem-solving), dizziness and vertigo, depression, fatigue, difficulty walking, numbness, pain, sexual dysfunction, spasticity, vision problems, headaches, hearing loss, itching, seizures, speech and swallowing disorders, blindness due to optic neuritis, tremors, and emotional changes (Mohr & Cox; NMSS). These symptoms make MS a chronic, unpredictable, and often disabling disease. Due to the fact that those with

MS often become disabled, assistance of some type is usually needed. Additionally, due to these symptoms, many individuals diagnosed with MS require the use of a caregiver. Spouses are the typical care partners but others may include siblings, offspring, close relatives, or hired nurses.

The uncertainty of this disease, accompanied with the large range of symptoms, can cause stress on spouses dealing with MS. In fact, studies have found that in marriages with a spouse having MS, the rate of divorce is significantly higher than in the normal population (Coles, Deans, & Compston, 2001; Harrison, Stuifbergen, Adachi, & Becker, 2004). Those in these marriages have been shown to have significantly more relationship problems (e.g. verbal conflicts, concerns about fulfilling role expectations) than those not in these types of marriages (Long & Glueckauf, 1998). Furthermore, Rogers & Calder (1990) found that negative marital change was attributed to MS in those who felt their marriages had gotten worse over the years whereas positive marital change was not attributed to MS.

Some of the problems in the marriage may be related to how the person with MS deals with their disease. For instance, Power (1979) found that those with MS tended to withdrawal from family activities as well as social activities. Withdrawing from social activities is an important issue in MS, as studies have found that an absence of social support systems is a predictor of suicidal tendencies (Speziale, 1997) whereas a presence of social support has been related to experiencing positive effects on marital relationships for those with MS (Brooks & Matson, 1992). Overall, those with MS are more likely to commit suicide (Speziale; Stenager & Stenager, 1992), be depressed (Pakenham, 1999; Rao, Huber, & Bornstein, 1992), have lower self-esteem and lower perceptions of social

support (Long & Glueckauf, 1998) than those without MS or with other neurological diseases. Furthermore, 80% of men and 72% of women with MS report some type of sexual dysfunction (Litwiller, Frohman, & Zimmerman, 1999) which undoubtedly affects their marital relationship.

Children with a parent who has MS are also affected. Studies have found that, while children accurately perceive and can report the effects of their parent's disability (e.g., mood changes, physical changes, stress), they believe that their behavior has an effect on their parent's illness (Cross & Rintell, 1999; White, Catarizano & Buchholz, 1995). For instance, Cross and Rintell found that children between the ages of 7 and 14 believed that their behavior or other's behavior could make their parents worse. White et al. found that adolescents were worried about the family's financial situation, the effects on the parent without MS, and the possible health deterioration of the parent with MS. Overall, these studies found that the children of those with MS did not have a good understanding of the disease.

Marriage

When examining spousal caregiving, it is important to be aware of aspects of marital relationships as a whole. Fifty-six percent of adults in the United States are married (Robles & Kiecolt-Glaser, 2003) and most adults will get married at least once during their lifetime (Spotts et al., 2004). Research has shown that married individuals are happier, have greater satisfaction with life, and have a lower risk of depression than unmarried individuals (Karney & Bradbury, 1995; Robles & Kiecolt-Glaser). Marital quality has been found to be positively associated with general well-being, mental health, and physical health (Kumashiro, Finkel, & Rusbult, 2002; Robles & Kiecolt-Glaser;

Umberson et al., 2005). Conversely, marital strain and lower marital quality have been found to be related to increases in mortality and morbidity (Robles & Kiecolt-Glaser). Unfortunately, an examination of marital factors has consistently been left out of research on spousal caregiving.

In the few studies that have examined marital satisfaction and marital quality, it has been found that higher marital satisfaction is related to the exchange of emotional support between husbands and wives and emotional support from the couple's social network (Wright & Aquilino, 1998). Ruiz, Matthews, Scheier, and Schulz (2006) found that low presurgical marital satisfaction was related to more caregiver strain after care receivers' surgery. In addition, Svetlik, Dooley, Weiner, Williamson, and Walters (2005) found that satisfaction declined with increases in the amount of care being provided and with declines in sexual intimacy among spouses. More depressive symptoms have also been reported in caregivers who feel they have a low level of marital satisfaction and marital cohesion with their partner (Rankin, Haut, & Keefner, 2001).

A couple of models have been presented in the literature that allow for an examination of how stress affects families and how various factors affect marriage. A closer look at these models instigated this study and a new model was formed by combining parts of the two major theoretical models.

II. Spousal Model of Stress

Reuben Hill's (1958) ABCX model of family stress allows for a better understanding of the caregiving relationship in relation to the effects on the family. Hill's model lies within a social systems model in that it recognizes the importance of the social world in a family's response to stress. Hill's model also allows for an explanation of how families can successfully adapt to stress or crisis over time (McKenry & Price, 2005). See Appendix A for an illustration of the ABCX model.

The A factor in Hill's model is a stressor that causes change in a family. This factor interacts with B, which are the family's resources or strengths. The B factor then interacts with C, which is the meaning the family attaches to the stressor event. These factors together produce the X factor, which is the reaction of stress or crisis. In other words, the X factor is not inherent in the stressor event itself, but is a function of the family's response to the stressor (McKenry & Price, 2005).

In caregiving, the stressor is a family member having an illness or disease. This stressor may cause changes in roles, goals, values, or boundaries. However, these changes may be influenced by resources that buffer the impact of the stressor event. Resources can be traits, characteristics, or abilities the family has available to use in order to meet the demands of the stressor event. Examples of resources and strengths include, economic well-being, education level, available information, physical and mental health, self-esteem, family cohesion, adaptability, coping strategies, marital quality, and social support. The effect of the stressor event will also be moderated by the family's perception or appraisal of the event. For example, a family that views the event as

challenging and an opportunity for growth will fare better than a family who views the event as hopeless and unmanageable. These events together (i.e., the stressor, resources, and perceptions) will produce the actual stress or crisis experienced by the family (McKenry & Price, 2005).

Karney and Bradbury's (1995) Vulnerability-Stress-Adaptation (VSA) model of marriage was developed after examining current theories of marriage. Factors in the VSA model include enduring vulnerabilities (V), stressful events (S; both outside of and internal to the marriage), and adaptive processes (A). The VSA model proposes that stress, enduring vulnerabilities, and adaptive processes together, reciprocally affect marital quality and stability. More specifically, marital quality is related to marital stability, to behavioral exchanges in the marriage, and perceptions of marital quality will affect how spouses resolve problems, conflicts, and transitions (Karney & Bradbury, 1995). See Appendix B for an illustration of the VSA model.

In caregiving, based on the VSA model, the outside stressful event would be a partner having an illness or disease, whereas the internal stressful event is the stress caused in the relationship because of the disease (i.e., effects of the disease, becoming a caregiver). Enduring vulnerabilities include SES, years of education, attachment style, personality, and experiences prior to the marriage (e.g., family history). Adaptive processes include social support within the relationship, coping skills, and attributions. The model shows that enduring vulnerabilities moderate the effects of stress on adaptive processes. For example, if you have beneficial enduring vulnerabilities (e.g., securely attached, conscientious) then being highly stressed (e.g., as a result of caregiving) would not result in detrimental behaviors.

To review, the ABCX model allows for an examination of how a stressor can affect the family. The VSA model allows for an examination of various factors that produce beneficial or detrimental effects on the spousal relationship. Therefore, a combination of these models, into the Spousal Model of Stress (see Appendix C), allows for an examination of how the stress involved in being a caregiver affects the family while also examining how this stressor affects the spousal relationship.

Studied Variables

Stress

It is well known that when one person in a family experiences stress, the effects may extend to the rest of the family. This is especially true when the stress being experienced involves a disability, disease, or chronic illness (Glozman, 2001; Minnes, Graffi, Nolte, Carlson, & Harrick, 2000). In addition, research shows that women experience more distress and depression as a result of stressful life events, especially when these events involve people with whom they have emotional relationships (Gray, 2003).

Due to the fact that stress affects all members of the family, each member of the dyad will be asked about their perceived levels of stress. Perceived stress is an important aspect to examine because not all individuals who experience the same life events will experience the same outcome. Therefore, what one sees as a stressor may not be seen as a stressor by another (Lazarus & Folkman, 1984).

Being a parent is also a potential stressor and is a factor that affects the marital relationship. It is generally agreed that having children is stressful to a marriage and that marital satisfaction decreases when children enter the family (Burpee & Langer, 2005;

Hoelter et al., 2004; Umberson et al., 2005). Having children, especially younger children, may decrease marital quality because there are more household duties and childcare duties which interfere with the quality and time spent together as a couple. In addition, Umberson et al. found that younger parents and parents that had been married for a shorter amount of time experienced a decline in marital quality. They suggested that these parents had fewer resources, both personal and social, to cope with the demands of parenting. Conversely, they found that having adult children living away from home was beneficial to the marriage in that marital quality was higher among these couples. It was suggested that these parents have the opportunity to spend time together and that adult children may provide a supportive role to the couple or may reduce stress between the couple by facilitating interaction between them. However, sometimes adult children come back to live in the home with their parents (known as boomerang children). This may also result in greater stress on the couple's resources. Taken together, the onset of parenthood will affect marital quality. Therefore, it can be inferred that the onset of caregiving will affect marital quality as well, especially if one becomes a spousal caregiver at the same time as becoming a parent.

One way to measure stress is physiologically, through cortisol. Cortisol is produced in the adrenal cortex. Corticotrophin-releasing hormone (CRH; secreted in the hypothalamus) and adrenocorticotropic hormone (ACTH; secreted in the pituitary) regulate the release of cortisol. When cortisol is released from the adrenal cortex into circulation, 90% of the hormone immediately binds to circulating proteins. The remaining 5-10% circulates as a free form. It is this free form of cortisol that crosses the blood-brain barrier and invokes responses in the brain and regulates the hypothalamic-

pituitary-adrenal (HPA) axis function (Kumar, Solano, Fernandez, & Kumar, 2005). This free form of cortisol can be detected and measured through saliva. There is some evidence to suggests that the cortisol response directly suppresses the immune system. For example, Riley, Spackman, McClanahan, and Santisteban (1979) found that cortisol leads to the reduction of spleen and lymph node tissue and to a reduction in natural killer cell activity (Siciliani, 2001). Overall, an increased amount of cortisol in the body is indicative of stress (Fisher, 1996). Therefore, a measure of salivary cortisol can provide an indication of stress.

Resources

Despite encountering stressful events, various resources can be used to buffer the possible effects of these events. So the good news is, families can utilize several resources and strengths to face the highly demanding nature of providing and needing care. Two examples of these resources include social support and coping skills.

Social Support

Social support is a crucial resource for couples dealing with a disease. Social support involves both outside support as well as internal, marital support. Having and seeking social support is a huge contributor to decreasing stress because being a caregiver to a loved one can be overwhelming and having others to help allows for the person to take better care of the sick person and themselves (Prokos & Keene, 2005). In addition, Gaugler et al. (2005) found that feeling the loss of intimate exchange was lower for caregivers who had support from family and friends. Additionally, in order to successfully give care, one must realize that the caregiver role is nearly impossible to fill alone (Brodie & Gadling-Cole, 2003; Minnes et al., 2000). “Couples who rely solely on

each other for emotional support place an impossible burden on the relationship and actually distance themselves from the resources that could be beneficial" (Gordon & Perrone, 2004).

Marital support is also a key factor in that couples are more satisfied when they have high levels of support (Acitelli & Antonucci, 1994). For example, Pasch and Bradbury (1998) found that wives asking for support from their husbands in a negative manner (e.g., demanding, expressing negative affect), and interacting with their husband in a negative manner (e.g., criticizing, blaming), predicted that the couple would be distressed two years later. In addition, Pasch and Bradbury found that couples who had poor conflict management and support skills were at risk for later marital dysfunction. On the other hand, support from partners can aid in both personal and relationship functioning in that couples who show positive support are more satisfied in their marriages and have better marital outcomes than those who do not show positive support (Neff & Karney, 2005).

Coping Skills

Coping is defined as, "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p.141). The use of certain coping skills can either help or hurt the person with the disease and their caregiver. Problem-focused coping deals with changing the source of the stress. This may be done by seeking support and/or taking action. Active coping and planning may be positively associated with the feeling of being able to do something to control the situation (Carver et al., 1989). This type of coping may be beneficial in that caregivers can actively seek support and information and

learn how to plan for future difficulties. Furthermore, the use of problem-focused coping on the part of the care receiver may allow them to learn compensatory behaviors that help themselves and that reduce the need for a caregiver.

Gordon and Perrone (2004) looked at adaptive coping strategies as methods a family can use to deal with caregiving. These include efforts to cooperate, identifying resources, and making compromises. These strategies are important in that the demands of caregiving can surpass resources and/or abilities which then result in stress. Using adaptive coping strategies such as getting help around the house, changing jobs or the amount of time spent at work, and seeking counseling may help the family deal with demands more effectively. Furthermore, adaptive coping is negatively associated with depression (Hastings et al., 2005) and positively associated with feeling in control and a sense of mastery (Hobfoll, Dunahoo, Ben-Porath, & Monnier, 1994).

Emotion-focused coping involves decreasing the emotional stress caused by the problem. Many times this is done through wishful thinking or using religion (Pakenham, 1998, 2001). This type of coping also involves self-blame, venting emotions, fantasizing, and avoidance (Felsten, 1998). Emotion-focused coping may be used more frequently and more effectively when stressful situations are appraised as unchangeable or uncontrollable (Folkman & Lazarus, 1980; Hobfoll et al., 1994; Lazarus & Folkman, 1984; Roth & Cohen, 1986). This type of coping may be hurtful in that the couple may give up and not try to find solutions to the problems associated with the disease or with having to provide care. In addition, wishing the illness away will not help either person. However, this type of coping can be beneficial in that spouses may develop greater acceptance of the situation.

Dysfunctional coping involves aspects of denial, disengagement, alcohol and drug use, and venting emotions. As the name implies, dysfunctional coping can be harmful as it does not allow for finding helpful ways to deal with aspects of a negative event such as disease. This type of coping is associated with stress, anxiety, and depression (Felsten, 1998; Hastings et al., 2005). It has been suggested that dysfunctional, avoidance coping may be used by individuals who do not have other resources to deal with stressors in a more efficacious way (Felsten).

It is generally agreed that the use of problem-focused coping is healthier and results in a better outcome than either emotion-focused or dysfunctional coping. For example, numerous chronic illness studies have found that high distress is related to a reliance on emotion-focused coping, whereas low levels of distress are associated with the use of problem-focused coping (Ben-Zur & Debi, 2005; Hobfoll et al., 1994; Pakenham, 1998). Furthermore, the use of problem-focused coping is related to better adaptation to health problems (Ben-Zur & Debi), while aggressive and hostile coping can help individuals meet their goals, this type of coping is harmful to health in general (Hobfoll et al.).

Enduring Vulnerabilities

Enduring vulnerabilities are similar to resources in the ABCX model but they involve a more intrapersonal component. For example, personality traits, attachment styles, and being optimistic are enduring vulnerabilities. These vulnerabilities can affect how a couple functions in their relationship. For this study, personality traits were examined due to the fact that neuroticism has consistently been found to be predictive of many outcomes.

Neuroticism is a personality trait most often associated with poor marital outcomes (Burpee & Langer, 2005). For example, Kelly and Conley (1987) found that husband's and wife's neuroticism was predictive of lower marital satisfaction and of divorce. In addition, Fisher and McNulty (under review) found that husband's neuroticism predicted marital satisfaction. Neuroticism has also been examined in comparison with coping strategies. Brebner (2001) along with O'Brien and DeLongis (1996) found neuroticism to be linked with emotion-focused coping. Additionally, Watson and Hubbard (1996) found neuroticism to be associated with ineffective coping strategies. Furthermore, several researchers have found that those high in neuroticism experience more stress and seem to rely upon a passive, maladaptive coping strategy such as denial (Brebner; O'Brien & DeLongis; Penley & Tomaka, 2002; Vollrath & Torgersen, 2000). Therefore, a neurotic caregiver may inherently experience more stress and may use destructive coping strategies which will inevitably hurt the care receiver.

Other personality traits have also been examined in relation to marital outcomes and to coping strategies. For example, Fisher and McNulty (under review) found that couple's agreeableness and conscientiousness, as well as husband's extraversion, predicted own marital satisfaction. Kelly and Conley (1987) found that husband's impulse control later in life predicted lower marital satisfaction for themselves and for their wives. Impulse control is similar to the Big Five trait of conscientiousness and those scoring high on conscientiousness have been found to use problem-focused coping and active problem solving (O'Brien & DeLongis, 1996; Vollrath & Torgersen, 2000; Watson & Hubbard, 1996). Similarly, Brebner (2001) found a negative correlation between conscientiousness and the use of emotion-focused coping. Lastly, extraversion

has been linked with the use of problem-focused coping and seeking social support (O'Brien & DeLongis; Vollrath & Torgersen; Watson & Hubbard). Therefore, it appears that caregivers and care receivers who are conscientious and extraverted may benefit from these personality traits as they will allow them to actively seek solutions to their stressful situation.

An interesting finding in relation to personality variables emerged from Burpee & Langer's (2005) study. They found that marital satisfaction was better predicted by the couple's beliefs that their personalities were similar than when they believed there were differences in personality. These results were independent of the couple's actual similarities in personality or behavior.

Perceptions

The couple's perception of the caregiving/care receiver relationship will influence their behavior towards each other. One factor that can influence behavior is the ability to reframe.

Reframing involves accepting, redefining, and effectively managing problems such as illnesses (Redinbaugh, Baum, Tarbell, & Arnold, 2003). Reframing the situation has been shown to help reduce the stress associated with caregiving (Hastings et al., 2005). In Minnes et al.'s (2000) study, reframing was negatively correlated with dependency, management, family disharmony, lack of personal reward, and stress. It may be beneficial for the couple to reframe the situation so that it is seen as a joint issue the couple can face together (Gordon & Perrone, 2004). Relatedly, it has been shown that individuals who can perceive benefits from hardship have better adjustment in terms of the dyadic relationship, life satisfaction, and experiencing positive affect than those couples who cannot reframe (Pakenham, 2005).

Hastings et al. suggested that the use of positive reframing when dealing with stressful events is a very effective coping strategy, especially when conditions do not allow for direct action to be taken to reduce or remove the stressor.

Adaptive Processes

Adaptive processes are ways that both individuals and couples handle differences of opinion, marital difficulties or individual difficulties, and transitions (Karney & Bradbury, 1995). In other words, how couples respond to one another and treat one another. Factors that affect responses and treatment of a spouse include attributions of the behavior. This in turn, will influence how dyads and individuals perceive a stressor.

The way individuals in the dyad attribute the behavior of one another and their beliefs about the relationship will undoubtedly affect their perceptions and the marital relationship. For example, Thompson and Bolger (1999) found that partners took into consideration the negative affect of a stressed partner and that partners saw themselves as supportive when their stressed partner needed them to be. Karney and Frye (2002) found that, for couples who were in less satisfying relationships, the feeling that there had been a recent change in the level of satisfaction for the better, was beneficial; there was a sense of hope for a more satisfying relationship. Neff and Karney (2005) found that when wives had an accurate view of their husbands' specific qualities, the couple was less likely to divorce. Since the specific qualities of the partner included intellectual capability and social skills, this finding is relevant to caregiving. For example, there is a tendency to attribute MS related cognitive changes to personality disorders and affective changes to emotional disorders (Foley, 1998). So, if a wife had an accurate view of her husband's intellectual capability before the disease, she can attribute changes in intellect

to the disease itself. This attribution may result in a more beneficial emotional outcome.

In Karney and Bradbury's (2000) longitudinal study with newlyweds, they found that marital satisfaction decreased as attributions became more maladaptive over time. They also found that divorced women made more maladaptive attributions than non-divorced women. Therefore, caregiving relationships in which the wife is the caregiver may be affected by her maladaptive attributions of her husband's behavior.

Disease symptoms and subsequent behavior can change on a day-to-day basis. Therefore, it is important to examine how global evaluations of the marriage are affected by these specific instances of behavior change. McNulty and Karney (2001) found that positive attributions were linked to spouses who were happier over time and suggested that this may be because they focus on the global aspects of the marriage instead of on specific negative events. In addition, they state that the use of maladaptive attributions were related to declines in satisfaction and suggested that this may be due to being more perceptive of negative specific relationship attributes. McNulty and Karney (2004) showed that initial positive attributions and initial positive expectations about the marriage predicted satisfaction over time. But, if couples had positive attributions and less positive expectations, there was a decline in satisfaction over time. This finding may hold true in the caregiving relationship as well in that pre-disease positive attributions and expectations may continue to predict satisfaction over time.

Outcome

Effects of Caregiving

The stress of caregiving can interfere with the caregiver's ability to carry out household and work duties (Glozman, 2001; Minnes et al., 2000). It can also jeopardize

both the physical and mental health of caregivers (Gonzalez-Salvador, Arango, Lyketsos, & Barba, 1999). For example, research has shown that caregivers have poorer physical health, higher morbidity and mortality, higher depression, and higher numbers of illness-related symptoms than non-caregivers (Acton, 2002; Brodie & Gadling-Cole, 2003; Lyons et al., 2004). Furthermore, it has been shown that caregivers who do not take care of themselves report more strain and burden (Acton; Schulz & Beach, 1999). This may be because the demands of caregiving are time consuming. Thus caregivers may neglect their own health, which in turn can lead to these physical and emotional problems (Acton; Gallant & Connell, 2003). It has also been documented that chronic stress can cause weariness, sleep problems, despair, a decrease in general well-being, and a suppression of the immune system. However, caregivers who have more resources, experience better quality of life than those managing similar problems who are without resources (Kramer).

It is important to realize that not all caregivers experience stress due to the caregiving role. In fact, some caregivers feel an emotional closeness with the ill person, a sense of satisfaction, and family cohesion due to the family members being brought together in a difficult time (McKenry & Price, 2005). Gordon and Perrone (2004) showed that positive aspects of the caregiving experience included the caregiver feeling a sense of pride and competence in being able to assist their partner and that couples dealing with the illness together brought them closer to each other. Additionally, they reported having more patience, an ability to delay their own needs, a stronger spiritual connection, and a positive view toward obtaining assistance. Furthermore, Pakenham (2005) found that caregivers reported benefits such as personal growth, a stronger

relationship with the care receiver, and a change in priorities. Similarly, Kramer (1993) found that the positive outcomes of caregiving involved pride in being able to meet challenges, an improvement in self-worth, greater closeness with the care receiver, and pleasure in giving care.

Effects of Having MS

Having an incurable, debilitating disease such as MS can affect the individual as well as their family. Studies have shown that persons with MS are more likely to experience exacerbations when they experience marital and job stress (Mohr & Cox, 2001). Furthermore, the development of new brain lesions has been found after experiencing conflict (Mohr, 2000). The effect of experiencing stress may in fact be a reciprocal effect where stress leads to exacerbations and the effect of the exacerbations leads to further stress.

However, as with those providing care for persons with MS, studies have found that persons with MS report benefits from having the disease. Examples of these benefits include, better relationships with their family, increased compassion, and a greater appreciation for life (Mohr et al., 1996). Furthermore, Brooks & Matson (1992) found that the self-concepts of those with MS improved over a 7 year period in those who felt they had an ability to affect the course of the disease.

In sum, it appears that the effects of caregiving and the effects of having MS may be both harmful and advantageous depending on a number of factors. The factors that predict who will fare better and who will fare worse include, stress, resources, enduring vulnerabilities, perceptions, and adaptive processes. For instance, spousal caregiving may be dealt with advantageously when couples have social support, use problem-

focused coping, are not neurotic, can positively reframe their situation, and can attribute behaviors in beneficial ways. On the other hand, spousal caregiving may be dealt with in a more detrimental manner if couples lack social support, use emotion-focused or dysfunctional coping, are neurotic, and attribute behaviors in less functional ways.

Study Objectives

Based on the above information concerning caregiving, MS, and the marital relationship, the aim of this study was to address factors that affect the relationship between spouses. More specifically, the aim was to examine how these factors are either beneficial or detrimental to the dyadic relationship, based on the outcomes of marital satisfaction (a cognitive assessment of the marriage), marital quality (an evaluation of the relationship as a whole), life satisfaction, and depression in married couples with and without MS. The ABCX model (Hill, 1958) and the Vulnerability-Stress-Adaptation model (Karney & Bradbury, 1995) provided a means of answering this question by addressing how the influences of stress, resources, vulnerabilities, perceptions, and adaptive processes come together to produce either a harmful or helpful outcome for spouses. From a novel perspective, these two models were merged to produce the Spousal Model of Stress. Therefore, the purpose of this study was to examine the Spousal Model of Stress. The model's variable relationships were examined in two samples. The first was a sample of married couples in which one person had been diagnosed with MS and the other was their caregiver. The second was a comparison group of married individuals in which neither was a spousal caregiver. The proposed model allowed for a prediction of who would fare well and who would fare poorly (i.e. life satisfaction and depression) as well as for a prediction of marital outcomes (quality

and satisfaction) in general.

Examining the Spousal Model of Stress' variable relationships in a MS/caregiving population allowed for a unique opportunity to study factors that have been previously left out of research on MS and caregiving. Specifically, the model examined factors that affect marital aspects in a caregiver/care receiver relationship. Furthermore, by also examining the model in a group of non-caregiver/care receivers, comparisons could be made between this group and those with MS and their caregivers. To date, there is a lack of knowledge about differences between those with MS and those without on the variables studied in this model. More specifically, not only have marital issues been ignored in the literature, comparisons of marital issues between those with MS and those without have not been studied. Therefore, a look at the Spousal Model of Stress in a sample of healthy spouses and in a sample of persons with MS and their spousal caregivers will contribute to an understanding of factors that affect marriage and to differences between these groups.

Hypotheses

Overall Hypothesis: The Spousal Model of Stress factors will predict marital quality/satisfaction, life satisfaction, and depression.

H1: The Stress factor will predict marital quality/satisfaction, life satisfaction, and depression in both groups.
- Ha: Higher perceived stress will be predictive of poorer outcome.
- Hb: Higher cortisol levels will be predictive of poorer outcome.
- Hc: Higher parental stress will be predictive of poorer outcome.

H2: The Resources/Vulnerabilities factor will predict marital quality/satisfaction, life satisfaction, and depression in both groups.
- Hd: Higher social support will be predictive of better outcome.
- He: Coping skills will predict outcome: problem-focused coping-better; emotion-focused coping-poorer.
- Hf: Personality will predict outcome: Neuroticism-poorer

H3: The Perception/Adaptive Processes factor will predict marital quality/satisfaction, life satisfaction, and depression in both groups.

Hg: Greater ability to reframe will be predictive of better outcome.

Hh: Attributing more behavior to the spouse (as opposed to the situation) will be predictive of a poorer outcome.

H4: Factors in the Spousal Model of Stress will predict caregiver depression and distress.

Hi: Higher stress will be predictive of greater depression and distress.

Hj: Lower social support will be predictive of greater depression and distress.

Hk: Inability to reframe will be predictive of greater depression and distress.

H5: Caregivers will experience greater stress than care receivers or non-caregiver/care receivers.

Hl: Caregivers will have greater perceived stress.

Hm: Caregivers will have higher cortisol levels.

Hn: Caregivers will have greater parental stress.

H6: There will be gender differences in studied variables.

Ho: Women will have greater parental stress.

Hp: Women will have greater social support.

Hq: Women caregivers will have greater perceived stress than male caregivers.

Hr: Women caregivers will have higher cortisol levels than male caregivers.

III. Method

Participants

One hundred and three participants (51 persons with multiple sclerosis/spousal caregivers (MS/CG), 52 healthy married controls) completed the study. One hundred questionnaire packets were distributed to the healthy control group, a 48% drop-out rate. Ninety-one packets were distributed to the MS/CG group, a 44% drop-out rate. In order to participate in the study, one had to be married. In addition, some dyads had to consist of a person diagnosed with MS and the other person had to be their spousal caregiver. These participants were recruited from the MidSouth Chapter of the National Multiple Sclerosis Society via flyers, email, newsletters, support group meetings, and through word-of-mouth. The healthy control participants were recruited via flyers and email from the UTK and UTC campuses and from local businesses, and through word-of-mouth. No money was awarded to participants. However, coupons to local restaurants and businesses, not exceeding a 20% discount, were given to those participants in the Knoxville area. The majority of participants had children (96%), the mean length of marriage for participants as a whole was 17.75 years (*SD* = 13.67), and the average age was 46.03 years (*SD* = 13.32).

Measures

In order to assess the nature of the spousal caregiving relationship, physiological and psychological variables were considered. The physiological measure was salivary cortisol to assess stress. Psychological measures included questionnaires concerning perceived stress, parental stress, social support, coping strategies, personality, reframing, attributions, marital quality, marital satisfaction, life satisfaction, depression, and

caregiver distress. Each of the following measures were used to address the factors in the Spousal Model of Stress (i.e., stress, resources/vulnerabilities, perceptions/adaptive processes, outcome). Please see Appendix D for the questionnaire packet (measures are in the following order).

Demographic Sheet: Demographic information was gathered regarding age, race, gender, income, level of education, employment status, length of marriage, and number of children (see Appendix E).

Perceived Stress: The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) was used to measure the degree to which situations in one's life are appraised as stressful (e.g. "How often have you been able to control irritations in your life?"). The PSS is a 14-item scale with responses ranging from '*never*' (0) to '*very often*' (4) based on the last month. Cronbach's $\alpha = .911$.

Parental Stress: The Parental Stress Scale (Berry & Jones, 1995) was used to assess parental stress. The scale consists of 18 items in which respondents are asked to indicate their extent of agreement with items in terms of their typical relationship with their child or children. Each item is rated on a five-point scale (1=*strongly disagree*, 5=*strongly agree*). The eight positive items are reverse scored. Scores range from 18-90 with higher scores indicating greater stress. Cronbach's $\alpha = .869$.

Social Support: The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) was used to assess 3 types of social support (family, friends, and significant other). This measure is comprised of 12 questions and responses are rated on a seven-point Likert scale (1= *strongly disagree*, 7= *strongly agree*). Higher scores indicate higher social support. Cronbach's $\alpha = .946$.

Coping: The Ways of Coping Checklist (WCCL; Vitaliano et al., 1985) was used to assess coping strategies. This measure is comprised of five coping subscales (problem-focused, seeks social support, blames self, wishful thinking, and avoidance). There are 42 questions and responses are rated on a five-point Likert scale (1=*strongly disagree*, 5=*strongly agree*). Higher scores indicate greater amount of the various coping strategies. Cronbach's α = .845.

Personality: The NEO-FFI (Costa & McCrae, 1992) was used to assess the "Big Five" dimensions of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. This measure includes 12 questions pertaining to each dimension. Individuals respond to each item using a five point Likert scale (0=*strongly disagree*, 4=*strongly agree*). Cronbach's α = .677.

Reframing: The Reframing subscale of the Family Crisis Oriented Personal Evaluation Scales (FCOPES; McCubbin, Olson,& Larsen, 1981) was used to assess a person's capability to redefine stressful events in order to make them more manageable. This measure consists of 8 questions which are rated on a five-point Likert scale (1=*strongly disagree*, 5=*strongly agree*). Higher scores indicate a greater ability to reframe stressful situations. Cronbach's α = .846.

Attributions: The Relationship Attribution Measure (RAM; Fincham & Bradbury, 1992) was used to assess different types of attributions for partner behavior. Four hypothetical negative partner behaviors (e.g., *Your spouse criticizes something you say*) are addressed. For each behavior, spouses are asked to rate their agreement with several statements (e.g., *The reason my spouse criticized me is <u>not</u> likely to change*) on a six point Likert scale (1=*disagree strongly*, 6=*agree strongly*). Scores range from 28-168

with higher scores indicating stronger attributions of partner's behavior. Cronbach's α = .943.

Marital Satisfaction: The Quality of Marriage Index (QMI; Norton, 1983) was used as a measure of marital satisfaction. This measure is comprised of 6 items which ask spouses to report how much they agree or disagree with general statements about their marriage (e.g., *We have a good marriage*). Five of the question responses are based on a seven point Likert scale (1=*very strongly disagree*, 7=*very strongly agree*), whereas one item (*The degree of happiness, everything considered, in my marriage*) is rated on a ten item scale. Scores range from 6-45 with higher scores representing higher satisfaction. Cronbach's α = .974.

Marital Quality: The Perceived Relationship Quality Components (PRQC; Fletcher, Simpson, & Thomas, 2000) was used as a measure of marital quality. This questionnaire consists of 18 items in which responses are based on a seven point Likert scale (1= *not at all*, 7= *extremely*). Six types of relationship quality are assessed by the measure (relationship satisfaction, commitment, intimacy, trust, passion, and love). Higher scores indicate greater relationship quality. Cronbach's α = .955.

Satisfaction with Life: The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a 5-item instrument designed to measure global cognitive judgments of one's life. Responses are based on a seven point Likert scale (1= *strongly disagree*, 7= *strongly agree*). Higher scores indicate greater satisfaction. Cronbach's α = .880.

Depression: The Beck Depression Inventory-II (Beck, Steer, Ball, and Raineri, 1996) was used in order to assess depression. This survey consists of 21 groups of

statements in which the respondents are asked to identify the item which describes how they have been feeling within the past two weeks. The rate of severity of each statement ranges from 0 (*not at all*) to 3 (*severely—I could barely stand it*). A total score is calculated by summing the severity ratings for all 21 items. Higher scores indicate greater the level of distress. Cronbach's α = .907.

Benefit Finding: Caregivers and care receivers completed the Benefit Finding Scale (BFS; Mohr et al., 1999). This scale was used to assess 2 factors identified by Pakenham (2005): Family Relations Growth and Personal Growth. This survey consists of 19 items and responses are based on a 5-point Likert scale (1=*strongly disagree*, 5=*strongly agree*). Higher scores indicate greater growth since either being diagnosed with MS or since becoming a caregiver of a person with MS. Cronbach's α = .935.

Caregiver Distress: Caregiver's feelings of distress was measured by the Caregiving Distress Scale (CDS; Cousins, Davies, Turnbull, & Playfer, 2002). This scale has 17 questions and consists of 5 subscales (relationship distress, emotional burden, care receiver demands, social impact, and personal cost). Responses are rated on a 5-point Likert scale (0=*strongly disagree*, 4=*strongly agree*). Higher scores indicate greater distress. Cronbach's α = .944.

Procedure

Participants were assigned subject numbers in order to protect their identities and to ensure confidentiality. Packets containing supplies (i.e., saliva collection tube, questionnaires) and directions (see Appendix F) were mailed or handed out to interested participants. Packets were then either mailed back or picked up. Participants were instructed to keep their saliva samples in the freezer until they could be picked up.

Participants were required to avoid smoking, food, and fluid intake for one hour prior to saliva collection. The data were collected between 10:00 a.m. and 2:00 p.m. After providing consent, participants rendered timed, 3-minute saliva samples for the purpose of assessing salivary cortisol levels. In order to obtain these saliva samples, participants were asked to rinse their mouths with water and then to sit quietly in a comfortable chair. Samples were collected as participants expectorated into a sanitized 50 mL test tube once per minute for three minutes. Once returned to the lab, all samples were centrifuged for 10 minutes, the aliquot was placed into microtubes and stored in the ultra freezer (-75° C) for subsequent analysis (Navazesh, 1993). After rendering saliva samples, participants were instructed to complete the survey packet. This study was approved by the university's institutional review board.

IV. Results

Demographics

Table 1 in Appendix G contains demographic data for each group. The mean age of control group husbands was 40.7 (*SD* = 13.33) years with a range of 25-62 years. The mean age of control group wives was 40.7 (*SD* = 13.14) years with a range of 24-58 years. The mean age of caregivers was 53.08 (*SD* = 12.57) years with a range of 28-78 years. The mean age of those with multiple sclerosis was 49.9 (*SD* = 9.78) years with a range of 28-67 years.

Differences in demographic data between all groups were examined. Results indicated that the MS/CG group was significantly older F(1, 99) = 19.687, $p = .000$ (M = 51,48, SD = 11.26 vs. M = 40.69, SD = 13.09), married longer, $F(1,100) = 7.33$, $p = .008$ (M = 21.38, SD = 13.57 vs. M = 14.27, SD = 12.96) and worked less (i.e. more part-time, retired, or on disability) than those in the control group, $X^2(5, N=103) = 14.76$, $p = .011$. No other significant differences were found.

Descriptive Statistics

Table 2 illustrates means and standard deviations for all dependent variables for each group.

Correlations

Table 3 in Appendix H shows significant correlations between the scales for the groups overall (control group and MS/CG group). Not surprisingly, perceived stress correlated positively with parental stress and correlated negatively with marital quality, satisfaction, and life satisfaction. Social support was also significantly correlated with these outcome measures (marital quality, satisfaction, and life satisfaction) but the relationships were in the positive direction.

Table 2: Dependent Variable Means and Standard Deviations

Variables	MS/CG Mean (SD)	Control Mean (SD)
Perceived Stress	37.73 (9.398)	35.92 (6.885)
Parental Stress	38.80 (13.092)	32.96 (7.809)
Cortisol	.1314 (.07712)	.1125 (.08446)
Social Support	65.58 (12.873)	63.23 (21.464)
Problem-focused coping	52.53 (5.986)	53.23 (5.327)
Seeks social support coping	17.45 (5.374)	15.39 (5.040)
Blames self coping	7.73 (2.908)	7.76 (3.338)
Wishful thinking coping	25.52 (6.662)	21.86 (6.184)
Avoidance coping	27.25 (6.079)	23.57 (5.988)
Neuroticism	32.47 (8.855)	29.67 (7.755)
Extraversion	39.25 (7.427)	42.56 (6.301)
Conscientiousness	44.24 (7.504)	46.90 (5.203)
Agreeableness	45.27 (6.536)	45.83 (5.408)
Openness	36.88 (5.279)	37.25 (6.174)
Reframing	30.71 (5.456)	33.63 (4.097)
Attributions	82.86 (22.438)	83.63 (20.397)

Preliminary Analyses

In order to identify which variables would most likely make a good model, multiple regression was first used to examine each factor and outcome (e.g. stress and marital quality) in each group (husband and wives together, MS and caregivers together). Variables found to be significant were then entered as a whole (e.g. stress, resources, and perceptions) into a regression. Therefore, the betas from the initial multiple regressions are not of importance because these values will change when performing regressions as a whole. Multiple regression was performed using SPSS to determine which factors would provide a good model, based on significant coefficients, for each outcome (marital quality, satisfaction, life satisfaction, and depression) by factor (stress, resources/vulnerabilities, perceptions/adaptive processes). P-values were set at .05.

Results from the initial multiple regressions are as follows:

Control Group: Husbands and Wives (n=52)

Stress

It was hypothesized that higher perceived stress would be predictive of a poorer outcome (i.e. less marital satisfaction, lower marital quality, lower life satisfaction, greater depression). The analysis indicated that marital satisfaction and marital quality were not predicted by perceived stress ($p > .05$). However, perceived stress did predict life satisfaction ($p = .01$) and depression ($p = .000$) indicating that more stress predicts less satisfaction and greater depression.

It was hypothesized that higher cortisol levels would be predictive of a poorer outcome. It was found that cortisol levels did not predict marital satisfaction, quality, life satisfaction, or depression ($p > .05$).

It was hypothesized that higher parental stress would be predictive of a poorer outcome. The analysis showed that marital satisfaction, quality, life satisfaction, and depression were not predicted by the Parental Stress Scale ($p > .05$).

Resources/Vulnerabilities

It was hypothesized that greater social support would be predictive of better outcome (i.e. greater marital satisfaction, higher marital quality, higher life satisfaction, less depression). Results indicated that no outcome was predicted by social support ($p > .05$).

It was hypothesized that coping skills would predict outcome (i.e. problem-focused coping would predict better outcome whereas emotion-focused coping would predict a poorer outcome). However, no coping skills predicted marital quality, satisfaction, life satisfaction, or depression ($p > .05$).

It was hypothesized that personality would predict outcome. More specifically, it was hypothesized that neuroticism would predict a poorer outcome. Depression was predicted both by neuroticism and agreeableness (p = .001, p = .018) indicating that greater neuroticism predicts greater depression whereas greater agreeableness predicts less depression. No other personality traits (extraversion, openness, conscientiousness) predicted depression. Furthermore, no personality traits predicted marital quality, satisfaction, or life satisfaction (p > .05).

Perception/Adaptive Processes

It was hypothesized that a greater ability to reframe would be predictive of a better outcome. The analysis showed that reframing did not predict marital satisfaction, quality, life satisfaction, or depression (p > .05). However, there was a trend indicating that marital satisfaction was predicted by reframing (p = .054) suggesting that a greater ability to reframe is related to higher marital quality.

It was hypothesized that attributing more behavior to the spouse (as opposed to the situation) would be predictive of a poorer outcome. It was found that marital satisfaction and quality were predicted by the attribution measure (p = .002; p = .002) suggesting that attributing behavior to the spouse predicted lower marital quality and satisfaction. Neither life satisfaction nor depression was predicted by the attribution measure (p > .05).

MS and Caregiver Group (n=51)

Stress

It was hypothesized that higher perceived stress would be predictive of a poorer outcome (i.e. less marital satisfaction, lower marital quality, lower life satisfaction,

greater depression). The analysis showed that marital satisfaction, life satisfaction, and depression were predicted by perceived stress ($p = .037$; $p = .004$, $p = .000$) indicating that more stress predicts lower marital satisfaction, less satisfaction with life, and greater depression. However, perceived stress did not predict marital quality ($p > .05$).

It was hypothesized that higher cortisol levels would be predictive of a poorer outcome. However, cortisol did not predict marital satisfaction, quality, life satisfaction, or depression ($p > .05$).

It was hypothesized that higher parental stress would be predictive of a poorer outcome. The analysis showed that marital satisfaction and marital quality were predicted by the Parental Stress Scale ($p = .008$; $p = .02$) indicating that greater parental stress predicts lower quality and less satisfaction. However, life satisfaction and depression were not predicted by the scale ($p > .05$).

Resources/Vulnerabilities

It was hypothesized that greater social support would be predictive of better outcome. The analysis showed that marital satisfaction, quality, and life satisfaction were predicted by the social support measure ($p = .000$; $p = .000$; $p = .001$) indicating that greater social support predicts higher marital quality, greater marital satisfaction, and higher life satisfaction. Social support did not predict depression ($p > .05$).

It was hypothesized that coping skills would predict outcome. It was found that the blames-self subscale predicted marital satisfaction ($p = .018$). However, the prediction was in the opposite direction; greater blaming was related to greater satisfaction. No other coping skills predicted marital satisfaction. The avoidance subscale predicted depression ($p = .029$) indicating that more avoidance predicts greater

depression. No other coping skills predicted depression. Furthermore, no coping skills predicted marital quality or life satisfaction ($p > .05$).

It was hypothesized that personality would predict outcome. More specifically, it was hypothesized that neuroticism would predict a poorer outcome. The analysis showed that marital quality was not predicted by any personality dimensions ($p > .05$). However, marital satisfaction was predicted by agreeableness ($p = .006$), life satisfaction was predicted by extraversion ($p = .016$), and depression was predicted by neuroticism ($p = .000$). These results suggest that the more agreeable, the greater marital quality; the more extraverted, the more satisfied with life one is; and the more neurotic, the more depressed one is.

Perception/Adaptive Processes

It was hypothesized that a greater ability to reframe would be predictive of better outcome. The analysis showed that reframing did not predict marital satisfaction, quality, life satisfaction, or depression ($p > .05$).

It was hypothesized that attributing more behavior to the spouse (as opposed to the situation) would be predictive of a poorer outcome. Results showed that the attribution measure predicted marital satisfaction and quality ($p = .000$; $p = .005$) suggesting that attributing behavior to the spouse predicted less marital satisfaction and lower marital quality. Life satisfaction and depression were not predicted by the attribution measure ($p > .05$).

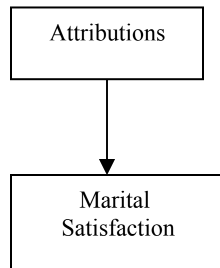
Multiple Regression: Final Models

Based on the above findings, each outcome (marital satisfaction, quality, life satisfaction, and depression) was entered into separate multiple regressions with the significant predictors entered as independent variables. Results are below:

Control Group (n=52)

Outcome: Marital Satisfaction

Based on initial regressions examining the stress, resources/vulnerabilities, and perception/adaptive processes variables separately, it was found that only the attributions factor significantly predicted marital satisfaction. When examining this factor alone in regression, it was found that, the more one attributes behaviors to their spouse, the lower their marital satisfaction (R^2=0.249, B = -.102, ß= -.499, t = -4.073, p = .000). Therefore, the model looks like the following:



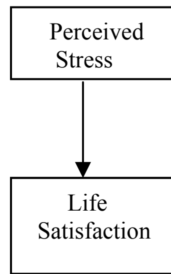
Outcome: Marital Quality

Based on initial regressions, it was again found that only the attributions factor significantly predicted marital quality. When examining this factor alone in regression, it was found that the more one attributes behaviors to their spouse, the lower their marital quality (R^2 = .223, B = -.383, ß= -.472, t = -3.788, p = .000). Therefore, the model looks the same as above, only marital satisfaction becomes marital quality.

Outcome: Life Satisfaction

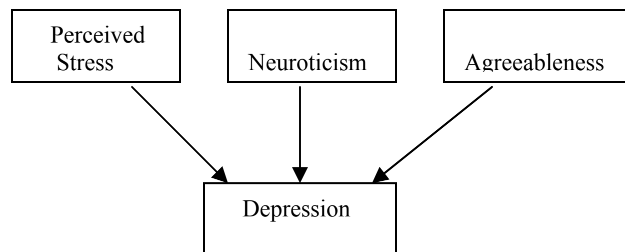
Based on initial regressions, it was found that only the perceived stress factor significantly predicted life satisfaction. When examining this factor alone in regression, the analysis showed that, the more stress one perceives, the lower their life satisfaction

(R^2= .167, B = -.276, ß= -.409, t = -3.169, p = .003). Therefore, that model looks like:



Outcome: Depression

Based on initial regressions, it was found that depression was predicted by perceived stress, neuroticism, and agreeableness. When examining these factors together, the analysis showed that the model was significant (R^2 = .526, *SE* = 3.175, $F(3,48)$ = 17.760, p = .000) and that all factors remained significant contributors (perceived stress: B = .223, ß= .343, t = 2.587, p = .013; neuroticism: B = .205, ß= .356, t = 2.792, p = .007; agreeableness: B = -.203, ß= -.246, t = -2.358, p = .023). Therefore, greater perceived stress and greater neuroticism predicted higher depression and greater agreeableness predicted less depression. The model for depression is as follows:

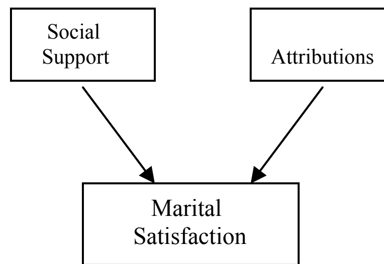


MS/CG Group (n=51)

Outcome: Marital Satisfaction

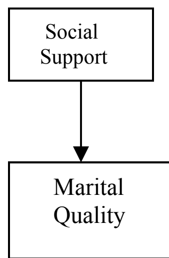
Based on initial regressions examining the stress, resources/vulnerabilities, and perception/adaptive processes variables separately, it was found that perceived stress, parental stress, social support, the blames self coping strategy, agreeableness, and the

attributions variables significantly predicted marital satisfaction. When these variables were entered together to predict marital satisfaction, the model was significant ($R^2 = .348$, $SE = 3.612$, $F(6,44) = 3.909$, $p = .003$). However, the analysis indicated that only the social support variable (B = .059, ß = .304, $t = 2.103$, $p = .041$) and the attribution variable (B = -.092, ß = -.447, $t = -3.294$, $p = .002$) remained significant contributing factors. These results suggest the following: 1) the stress factors do not predict marital satisfaction, 2) social support predicts marital satisfaction in that greater support equals greater satisfaction and 3) the more behaviors attributed to one's spouse, the lower one's marital satisfaction. The model looks like the following:



Outcome: Marital Quality

Based on initial regressions, it was found that parental stress, social support, and the attributions variables significantly predicted marital quality in this group. When these variables were entered together to predict quality, the model was significant ($R^2 = .532$, $F(3,41) = 15.513$, $p = .000$). However, the analysis indicated that only the social support variable remained a significant contributor (B = .706, ß = .539, $t = 3.886$, $p = .000$). This result suggests that neither the stress factor nor the perception/adaptive process factor predicted marital quality. However, it appears that the more social support one has, the greater their marital quality. Therefore, the model looks like the following:

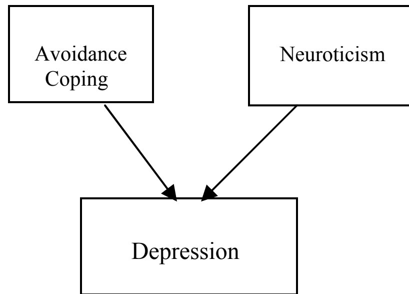


Outcome: Life Satisfaction

Based on initial regressions, it was found that perceived stress, social support, and extraversion significantly predicted life satisfaction. When these variables were entered together to predict satisfaction, the model was significant (R^2 = .437, F(3,46) = 11.88, p = .000). However, the analysis showed that only the social support variable remained a significant contributor (B = .223, ß= .464, t = 3.455, p = .001). Again, this result suggests that neither the stress factor nor the perception/adaptive process factor predict life satisfaction. However, it appears that the more social support one has, the greater their satisfaction with life. Therefore, the model looks the same as above, only marital quality becomes life satisfaction.

Outcome: Depression

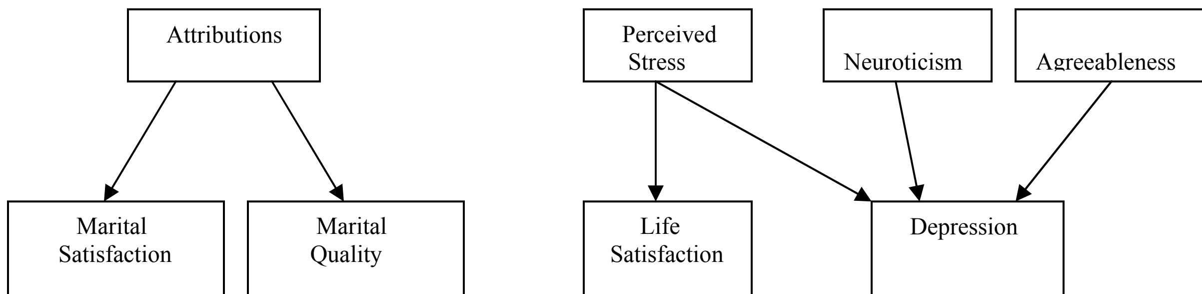
Based on initial regressions, it was found that perceived stress, the avoidance coping strategy, and neuroticism significantly predicted depression. When these variables were entered together to predict depression, the model was significant (R^2 = .758, F(3,44) = 46.053, p = .000). However, the analysis showed that the avoidance coping strategy and neuroticism were the only significant predictors of depression (B = .435, ß= .235, t = 2.610, p = .012; B = .689, ß= .554, t = 5.113, p = .000). It appears that individuals in this group are more depressed when they use more avoidance coping and are more neurotic. The model for depression is as follows:



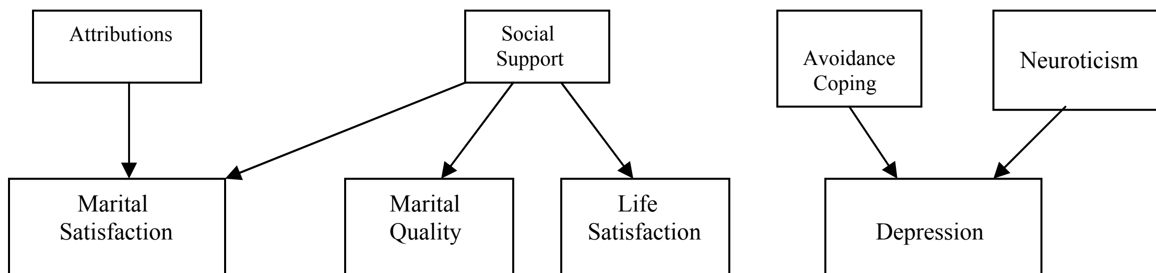
Spousal Models of Stress

The complete models for both groups can be seen below. Appendix I illustrates these models in relation the Spousal Model of Stress variables (e.g., stress, resources, perceptions, outcomes).

Control group



MS/CG group



Caregivers (n=25)

Stress

It was hypothesized that higher stress levels would predict greater depression and distress. Multiple regression analyses indicated that perceived stress predicted depression (R^2= .708, B = .890, ß= .603, t = 3.710, p = .002) but not distress suggesting that greater perceived stress predicts greater depression. The analysis also showed that the parental stress predicted caregiver distress (R^2= .558, B = .500, ß= .521, t = 2.578, p = .019) but not depression suggesting that greater parental stress predicts greater distress for caregivers. Cortisol did not predict depression or distress ($p > .05$).

Resources/Vulnerabilities

It was hypothesized that lower social support would be predictive of greater depression and distress. The analyses showed that social support did not predict depression or distress ($p > .05$). Although not hypothesized, results showed that neuroticism and conscientiousness predicted depression (B = .587, ß= .421, t = 2.880, p = .016; B = -.456, ß= -.314, t = -2.666, p = .024) suggesting that greater neuroticism predicts greater depression whereas greater conscientiousness predicts less depression. No other resource/vulnerability factors predicted depression or distress ($p > .05$).

Perception/Adaptive Processes

It was hypothesized that an inability to reframe would predict depression and distress. The analyses showed that reframing did not predict depression or distress ($p >$ .05). However, attributing behavior to one's spouse (the person with MS) did predict caregiver depression and distress (B = .365, ß= .596, t = 3.606, p = .002; B = .422, ß= .623, t = 3.733, p = .001) suggesting that attributing more behavior to the spouse

predicted greater depression and distress.

Caregivers vs. Others (n=103)

An ANOVA was used to compare caregivers to others. It was hypothesized that caregivers would experience greater perceived stress, more parental stress, and higher cortisol levels than care receivers or non-caregivers/care receivers. Results indicated that caregivers did not experience greater stress of any kind ($p > .05$).

Gender Differences (n=103)

ANOVAs were used to assess differences between gender in the sample as a whole.

Stress

It was hypothesized that women would have greater perceived stress, parental stress, and higher cortisol levels than men. No differences were found between men and women in regard to these factors ($p > .05$). Furthermore, no differences were found between female caregivers and others on these stress factors.

Resources/Vulnerabilities

It was hypothesized that women would have greater social support than men. This hypothesis was unsupported ($p > .05$). However, an examination of the other resource/vulnerability factors showed that women were significantly more neurotic, $F(1,101) = 6.39$, $p = .013$ ($M = 33.08$, $SD = 8.89$ vs. $M = 29$, $SD = 7.39$) and more agreeable $F(1,101) = 16.69$, $p = .000$ ($M = 47.77$, $SD = 4.78$ vs. $M = 43.29$, $SD = 6.25$) than men.

Perception/Adaptive Processes

No differences were found on the Perception/Adaptive Process factors or on any outcome measures ($p > .05$).

Differences between Groups

As a point of interest, ANOVAs were used to examine if there were differences between the groups (control vs. MS/CG). Significant differences were found between groups on parental stress, $F(1,96) = 7.391$, $p = .008$: the MS/CG group experienced greater parental stress ($M = 38.8$, $SD = 13.09$ vs. $M = 32.96$, $SD = 7.81$) than the control group. Significant differences were also found on 4 of the resource/vulnerability factors (see Figure 1). It was also found that the control group had a greater ability to reframe situations than the MS/CG group, $F(1,101) = 9.513$, $p = .003$. Lastly, significant differences were found on 2 outcome measures (see Figure 2).

Differences between those with MS and Caregivers (n=51)

An ANOVA was used to test differences between persons with MS and spousal caregivers. Results indicated that persons with MS had significantly higher cortisol levels and used more problem-focused coping, $F(1,49) = 10.703$, $p = .002$ ($M = .163$, $SD = .08$ vs. $M = .098$, $SD = .056$); $F(1,47) = 4.24$, $p = .045$ ($M = 54.2$, $SD = 5.6$ vs. $M = 50.79$, $SD = 5.99$) than caregivers. This finding suggests that those with MS display more physiological stress but that they use more effective coping strategies than caregivers.

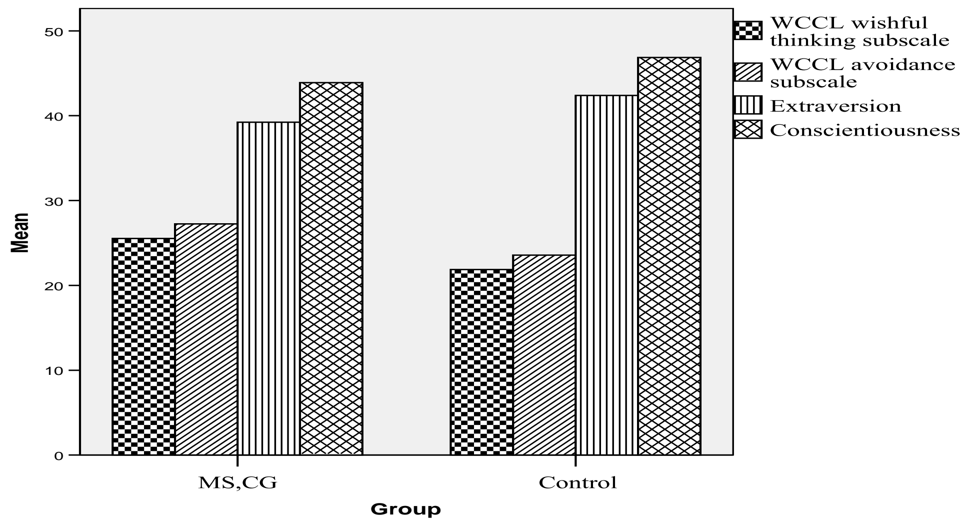


Figure 1: Significant Differences between Groups on Resource/Vulnerability Variables

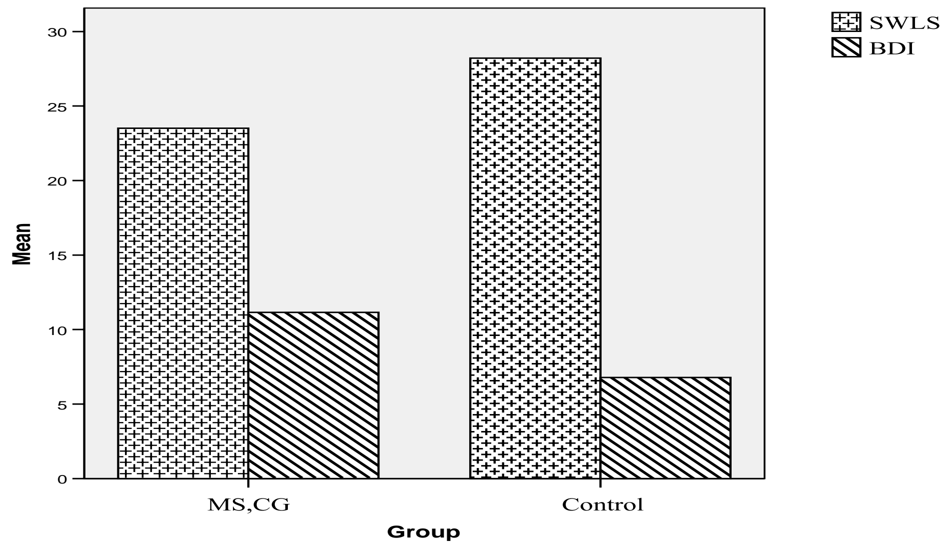


Figure 2: Significant Differences between Groups on Outcome Measures

V. Discussion

The aim of this study was to examine factors that were either beneficial or detrimental to the spousal relationship based on outcomes such as marital satisfaction, marital quality, life satisfaction, and depression. The ABCX model (Hill, 1958) and the Vulnerability-Stress-Adaptation model (Karney & Bradbury, 1995) provided a platform for addressing how the influences of stress, resources, vulnerabilities, perceptions, and adaptive processes come together to produce either a harmful or helpful outcome for spouses. However, these models have not been sufficiently examined within the caregiver/receiver literature. From a novel perspective, these two models were merged to produce the Spousal Model of Stress. Therefore, the purpose of this study was to examine this new model in two samples (married couples, married couples in which one person had been diagnosed with MS and the other was their caregiver). The proposed model allowed for an examination of general well-being, marital quality, and marital satisfaction within and between groups.

It was hypothesized that factors in the Spousal Model would predict marital quality/satisfaction, life satisfaction, and depression in both groups. More specifically, it was hypothesized that higher stress would predict a poorer outcome, and that the resource/vulnerabilities and the perception/adaptive processes factors would predict outcome in both groups (Hypotheses 1-3). For the control group, this study found that life satisfaction was only predicted by the perceived stress factor in that, the more stress one perceives, the lower their life satisfaction. This result has been found in other studies as well (Chang, 1998; Matheny et al., 2002). This makes sense as perception of stress directly influences satisfaction and it seems a person is not likely to experience high

satisfaction when experiencing stress (Diener, 2000; Matheny et al., 2002). Furthermore, perceived stress predicted depression in that the more stress one perceives, the greater their depression. Others have also found a relationship between perceived stress and depression (Chang, 1998; Spada, Nikcevic, Moneta, &Wells, 2008; Van Eck & Nicolson, 1994).

Also for the control group, depression was predicted by neuroticism and agreeableness. Findings indicated that greater depression was associated with greater neuroticism whereas less depression was associated with greater agreeableness. Others have also found strong associations between depression and neuroticism in the general population (Goodwin, Hoven, Lyons, & Stein, 2002; Jylah & Isometsa, 2006). Some have also found a relationship between low agreeableness and greater depression (Harkness, Bagby, Joffe, & Levitt, 2002).

Lastly, for the control group, the perception factor of attributing behavior to the spouse (as opposed to the situation) was the only factor that significantly predicted marital quality and satisfaction in that, the more one attributes behaviors to the spouse, the lower their marital quality and satisfaction. Similarly, Karney and Bradbury (2000) found that, over time, satisfaction declined as attributions become more negative. This finding supports the behavioral theory of marriage (Weiss, 1984; Wills, Weiss, & Patterson, 1974) which suggests that marriage is affected by cognitive responses and by their influence on later interactions between spouses. In other words, if a spouse attributes the cause of problems to their spouse, they will remember this in future interactions and these interactions will affect their satisfaction with the marriage over time. In fact, Gottman and Levenson (2000) were able to predict divorce with 93%

accuracy based on negative affect during marital conflict and a lack of positive affect in discussions about daily events. Furthermore, the attribution measure asks the person to image four negative scenarios (spouse criticizes something you say, begins to spend less time with you, doesn't pay attention to what you're saying, is cool and distant). The measure does not ask about a specific instance, it is instead a more global assessment. Furthermore, because the questionnaire is so salient to the marriage, whereas the others ask about general areas, this may explain why it is the only measure that predicts quality and satisfaction.

The results for the MS/CG group revealed a somewhat different picture. For this group, the resource factor of social support predicted marital quality, satisfaction, and life satisfaction, showing that the greater support one has, the better these outcomes. These results are not surprising as numerous studies have reported the benefits of social support (e.g. Acitelli & Antonucci, 1994; Haley, LaMonde, Han, Burton & Schonwetter, 2004; Wright & Aquilino, 1998). Furthermore, Gaugler et al. (2005) found that spouses experienced a lower loss of intimate exchange when caregivers had family and friend support. While not tested, the stress-buffering model of social support may also be work here. For instance, Pakenham (1999) found support of the buffering model in that persons with MS with high levels of social support who perceived their MS-related problems as threatening, had better social adjustment a year later than those with low social support. Because the MS/CG were married longer and worked less than the control group, they may have a larger social support network and be able to spend more time with those in their network. Furthermore, because these participants were recruited from the National MS Society through support group meetings and newsletters, it may be

that those in this group utilize the MS Society as a large support network. Therefore, they may be more able to handle MS-related problems and stress through the use this network.

Marital satisfaction was also predicted by the attribution measure, again showing that the more one attributes behavior to their spouse, the lower their marital satisfaction. This result is consistent with Pasch and Bradbury's (1998) finding that couples' later distress was predicted by interacting in a negative manner (e.g. blaming and criticizing) and by poor conflict management.

Lastly for the MS/CG group, depression was predicted by use of the avoidance coping strategy and by neuroticism. The use of more avoidance coping and being more neurotic predicted greater levels of depression. Others have found the same relationship between neuroticism and depression in both the general population and in clinical samples (Clarke, 2004; Cox, McWilliams, Enn & Clara, 2004; Farmer et al, 2002). The relationship between use of avoidance coping and greater depression has also been found in previous studies (Gard, 1999; Seiffge-Krenke & Klessinger, 2000).

It was also hypothesized that factors in the Spousal Model would predict caregiver depression and distress (Hypothesis 4). More specifically, it was hypothesized that greater depression and distress in caregivers would be predicted by high stress, low social support, and an inability to reframe. The results showed that perceived stress predicted greater depression whereas parental stress predicted greater caregiver distress. These findings are consistent with previous studies which document the positive correlation between stress and depression (Bergdahl & Bergdahl, 2002; Spada, 2008). Social support did not predict either outcome. However, Haley et al. (2004) also found that social resources were not associated with depression in a group of spousal caregivers.

It may be interesting to ask about their satisfaction with social support as Haley found this aspect was related to greater life satisfaction.

Two of the personality resource/vulnerability factors did predict depression: neuroticism and extraversion. Greater neuroticism predicted greater depression whereas greater extraversion predicted less depression. These results are similar to others' findings (e.g. Jylha & Isometsa, 2006; Ormel, Oldehinkel & Brilman, 2001) and suggest that those likely to be less depressed are optimistic, confident and sociable while those more likely to become depressed are hostile and easily stressed.

The reframing variable did not predict caregiver outcome but the attribution variable did. Again, conflict with one's spouse seems more important in that it predicted caregiver depression and distress. An examination of the reframing scale reveals that those with MS and caregivers may not benefit from reframing compared with a non-clinical sample. One plausible explanation may be that they know their situation will not change because there is no cure for MS. Results indicated that attributing behavior to one's spouse predicted greater depression and distress. Similarly, Haley et al. (2003) found that conflict in the family was a risk factor for caregiver depression.

Although salivary cortisol concentrations were expected to predict outcome in both groups, several studies also failed to find significant cortisol results (e.g. Manuck, Cohen, Rabin, & Muldoon, 1991). Overall, it appears that several factors contribute to activation of the HPA axis and that not all types of stress and negative situations trigger the axis and subsequent cortisol changes (Biondi & Picardi, 1999; Dickerson & Kemeny, 2004; Mason, 1968). Additionally, the body (specifically the prefrontal cortex) must first appraise the situation as stressful or it will not produce a stress response (i.e. increase in

cortisol). In the current study, perceived stress was not related to cortisol levels. Furthermore, a meta-analysis of 208 laboratory studies indicated that cortisol effects vary greatly depending on the tasks performed, the length of the stressor, and the time of day (Dickerson and Kemeny). For example, this review found that shorter in-lab stress tasks did not lead to differences in cortisol responses than longer tasks. Additionally, cortisol levels appear to have a circadian rhythm and are highest in the early morning just after waking, gradually decrease throughout the day, and at the lowest level in the evening. In fact, Steptoe, Cropley, Griffith, and Kirschbaum (2000) reported that cortisol effects are inconclusive when assessed in the late day. Although participants in the current study were instructed as to when they should provide their saliva samples, one cannot be certain when samples were actually provided.

It was also believed that caregivers would experience greater stress than non-caregiver/care receivers (Hypothesis 5). However, no differences in stress were found between these groups. This may be due to the fact that care receivers were not in need of care and they may represent a more normative sample of spousal dyads. In fact, 69% of those with MS reported that they were not currently experiencing any symptoms that needed care and 76% of caregivers reported providing care for only 0-2 hours per day. Other studies have found significant group differences between caregivers who provide many hours of care compared to non-caregivers and/or caregivers who provide less hours of care (Cannuscio et al, 2004; Hirst, 2003; Mills et al, 2004; Soskolne, Halevy-Levin, & Ben-Yehunda, 2002). Therefore, the present study findings are consistent with previous studies.

Lastly, it was hypothesized that women would experience greater parental stress

and have greater social support than men (Hypothesis 6). However, no gender differences were found in regard to stress or social support for caregivers or non-caregivers. Wallsten (2000) also found no difference in the number of social supports in spousal caregivers versus non-caregivers. Furthermore, Pinquart and Sorenson (2006) found that men and women did not differ in their use of formal or informal support. An examination of the social support subscales used in this study reveals that support from a significant other outweighs support from friends or family in both groups. Therefore, both groups may be relying most heavily on their spouse for support and this could account for the lack of a significant difference. It was also hypothesized that female caregivers would experience greater perceived stress and have higher cortisol levels than male caregivers. Other studies have also failed to find gender differences in caregiving or in stress differences (Ford, Goode, Barrett, Harrell, & Haley, 1997; Houde, 2002).

The MS/CG group reported greater parental stress than the control group but there were no differences between those with MS and their spousal caregivers. Possible reasons for this difference are that those with MS and their caregivers may feel they do not have a lot of energy, that their disease or amount of time giving care to their spouse interferes with doing things for their children and with other responsibilities, and/or that they would not have children because they feel their disease has interfered with their ability to parent (Deatrick, Brennan, & Cameron, 1998; Kikuchi, 1987; Wineman, O'Brien, Nealon, & Kaskel, 1993). In fact, an examination of the parenting scale illustrates these very concerns. For example, the survey asks questions such as "caring for my children takes more time and energy than I have", "I worry whether I'm doing enough", "It is difficult to balance different responsibilities because of my children", and

“If I had to do it over, I might not have children” (Berry & Jones, 1995).

Results also indicated that the MS/CG group used wishful thinking and avoidance coping skills more than the control group. These two emotion-focused coping strategies involve decreasing the emotional stress caused by the problem. Others have shown that emotion-focused coping may be used more frequently and more effectively when stressful situations are appraised as unchangeable or uncontrollable and that this type of coping can be beneficial in that spouses may develop greater acceptance of the situation (Folkman & Lazarus, 1980; Lazarus & Folkman, 1984; Hobfoll et al., 1994; Roth & Cohen, 1986). Furthermore, these differences make sense because the survey responses are based on thinking about a current serious stressor. Although participants were not asked what this stressor was, they were aware that the study was about having MS or being a caregiver. Therefore, they may have answered questions with this in mind. Responses such as “I wish I could change what happened”, “ I hoped a miracle would happen”, “I imagined a better place than the one I was in”, “ I wished the situation would go away or be finished” (Vitaliano et al., 1985) seem applicable to wishing a person did not have a disease. Furthermore, avoidance questions such as “I kept feelings to myself”, “I tried to forget the whole thing”, “I kept others from knowing how bad things were”, and “I went on as if nothing had happened” are likely responses from both a person with an illness and a caregiver.

Results showed that the control group had a greater ability to reframe situations than the MS/CG group. This result is somewhat surprising as previous research has shown that reframing the situation can help reduce caregiving stress and that the use of positive reframing when dealing with stressful events is a very effective coping strategy, especially when conditions do not allow for direct action to be taken to reduce or remove

the stressor (Hastings et al., 2005). However, others have shown that if appraising an event as threatening (i.e., to life goals, to financial security) and limiting to personal growth, the event will have a negative influence on adjustment (Pakenham, 2001; Schulz, O'Brien, Bookwala, & Fleissner, 1995; Stanton & Snider, 1993). Similarly, adjustment is better when persons appraise situations as controllable (Pakenham). Therefore, the differences found between the control group and the MS/CG group may be because those providing care and those with an incurable disease appraise these situations as threatening and uncontrollable. The study did find a significant positive correlation between benefit finding and reframing in the MS/CG group and it has been shown that individuals who can perceive benefits from hardship have better adjustment in terms of the dyadic relationship, life satisfaction, and experiencing positive affect (Pakenham, 2005).

Results also showed significant differences between the groups on 2 outcome measures: satisfaction with life and depression. Results indicated that the control group reported greater satisfaction with life than the MS/CG group. Not surprisingly, the MS/CG group experienced greater depression than the control group (Acton, 2002).

Appendix I illustrates the potentially distinct pathways for the Spousal Model of Stress. This model may guide future inquiry. The data provided some support for a stress, resource, perception pathway with regard to beneficial or detrimental outcomes in relation to marital satisfaction, marital quality, life satisfaction and depression.

Limitations

Several limitations should be noted. First, statistical power for detecting differences between the groups is limited due to the small sample size. Second, because the study was cross-sectional in design, causal conclusions cannot be drawn. Other

potential limitations stem from the fact that participants completed the study in their homes. For example, participants may have been more likely to fill out the surveys on days they were happy and less stressed. Also, they may have provided their saliva samples on different days than when they completed the survey packet. Furthermore, cortisol is a time-sensitive measure and there is no way of knowing if participants provided their samples during the instructed times.

Other limitations involving the samples must also be addressed. First, there was an unusually high mortality rate in the present study (48% in the control group, 44% in the MS/CG group) which makes it difficult to know if the sample is different from those who initially agreed to participate but then declined due to unknown reasons or to other reasons given (e.g., because they were uncomfortable answering questions about their marital relationship, they had concerns about providing a saliva sample in fear of having their DNA tested). Second, all of those in the MS/CG group were recruited from the National MS Society which makes them an unrepresentative sample. Relatedly, the sample as a whole were mostly Caucasian, were fairly well educated, and made a decent living (>$40,000/year) which hinders generalization of the results to other demographic groups. Furthermore, 69% of care receivers reported that they were not currently experiencing symptoms that needed care and 76% of caregivers reported providing care for 0-2 hours per day. Clearly, this sample is different from those with MS who are in greater need of care and their caregivers who provide more care.

Future Studies

The current study revealed important information about marital quality, satisfaction, life satisfaction and depression in healthy controls, persons with MS, and their spousal

caregivers. For example, it appears that social support is a crucial factor for those with MS and their caregivers. However, other factors may have appeared had the sample been larger. Therefore, future studies should expand the sample size and consider examining the Spousal Model in other clinical populations. It would also be interesting to examine the model in persons with MS who are exhibiting symptoms and need care at the time of the study. The model should also be examined in a group not recruited from the National MS Society (i.e., from neurologists offices) as the social support findings may reveal a different picture. The current study may have revealed different findings had the subjects been required to come to the lab to complete the study. Future studies should incorporate more of an experimental design in which sample times are controlled and monitored. Lastly, while the current study's use of regression allowed for a unique examination of the model components, future studies should aim to test the model as a whole through path analyses rather than simply examining variable relationships within the model.

Conclusion

An examination of Kennedy's Spousal Model of Stress revealed that spousal attributions were an important factor in predicting marital quality and satisfaction in a group of healthy spouses. Life satisfaction and depression in this group were predicted by amount of perceived stress. The Model also revealed that social support was an important factor in predicting marital quality, satisfaction, and life satisfaction in a group of persons with MS and their spousal caregivers. Therefore, physicians and counselors should consider discussing the impact of spousal attributions on the marriage and the importance of social support, especially marital support, when dealing with illness and/or caregiving.

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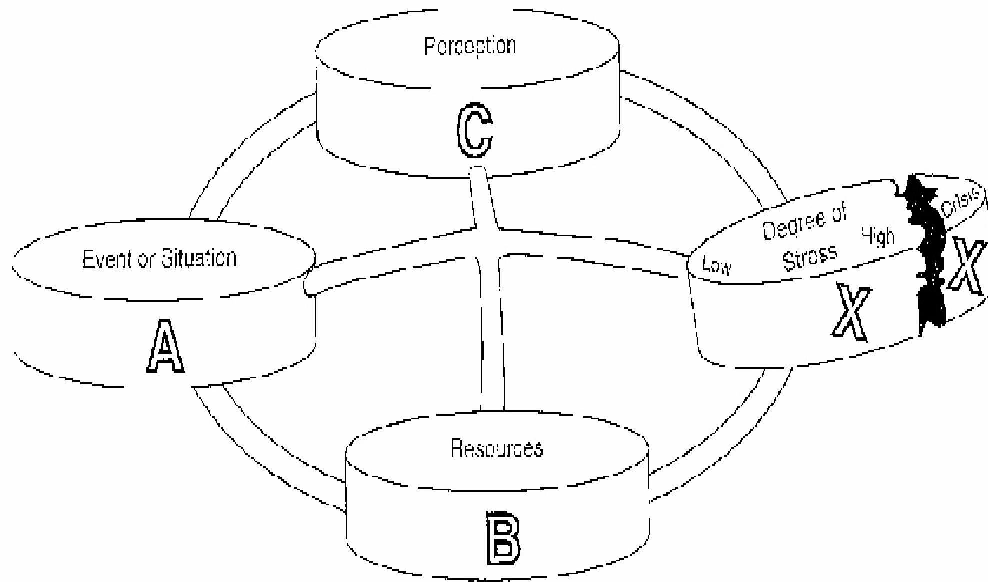
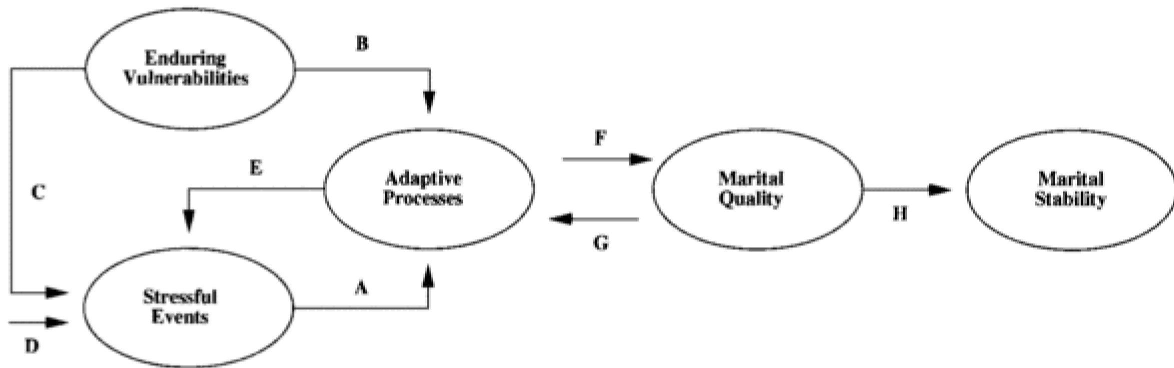
Appendices

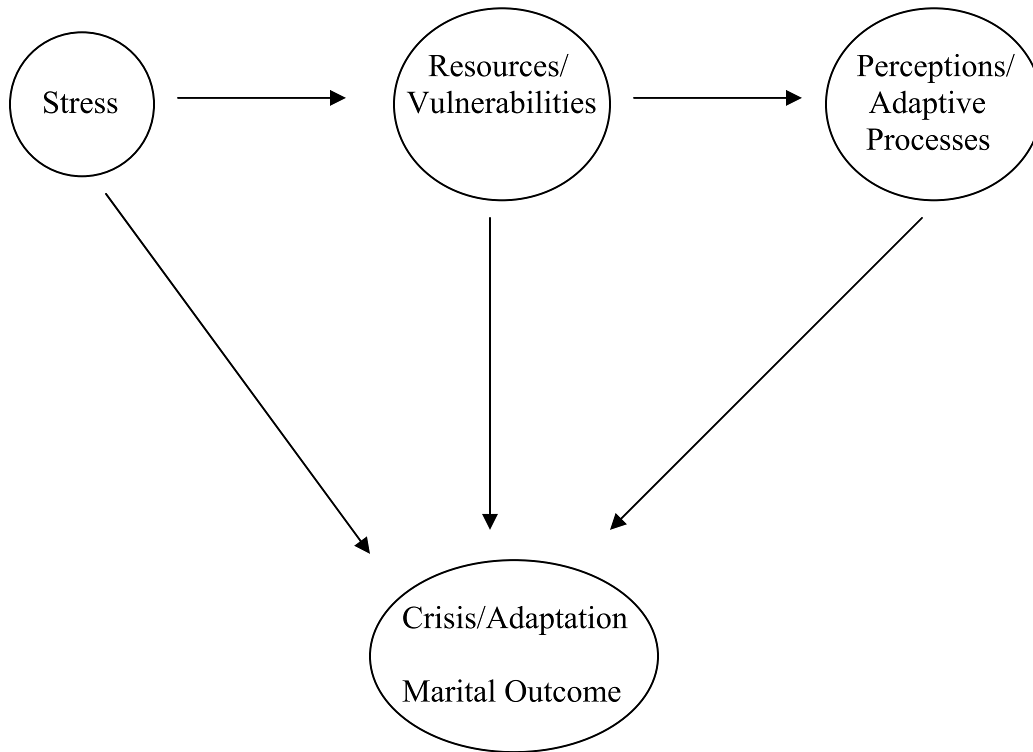
Appendix A: Hill's (1958) ABCX Model of Stress



Appendix B: Karney & Bradbury's (1995) Vulnerability-Stress-Adaptation Model



Appendix C: Kennedy's (2008) Spousal Model of Stress



Appendix D: Questionnaire Packet

Informed Consent Contract

I, ____________________, hereby agree to participate voluntarily in a study conducted by Donna Kennedy and that has been approved by the Institutional Review Board of The University of Tennessee at Knoxville. I understand that:

(1) The purpose of this research is to examine a model of stress. More specifically, this study is being done in order to examine various factors that lead to good and poor outcomes in life satisfaction and marital satisfaction. A saliva sample will be collected and used as a physiological measure of stress.

(2) My participation is voluntary. I am under no direct obligation to participate in this research. Furthermore, I understand that I may withdraw from this project at any time. If I do withdraw, the data I generated will be destroyed.

(3) All records of my behavior be coded and will remain confidential. Only the Principal Investigator will have access to the data. The data will be stored in a locked filing cabinet in the Biopsychology Laboratory in Walters Life Sciences, A308. The researcher will not publish or share with others personally identifiable information about me without my written consent.

(4) The risks for participating are minimal. If any discomfort occurs, you may withdraw from the study at any time without penalty. In addition, if you become distressed, a counselor will be available through the UT counseling center (974-2196).

(5) Contact Information:
Principal Investigator: Donna Kennedy, 974-5694
Co-Principal Investigator: Dr. Debora Baldwin, 974-3357
If you have questions about your rights as a participant, contact the Office of Research at 974-3466.

_______________________________________ ___________
Participant's Signature Date

Please sign and keep this contract for your records.

PSS

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate *how often* you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

		Never	**Almost Never**	**Sometim es**	**Fairly Often**	**Very Often**
1	In the last month, how often have you been upset because of something that happened unexpectedly?	①	②	③	④	⑤
2	In the last month, how often have you felt that you were unable to control the important things in your life?	①	②	③	④	⑤
3	In the last month, how often have you felt nervous and "stressed"?	①	②	③	④	⑤
4	In the last month, how often have you dealt successfully with irritating life hassles?	①	②	③	④	⑤
5	In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	①	②	③	④	⑤
6	In the last month, how often have you felt confident about your ability to handle your personal problems?	①	②	③	④	⑤
7	In the last month, how often have you felt that things were going your way?	①	②	③	④	⑤
8	In the last month, how often have you found that you could not cope with all the things that you had to do?	①	②	③	④	⑤
9	In the last month, how often have you been able to control irritations in your life?	①	②	③	④	⑤
10	In the last month, how often have you felt that you were on top of things?	①	②	③	④	⑤

		Never	Almost Never	Sometimes	Fairly Often	Very Often
11	In the last month, how often have you been angered because of things that happened that were outside of your control?	①	②	③	④	⑤
12	In the last month, how often have you found yourself thinking about things that you have to accomplish?	①	②	③	④	⑤
13	In the last month, how often have you been able to control the way you spend your time?	①	②	③	④	⑤
14	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	①	②	③	④	⑤

Parental Stress Scale

The following survey asks various questions about your role as a parent. Your answers should be based on how you are currently feeling.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I am happy in my role as a parent.	①	②	③	④	⑤
2	There is little or nothing I wouldn't do for my child(ren) if it was necessary.	①	②	③	④	⑤
3	Caring for my child(ren) sometimes takes more time and energy than I have to give.	①	②	③	④	⑤
4	I sometimes worry whether I am doing enough for my child(ren).	①	②	③	④	⑤
5	I feel close to my child(ren).	①	②	③	④	⑤
6	I enjoy spending time with my child(ren).	①	②	③	④	⑤
7	My child(ren) is (are) an important source of affection for me.	①	②	③	④	⑤
8	Having children gives me a more certain and optimistic view for the	①	②	③	④	⑤

		Strongl y Disagr ee	Disagr ee	Neutra l	Agree	Strongl y Agree
	future.					
9	The major source of stress in my life is my child(ren).	①	②	③	④	⑤
10	Having children leaves little time and flexibility in my life.	①	②	③	④	⑤
11	Having children has been a financial burden.	①	②	③	④	⑤
12	It is difficult to balance different responsibilities because of my child(ren).	①	②	③	④	⑤
13	The behavior of my child(ren) is often embarrassing or stressful to me.	①	②	③	④	⑤
14	If I had it to do over again, I might decide not to have children.	①	②	③	④	⑤
15	I feel overwhelmed by the responsibility of being a parent.	①	②	③	④	⑤
16	Having children has meant having too few choices and too little control over my life.	①	②	③	④	⑤
17	I am satisfied as a parent.	①	②	③	④	⑤
18	I find my child(ren) enjoyable.	①	②	③	④	⑤

MSPSS

Please rate your agreement with the following statements.

		Very Strong ly Disagr ee	Strong ly Disagr ee	Disagr ee	Neutra l	Agree	Strongl y Agree	Very Strongl y Agree
1	There is a SPECIAL PERSON who is around when I am in need.	①	②	③	④	⑤	⑥	⑦
2	There is a SPECIAL PERSON with whom I can share my joys and sorrows.	①	②	③	④	⑤	⑥	⑦

		Very Strong ly Disagr ee	Strong ly Disagr ee	Disagr ee	Neutra l	Agree	Strongl y Agree	Very Strongl y Agree
3	My FAMILY really tries to help me.	①	②	③	④	⑤	⑥	⑦
4	I get the emotional help and support that I need from my FAMILY.	①	②	③	④	⑤	⑥	⑦
5	I have a SPECIAL PERSON who is a real source of comfort to me.	①	②	③	④	⑤	⑥	⑦
6	My FRIENDS really try to help me.	①	②	③	④	⑤	⑥	⑦
7	I can count on my FRIENDS when things go wrong.	①	②	③	④	⑤	⑥	⑦
8	I can talk about my problems with my FAMILY.	①	②	③	④	⑤	⑥	⑦
9	I have FRIENDS with whom I can share my joys and sorrows.	①	②	③	④	⑤	⑥	⑦
10	There is a SPECIAL PERSON in my life who cares about my feelings.	①	②	③	④	⑤	⑥	⑦
11	My FAMILY is willing to help me make decisions.	①	②	③	④	⑤	⑥	⑦
12	I can talk about my problems with my FRIENDS.	①	②	③	④	⑤	⑥	⑦

WCC

In this section of the survey, I would like you to think of a current serious stressor involving your spouse. Think about this problem/stressor as you respond to the following statements.

		Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1	I bargained or compromised to get something positive from the situation.	①	②	③	④	⑤
2	I concentrated on something good that could come out of the whole thing.	①	②	③	④	⑤
3	I tried not to burn my bridges behind me, but left things open somewhat.	①	②	③	④	⑤
4	I changed or grew as a person in a good way.	①	②	③	④	⑤
5	I made a plan of action and followed it.	①	②	③	④	⑤
6	I accepted the next best thing to what I wanted.	①	②	③	④	⑤
7	I came out of the experience better than when I went in.	①	②	③	④	⑤
8	I tried not to act too hastily or follow my own hunch.	①	②	③	④	⑤
9	I changed something so things would turn out all right.	①	②	③	④	⑤
10	I just took things one step at a time.	①	②	③	④	⑤
11	I knew what had to be done, so I doubled my efforts and tried harder to make things work.	①	②	③	④	⑤
12	I came up with a couple of different solutions to the problem(s).	①	②	③	④	⑤
13	I accepted my strong feelings, but didn't let them interfere with other things too much.	①	②	③	④	⑤
14	I changed something about myself so I could deal with the situation better.	①	②	③	④	⑤
15	I stood my ground and fought for what I wanted.	①	②	③	④	⑤

		Strongl y Disagr ee	Disagr ee	Neutra l	Agree	Strongl y Agree
16	I talked to someone to find out about the situation.	①	②	③	④	⑤
17	I accepted sympathy and understanding from someone.	①	②	③	④	⑤
18	I got professional help and did what they recommended.	①	②	③	④	⑤
19	I talked to someone who could do something about the problem.	①	②	③	④	⑤
20	I asked someone I respected for advice and followed it.	①	②	③	④	⑤
21	I talked to someone about how I was feeling.	①	②	③	④	⑤
22	I blamed myself.	①	②	③	④	⑤
23	I criticized or lectured myself.	①	②	③	④	⑤
24	I realized I brought the problem on myself.	①	②	③	④	⑤
25	I hoped a miracle would happen.	①	②	③	④	⑤
26	I wished I was a stronger person--more optimistic and forceful.	①	②	③	④	⑤
27	I wished that I could change what had happened.	①	②	③	④	⑤
28	I wished I could change the way I felt.	①	②	③	④	⑤
29	I daydreamed or imagined a better time or place than the one I was in.	①	②	③	④	⑤
30	I had fantasies or wishes about how things might turn out.	①	②	③	④	⑤
31	I thought about fantastic or unreal things (like perfect revenge or finding a million dollars) that made me feel better.	①	②	③	④	⑤
32	I wished the situation would go away or somehow be finished.	①	②	③	④	⑤
33	I went on as if nothing had happened.	①	②	③	④	⑤
34	I felt bad that I couldn’t avoid the problem.	①	②	③	④	⑤
35	I kept my feelings to myself.	①	②	③	④	⑤

		Strongl y Disagr ee	Disagr ee	Neutra l	Agree	Strongl y Agree
36	I slept more than usual.	①	②	③	④	⑤
37	I got mad at the people or things that caused the problem.	①	②	③	④	⑤
38	I tried to forget the whole thing.	①	②	③	④	⑤
39	I tried to make myself feel better by eating, drinking, smoking, taking medications.	①	②	③	④	⑤
40	I avoided being with people in general.	①	②	③	④	⑤
41	I kept others from knowing how bad things were.	①	②	③	④	⑤
42	I refused to believe it had happened.	①	②	③	④	⑤

NEO-FFI

This survey will help us better understand who you are as an individual. Each statement describes a personal characteristic with which you may agree or disagree as being an accurate statement of you. For each statement fill in the circle with the response that best represent your opinion.

		Strongl y Disagr ee	Disagr ee	Neutra l	Agree	Strongl y Agree
1	I am not a worrier.	①	②	③	④	⑤
2	I like to have a lot of people around me.	①	②	③	④	⑤
3	I don’t like to waste my time daydreaming.	①	②	③	④	⑤
4	I try to be courteous to everyone I meet.	①	②	③	④	⑤
5	I keep my belongings neat and clean.	①	②	③	④	⑤
6	I often feel inferior to others.	①	②	③	④	⑤
7	I laugh easily.	①	②	③	④	⑤
8	Once I find the right way to do	①	②	③	④	⑤

		Strongl y Disagr ee	Disagr ee	Neutra l	Agree	Strongl y Agree
	something, I stick to it.					
9	I often get into arguments with my family and co-workers.	①	②	③	④	⑤
10	I'm pretty good about pacing myself so as to get things done on time.	①	②	③	④	⑤
11	When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.	①	②	③	④	⑤
12	I don't consider myself especially "light-hearted".	①	②	③	④	⑤
13	I am intrigued by the patterns I find in art and nature.	①	②	③	④	⑤
14	Some people think I'm selfish and egotistical.	①	②	③	④	⑤
15	I am not a very methodical person.	①	②	③	④	⑤
16	I rarely feel lonely or blue.	①	②	③	④	⑤
17	I really enjoy talking to people.	①	②	③	④	⑤
18	I believe letting students hear controversial speakers can only confuse and mislead them.	①	②	③	④	⑤
19	I would rather cooperate with others then compete with them	①	②	③	④	⑤
20	I try to perform all the tasks assigned to me conscientiously.	①	②	③	④	⑤
21	I often feel tense and jittery.	①	②	③	④	⑤
22	I like to be where the action is.	①	②	③	④	⑤
23	Poetry has little or no effect on me.	①	②	③	④	⑤
24	I tend to be cynical and skeptical of others' intentions.	①	②	③	④	⑤
25	I have a clear set of goals and work toward them in an orderly fashion.	①	②	③	④	⑤
26	Sometimes I feel completely worthless.	①	②	③	④	⑤
27	I usually prefer to do things alone.	①	②	③	④	⑤
28	I often try new and foreign foods.	①	②	③	④	⑤

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
29	I believe that most people will take advantage of you if you let them.	①	②	③	④	⑤
30	I waste a lot of time before settling down to work.	①	②	③	④	⑤
31	I rarely feel fearful or anxious.	①	②	③	④	⑤
32	I often feel as if I'm bursting with energy.	①	②	③	④	⑤
33	I seldom notice the moods of feelings that different environments produce.	①	②	③	④	⑤
34	Most people I know like me.	①	②	③	④	⑤
35	I work hard to accomplish my goals.	①	②	③	④	⑤
36	I often get angry at the way people treat me.	①	②	③	④	⑤
37	I am a cheerful, high-spirited person.	①	②	③	④	⑤
38	I believe we should look to our religious authorities for decisions on moral issues.	①	②	③	④	⑤
39	Some people think of me as cold and calculating.	①	②	③	④	⑤
40	When I make a commitment, I can always be counted on to follow through.	①	②	③	④	⑤
41	Too often, when things go wrong, I get discouraged and feel like giving up.	①	②	③	④	⑤
42	I am not a cheerful optimist.	①	②	③	④	⑤
43	Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement.	①	②	③	④	⑤
44	I'm hard-headed and tough-minded in my attitudes.	①	②	③	④	⑤
45	Sometimes I'm not as dependable or reliable as I should be.	①	②	③	④	⑤
46	I am seldom sad or depressed.	①	②	③	④	⑤
47	My life is fast-paced.	①	②	③	④	⑤

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
48	I have little interest in speculating on the nature of the universe or the human condition.	①	②	③	④	⑤
49	I generally try to be thoughtful and considerate.	①	②	③	④	⑤
50	I am a productive person who always gets the job done.	①	②	③	④	⑤
51	I often feel helpless and want someone else to solve my problems.	①	②	③	④	⑤
52	I am a very active person.	①	②	③	④	⑤
53	I have a lot of intellectual curiosity.	①	②	③	④	⑤
54	If I don't like people, I let them know it.	①	②	③	④	⑤
55	I never seem to be able to get organized.	①	②	③	④	⑤
56	At times I have been so ashamed I just wanted to hide.	①	②	③	④	⑤
57	I would rather go my own way than be a leader of others	①	②	③	④	⑤
58	I often enjoy playing with theories or abstract ideas.	①	②	③	④	⑤
59	If necessary, I am excited to manipulate people to get what I want.	①	②	③	④	⑤
60	I strive for excellence in everything I do.	①	②	③	④	⑤

FCOPES

For this survey, indicate how well each statement describes your attitudes and behavior in response to problems or difficulties.

When we face problems or difficulties in our family, we respond by:

		Strongly Disagree	Moderately Disagree	Neither Agree nor Disagree	Moderately Agree	Strongly Agree
1	Knowing we have the power to	①	②	③	④	⑤

		Strongl y Disagr ee	Moderat ely Disagree	Neithe r Agree nor Disagr ee	Moderate ly Agree	Strongl y Agree
	solve major problems.					
2	Knowing that we have the strength within our own family to solve our problems.	①	②	③	④	⑤
3	Facing the problems "head-on" and trying to get a solution right away.	①	②	③	④	⑤
4	Showing that we are strong.	①	②	③	④	⑤
5	Accepting stressful events as a fact of life.	①	②	③	④	⑤
6	Accepting that difficulties occur unexpectedly.	①	②	③	④	⑤
7	Believing we can handle our own problems.	①	②	③	④	⑤
8	Defining the family problem in a more positive way so that we do not become too discouraged.	①	②	③	④	⑤

RAM

This questionnaire describes several things that your spouse might do. Imagine your spouse performing each behavior and then read the statements that follow it. Please circle the number that indicates how much you agree or disagree with each statement, using the rating scale below.

YOUR SPOUSE CRITICIZES SOMETHING YOU SAY…

		Strongl y Disagre e	Disagre e	Somewhat Disagree	Somewh at Agree	Agree	Strongl y Agree
1	My spouse's behavior was due to something about him/her (e.g., the type of person he/she is, his/her mood).	①	②	③	④	⑤	⑥
2	My spouse's behavior was due to something about me (e.g., the type of person I am, the mood I was in).	①	②	③	④	⑤	⑥

		Strongl y Disagre e	Disagre e	Somewhat Disagree	Somewh at Agree	Agree	Strongl y Agree
3	The reason my spouse criticized me is not likely to change.	①	②	③	④	⑤	⑥
4	The reason my spouse criticized me is something that affects other areas of our marriage.	①	②	③	④	⑤	⑥
5	My spouse criticized me on purpose rather than unintentionally.	①	②	③	④	⑤	⑥
6	My spouse's behavior was motivated by selfish rather than unselfish concerns.	①	②	③	④	⑤	⑥
7	My spouse deserves to be blamed for criticizing me.	①	②	③	④	⑤	⑥

YOUR SPOUSE BEGINS TO SPEND LESS TIME WITH YOU….

		Strongl y Disagre e	Disagre e	Somewhat Disagree	Somewh at Agree	Agree	Strongl y Agree
8	My spouse's behavior was due to something about him/her (e.g., the type of person he/she is, his/her mood).	①	②	③	④	⑤	⑥
9	My spouse's behavior was due to something about me (e.g., the type of person I am, the mood I was in).	①	②	③	④	⑤	⑥
10	The reason my spouse is beginning to spend less time with me is not likely to change.	①	②	③	④	⑤	⑥
11	The reason my spouse is beginning to spend less time with me is something that affects other areas of our	①	②	③	④	⑤	⑥

		Strongl y Disagre e	Disagre e	Somewhat Disagree	Somewh at Agree	Agree	Strongl y Agree
	marriage.						
12	My spouse is beginning to spend less time with me on purpose rather than unintentionally.	①	②	③	④	⑤	⑥
13	My spouse's behavior was motivated by selfish rather than <u>un</u>selfish concerns.	①	②	③	④	⑤	⑥
14	My spouse deserves to be blamed for beginning to spend less time with me.	①	②	③	④	⑤	⑥

YOUR SPOUSE DOES NOT PAY ATTENTION TO WHAT YOU ARE SAYING….

		Strongl y Disagre e	Disagre e	Somewhat Disagree	Somewh at Agree	Agree	Strongl y Agree
15	My spouse's behavior was due to something about him/her (e.g., the type of person he/she is, his/her mood).	①	②	③	④	⑤	⑥
16	My spouse's behavior was due to something about me (e.g., the type of person I am, the mood I was in).	①	②	③	④	⑤	⑥
17	The reason my spouse did not pay attention to me is <u>not</u> likely to change.	①	②	③	④	⑤	⑥
18	The reason my spouse did not pay attention to me is something that affects other areas of our marriage.	①	②	③	④	⑤	⑥
19	My spouse did not pay attention to me on purpose rather than	①	②	③	④	⑤	⑥

		Strongl y Disagre e	Disagre e	Somewhat Disagree	Somewh at Agree	Agree	Strongl y Agree
	unintentionally.						
20	My spouse's behavior was motivated by selfish rather than unselfish concerns.	①	②	③	④	⑤	⑥
21	My spouse deserves to be blamed for not paying attention to me.	①	②	③	④	⑤	⑥

YOUR SPOUSE IS COOL AND DISTANT….

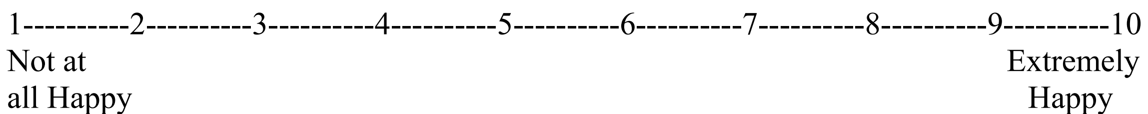
		Strongl y Disagre e	Disagre e	Somewhat Disagree	Somewh at Agree	Agree	Strongl y Agree
22	My spouse's behavior was due to something about him/her (e.g., the type of person he/she is, his/her mood).	①	②	③	④	⑤	⑥
23	My spouse's behavior was due to something about me (e.g., the type of person I am, the mood I was in).	①	②	③	④	⑤	⑥
24	The reason my spouse was cool and distant is not likely to change.	①	②	③	④	⑤	⑥
25	The reason my spouse was cool and distant is Something that affects other areas of our marriage.	①	②	③	④	⑤	⑥
26	My spouse was cool and distant on purpose rather than unintentionally.	①	②	③	④	⑤	⑥
27	My spouse's behavior was motivated by selfish rather than unselfish concerns.	①	②	③	④	⑤	⑥
28	My spouse deserves to be blamed for being cool and distant.	①	②	③	④	⑤	⑥

QMI

The following questions ask about your marriage.

		Very Strongly Disagree	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Very Strongly Agree**
1	We have a good marriage.	①	②	③	④	⑤	⑥	⑦
2	My relationship with my partner is very stable.	①	②	③	④	⑤	⑥	⑦
3	Our marriage is strong.	①	②	③	④	⑤	⑥	⑦
4	My relationship with my partner makes me happy.	①	②	③	④	⑤	⑥	⑦
5	I really feel like part of a team with my partner.	①	②	③	④	⑤	⑥	⑦

The degree of happiness, everything considered, in my marriage.



PRQC

The following survey asks questions about various aspects of your relationship with your spouse.

		Not at All	**Very Little**	**A Little**	**Somewhat**	**A lot**	**A Great Deal**	**Extremely**
1	How satisfied are you with your relationship?	①	②	③	④	⑤	⑥	⑦
2	How content are you with your	①	②	③	④	⑤	⑥	⑦

		Not at All	Very Little	A Little	Somewhat	A lot	A Great Deal	Extremely
	relationship?							
3	How happy are you with your relationship?	①	②	③	④	⑤	⑥	⑦
4	How committed are you with your relationship?	①	②	③	④	⑤	⑥	⑦
5	How dedicated are you with your relationship?	①	②	③	④	⑤	⑥	⑦
6	How devoted are you with your relationship?	①	②	③	④	⑤	⑥	⑦
7	How intimate is your relationship?	①	②	③	④	⑤	⑥	⑦
8	How close is your relationship?	①	②	③	④	⑤	⑥	⑦
9	How connected are you to your partner?	①	②	③	④	⑤	⑥	⑦
10	How much do you trust your partner?	①	②	③	④	⑤	⑥	⑦
11	How much can you count on your partner?	①	②	③	④	⑤	⑥	⑦
12	How dependable is your partner?	①	②	③	④	⑤	⑥	⑦
13	How passionate is your relationship?	①	②	③	④	⑤	⑥	⑦
14	How lustful is your relationship?	①	②	③	④	⑤	⑥	⑦
15	How sexually intense is your relationship?	①	②	③	④	⑤	⑥	⑦
16	How much do you love your partner?	①	②	③	④	⑤	⑥	⑦
17	How much do you adore your partner?	①	②	③	④	⑤	⑥	⑦
18	How much do you cherish your partner?	①	②	③	④	⑤	⑥	⑦

SWLS

Below are five statements that you may agree or disagree with. Indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

		Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neither Agree or Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
1	In most ways my life is close to my ideal.	①	②	③	④	⑤	⑥	⑦
2	The conditions of my life are excellent.	①	②	③	④	⑤	⑥	⑦
3	I am satisfied with my life.	①	②	③	④	⑤	⑥	⑦
4	So far I have gotten the important things I want in life.	①	②	③	④	⑤	⑥	⑦
5	If I could live my life over, I would change almost nothing.	①	②	③	④	⑤	⑥	⑦

BDI

After reading each group of statements carefully, circle the number (0, 1, 2, or 3) next to the one statement in each group which best describes the way you have been feeling the **PAST WEEK**, including today. If several statements within a group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1. 0 I do not feel sad.
   1 I feel sad.
   2 I am sad all the time and I can't snap out of it.
   3 I am so sad or unhappy that I can't stand it.

2. 0 I am not particularly discouraged about the future.
   1 I feel discouraged about the future.
   2 I feel I have nothing to look forward to.
   3 I feel that the future is hopeless and that things cannot improve.

3. 0 I do not feel like a failure.
1 I feel I have failed more than the average person.
2 As I look back on my life, all I can see is a lot of failures.
3 I feel I am a complete failure as a person.

4. 0 I get as much satisfaction out of things as I used to.
1 I don't enjoy things the way I used to.
2 I don't get real satisfaction out of anything anymore.
3 I am dissatisfied or bored with everything.

5. 0 I don't feel particularly guilty.
1 I feel guilty a good part of the time.
2 I feel guilty most of the time.
3 I feel guilty all of the time.

6. 0 I don't feel that I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.

7. 0 I don't feel disappointed in myself.
1 I am disappointed in myself.
2 I am disgusted with myself.
3 I hate myself.

8. 0 I don't feel I am any worse than anybody else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.

9. 0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10. 0 I don't cry any more than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.

11. 0 I am no more irritated now than I ever am.
1 I get annoyed or irritated more easily than I used to.
2 I feel irritated all the time now.
3 I don't get irritated at all by the things that used to irritate me.

12. 0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

13. 0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions at all anymore.

14. 0 I don't feel I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe that I look ugly.

15. 0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.

16. 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.

17. 0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing anything.
3 I am too tired to do anything.

18. 0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.

19. 0 I haven't lost much weight, if any, lately.
1 I have lost more than 5 pounds.
2 I have lost more than 10 pounds.
3 I have lost more than 15 pounds.

20. 0 I am no more worried about my health than usual.
    1 I am worried about physical problems such as aches and pains or upset stomach or constipation.
    2 I am very worried about physical problems and it is hard to think of much else.
    3 I am so worried about my physical problems than I cannot think about anything else.

21. 0 I have not noticed any recent change in my interest in sex.
    1 I am less interested in sex than I used to be.
    2 I am much less interested in sex now.
    3 I have lost interest in sex completely.

BFS

Please indicate how much you agree with each of the following statements. ________'s MS indicates the person for whom you provide care. Read each statement with this person's name in mind.

		Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1	Since _____________'s MS I have learned to communicate better with people.	①	②	③	④	⑤
2	I feel my family or friends worry about me more since _____________'s MS.	①	②	③	④	⑤
3	I keep in better touch with my family since _____________'s MS.	①	②	③	④	⑤
4	_____________'s MS has helped me be closer to my family.	①	②	③	④	⑤
5	_____________'s MS has made me appreciate life more.	①	②	③	④	⑤
6	I express more feelings since _____________'s MS.	①	②	③	④	⑤
7	_____________'s MS has made me more independent.	①	②	③	④	⑤
8	_____________'s MS has helped me become more compassionate towards others.	①	②	③	④	⑤
9	_____________'s MS has helped me become closer to my partner/significant other.	①	②	③	④	⑤

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10	_____________'s MS has made me realize the importance of being independent.	①	②	③	④	⑤
11	My friends and family have become more helpful since _____________'s MS.	①	②	③	④	⑤
12	_____________'s MS has helped me be a better friend.	①	②	③	④	⑤
13	_____________'s MS has made me more conscientious and self-disciplined.	①	②	③	④	⑤
14	I have become more introspective since _____________'s MS.	①	②	③	④	⑤
15	I am less inhibited now as compared to before __________ had MS.	①	②	③	④	⑤
16	I have become more spiritual since _____________'s MS.	①	②	③	④	⑤
17	I have become more respectful towards others since _____________'s MS.	①	②	③	④	⑤
18	I am more compassionate towards others since ____________'s MS.	①	②	③	④	⑤
19	I am more motivated to succeed since ______________'s MS.	①	②	③	④	⑤

CDS

Specific aspects of family life are affected by the demands of caregiving. With respect to your current situation as a caregiver for your spouse, please indicate whether YOU PERSONALLY disagree or agree with the following statements.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I take part in organized activities less.	①	②	③	④	⑤
2	I visit my family/friends less.	①	②	③	④	⑤
3	I take part in other social activities less.	①	②	③	④	⑤

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
4	I feel frustrated with caring for my spouse.	①	②	③	④	⑤
5	My relationship with my spouse depresses me.	①	②	③	④	⑤
6	I feel pressured between giving to my spouse and others in the family.	①	②	③	④	⑤
7	I feel that my own health has suffered because of my spouse.	①	②	③	④	⑤
8	My relationship with my spouse is strained.	①	②	③	④	⑤
9	Caring for my spouse has made me nervous.	①	②	③	④	⑤
10	I feel my spouse can only depend on me.	①	②	③	④	⑤
11	I feel resentful towards my spouse.	①	②	③	④	⑤
12	I feel helpless in caring for my spouse.	①	②	③	④	⑤
13	My relationship with my spouse no longer gives me pleasure.	①	②	③	④	⑤
14	My spouse tries to manipulate me.	①	②	③	④	⑤
15	I feel overwhelmed by caring for my spouse.	①	②	③	④	⑤
16	My spouse makes more requests than necessary.	①	②	③	④	⑤
17	I feel that my personal life has suffered because of my spouse.	①	②	③	④	⑤

Appendix E: Demographic Sheets

Personal Information

Age: _____ **Sex:** ☐ Male ☐ Female

My education:
- ❑ Less than high school
- ❑ High school
- ❑ Some college
- ❑ Associate's Degree
- ❑ College
- ❑ Master's Degree
- ❑ Ph. D.
- ❑ Professional Degree (e. g. Physician, Lawyer…)

My employment status:
- ❑ Employed full-time
- ❑ Employed part-time
- ❑ Unemployed
- ❑ Receiving disability compensation
- ❑ Retired
- ❑ Other

My race:
- ❑ Caucasian
- ❑ African American
- ❑ Native American
- ❑ Hispanic
- ❑ Other

My annual income:
- ❑ ≤ $10,000 - $20,000
- ❑ $21,000 - $40,000
- ❑ $41,000 - $60,000
- ❑ $61,000 - $80,000
- ❑ ≥ $81,000

Number of Children ______

How long have you been married? _________

Does your spouse have a disabling disease in which care must be provided?

- ❑ Yes
- ❑ No

If yes, are you the person who primarily provides care to your spouse?

❑ Yes ☐ No

Additional Questions in the MS packet:

Which of the following best describes the status of your MS?

- ❑ Relapsing-remitting
- ❑ Secondary-progressive
- ❑ Primary Progressive
- ❑ Progressive Relapsing

Are you currently experiencing any symptoms of MS in which you need care to provided?

- ❑ Yes
- ❑ No

Additional Question in the CG packet:

How many hours of care do you personally (not including monetarily) provide to your spouse each day?

- ❑ 0-2
- ❑ 3-5
- ❑ 6-8
- ❑ ≥ 10

Appendix F: Instruction Sheet

INSTRUCTION SHEET

Thank you for considering participation in this experiment conducted by Donna Kennedy as partial fulfillment of Doctorate of Philosophy degree requirements for the Experimental Psychology Program at the University of Tennessee. **Please read these instructions before completing the questionnaire packet or rendering your saliva sample**. You may abort your participation at any time without penalty. You should complete your participation within <u>one week</u> of receiving the materials. **It is important that you complete the questionnaire packets independently (e.g., without your partner around to discuss questions or influence your answers).**

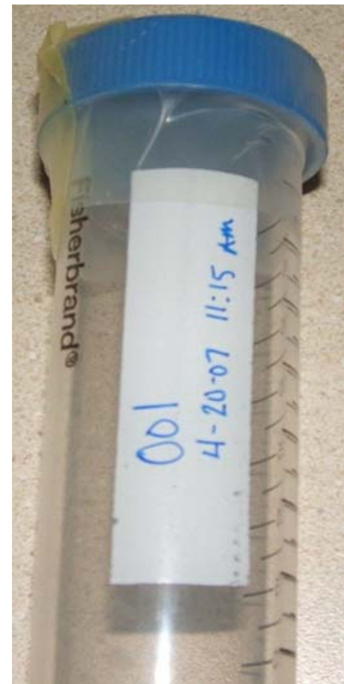
Between the hours of 10:00 AM and 2:00 PM, you will collect a sample of your saliva. This sample will be used as a physiological measure of stress. You should plan to avoid smoking and consumption of food or liquids for one hour prior to providing these samples. Prepare for giving a sample by sitting in a comfortable chair. Place the plastic tube labeled with your ID number, a watch with a second hand, a glass of room-temperature water, and a pen before you within comfortable reach. Relax and record the date and time on the plastic tube below your ID number. Rinse with one mouthful of water and spit this liquid into a sink or receptacle. Swallow all saliva until you are aware of a feeling of dryness in your mouth. Remove the cap from the plastic tube and place the opening of the tube against the right corner of your mouth (see picture). Note the time in minutes and seconds. Sitting straight, lower your head slightly and allow saliva to flow spontaneously into the tube. You may spit once per minute during collection.

After exactly 3 minutes, cap the tube. Promptly wrap the top of the tube with the provided Parafilm (see picture). Then place your sample in the freezer. Please complete the questionnaire packet on the same day as rendering your saliva sample.

Please return packets with saliva samples on the specified date and time. Thank you for your participation.

Sincerely,

Donna Kennedy



If you become distressed as a result of participating in this study, remember that you may withdraw from the study at anytime without penalty. Below is a referral number in case you want to talk with a trained mental health professional.

Tennessee Mental Health
5908 Lyons View Pike
Knoxville, TN 37919
865-584-3638

Appendix G: Table of Demographic Data

Table 1: Demographic Data for each Group (in percentages).

	Husbands n=26	Wives n=26	MS n=26	CG n=25
Race:				
Caucasian	88.5	96.2	92.3	81.5
African American	3.8	0	7.7	7.4
Native American	0	3.8	0	0
Hispanic	7.7	0	0	3.7
Other	0	0	0	0
Education:				
<High school	3.8	0	0	0
High school	7.7	3.8	23.1	18.5
Some college	15.4	15.4	7.7	25.9
Associate's	3.8	3.8	19.2	7.4
Bachelor's	26.9	57.7	30.8	25.9
Master's	30.8	15.4	15.4	3.7
Ph.D.	3.8	3.8	3.8	7.4
Professional degree	7.7	0	0	3.7
Employment:				
Full-time	84.6	65.4	34.6	51.9
Part-time	3.8	7.7	3.8	7.4
Unemployed	0	11.5	15.4	3.7
Disability	0	0	30.8	3.7
Retired	11.5	7.7	11.5	22.2
Other	0	7.7	3.8	3.7
Income:				
≤$10-20,000	0	15.4	19.2	22.2
$21-40,000	34.6	19.2	11.5	18.5
$41-60,000	19.2	23.1	30.8	22.2
$61-80,000	19.2	7.7	19.2	7.4
≥$81,000	26.9	26.9	7.7	18.5
# of children:				
0	0	0	7.7	7.4
1	34.6	34.6	19.2	14.8
2	46.2	50.0	23.1	25.9
3	3.8	3.8	26.9	29.6
4	11.5	7.7	19.2	11.1
5	0	0	3.8	3.7
6	3.8	3.8	0	0
Gender:				
Male	100	0	38.5	59.3
Female	0	100	61.5	33.3
Type of MS:				
Relapsing-remitting			79.6	
Secondary progressive			11.5	
Primary progressive			3.8	
Progressive relapsing			3.8	

*MS=multiple sclerosis group; CG=caregiver group

Appendix H: Correlations Table

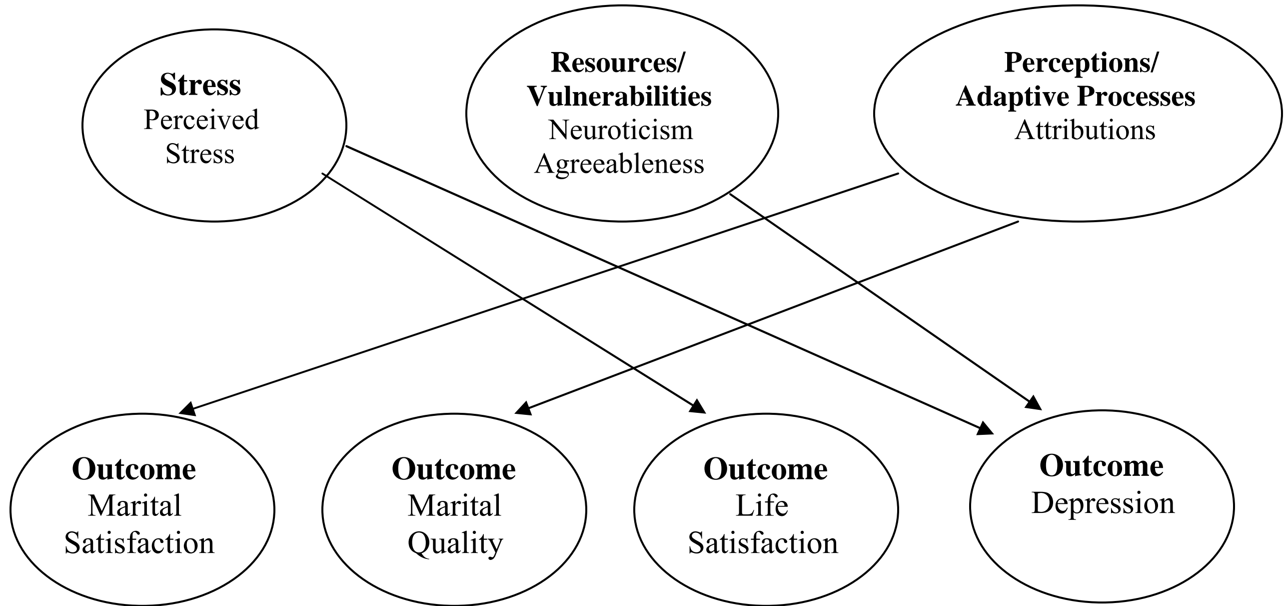
Table 3: Significant Correlations among Scales

	ParSS	Cortisol	MSPSS	pf	sss	blame	wish	avoid	N	E	O	A	C	FCOPE	RAM	QMI	PRQC	SWLS
PSS	.467**	-----	-.238*	-----	-----	.320**	.410**	.500**	.681**	-.303**	-.252*	-.316**	-.412**	-.229*	.255**	-.375**	-.229*	-.482**
ParSS	1	-----	-----	-----	-----	.254*	.357**	.469**	.376**	-.333**	-.359**	-.467**	-.359**	-.201*	.360**	-.436**	-.331**	-.406**
Cortisol		1	-----	-----	-----	-----	-----	-----	-----	-.267**	-----	-----	-----	-----	-----			
MSPSS			1	-----	-----	-.271**	-----	-----	-----	-----	-----	.377**	-----	-----	-.335**	.454**	.329**	.413**
p-f				1	.373**	-----	-----	-.251*	-----	-----	.447**	.273**	.355**	.374**	-.206**	.204*	-----	-----
sss					1	-----	.250*	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
blames						1	.483**	.479**	.431*	-.218*	-----	-----	-.323**	-.205*	-----	-----	-----	-.300**
wish							1	.654**	.497**	-.207*	-.283**	-----	-.365**	-----	.227*	-.272**	-----	-.381**
avoid								1	.564**	-.286**	-.236*	-.271**	-.476**	-.210*	.254*	-.306**	-----	-.437**
N									1	-.402**	-.325**	-.236*	-.447**	-.262**	-----	-.305**	-----	-.397**
E										1	.217*	-----	.284**	.431**	-.305**	.214*	.232*	.389**
O											1	-----	.228*	.235*	-----	-----	-----	-----
A												1	.322**	.214*	-.301**	.394**	.235*	.214*
C													1	.440**	-.261**	.278**	-----	.240*
FCOPE														1	-.318**	.348**	.241*	.257**
RAM															1	-.552**	-.510**	-.261**
QMI																1	.785**	.513**
PRQC																	1	.471**
SWLS																		1

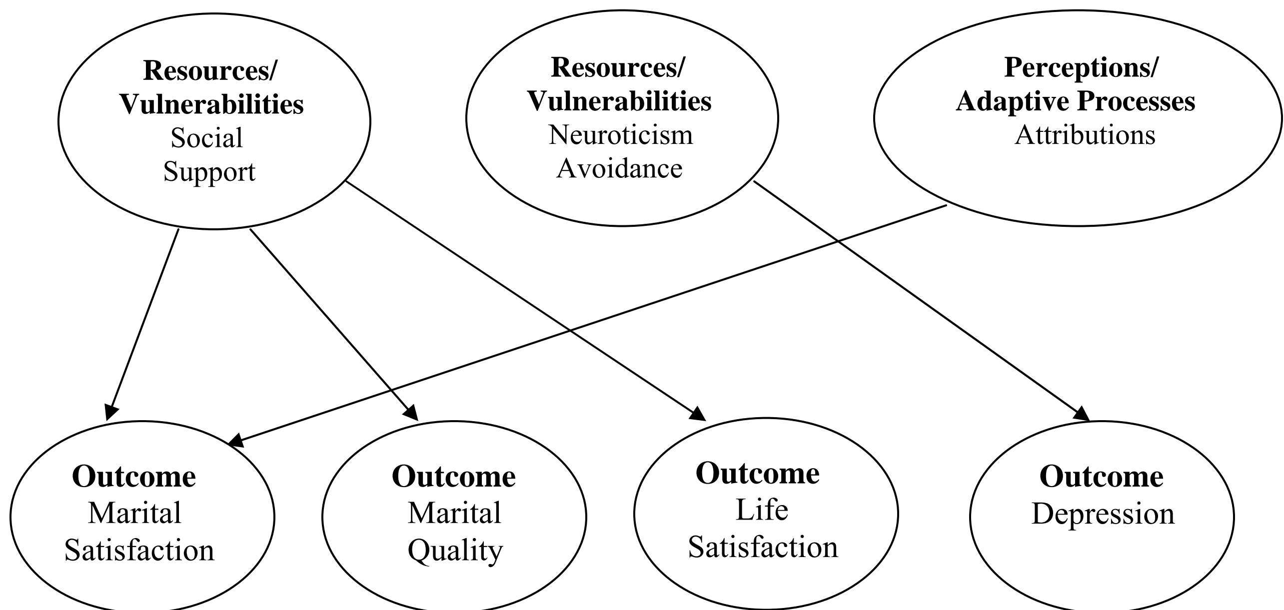
PSS: perceived stress scale; ParSS: parental stress scale; MSPSS: social support scale; p-f: problem-focused coping; sss: seeks social support coping; blames: blames self coping; wish: wishful thinking coping; avoid: avoidance coping; N: neuroticism; E: extraversion; O: openness; A: agreeableness; C: conscientiousness; FCOPE: family crisis oriented personal evaluation scales; RAM: relationship attribution measure; QMI: quality of marriage index; PRQC: perceived relationship quality components; SWLS: satisfaction with life scale
$*$ $p \leq 0.05$ $**$ $p \leq 0.01$

Appendix I: Spousal Models of Stress

Control Group



MS/CG Group



Vita

Donna LeAnn Kennedy was born in Oak Ridge, TN in 1980. She completed her B.A. in Psychology from The University of Tennessee, Knoxville in December, 2001. From there, she went to the University of Tennessee, Chattanooga where she completed her M.S. in Research Psychology in 2004. Donna then returned to UT Knoxville and completed her Ph.D. in Experimental Psychology with a concentration in Health Research in December, 2008.

In 2008, Donna was working as the Executive Director of a non-profit organization whose aim is to assist professional drivers with medical care they are unable to afford. She was also working as a Project Coordinator where she developed and ran studies on sleep apnea and diabetes prevention.