

AN ABSTRACT OF THE THESIS OF

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Title: Personality Traits and Mental Health of Spouse Caregivers in Two Disease Groups: Alzheimer's and Parkinson's Disease.

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A consistent research question in caregiving is why caregivers show individual differences in their abilities to manage stress. This study focuses on the personality traits of spouse caregivers to assess individual differences which enable them to adapt to their particular caregiving situation. Previous research has established concurrent relationships between personality traits of neuroticism and optimism to the mental and physical health of the spouse caregivers. What has not been shown to date is whether the personality traits of caregivers predict their health outcomes. Therefore, the purpose of the current study is to examine a predictive relationship between personality traits (neuroticism and extraversion) of spouse caregivers at baseline and their psychological mal-being (opposite of well-being) approximately one year later, hypothesized to be mediated by social support from family and friends. In particular, higher scores on neuroticism are expected to predict worse mental health and higher scores on extraversion, better mental health. This study also proposes to determine whether there are differences in such a relationship, based on gender, or whether caregivers are caring for a spouse with a cognitive or physical impairment.

A sample of 122 spouse caregivers of people with Alzheimer's disease (n = 64) and Parkinson's disease (n = 58) participated in this longitudinal study. Structural equation modeling was used to examine the predicted relationships.

The results of this study show that neuroticism and extraversion (as measured by the NEO-FFI) at Time 1 predict social support (SSA scale) and perceived stress (PSS) at Time 2, and all of these variables are related to depression (CES-D) and negative affect (Bradburn scale) at Time 2. Particularly, spouse caregivers who have higher scores on neuroticism experience lower social support, higher perceived stress, and worse psychological health. Furthermore, spouse caregivers high in extraversion experienced higher social support. Moreover, Alzheimer's disease spouse caregivers felt more depressed and more anxious than Parkinson's disease spouse caregivers. The findings of the current study suggest that interventions could be targeted individually to caregivers based on knowledge of trait characteristics to sustain their caregiving role and to improve their psychological well-being.

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Personality Traits and Mental Health of Spouse Caregivers in Two Disease Groups:
Alzheimer's and Parkinson's Disease

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Dedicated in Memory of Youngsoon Lim

My mother who suffered with dementia

Personality Traits and Mental Health of Spouse Caregivers in Two Disease Groups: Alzheimer's and Parkinson's Disease

Chapter 1 INTRODUCTION

Caregiving for a spouse with Alzheimer's or Parkinson's disease, experiencing progressive cognitive loss or physical impairment can be an extremely challenging and overwhelming task. Previous research suggests that prolonged caregiving adversely affects the caregiver's mental and physical health (Schulz & Williamson, 1994), and that high levels of psychological stress among caregivers are associated with a risk factor for mortality (Schulz & Beach, 1999). Although the toll on caregivers can be emotional, physical, social, and financial, the effects are not the same for all caregivers (Schulz, 1990). Spouse caregivers, in similar caregiving situations show great variability in their abilities to adapt to the changes in their spouse and to the demands of caregiving (Schulz, 1990; Pearlin, 1994). Some are likely to adapt well to the role of caregiver, while others are at greater risk of suffering negative consequences (Pearlin, 1994). Pearlin, Mullan, Semple, and Skaff (1990) provide a model of the stress process as a useful framework for understanding how caregiving influences mental and physical health. Pearlin et al. (1990) identified coping and social support as mediators, which explain the variability in stress management abilities among caregivers of persons with Alzheimer's disease in similar caregiving situations.

This study focuses on the personality traits of spouse caregivers, in order to assess individual differences in their abilities, which enable them to adapt to their particular caregiving situation. Although the vital role of family caregivers has been

acknowledged, caregivers' characteristics have frequently been ignored and personality has rarely been included as a predictor of caregiver's well-being (Hooker, Monahan, Shifren, & Hutchinson, 1992; Patrick & Hayden, 1999; Jang, Clay, Roth, Haley, & Mittelman, 2004). Hooker and her colleagues (1992; 1998) have identified personality traits as significant predictors of physical and psychological health among spouse caregivers. Research on the influence of personality on health, suggests that the personality of spouse caregivers needs to be included in the caregiving process model because the psychological structure of meaning of caregiving in the spouse caregiver's everyday experience is influenced by personality (Hooker, Monahan, Bowman, Frazier, & Shifren, 1998).

The purpose of this study is to enhance the understanding of later life caregiving and spouse caregiver's psychological well-being by integrating personality traits of neuroticism and extraversion into a longitudinal model of the caregiving stress process. According to Costa and McCrae (2003), neuroticism reflects the tendency to experience emotional distress, and extraversion refers to the propensity of an individual seeking out social interactions and activities. Robinson, Meier, and Vargas (2005) suggest that extraversion is related to predicting daily experiences of negative emotion. Recent research on an intervention program for spouse caregivers indicates that it is important to assess whether neuroticism predicts longitudinal changes in caregivers' depression because neuroticism is associated with their response to intervention (Jang, Clay, Roth, Haley, & Mittelman, 2004). Patrick and Hayden (1999) suggest that longitudinal data will provide a more adequate test of the relationship between neuroticism and negative

well-being in the process of caregiving. Jang et al. (2004) recommends that future studies should examine the impact of other personality characteristics to predict one's response to treatment. This study examines a predictive relationship between personality traits (neuroticism and extraversion) of spouse caregivers at baseline and their psychological mal-being (opposite of well-being) approximately one year later, which is hypothesized to be mediated by social support from family and friends and perceived stress. This study also proposes to determine whether there are differences in such a relationship, depending on gender, and whether caregivers are caring for a spouse with cognitive impairment or physical impairment.

This study is guided by the stress process model of caregivers of Alzheimer's disease, presented by Pearlin et al. (1990). This study utilizes data from the Health of Caregivers project, a multivariate study of Alzheimer's disease or Parkinson's disease spouse caregivers, conducted from 1991 to 1992 and approximately one year later, from 1992 to 1994. The sample for this study ($N = 122$) was taken from both waves by selecting cases after merging Time 1 data and Time 2 data. The study employs quantitative methods to examine a prospective relationship between personality traits of spouse caregivers and their psychological mal-being one year later. Structural equation modeling (SEM) is used to examine an objective evaluation of the adequacy of fit of hypothetical models to empirical data (Raykov, Tomer, & Nesselroade, 1991). SEM is used to examine the relationship among personality traits of neuroticism and extraversion, social support from family and friends, perceived stress, and mental health

outcomes of depression, and negative affect. Gender and disease context will be included as covariates in the model.

The main research questions are: (a) Do personality traits of neuroticism and extraversion of spouse caregivers at Time 1 predict their mental health one year later at Time 2? (b) If there are significant relationships between personality traits and mental health, to what extent are these mediated by social support and perceived stress? (c) To what extent does gender affect these relationships? (d) To what extent does disease affect these relationships?

Chapter 2 LITERATURE REVIEW

Theoretical Perspectives

Caregiving has been considered within the context of a stress process paradigm (Zarit, 1989; George, 1990; Pearlin et al., 1990). This study employs a model of the stress process of Alzheimer's caregivers presented by Pearlin, Mullan, Semple, and Skaff (1990). This model specifies a process that describes in detail many difficult situations engaging the lives of Alzheimer's caregivers (Pearlin, 1994). In the stress process model (Pearlin et al., 1990), four domains are identified: the background and context of stress, the stressors, the mediators of stress, and the outcomes of stress. The background and the context of stress for caregivers include socioeconomic status, caregiving history, and family and network composition. The stressors refer to the problematic behaviors of care recipients and dependencies in the activities of daily living (ADL) as the primary stressors, and social and emotional isolation of the caregivers and their financial strains as secondary stressors. The mediators of stress are coping and social support. Finally, the outcomes of stress in the model are mental and physical health. The stress process model (Pearlin et al., 1990) presents a useful framework for the understanding of how stressful caregiving influences health outcomes. In their multiwave study of 555 caregivers, Pearlin et al. (1990) identify the mediating conditions of stress that explain why Alzheimer's caregivers, under similar stressors show great variability in their abilities to manage stress.

Although the Pearlin et al. (1990) model demonstrates the background and contextual conditions as antecedent influences on mediators, their model does not

include caregiver's personal characteristics that could influence mediators, such as coping and social support (Hooker, Frazier, & Monahan, 1994). Personal characteristics, such as personality, may be critical determinants of whether social support transactions increase or decrease over time because social support is a transaction between two or more people (Pierce, Lakey, Sarason, Sarason, & Joseph, 1997). The theoretical framework in previous studies on coping strategies and caregivers' well-being postulates a role for personality dispositions to predict caregivers' coping strategies and their well-being (Patrick & Hayden, 1999).

Research on caregivers, using the stress process model (Pearlin et al., 1990) demonstrates that some individual difference variables in caregiving outcomes can be attributed to the caregiver's personal characteristics (Hooker et al., 1992; 1998; Patrick & Hayden, 1999). Studies (Hooker et al., 1994; Hooker et al., 1998) suggest that individual difference variables must be included in the stress process model (Pearlin et al., 1990) to understand individual differences in the caregiving process. Therefore, this study modifies the stress process model (Pearlin et al., 1990) to include personality as an antecedent to the mediators of caregiving stress. Furthermore, research has identified that personality was associated with physical and psychological health among spouse caregivers of persons with Alzheimer's disease (Hooker et al., 1992, 1994, 1998). Including personality in the model of caregiving increases our knowledge of caregivers' mental and physical health (Hooker et al., 1998; Gallant & Connell, 2003) and increases our understanding of how to provide support for caregivers (Patrick & Hayden, 1999).

Understanding Personality Traits

In general, when we describe someone, we usually use trait terms such as quiet or talkative, irritable or good-natured, lazy or hardworking. Research on personality by Lazarus and Monat (1979) defines that “traits are dispositional concepts which refer to tendencies to act or react in certain ways” (p. 97). According to Costa and McCrae (2003), traits are defined as, “dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions” (p. 25). In Hooker and McAdams’s (2003) Six Foci of Personality Model, the first level traits are defined as, “a dispositional signature and account for broad consistencies in behavior across situations and over time” (p. 296).

Characterizing traits of personality as dimensions of individual differences refers to the idea that individuals can be ranked by variation in personality traits (Costa & McCrae, 2003). McAdams (1995) argues that traits based on cautious observations reflect individual differences in behavior and the personality of the person being rated. Through frequency and intensity in ways of thinking, feeling, and acting, we infer the level of a trait. Costa and McCrae (2003) state that traits must be seen over time and across situations. Similarly, Hooker (2002) notes that traits are broad and general dispositions that are not fixed to particular contexts and are generally stable.

Costa and McCrae (2003) identify five major dimensions of personality that have come to be accepted by most personality researchers and are known as The Five-Factor Model of Personality. The dimensions of The Five-factor Model, described in

Table 1 (see p. 9), are neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Costa & McCrae, 2003).

The NEO Five-Factor Inventory (Costa & McCrae, 2003) is one well-known measure of the traits of personality. According to Costa and McCrae (2003), high scores on neuroticism reflect aspects of emotional instability such as anxiety, hostility, self-pity, worry, depression, and impulsiveness, while lower scores reflect aspects of stability such as calm, relaxed, unemotional, secure, and self-satisfied (p. 48). High scores on extraversion tend toward facets of sociability such as assertiveness, warmth, energetic, enthusiastic, and optimistic whereas lower scores reflect facets of introversion such as reserved, sober, quiet, aloof, and passive (p.49). High scores on openness to experience refer to curiosity, imagination, and interest in variety versus preference for sameness, while lower scores refer to conventional, uncreative, uncurious, inartistic, and conservative (p.49). High scores on agreeableness denote compliance and cooperativeness such as trust, modesty, forgiving, generous, and sympathetic, whereas lower scores denote suspicion such as rude, cynical, suspicious, uncooperative, and stingy (p.50). Finally, high scores on conscientiousness reflect characteristics of discipline and organization such as competence, order, achievement, efficiency, and reliability, while lower scores reflect lack of seriousness such as aimless, unreliable, lazy, careless, and negligent (p.50). Research on aging and personality by Costa and McCrae (2003) demonstrates that each of these five major dimensions of personality is stable over relatively long periods of adulthood. This study focuses on two personality traits, neuroticism and extraversion based on The Five-Factor Model of

Table 1
The Five-Factor Model of Personality

Dimension	Characteristics
Neuroticism	Calm – Worrying Even-tempered – Temperamental Self-satisfied – Self-pitying Comfortable – Self-conscious Unemotional – Emotional Hardy – Vulnerable
Extraversion	Reserved – Affectionate Loner – Joiner Quiet – Talkative Passive – Active Sober – Fun-loving Unfeeling – Passionate
Openness to Experience	Down-to-earth – Imaginative Uncreative – Creative Conventional – Original Prefer routine – Prefer variety Uncurious – Curious Conservative – Liberal
Agreeableness	Ruthless – Softhearted Suspicious – Trusting Stingy – Generous Antagonistic – Acquiescent Critical – Lenient Irritable – Good-natured
Conscientiousness	Negligent – Conscientious Lazy – Hardworking Disorganized – Well-organized Late – Punctual Aimless – Ambitious Quitting – Persevering

Note. Adapted from Costa and McCrae (2003), Table 1, p. 4.

Personality (Costa & McCrae, 2003), that are expected to be reliably related to perception of social support, appraisal of stress, and experience of psychological health.

Neuroticism, Extraversion and Psychological Mal-Being

Personality has been recognized to be associated with psychological and physical health. Duberstein, Sorensen, Lyness, King, Conwell, Seidlitz, and Caine (2003) suggest that high neuroticism and low extraversion are related to worse perceived health in older adults. Previous study on individual differences in the tendency to experience negative emotions in daily life identify that extraversion may act as a predictor for individual's daily experiences of negative emotion (Robinson, Meier, & Vargas, 2005). A high score on extraversion significantly inhibits negative affect (Robinson et al., 2005) whereas a high score on neuroticism is significantly associated with greater negative emotions (Costa & McCrae, 1989). Research on the associations of personality traits and marital relationships found that neuroticism is positively correlated with negative interactions between couples, but negatively correlated with global evaluations of their marriage (Donnellan, Conger, & Bryant, 2004). Previous research on the indicators of subjective well-being and psychological well-being suggests that high subjective well-being and psychological well-being relate to high extraversion and low neuroticism (Keyes, Shmotkin, & Ryff, 2002). By examining the influence of personality on social support and coping, Amirkhan, Risinger, and Swickert (1995) found that scores high in extraversion are related to greater social support seeking and help seeking, but express less avoidance. Furthermore, extraversion was identified as a predictor of the choice of coping strategies (1995).

Bookwala and Schulz (1998) suggest that personality traits, particularly neuroticism, are associated with the appraisal of the stressor and the experience of distress among caregivers. For example, caregivers high in neuroticism are likely to appraise stress as more negative, and are likely to be more responsive to a given level of stress. According to Hooker et al. (1998), among caregivers of a spouse with Alzheimer's disease, neuroticism has a direct effect on higher perceived stress and is related to worse psychological health. Moreover, Patrick and Hyden (1999) recognize that higher neuroticism has direct and indirect effects on negative well-being among older women caregivers. Previous research suggests that caregivers with higher neuroticism are more likely to assess the caregiving situation as stressful and to experience more negative well-being than other caregivers (Gallant & Connell, 2003). Jang et al. (2004) argue that caregivers who score high in neuroticism have higher levels of depression than caregivers who score low on neuroticism. In the study by Hooker et al. (1994), neuroticism and extraversion showed strong relationships with problem-focused and emotion-focused coping strategies among caregivers of spouses with dementia. In addition, extraversion was strongly related to social support coping.

Understanding certain personality traits could be helpful in intervention for caregivers (Jang et al. 2004). Many studies suggest that knowledge of personality traits could be useful in psychological health screening as indicators of caregivers in overwhelming situations who may need more social support, or may be at greater risk for poor mental health (Hooker, 2002; Gallant & Connell, 2003; Jang et al., 2004). Furthermore, if certain personality characteristics are predictive of negative or positive

outcomes, this information will maximize the effectiveness of intervention strategies and caregiver education (Bookwala & Schulz, 1998; Hooker et al., 1998; Jang et al., 2004).

Social Support and Psychological Well-Being

Social support has positive effects on the health and well-being of adults of all ages (Antonucci & Jackson, 1987). Social support is defined as receiving various forms of informal assistance such as information, tangible help, emotional support, and social integration from family, friends, neighbors, and other community members (Antonucci, 2001). Although perceived support and received support are used as indicators of informal support (Williams & Dilworth-Anderson, 2002), only perceived support (such as satisfaction with social support from family and friends) was examined in this study. Research (Feld & George, 1994) suggests that an individual's perception of the adequacy of their social contacts and emotional support has critical and positive association with their psychological and physical health. Helen (2000) states that individuals with adequate social support have lower risk of depression than individuals with less supportive relationships. Gurung, Taylor, and Seeman (2003) suggest that social support also reduces the negative impact of stressful experiences among older adults. There are also wide gender differences among older adults indicating that men and women experience different benefits and gaps in social support (Gurung et al., 2003). For instance, wives have stronger perceptions of social support in marriage associated with marital satisfaction and well-being than husbands (Acitelli & Antonucci, 1994).

Social risks of caregiving include difficulty maintaining contact with family and friends, loss of personal and pleasurable activities, and social and emotional isolation (Butler, 1998). Receiving emotional and tangible support from family and friends is positively associated with effective coping strategies for both spouse caregivers and persons with Alzheimer's disease (Cohen, Teresi, & Blum, 1994). Henry (1998) indicates that family support has a significant influence on the patient and the caregiver, as well as on the treatment and outcome. Henry (1998) emphasizes that social support from family is the most important element in Alzheimer's disease. Social support from family and friends is a vital determinant of how caregivers deal with their stressful situation (Schulz & Williamson, 1991).

In previous research with caregivers of spouses with Alzheimer's disease, Monahan and Hooker (1995) found that the perception of social support predicts caregiver's health. Similarly, many studies also reported relationships between social support and depression, suggesting that depressed individuals ultimately tend to drive off potential supporters (Gurung et al., 2003). Hooker et al. (1998) suggests that there is an indirect effect of social support on psychological health, and concludes that perceived social support potentially mediates the effect of personality on perceived stress and psychological health. Although social support may play an indirect role in health outcomes by its association with personality, the beneficial effect of social support is even clearer in contexts where a person experiences high levels of stress, such as caregiving (Hooker et al., 1998).

Caregiving and Stress

Caregivers who care for family members play a significant role in the lives of their family members as well as in providing value for society as a whole. Research on caregiving in the U.S. estimates there are 44.4 million caregivers who provide unpaid care to family and friends (National Alliance for Caregiving and AARP, 2004). In the study based on a national survey of 6,139 adults in the U.S., most caregivers report that they experience physical strain, emotional stress, and economic strain as a result of being a caregiver (National Alliance for Caregiving and AARP, 2004).

Living with and caring for a spouse with Alzheimer's, or kindred disorders experiencing progressive cognitive loss or physical impairment, is extremely challenging and time-consuming (Pearlin, 1994). Rabins, Mace, and Lucas (as cited in Reese, Gross, Smalley, & Messer, 1994) identify that caregivers often report having to give up hobbies, contact with friends, and jobs because of their obligations to provide care. Although providing care for family members can have positive aspects that are satisfying and meaningful (Boerner, Schulz, & Horowitz, 2004), family caregivers face substantial stress as a consequence of their caregiving obligations (Vitaliano, Zhang, & Scanlan, 2003). Cicirelli (1988) suggests that caregivers' stress may be result from anxiety, worry about the predictable decline of their family member, and the caregiver's ability to meet the care recipient's needs.

In addition, many spouse caregivers become isolated from family and friends as family routines and dynamics are frequently disrupted (George, 1994). Research on caregiving has consistently shown that spouse caregivers have a higher level of

depression than non-spouse caregivers (Schulz, 1990) and that women tend to be more depressed than men among caregivers (Schulz & Williamson, 1994). Furthermore, caregiver's physical health is often impaired by loss of sleep, decreased exercise, poor nutrition, and lack of attention to personal needs (Butler, 1998). Caregiver's physical and psychological health can be adversely affected by prolonged caregiving (Schulz & Williamson, 1994) which is also a risk factor for mortality (Schulz & Beach, 1999). Consequently, family caregivers themselves frequently become the hidden patients who experience emotional distress, depression, poor health, fatigue, financial burden, and a higher rate of mortality compared with non-caregivers (Schulz & Williamson, 1994).

Gender Differences

Moen (2001) states that "gender matters are when men and women in the same types of roles and relationships experience distinct impacts" (p. 180). For example, social isolation appears to be more stressful for men than for women (Moen, 2001), however, women experience more stress than men in caregiving roles (Walker, Pratt, & Eddy, 1995). Women tend to be more likely to become caregivers (Moen, 2001). Women both provide and receive more social support than men do (Ingersoll-Dayton, Starrels, & Dowler, 1996). The literature on caregiver stress in family eldercare indicates that guilt in women caregivers is caused by higher expectations of providing care to a parent (Brody, 1985). Recent research on the role of neuroticism in determining the effectiveness of an intervention for spouse caregivers found significant gender differences in depression and neuroticism at baseline (Jang, 2004). For example, wives experience higher levels of depression, and have higher scores on neuroticism

than husbands do. Research on gender differences among spouse caregivers of Alzheimer's and Parkinson's disease suggests that wives in the Alzheimer's disease group experience higher levels of depression, stress, and anxiety compared to caregiving husbands (Hooker et al. 2000).

Disease Context: Alzheimer's and Parkinson's Disease

In order to examine a relationship between personality traits of spouse caregivers and their psychological well-being, this study chooses to compare Alzheimer's disease caregivers with Parkinson's disease spouse caregivers. Because many potentially confounding variables are controlled within these populations (Hooker et al., 1998), these two disease groups have been selected. Both Alzheimer's and Parkinson's disease are chronic, progressive, irreversible, and neurological disorders, in which the onset of these diseases is common in later life (Frazier, Cotrell, & Hooker, 2003). However, these disease groups are not in immediate danger of death (Frazier et al., 2003). These disease groups show unpredictable patterns that can be stressful for caregivers (Hooker et al., 1998). Alzheimer's disease results in slowly progressive deterioration of memory and cognition. In contrast, Parkinson's disease reports progressive degeneration of motoric function such as tremor, rigidity, and drooling (Frazier et al., 2003).

Overall Goal of the Study

The overall goal of this study is to enhance the understanding of later life caregiving and spouse caregiver's psychological well-being by integrating personality

traits of neuroticism and extraversion into a longitudinal model of the caregiving stress process.

Research Questions

- (a) Do personality traits of neuroticism and extraversion of spouse caregivers at Time 1 predict their mental health one year later at Time 2?
- (b) If there are significant relationships between personality traits and mental health, to what extent are these mediated by social support and perceived stress?
- (c) To what extent does gender affect these relationships?
- (d) To what extent does disease affect these relationships?

Because there is a research base related to all these research questions, it is possible to derive specific directional hypotheses.

Specific Research Hypotheses

Five hypotheses are tested:

1. Spouse caregivers high in neuroticism will experience more psychological mal-being (opposite of well-being) and less social support compared to caregivers low in neuroticism.
2. Spouse caregivers high in extraversion will experience less psychological mal-being and more social support compared to caregivers low in extraversion.
3. Spouse caregivers with higher social support will experience less psychological mal-being than caregivers with less supportive relationships.
4. Caregiving wives will have higher levels of social support compared to caregiving husbands regardless of the disease.

5. Caregivers of spouses with Alzheimer's disease will experience higher levels of perceived stress and more psychological mal-being compared to caregivers of spouses with Parkinson's disease.

Chapter 3 METHOD

This study utilized data from a project entitled, “Health of Caregivers: The Role of Personality.” This project was designed to be a multivariate study supported by the National Institution of Mental Health (NIMH) as an effort to answer questions regarding psychosocial processes and caregivers’ health. Caregivers of people who had spouses diagnosed with Alzheimer’s disease (AD) and Parkinson’s disease (PD) were interviewed in their homes between 1991 and 1992. Approximately one year later, from 1992 to 1994, there was an opportunity to collect follow-up information through questionnaires, which were mailed. In any longitudinal study, there is the inevitable problem of attrition over time due to death, illness, and changes in location. Since this study was not originally designed to be a longitudinal study, these problems may have been exacerbated. On the other hand, selection effects due to reluctance to be followed over time, may have been minimized.

Participants

The sample for this study ($N = 122$) includes participants who have participated at both Time 1 and Time 2.

Time 1 Summary

At Time 1, participants for this study were 175 spouse caregivers (88 AD, 87 PD) recruited from a wide variety of sources in Central New York, including a hospital-based dementia evaluation clinic, local neurologists’ offices, AD and PD support groups, newspaper ads and articles, public service announcements, local churches, and health fairs (Hooker et al., 1998). Screening criteria included (a) confirmed diagnosis of AD or

PD, (b) diagnosis at least 1 year previously, (c) caregiver and spouse had to be living in the same household, and (d) PD patients had to be cognitively intact (Hooker et al., 1998).

AD caregivers. Of the 88 AD caregivers, 52 (59.1%) were wives, and 36 (40.9%) were husbands. All but one (African American) of the 88 AD caregivers were White (99.99 %). The average age of the caregivers was 70.2 years ($SD = 9.5$ years), and age ranged from 39 to 89 years. Caregivers had been married an average of 43.4 years ($SD = 13.8$ years) and caregiving an average of 4.4 years ($SD = 3.7$ years).

PD caregivers. Of the 87 PD caregivers, 55 (63.2%) were wives, 32 (36.8%) were husbands. Most of the 87 PD caregivers were White (99.94 %). Three caregivers were African American and one was Asian. The average age of the caregivers was 67.1 years ($SD = 8.6$ years) and ages ranged from 41 to 82 years. Caregivers had been married an average of 39.6 years ($SD = 12.6$ years) and caregiving an average of 7.6 years ($SD = 7.1$ years).

Time 2 Summary

At Time 2, participants for this study were 122 spouse caregivers (64 AD, 58 PD) who responded to the mail-back questionnaires at Time 2 (a return rate of 70%), approximately one year later after participating in the Time 1 interview.

AD caregivers. Of the 64 AD caregivers at Time 2, 40 (62.5%) were wives and 24 (37.5%) were husbands. All but one (African American) of the 64 AD caregivers were White (99.99 %). The average age of the AD caregivers was 70.3 years ($SD = 9.4$ years), and age ranged from 45 to 89 years. Caregivers had been married an average of

43.8 years ($SD = 14.1$ years) and caregiving an average of 4.8 years ($SD = 4.1$ years). As shown in Table 2, residence status of care recipients was reported by caregivers at Time 2: home (66%), nursing home (20%), and other (3%). The remainders of the care recipients (11%) were deceased at Time 2.

PD caregivers. Of the 58 PD caregivers, 36 (62%) were wives and 22 (38%) were husbands. Most caregivers were White (99.94%). Three caregivers were African American. The average age of the caregivers was 67.4 years ($SD = 8.9$ years) and ages ranged from 41 to 81 years. Caregivers had been married an average of 38.4 years ($SD = 13.6$ years) and caregiving an average of 8.5 years ($SD = 7.3$ years). Residence status of care recipients was reported by caregivers at Time 2: home (93%), nursing home (3%), and other (2%). The remainders of the care recipients (2%) were deceased at Time 2 (See Table 2).

Measures

As shown in the conceptual model for this study (Figure 1), personality traits of neuroticism and extraversion were measured at Time 1. Social support, perceived stress, depression, and negative affect were measured at Time 2.

Neuroticism and Extraversion at Time 1

An abbreviated version of the NEO Personality Inventory (Costa & McCrae, 1989), the *NEO-Five Factor Inventory* (NEO-FFI) was used to measure personality traits. This briefer inventory was chosen because of time limitations in conducting interviews with caregivers (Hooker et al., 1998). The NEO-FFI is a 60-item instrument with 12 items measuring each of the five personality trait domains. The NEO-FFI has

Table 2
Residence Status of Care Recipients with Alzheimer's and Parkinson's Disease at Time
2

Residence	Alzheimer's Disease (n = 62)			Parkinson's Disease (n = 58)			Total (n = 120)
	Husbands ^a (n = 38)	Wives (n = 24)	Total (n = 62)	Husbands (n = 36)	Wives (n = 22)	Total (n = 58)	
Home	26	17	41 (66%)	32	22	54 (93%)	97(81%)
Nursing Home	6	6	12 (20%)	2	0	2 (3%)	14(12%)
Deceased	6	1	7 (11%)	1	0	1 (2%)	8(6%)
Other	2	0	2 (3%)	1	0	1 (2%)	3(3%)

Note. N = 122.

a. 2 missing values for residence status in husbands with Alzheimer's disease.

been utilized extensively in gerontological research and health research (Hooker et al., 1992, 1998; Patrick & Hyden, 1999). For the purpose of this study, only neuroticism and extraversion scales were utilized. Given the stability of traits in adulthood (Costa & McCrae, 2003), the NEO-FFI was only collected at Time 1. These traits were used to predict later mental health outcomes at the one year follow up. According to Costa and McCrae (2003), high scores on neuroticism reflect the tendency to experience emotional distress, and high scores on extraversion tend the propensity of the individual to seek out social interactions and activities. Sample items are “I often feel inferior to others” (neuroticism), and “I like to have a lot of people around me” (extraversion). Five response options range from *strongly disagree* to *strongly agree*. Cronbach’s alpha coefficient for the neuroticism scale was .77 and for the extraversion scale was .82, indicating adequate internal consistency reliability (Hooker et al., 1998).

Social Support at Time 2

Caregivers’ subjective appraisals of social support were measured with the *Social Support Appraisals* (SSA) scale (Vaux et al., 1986). A shortened form of the SSA is a 15-item measure designed to assess perceptions of the social support. This SSA scale measures the degree to which one feels loved, respected, and involved, and has good validity and high reliability across samples (Hooker et al., 1998). Each item is rated on a Likert-type scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Twelve items are reverse scored so that higher scores reflect greater perceptions of social support from family members and friends. Sample items are “I am really admired by my family”, and “My friends respect me”. Response categories are *strongly disagree*

(1), *disagree* (2), *agree* (3), and *strongly agree* (4). For purposes of this study, the 12-item scale was divided into family support (6 items) and friends support (6 items) as the observed indicators of the social support latent variable. Scores ranged from a low of 6 to a high of 24 for each scale. Factor analysis confirmed that these two scales could be used as indicators of the social support latent variable. Cronbach's alpha for the family support scale (6 items) was .88 and for the friends' support scale (6 items) was .88, indicating adequate internal consistency reliability.

Perceived Stress at Time 2

Appraisals of current life stress were measured with the short form (4-item scale) of the *Perceived Stress Scale* (PSS). This stress appraisal measure, designed to assess the degree to which situations are appraised as stressful, has been utilized successfully with diverse samples (Cohen & Williamson, 1988). A sample item from this 4-item scale is, "In the last month, how often have you felt that you were unable to control the important things in your life?" Response categories are *never* (0), *almost never* (1), *sometimes* (2), *fairly often* (3), and *very often* (4). Therefore, scores by summing ranged 0 to 16 so that higher scores indicate more perceived stress.

Cronbach's alpha for the PSS in this study was .70.

Psychological Mal-Being Measures at Time 2

Depression and negative affect were included in the conceptual structural model as indicators on the psychological mal-being latent variable. Depression was assessed with the *Center for Epidemiologic Studies Depression Index* (CES-D; Radloff, 1977), a 20-item scale used to assess the overall level of depression experienced during the past

week. Sample items from this 20-item scale are, “I felt lonely”, “I felt depressed”, and “My sleep was restless”. Response categories are *rarely or none of the time* (0), *some or a little of the time* (1), *occasionally or a moderate amount of the time* (2), and *most or all the time* (3). Therefore, after summing scores of 20 items scores range from 0 to 60, higher scores indicate higher level of depression. CES-D has shown significant psychometric characteristics in many studies, including those using samples of spouse caregivers (Hooker et al., 1998). Cronbach’s alpha for the CES-D with this sample at Time 2 was .91.

A second measure of psychological mal-being was the 5-item negative affect balance subscale. Affect was measured with the positive and negative subscales of the 10-item *Bradburn Affect Balance Scale* (Bradburn, 1969). For the purpose of this study, only the negative affect scale was utilized. Sample items from this scale are, “During the past few weeks, did you feel (a) bored, (b) depressed or unhappy, (c) upset, (d) very lonely, or (e) very restless?” Response categories are *yes* (1), *no* (0). Therefore, after summing scores of 5 items, scores range from 0 to 5, higher scores indicate more negative mental health. Cronbach’s alpha for the 5-item negative affect subscale with this sample was .64.

Attrition Analysis

Fifty-three cases dropped from the study between Time 1 ($N=175$) and Time 2 ($N=122$) due to death, illness, and difficulty locating the participants at Time 2. An attrition analysis was conducted to examine if there were any differences between the dropped and retained participants. Chi-square tests and *t*-tests indicated that there were

no differences between the dropped and the retained samples: Disease group ($\chi^2 = .282$, $p = .618$), gender ($\chi^2 = .324$, $p = .613$), age ($t = 1.266$, $p = .207$), number of years married ($t = -.131$, $p = .896$), number of years caregiving ($t = 1.747$, $p = .082$), neuroticism ($t = 1.64$, $p = .870$), and extraversion ($t = -.032$, $p = .974$). Thus, the sample at Time 2 was not different from the sample at Time 1.

Missing Values

The present analysis relies on the 122 participants who participated in both waves of the data collection. There were few missing values for the 122 participants. A total of 97 (79.5%) of them had no missing data. The most missing data involved the measure of social support. This study had 12 participants who did not provide social support information for either family or friends (9.8%). For social support from family, there was a total of 15 missing participants and for social support from friends there was a total of 16 missing participants. There were only 3 participants who had missing values on more than two of the nine observed variables. This study used the full informational maximum likelihood (ML) estimation that is available with Mplus ((Muthen & Muthen, 2006). This estimation method utilized all of the available information (means, variances, and covariances) that are available for the 122 participants (e.g., Boomsma, 2000; Schafer & Graham, 2002; Kline, 2005).

Demographic Differences between Two Caregiving Groups

A multivariate analysis of variance (MANOVA) was conducted to determine whether two caregiving groups of Alzheimer's (AD) and Parkinson's disease (PD) differed significantly on the demographic variables of gender, age of caregiver, years

married, years caregiving, and socioeconomic status (SES). Based on a multivariate analysis of variance (MANOVA), results indicated that there were significant differences between Alzheimer's (AD) and Parkinson's disease (PD) caregiver groups, Wilks' Lambda = .817, $F(5, 120) = 5.108$, $p \leq .0001$. As shown in Table 3, t -tests indicated that caregivers of spouse with Alzheimer's disease were significantly older ($t = 1.99$, $p \leq .05$) than caregivers of spouse with Parkinson's disease. Furthermore, caregivers of spouse with Alzheimer's disease had been married for a significantly longer time ($t = 2.18$, $p \leq .05$) than caregivers of spouse with Parkinson's disease. However, caregivers of spouse with Parkinson's disease had been caregiving significantly longer ($t = 3.47$, $p = .001$) than caregivers of spouse with Alzheimer's disease.

Analytic Strategies

Structural equation modeling (SEM) was used to examine the relationship among personality traits of neuroticism and extraversion, social support from family and friends, perceived stress, and mental health outcomes of depression and negative affect by gender and disease context. Structural equation modeling (SEM) is known as path analysis with latent variables (McDonald & Ho, 2002), and now widely used in the behavioral and social science research (Raykov et al., 1991; McDonald & Ho, 2002). According to Raykov and his colleagues (1991), SEM methodology has become a useful tool in "applied multivariate analysis for theory testing and causal modeling" (p. 499). SEM provides "the possibility of fitting and evaluating the fit of a theoretical model to data, and testing developmental hypotheses" (Raykov et al., 1991, p. 499).

Table 3
 Comparison Between Alzheimer's and Parkinson's Disease Caregivers at Time 2

Variable	Alzheimer's Disease (n = 64)				Parkinson's Disease (n = 58)				Total <i>t</i>
	Wives (n = 40) <i>M (SD)</i>	Husbands (n = 24) <i>M (SD)</i>	Total <i>M (SD)</i>	<i>t</i>	Wives (n = 36) <i>M (SD)</i>	Husbands (n = 22) <i>M (SD)</i>	Total <i>M (SD)</i>	<i>t</i>	
Age of Caregivers	69.25(9.34)	73.21(9.16)	70.30(9.40)	1.65	65.47(9.99)	70.64(5.69)	67.43(8.92)	- 2.211*	1.99*
SES	40.49(13.87)	45.83(11.44)	42.52(13.16)	- 1.59	47.75(12.10)	41.68(10.1)	45.45(11.66)	1.97	- 1.29
Years Married	42.80(14.50)	45.58(13.30)	43.80(14.10)	- .76	36.75(14.48)	41.05(11.74)	38.38(3.56)	- 1.17	2.18*
Years Caregiving	4.08(2.89)	5.91(5.46)	4.80(4.10)	- 1.76	8.56(8.56)	8.27(4.83)	8.45(7.32)	.14	- 3.47**
Neuroticism	50.53(9.93)	51.79(7.59)	51.00(9.08)	- .54	47.94(10.37)	48.50(8.66)	48.16(9.68)	- .21	1.67
Extraversion	49.38(10.28)	49.96(8.99)	49.59(9.75)	- .23	53.92(10.89)	51.59(11.23)	53.03(10.98)	.78	- 1.83
Family Support	19.97(3.52)	19.95(4.33)	19.96(3.80)	.02	20.47(2.74)	20.60(2.48)	20.52(2.62)	- .17	- .88
Friends' Support	18.44(3.16)	17.85(3.31)	18.22(3.20)	.65	19.47(3.30)	19.25(2.63)	19.38(3.04)	.25	- 1.92
Perceived Stress	7.16(3.00)	6.13(3.08)	6.77(3.05)	1.28	5.19(2.38)	4.95(2.57)	5.10(2.43)	.362	3.29**
Depression	18.26(11.50)	13.63(10.17)	16.67(11.19)	1.48	12.58(9.51)	12.18(9.98)	12.42(9.61)	.15	2.14*
Negative Affect	1.97(1.40)	2.04(1.43)	2.00(1.40)	- .19	1.72(1.54)	1.23(1.34)	1.53(1.48)	1.24	1.76

Note. *N* = 122. * $p \leq .05$, and ** $p \leq .01$. Two-tailed tests.

This study followed some guidelines for reporting SEM results proposed by Raykov, Tomer, and Nesselroade (1991).

In preliminary analyses, the first step was to confirm covariances and correlations between variables on the information matrix after identifying the variables' reliability from the personality on the mental and physical health data set. According to Kline (2004), the procedure of analyzing structural models involves estimating presumed causal versus noncausal relations among observed correlations or covariances. The second step was to find appropriate variables to predict dependent variable indicators for the latent variables and other variables, depending on the correlations between included and excluded variables. Application of latent variables in a structural equation model allows "estimation of relationships among theoretically interesting constructs that are free of the effects of measurement unreliability" (Raykov et al., 1991, p. 499). The third step was to construct the structural equation model (Fig.1) to test the hypothesized relationship between the variables by describing a diagram of a model. The structural equation model was described as a series of equations that correspond to presumed relations among observed and latent variables (Kline, 2004) by using the Mplus SEM program (Muthen & Muthen, 2006).

Data Management.

This study used SPSS 14, STATA 9, Stat Transfer 8, and Mplus 4.0 programs. SPSS 14 and STATA 9 were used to organize data and to calculate descriptive statistics. Stat Transfer 8 was used to communicate between SPSS and Mplus programs. The

Mplus 4.0 program was used to analyze missing values, test the model fit, and to calculate the estimation of parameters.

Hypothesized Structural Equation Model

In the hypothesized model presented in Figure 1, the observed independent (exogenous) variables are personality traits of neuroticism and extraversion, disease group, and gender. The observed dependent (endogenous) variables are family support, friends' support, perceived stress, depression, and negative affect. The latent variables are social support and psychological mal-being. As shown in Figure 1, observed variables are represented with rectangles, and latent variables are represented with circles.

In the structural part of this model (Figure 1), two independent factors of neuroticism and extraversion are postulated to be correlated with each other as indicated by the curved two-way arrow joining them. The unidirectional arrows indicate that neuroticism and extraversion are linked to other factors by a series of regression paths. Because three dependent factors, social support, perceived stress, and psychological mal-being have one-way arrows pointing at them, they are easily identified as dependent variables in the model. The directional arrows indicate that personality traits of neuroticism and extraversion at Time 1 predict psychological mal-being at Time 2 through social support at Time 2 and perceived stress at Time 2. Direct paths from gender to social support and psychological mal-being and from disease group to perceived stress and psychological mal-being are included in the model.

The measurement component of the model shows that the social support latent variable has two indicator measures, and the psychological mal-being latent variable has two indicator measures. Measurement errors associated with observed indicator variables are represented by the error terms (E) (Arbuckle & Wothke, 1999; Kline, 2004). The error terms (E) are not labeled in Figure 1. Residual errors on the factors of social support, perceived stress, and psychological mal-being are captured by the disturbance terms D1, D2, and D3, respectively (Arbuckle & Wothke, 1999; Kline, 2004).

The structural component of this model represents the hypotheses that a spouse caregiver's psychological mal-being derives from his or her perceived stress which is influenced by the caregiver's perceived social support from family members and friends. Social support is influenced by caregiver's personality traits of neuroticism and extraversion. Gender and disease differences affect spouse caregiver's psychological mal-being.

It was hypothesized, as depicted in this structural equation model (Figure 1), that the personality of spouse caregivers affects social support, perceived stress, and their mental health one year later, both directly and indirectly. Social support was hypothesized to affect perceived stress and psychological mal-being both directly and indirectly. Perceived stress was predicted to affect psychological mal-being. It was hypothesized that the disease group affects perceived stress and psychological mal-being directly and indirectly, and that gender differences affect social support and psychological mal-being directly and indirectly. The hypothesized model presented in

Figure 1 was estimated with maximum likelihood (ML) estimation using Mplus 4.0 (Muthen & Muthen, 2006).

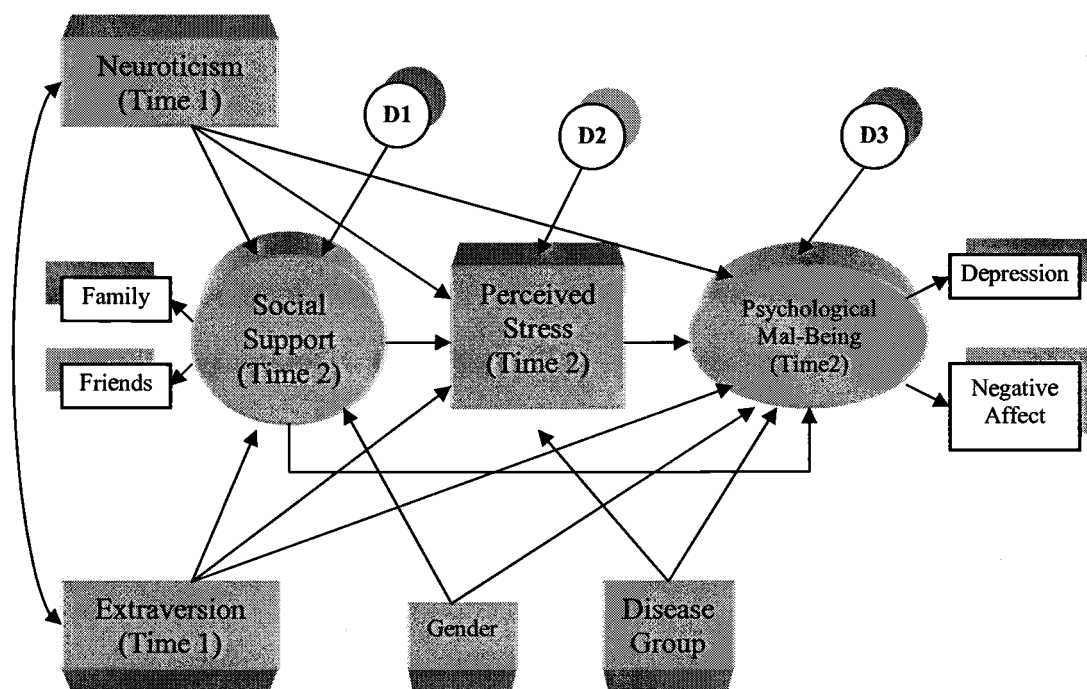


Figure 1. Hypothesized Model

Note. Rectangles represent measured variables, and large circles represent latent variables. Small circles (D) reflect disturbances. A bidirectional arrow depicts a correlation, and unidirectional arrows depict hypothesized directional links. The error terms (E) associated with observed indicator variables are not labeled in Figure 1.

Chapter 4 RESULTS

Descriptive Statistics

Table 4 shows means, standard deviations, and correlations for the nine observed variables. The outcome variable, psychological mal-being was constructed by using depression and negative affect. Depression showed significant correlations with all of the variables except gender. Negative affect was negatively correlated to social support from friends, and positively correlated to perceived stress, and depression. As expected, neuroticism was significantly correlated to social support from family and friends, perceived stress, depression and negative affect. Extraversion was significantly correlated to social support from family and friends, perceived stress and depression, but not to negative affect.

Model identification

With 9 observed variables in the model of Figure 2, there were 45 $[9(9 + 1)/2]$ observed variances and covariances from which to derive the parameters of the model. In maximum likelihood (ML) estimation, Mplus reported that there were 13 degrees of freedom; consequently, the structural model was identified (over-identified). Counting the unknown parameters in the model, there were 32 $(45 - 13)$ parameters to be estimated. The model of Figure 2 was recursive because its disturbances are uncorrelated and all causal effects are unidirectional (Arbuckle & Wothke, 1999; Kline, 2004). Therefore, the hypothesized model was a recursive and identified model with 13 degree of freedom. In the structural equation model, neuroticism, extraversion and gender explained 21% of the variance in social support. 36% of the variance in

Table 4
Correlations, Means, and Standard Deviations for Variables in the Full Model

Variables	1	2	3	4	5	6	7	8	9
1. Gender ^a									
2. Disease Group ^b	-.04								
3. Neuroticism	.05	.15							
4. Extraversion	-.04	-.17	-.40**						
5. Social support- Family	.01	-.09	-.25*	.25**					
6. Social support-Friends	-.06	-.19	-.31**	.27**	.46**				
7. Perceived stress	-.11	.29**	.49**	-.35**	-.29**	-.33**			
8. Depression	-.12	.20**	.47**	-.26**	-.35**	-.35**	.74**		
9. Negative affect	-.07	.16	.35**	-.03	-.13	-.20*	.45**	.59**	
Mean	.38	.52	49.65	51.23	20.23	18.79	5.96	14.55	1.77
SD	.49	.50	9.44	10.45	3.28	3.16	2.88	10.60	1.45

Note. $N = 122$.

^a0 = wife, 1 = husband, ^b0 = Parkinson's disease, 1 = Alzheimer's disease.

* $p \leq .05$, and ** $p \leq .01$. Two-tailed tests.

perceived stress was explained by neuroticism, extraversion, social support, and disease group. 63% of the variance in psychological mal-being was explained by neuroticism, extraversion, social support, perceived stress, gender, and disease group (Full Mplus text output is included in Appendix A).

The Measurement Model

A structural equation model consists of two main components: the measurement model and the structural (path or causal) model (McDonald & Ho, 2002). The analyses in this study followed the two step testing procedure (Anderson & Gerbing, 1988) recommended by McDonald and Ho (2002): the first step was a confirmatory factor analysis that was used to develop a measurement model and the second step was the structural model. The Mplus (version 4.0) program simultaneously evaluated both the measurement model and the structural model.

For the measurement model testing, each observed measure is regressed on factors, and the maximum likelihood (ML) estimate is evaluated for statistical significance by utilizing the critical value z -score (Unstandardized estimate/Estimated Standard Error), for which values greater than 1.96 indicate two-tailed statistical significance (Kline, 2004). The measurement component of the model (Figure 2) shows that the social support latent variable has two indicator measures, and the psychological mal-being latent variable has two indicator measures. The loadings of indicator variables were fixed to 1.0; the variance of latent variables can be freely estimated (Arbuckle & Wothke, 1999; Kline, 2004). As presented in Table 5, all of the loadings of the measured variables on the latent variables were statistically significant. Family

support ($p \leq .001$) and friends' support ($p \leq .001$) loaded significantly on the social support latent variable. Depression ($p \leq .001$) and negative affect ($p \leq .001$) loaded significantly on the psychological mal-being latent variable (Full Mplus text output is included in Appendix A). Therefore, two latent variables in the model were adequately measured by their indicators.

Table 5
Factor Loadings for the Measurement Model (based on the Full Model)

Measured Variables	Estimates (Unstandardized Coefficient)	SE	Est./S.E. (Z)	StdYX (Standardized Coefficient)
Social support				
Family	1.000	0.000	0.000	0.646***
Friends	1.057	0.293	3.609	0.709***
Psychological mal-being				
Depression	1.000	0.000	0.000	0.944***
Negative affect	0.090	0.014	6.280	0.611***

Note. $N = 122$. Est. / S.E. Critical Value (z) above 3.291 are significant at *** $p \leq .001$. Two-tailed tests.

The Structural Model Fit

To evaluate the structural model, this study used multiple indexes of model fit that should be reported and interpreted when reporting the results of SEM analyses (e.g., Raykov et al, 1991; Hoyle & Panter, 1995; Boomsma, 2000; McDonald & Ho, 2002). The current version of Mplus offers various indexes reflecting model fit. An overall chi-square index was used to assess the degree of fit between the estimated and observed

values. Actually, an overall chi-square index is a “badness-of-fit” because the higher its value, the worse the model fit to the data (Kline, 2004). A value $>.95$ of the Bentler comparative fit index (CFI) and Tucker-Lewis Index (TLI) was originally considered representative of a good-fit to the data. The Steiger-Lind root mean square error of approximation (RMSEA) values less than .05 or .06 indicate an adequate fit. The standardized root mean square residual (SRMR) is the index based on covariance residuals between observed and predicted covariances. Ideally, SRMR suggests that all covariance residuals should be about zero for a good model fit. This study used the chi-square test statistic, CFI, TLI, RMSEA, and SRMR to test the structural model using the maximum likelihood method in the Mplus (version 4.0) program. The results of the hypothesized structural model with standardized estimates in Figure 2 demonstrated an excellent fit to the data for the hypothesized structural model, $\chi^2 (df = 13, n = 122) = 12.480, p = .4887, CFI = 1.00, TLI = 1.006, RMSEA = 0.000$, with the 90% C.I. = 0.000 to 0.087, and SRMR = .036 (Full Mplus text output is included in Appendix A). The results of an excellent fit of the model to the data indicated that further modification for the model was not necessary.

Parameter Examination.

Neuroticism to Psychological Mal-Being

Direct effects. The maximum likelihood estimation in Mplus was applied to calculate the estimation of each path coefficient to examine and test the estimates of direct and indirect effects (Muthen & Muthen, 2006). The estimates of direct effects for the hypothesized structural model in Table 6 showed that there were several significant

paths related to psychological mal-being. Particularly, high scores on neuroticism at Time 1 was significantly related directly to lower social support ($\beta = -.279$, $z = -2.114$, $p \leq .05$) at Time 2. The unstandardized estimate of direct effects of neuroticism on social support was $-.279$. This means that a 1-point increase on the neuroticism variable predicts a $.279$ -point decrease on the social support variable. The estimated standard error for this direct effect was $.030$, therefore, $z = -.279 / .030 = -2.114$, which exceeds the critical value of 1.96 for two-tailed statistical significance at the $.05$ level (Kline, 2004). Furthermore, higher neuroticism was significantly related to higher perceived stress ($\beta = .321$, $z = 3.488$, $p \leq .001$). Direct effect of neuroticism on psychological mal-being was marginally significant ($\beta = .149$, $z = 1.739$, $p \leq .10$).

Indirect effects. As shown in Table 7, first estimation of the indirect effect for neuroticism on psychological mal-being through social support was not significant ($\beta = .042$, $z = 1.117$, $p > .10$) and calculated by two paths: (a) from neuroticism to social support, (b) from social support to psychological mal-being. However, the indirect effect of neuroticism on psychological mal-being through perceived stress was highly significant ($\beta = .216$, $z = 3.109$, $p \leq .01$) and evaluated by two paths: (a) from neuroticism to perceived stress, (b) from perceived stress to psychological mal-being. Third, the indirect effect through social support and perceived stress was not statistically significant ($\beta = .050$, $z = 1.518$, $p > .10$) and examined by three paths: (a) from neuroticism to social support, (b) from social support to perceived stress, (c) from perceived stress to psychological mal-being.

Extraversion to Psychological Mal-Being

Direct effects. As shown in Table 6, high scores on extraversion at Time 1 were significantly related to higher social support ($\beta = .274$, $z = 1.989$, $p \leq .05$) at Time 2 directly. The direct effects from extraversion to both perceived stress ($\beta = -.088$, $z = -.958$, $p > .10$) and psychological mal-being ($\beta = .113$, $z = 1.395$, $p > .10$) were not statistically significant.

Indirect effects. Table 7 shows the estimates of the indirect effects for extraversion on psychological mal-being. First, the indirect effect through social support was not significant ($\beta = -.041$, $z = -1.050$, $p > .10$) and calculated by two paths: (a) from extraversion to social support, (b) from social support to psychological mal-being. Second, likewise, the indirect effect through perceived stress was not significant ($\beta = -.059$, $z = -.942$, $p > .10$) and estimated by two paths: (a) from extraversion to perceived stress, (b) from perceived stress to psychological mal-being. Third, similarly, the indirect effect through social support and perceived stress was not significant ($\beta = -.049$, $z = -1.464$, $p > .10$) and examined by three paths: (a) from extraversion to social support, (b) from social support to perceived stress, (c) from perceived stress to psychological mal-being.

Social Support and Perceived Stress on Psychological Mal-being

As shown in Table 6, the direct effect on psychological mal-being from social support was not statistically significant ($\beta = -.150$, $z = -1.230$, $p > .10$). On the other hand, higher levels of social support were significantly related to lower perceived stress ($\beta = -.267$, $z = -2.076$, $p \leq .05$). Furthermore, higher levels of perceived stress were

significantly related to worse psychological health ($\beta = .672, z = 7.414, p \leq .001$).

Therefore, social support had a significant indirect effect on psychological health through perceived stress ($\beta = -.179, z = -2.071, p \leq .05$).

Gender and Disease Differences

Direct effects. As shown in Table 6 where spouses were coded 0 = wife and 1 = husband, there was not a significant gender difference on psychological health outcomes ($\beta = .006, z = -.872, p > .10$). In addition, the effect of gender difference on social support showed that there was no significant difference between wives and husbands in both Alzheimer's and Parkinson's disease caregivers ($\beta = .038, z = .326, p > .10$).

With disease groups being coded 0 = Parkinson's disease and 1 = Alzheimer's disease, caregivers who care for a spouse with Alzheimer's disease had significantly higher perceived stress ($\beta = .187, z = 2.430, p \leq .05$). However, the direct effect of disease difference on psychological health was not statistically significant ($\beta = -.026, z = -.363, p > .10$).

Indirect effects. Table 7 shows the estimates of the indirect effect for gender difference on psychological mal-being. First, the indirect effect through social support was not significant ($\beta = -.006, z = -.316, p > .10$) and calculated by two paths: (a) from gender to social support, (b) from social support to psychological mal-being. Second, the indirect effect through social support and perceived stress was not significant ($\beta = -.007, z = -.316, p > .10$) and estimated by three paths: (a) from

gender to social support, (b) from social support to perceived stress, (c) from perceived stress to psychological mal-being.

As shown in Table 7, there were significant indirect effects of disease differences on psychological health through perceived stress ($\beta = .125$, $z = 2.304$, $p \leq .05$). As this study hypothesized, the results reported that Alzheimer's disease caregivers experience worse mental health than Parkinson's disease caregivers through higher levels of perceived stress.

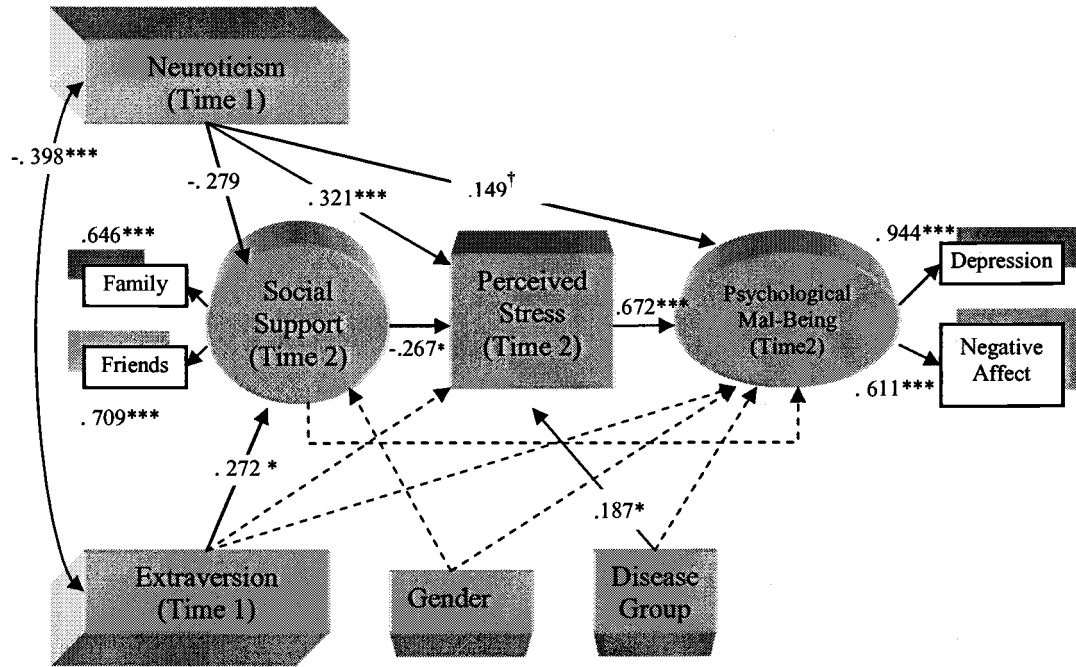


Figure 2. Full Model with Estimates

Note. $\chi^2 = 12.480$, $df = 13$, $n = 122$, $p = .4887$, CFI = 1.00, TLI = 1.006, RMSEA = 0.000, with the 90% C.I. = 0.000 to 0.087, and SRMR = .036.

Solid paths are statistically significant and broken paths are not significant. See Table 6 for parameter estimates for these paths.

† $p \leq .10$, * $p \leq .05$, ** $p \leq .01$, and *** $p \leq .001$. Two-tailed tests.

Table 6
Estimates of Direct Effects in Full Model

Variables	Unstandardized Coefficient	SE	Z	Standardized Coefficient
Neuroticism → Social support	-.062	.030	-2.114	-.279*
Neuroticism → Perceived stress	.098	.028	3.488	.321***
Neuroticism → Psychological Mal-being	.155	.089	1.739	.149 [†]
Extraversion → Social support	.055	.028	1.989	.272*
Extraversion → Perceived stress	-.024	.025	-.958	-.088
Extraversion → Psychological Mal-being	.106	.076	1.395	.113
Disease ^a → Perceived stress	1.067	.439	2.430	.187*
Disease → Psychological Mal-Being	.500	1.377	-.363	-.026
Gender ^b → Social support	.165	.505	.326	.038
Gender → Psychological Mal-being	-1.198	1.374	-.872	.0060
Social support → Perceived stress	-.362	.175	-2.076	-.267*
Social support → Psychological Mal-being	-.696	.566	-1.230	-.150
Perceived stress → Psychological Mal-being	2.295	.310	7.414	.672***

Note. $N = 122$.

^a0 = Parkinson's disease, 1 = Alzheimer's disease. ^b0 = wife, 1 = husband.

Est. / S.E. Critical Value (z) above 1.645, 1.960, 2.576, and 3.291 are significant at $^{\dagger}p \leq .10$, $*p \leq .05$, $**p \leq .01$, and $***p \leq .001$, respectively (two-tailed tests).

Table 7
Estimates of Indirect Effects in Full Model

Parameters	Variables	Unst.	SE	Z	St.
Neuroticism to:	Social support → Psychological Mal-Being	.043	.039	1.117	.042
	Perceived stress → Psychological Mal-Being	.224	.072	3.109	.216**
	Social support → Perceived stress → Psychological Mal-Being	.052	.034	1.518	.050
Extraversion to:	Social support → Psychological Mal-Being	-.038	.036	-1.050	-.041
	Perceived stress → Psychological Mal-Being	-.055	.059	-.942	-.059
	Social support → Perceived stress → Psychological Mal-Being	-.046	.031	-1.464	-.049
Social support to:	Perceived stress → Psychological Mal-Being	-.831	.041	-2.071	-.179*
Disease ^a to:	Perceived stress → Psychological Mal-Being	2.449	1.063	2.304	.125*
Gender ^b to:	Social support → Psychological Mal-Being	-.115	.363	-.316	-.006
	Social support → Perceived stress → Psychological Mal-Being	-.137	.433	-.316	-.007

Note. $N = 122$. Unst., unstandardised; St., standardized.

^a0 = Parkinson's disease, 1 = Alzheimer's disease. ^b0 = wife, 1 = husband.

Est. / S.E. Critical Value (z) above 1.960 and 2.576 are significant at

* $p \leq .05$ and ** $p \leq .01$, respectively (two-tailed tests).

Chapter 5 DISCUSSION

A consistent research question in caregiving is why caregivers show great individual differences in their abilities to manage their stress (Hooker et al., 1998). Whereas some caregivers adapt well to the role of caregiving, others do not (Pearlin, 1994). By including personality as a predictor in the model of the caregiving process, our knowledge of individual differences is increased in the psychological well-being of caregivers (Hooker et al., 1998) while an improved understanding is provided of how caregivers deal with their stressors (Gallant & Connell, 2003). Previous research has established coexisting relationships between personality traits of neuroticism and optimism, and mental and physical health of spouse caregivers (Hooker et al., 1998). What has not been shown to date is whether the personality traits of caregivers predict their health outcomes. In the current study, I examined whether neuroticism and extraversion of spouse caregivers at baseline could significantly predict aspects of their mental health one year later.

Neuroticism and Extraversion

Higher scores on neuroticism were expected to predict worse mental health. This expectation was consistent with apparent findings that compared to individuals low in neuroticism, individuals with higher neuroticism were likely to experience more negative emotions (Costa & McCrae, 1989), worse mental health (Hooker et al., 1998), greater perceived strain (Bookwala & Schulz, 1998), negative well-being (Patrick & Hayden, 1999), more depressive symptoms (Gallant & Connell, 2003), and higher levels of depression (Jang et al, 2004). The results of this study reveal that higher

neuroticism has direct effects on worse psychological health, as well as, indirect effects on worse psychological health after a year through perceived stress. Furthermore, the results show that higher scores on neuroticism have significant direct effects on lower social support and higher perceived stress one year later. These results are also consistent with the hypothesis in this study which assumed that spouse caregivers who have higher scores on neuroticism experience worse psychological health, and that these caregivers are significantly less likely to have sufficient social support compared with caregivers low in neuroticism. Moreover, these findings are congruent with previous research (Hooker et al., 1998) which showed that spouse caregivers who have higher scores on neuroticism experience lower social support, higher perceived stress, and worse psychological health. Aldwin, Levenson, Spiro, and Bossé (1989) suggest that people with high scores on neuroticism negatively interpret their life experiences compared to people with low scores on neuroticism. It was also noticed that anxious and depressed caregivers ultimately repel potential providers of support (Gurung et al., 2003). Therefore, in this study, spouse caregivers high in neuroticism perceive their stressful circumstances differently and more negatively than spouse caregivers low in neuroticism.

Extraversion is another predictor of caregivers' abilities to adapt to their life events. In the current study, the results show that higher scores on extraversion have insignificant direct and indirect effects on psychological health after a year with social support and perceived stress as mediators. The results of this study do not support the hypothesis of this study which assumed that spouse caregivers with higher scores on

extraversion would experience better mental health one year later. However, this finding is consistent with previous studies which stated that there are insignificant relationships between extraversion and subjective well-being (Robinson, Solberg, Vargas, & Tamir, 2003), and extraversion and greater emotional reactivity (Lucas & Baird, 2004).

Although the direct effect from extraversion to psychological mal-being fails to reach significance, the results show that extraversion has significant direct effects on social support one year later. These findings support the hypothesis of this study that spouse caregivers high in extraversion would be more likely to have social support compared with caregivers low in extraversion. The results of this study concerning the significant relations associated with extraversion and social support are unvarying from prior studies which reported that higher scores in extraversion are related to greater social support seeking (Amirkhan, Risinger, & Swickert, 1995), and inhibition of negative affect (Robinson, Meier, & Vargas, 2005).

Given these considerations, it seems that spouse caregivers high in extraversion and low in neuroticism are better able to activate their social support system. Ultimately, personality traits of caregivers may act as risk factors or protective factors for psychological health in chronically stressful situations.

Social Support and Perceived Stress

It is important to examine potential mediating roles of social support and perceived stress between personality traits and psychological mal-being. It was expected in this study that social support would have both direct and indirect effects on

psychological health outcomes through perceived stress. Results show that although social support does not significantly predict spouse caregiver's psychological health outcomes directly, social support has an indirect effect on caregiver's psychological health mediated by caregiver's perceived stress. This finding is consistent with previous research (Hooker et al., 1998) which stated that there was not a significant direct effect of social support on psychological health.

However, greater social support is significantly related to caregiver's lower perceived stress. This result is consistent with a prior study (Schulz & Williamson, 1991) showing that spouse caregivers with sufficient social support have a lower level of stress compared to spouse caregivers with less supportive relationships. Additionally, higher levels of caregiver's perceived stress are significantly associated with worse psychological health. This finding is parallel to prior research (Lazarus & Folkman, 1984) which suggested that perceived stress was significantly related to mental health. In this study, perceived stress is a vital variable in the hypothesized model to predict indirect effects on psychological mal-being from personality traits, social support, and type of disease group. Therefore, these findings correspond with the hypothesis of this study which expected that spouse caregivers with higher social support would have a lower risk of psychological mal-being than spouse caregivers with less supportive relationships. These findings support the notion of this study that a predictive relationship between personality traits and psychological mal-being is mediated by social support and perceived stress. Given these relationships, the concept of potential mediating role of social support was consistent with the theoretical framework of the

stress process model of Alzheimer's disease caregivers presented by Pearlin et al. (1990). Furthermore, these findings are congruent with previous studies that suggested an individual's perception of sufficient social support is significantly and positively associated with psychological health (Feld & George, 1994; Hooker et al., 1998) while lowering the negative impact of stressful experience (Gurung, Taylor, & Seeman, 2003).

Gender and Disease Group

Gender of the caregivers and type of disease were also included as predictors in the model based on the past research. This study was also proposed to determine the differences in the relationship between personality traits and psychological mal-being depending on the caregivers' gender and whether caregivers are caring for a spouse with Alzheimer's or Parkinson's disease. In this study, it was predicted that wives would be more likely to have social support compared to husbands of patients regardless of the disease type. By examining predictive relationships among gender, social support, and psychological health, some controversies in the research on gender differences were identified. Antonucci (2001), indicated that the issue of gender difference is "most complex and controversial" in the study of social relations (p. 432). Previous research found significant gender differences in caregiving stress (Walker, Pratt, & Eddy, 1995), social support (Ingersoll-Dayton, Starrels & Dowler, 1996), mental health (Hooker et al., 2000), relationship between social isolation and stress (Moen, 2001), and relationship between neuroticism and depression (Jang et al., 2004). However, the results of this study do not support the hypothesis, and reveal that there are no effects of gender differences on social support and psychological health

outcomes. The difference between findings of this study and those of other research could be partially explained in that the sample of this study was comprised of only spouse caregivers.

Regarding the differences of caregiving disease groups, I assumed that caregivers who provide care for a spouse with Alzheimer's disease would experience higher levels of perceived stress and worse psychological health compared to caregivers who provide care for a spouse with Parkinson's disease. The results of this study show that disease group variable has significant direct effects on perceived stress as hypothesized. Additionally, there was significant indirect effect on psychological health outcomes through perceived stress. Caregivers who care for a spouse with Alzheimer's disease had significantly higher perceived stress than their Parkinson's disease counterparts. However, interestingly, these findings are in contrast to past research (Hooker et al., 1998) which showed that there were no significant group differences in the level of perceived stress. Hooker et al. (1998) assumed that spouse caregivers in both groups (e.g., Alzheimer's vs. Parkinson's disease) might already have quite high levels of stress in their current caregiving circumstances compared to their past. In addition, Hooker and her colleagues (1998) suggest that the unapparent group difference in perceived stress between spouse caregivers for Alzheimer's and Parkinson's disease were not "wholly speculative" (p.81). By examining differences between two caregiver groups, results show that Alzheimer's disease spouse caregivers have worse psychological health through high levels of perceived stress than Parkinson's disease spouse caregivers. Given this result, the disease differences on

caregivers' psychological mal-being partially confirm hypotheses of this study and previous studies. Previous studies (Hooker et al., 1998) found that there were significant direct effects of disease differences on caregivers' mental health. For example, Alzheimer's disease spouse caregivers felt more depressed and more anxious than Parkinson's disease spouse caregivers did.

Limitations and Future Directions

There were several limitations in the current study. Racial and geographical diversity are not represented in this sample; participants were predominantly white (99.9%) and recruited in Central New York. Another limitation is an imbalance in the gender of caregivers; wives (62%) and husbands (38%). Therefore, the results cannot be generalized to other populations. The sample size was relatively small for the methodology of structural equation modeling. In the future, larger, diverse samples of family caregivers will provide a more complete picture of the stress process of caregiving over time.

In this study, I did not examine the influence of other possible predictor variables such as coping. In general, coping involves some sort of stress. Coping is defined as cognitive and behavioral efforts to manage demands that are perceived as exceeding an individual's resources (Lazarus & Folkman, 1984). The model of caregiving stress (Pearlin, et al., 1990) includes coping as one of the key mediators. Coping was not included in the longitudinal follow-up. In the future, coping variables should be included in the model as predictors of caregivers' ability to adapt to their chronic life stressors. Knowledge of individual differences in coping with the

caregiving experience will extend understanding of caregiver's psychological well-being. Moreover, future research should examine more process-oriented personality constructs, such as goals and self-regulatory strategies, as linkages between traits and health outcomes.

Chapter 6 CONCLUSION

This study served to update information based on previous research by integrating predictive power of personality traits of spouse caregivers, perceptions of social support from family and friends, perceived stress, psychological mal-being based on depression and negative affect, gender and group differences into the hypothesized structural equation model. It is true that interrelationships among these variables are complex; however, the model in this study presents an overall picture of the hypotheses to be examined while demonstrating clear associations of the effects among variables. The summary of the findings of this study are as follows: (1) spouse caregivers with higher scores on neuroticism experience less social support, greater perceived stress, and more psychological mal-being; (2) spouse caregivers with higher scores on extraversion experience greater social support; (3) spouse caregivers with higher level of social support experience less perceived stress; (4) spouse caregivers with higher level of perceived stress experience more psychological mal-being; (5) spouse caregivers with higher level of social support experience less psychological mal-being through less perceived stress; (6) caregivers of spouses with Alzheimer's disease feel more depressed and anxious than caregivers of spouses with Parkinson's.

The findings of the current study suggest that interventions could be targeted individually to caregivers, based on the knowledge of trait characteristics. In particular, caregivers of a spouse with Alzheimer's disease who have high scores on neuroticism need special attention and psychological and educational intervention. These interventions will allow caregivers to sustain their caregiving role, and improve their

psychological well-being (Jang et al., 2004). Utilizing the brief inventory such as the *NEO-Five Factor Inventory* for measuring personality traits of caregivers in the treatment program will enhance knowledge of the relationship between trait characteristics (particularly neuroticism) and depression. Knowledge of personality traits could be useful in psychological health screening as indicators of caregiver's mental health (Hooker, 2002; Gallant & Connell, 2003; Jang et al., 2004).

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APPENDICES

Appendix A Full Mplus Text Output

Mplus VERSION 4.0
MUTHEN & MUTHEN
05/01/2006 7:41 PM

INPUT INSTRUCTIONS

Title:

Stata2Mplus conversion for mplus.dta
List of variables converted shown below
id : id
group : disease group
0: pd
1: ad
gender : gender
0: female
1: male
nt : neuroticism
et : extraversion
t2pss : t2: perceived stress scale (1-4)
t2ssfam : t2: family social support (2,3, 5,6,8,12) sum
t2ssfrn : t2: social support friend (1,4,10,11,13,15) sum
t2cesd : t2: depression
t2absneg : t2: negative affect balance scale (3, 6,8,9,10) sum
t2abspos : t2: positive affect balance scale (1,2,4,5,7) sum

Data:

File is mplus.dat ;

Variable:

Names are

id group gender nt et t2pss t2ssfam t2ssfrn t2cesd t2absneg t2abspos;

Missing are all (-9999) ;

usevariables are group-t2absneg;

Analysis:

Type = general missing h1 ;

Model:

support by t2ssfam t2ssfrn;

malbeing by t2cesd t2absneg;

support on gender nt et;

t2pss on nt et support group;

malbeing on nt et support t2pss gender group;

nt with et;

Model indirect:

malbeing ind nt;

malbeing ind et;

malbeing ind support;

malbeing ind group;

malbeing ind gender;

Output:

Standardized sampstat modindices (4);

INPUT READING TERMINATED NORMALLY

Stata2Mplus conversion for mplus.dta

List of variables converted shown below

id : id

group : disease group

0: pd

1: ad

gender : gender

0: female

1: male

nt : neuroticism

et : extraversion

t2pss : t2: perceived stress scale (1-4)

t2ssfam : t2: family social support (2,3, 5,6,8,12) sum

t2ssfarn : t2: social support friend (1,4,10,11,13,15) sum

t2cesd : t2: depression

t2absneg : t2: negative affect balance scale (3, 6,8,9,10) sum

t2abspos : t2: positive affect balance scale (1,2,4,5,7) sum

SUMMARY OF ANALYSIS

Number of groups	1
Number of observations	122
Number of dependent variables	5
Number of independent variables	4
Number of continuous latent variables	2

Observed dependent variables

Continuous

T2PSS	T2SSFAM	T2SSFARN	T2CESD	T2ABSNEG
-------	---------	----------	--------	----------

Observed independent variables

GROUP	GENDER	NT	ET
-------	--------	----	----

Continuous latent variables

SUPPORT	MALBEING
---------	----------

Estimator

ML

Information matrix

OBSERVED

Maximum number of iterations

1000

Convergence criterion

0.5000-04

Maximum number of steepest descent iterations 20
 Maximum number of iterations for H1 2000
 Convergence criterion for H1 0.100D-03

Input data file(s)
 mplus.dat

Input data format FREE

SUMMARY OF DATA

Number of patterns 5

COVARIANCE COVERAGE OF DATA

Minimum covariance coverage value 0.100

PROPORTION OF DATA PRESENT

	Covariance Coverage				
	T2PSS	T2SSFAM	T2SSFRN	T2CESD	T2ABSNEG
T2PSS	0.975				
T2SSFAM	0.877	0.877			
T2SSFRN	0.869	0.869	0.869		
T2CESD	0.902	0.803	0.795	0.902	
T2ABSNEG	0.975	0.877	0.869	0.902	0.975
NT	0.975	0.877	0.869	0.902	0.975
ET	0.975	0.877	0.869	0.902	0.975
GROUP	0.975	0.877	0.869	0.902	0.975
GENDER	0.975	0.877	0.869	0.902	0.975

	Covariance Coverage			
	NT	ET	GROUP	GENDER
NT	1.000			
ET	1.000	1.000		
GROUP	1.000	1.000	1.000	
GENDER	1.000	1.000	1.000	1.000

SAMPLE STATISTICS

ESTIMATED SAMPLE STATISTICS

Means

	T2PSS	T2SSFAM	T2SSFRN	T2CESD	T2ABSNEG
1	5.967	20.266	18.814	14.731	1.768
Means					
	NT	ET	GROUP	GENDER	
1	49.648	51.230	0.525	0.377	
Covariances					
	T2PSS	T2SSFAM	T2SSFRN	T2CESD	T2ABSNEG
T2PSS	8.226				
T2SSFAM	-2.708	10.617			
T2SSFRN	-2.878	4.678	9.806		
T2CESD	21.813	-9.550	-10.228	108.367	
T2ABSNEG	1.881	-0.615	-0.904	8.741	2.102
NT	13.169	-7.023	-8.475	43.554	4.829
ET	-10.339	8.587	8.607	-25.329	-0.440
GROUP	0.410	-0.121	-0.277	0.919	0.111
GENDER	-0.166	0.036	-0.076	-0.684	-0.056
Covariances					
	NT	ET	GROUP	GENDER	
NT	88.409				
ET	-38.927	108.308			
GROUP	0.709	-0.858	0.249		
GENDER	0.215	-0.185	-0.001	0.235	
Correlations					
	T2PSS	T2SSFAM	T2SSFRN	T2CESD	T2ABSNEG
T2PSS	1.000				
T2SSFAM	-0.290	1.000			
T2SSFRN	-0.320	0.458	1.000		
T2CESD	0.731	-0.282	-0.314	1.000	
T2ABSNEG	0.452	-0.130	-0.199	0.579	1.000
NT	0.488	-0.229	-0.288	0.445	0.354
ET	-0.346	0.253	0.264	-0.234	-0.029
GROUP	0.287	-0.075	-0.177	0.177	0.154
GENDER	-0.120	0.023	-0.050	-0.136	-0.080
Correlations					
	NT	ET	GROUP	GENDER	

NT	1.000			
ET	-0.398	1.000		
GROUP	0.151	-0.165	1.000	
GENDER	0.047	-0.037	-0.004	1.000

MAXIMUM LOG-LIKELIHOOD VALUE FOR THE UNRESTRICTED (H1) MODEL IS -2416.731

THE MODEL ESTIMATION TERMINATED NORMALLY

TESTS OF MODEL FIT

Chi-Square Test of Model Fit

Value	12.480
Degrees of Freedom	13
P-Value	0.4887

Chi-Square Test of Model Fit for the Baseline Model

Value	242.198
Degrees of Freedom	30
P-Value	0.0000

CFI/TLI

CFI	1.000
TLI	1.006

Loglikelihood

H0 Value	-2422.971
H1 Value	-2416.731

Information Criteria

Number of Free Parameters	36
Akaike (AIC)	4917.942
Bayesian (BIC)	5018.886
Sample-Size Adjusted BIC	4905.062
(n* = (n + 2) / 24)	

RMSEA (Root Mean Square Error Of Approximation)

Estimate	0.000	
90 Percent C.I.	0.000	0.087
Probability RMSEA <= .05	0.737	

SRMR (Standardized Root Mean Square Residual)

Value	0.036
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MODEL RESULTS

	Estimates	S.E.	Est./S.E.	Std	StdYX
SUPPORT BY					
T2SSFAM	1.000	0.000	0.000	2.105	0.646
T2SSFAN	1.057	0.293	3.609	2.225	0.709
MALBEING BY					
T2CESD	1.000	0.000	0.000	9.760	0.944
T2ABSNEG	0.090	0.014	6.280	0.883	0.611
MALBEING ON					
SUPPORT	-0.696	0.566	-1.230	-0.150	-0.150
SUPPORT ON					
GENDER	0.165	0.505	0.326	0.078	0.038
NT	-0.062	0.030	-2.114	-0.030	-0.279
ET	0.055	0.028	1.989	0.026	0.272
MALBEING ON					
NT	0.155	0.089	1.739	0.016	0.149
ET	0.106	0.076	1.395	0.011	0.113
T2PSS	2.295	0.310	7.414	0.235	0.672
GENDER	-1.198	1.374	-0.872	-0.123	-0.060
GROUP	-0.500	1.377	-0.363	-0.051	-0.026
T2PSS ON					
SUPPORT	-0.362	0.175	-2.076	-0.763	-0.267
T2PSS ON					
NT	0.098	0.028	3.488	0.098	0.321
ET	-0.024	0.025	-0.958	-0.024	-0.088
GROUP	1.067	0.439	2.430	1.067	0.187
NT WITH					

ET		-38.927	9.529	-4.085	-38.927	-0.398
GROUP	WITH					
NT		0.709	0.420	1.690	0.709	0.151
ET		-0.858	0.464	-1.850	-0.858	-0.165
GENDER	WITH					
NT		0.215	0.407	0.527	0.215	0.047
ET		-0.185	0.450	-0.411	-0.185	-0.037
Means						
NT		49.648	0.841	59.068	49.648	5.280
ET		51.230	0.929	55.168	51.230	4.923
Intercepts						
T2PSS		1.716	2.096	0.819	1.716	0.601
T2SSFAM		20.496	2.369	8.653	20.496	6.291
T2SSFRN		19.066	2.505	7.611	19.066	6.077
T2CESD		-11.545	6.566	-1.758	-11.545	-1.117
T2ABSNEG		-0.603	0.757	-0.796	-0.603	-0.418
Variances						
NT		88.409	11.316	7.813	88.409	1.000
ET		108.308	13.862	7.813	108.308	1.000
Residual Variances						
T2PSS		5.260	0.744	7.071	5.260	0.645
T2SSFAM		6.183	1.425	4.337	6.183	0.582
T2SSFRN		4.893	1.469	3.331	4.893	0.497
T2CESD		11.649	10.832	1.075	11.649	0.109
T2ABSNEG		1.304	0.192	6.804	1.304	0.626
SUPPORT		3.495	1.347	2.595	0.788	0.788
MALBEING		35.618	11.830	3.011	0.374	0.374

R-SQUARE

Observed Variable	R-Square
T2PSS	0.355
T2SSFAM	0.418
T2SSFRN	0.503
T2CESD	0.891
T2ABSNEG	0.374

Latent

Variable R-Square

SUPPORT 0.212
MALBEING 0.626

TOTAL, TOTAL INDIRECT, SPECIFIC INDIRECT, AND DIRECT EFFECTS

	Estimates	S.E.	Est./S.E.	Std	StdYX
Effects from NT to MALBEING					
Total	0.474	0.101	4.682	0.049	0.457
Total indirect	0.319	0.077	4.156	0.033	0.308
Specific indirect					
MALBEING T2PSS NT	0.224	0.072	3.109	0.023	0.216
MALBEING SUPPORT NT	0.043	0.039	1.117	0.004	0.042
MALBEING T2PSS SUPPORT NT	0.052	0.034	1.518	0.005	0.050
Direct					
MALBEING NT	0.155	0.089	1.739	0.016	0.149
Effects from ET to MALBEING					
Total	-0.033	0.092	-0.363	-0.003	-0.035
Total indirect	-0.139	0.066	-2.118	-0.014	-0.148
Specific indirect					
MALBEING T2PSS ET	-0.055	0.059	-0.942	-0.006	-0.059

MALBEING SUPPORT ET	-0.038	0.036	-1.050	-0.004	-0.041
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MALBEING T2PSS SUPPORT ET	-0.046	0.031	-1.464	-0.005	-0.049
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Direct MALBEING ET	0.106	0.076	1.395	0.011	0.113
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Effects from SUPPORT to MALBEING

Total	-1.527	0.706	-2.164	-0.329	-0.329
Total indirect	-0.831	0.401	-2.071	-0.179	-0.179

Specific indirect

MALBEING T2PSS SUPPORT	-0.831	0.401	-2.071	-0.179	-0.179
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Direct MALBEING SUPPORT	-0.696	0.566	-1.230	-0.150	-0.150
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Effects from GROUP to MALBEING

Total	1.949	1.692	1.152	0.200	0.100
Total indirect	2.449	1.063	2.304	0.251	0.125

Specific indirect

MALBEING T2PSS GROUP	2.449	1.063	2.304	0.251	0.125
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Direct MALBEING GROUP	-0.500	1.377	-0.363	-0.051	-0.026
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Effects from GENDER to MALBEING

Total	-1.450	1.494	-0.971	-0.149	-0.072
Total indirect	-0.252	0.788	-0.320	-0.026	-0.012
Specific indirect					
MALBEING SUPPORT					
GENDER	-0.115	0.363	-0.316	-0.012	-0.006
MALBEING T2PSS SUPPORT					
GENDER	-0.137	0.433	-0.316	-0.014	-0.007
Direct					
MALBEING					
GENDER	-1.198	1.374	-0.872	-0.123	-0.060

MODEL MODIFICATION INDICES

Minimum M.I. value for printing the modification index 4.000

M.I. E.P.C. Std E.P.C. StdYX E.P.C.

No modification indices above the minimum value.

Beginning Time: 19:41:43
Ending Time: 19:41:44
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Appendix B

Spouse Caregiver Measurement Scales at Time 2

- Thank-you for completing these questionnaires
- Social Support Appraisal (SSA) Scale
- Perceived Stress Scale (PSS)
- Center for Epidemiologic Studies Depression Index
- Bradburn Affect Balance Scale

THANK-YOU
for completing these questionnaires.

Some of these questions may look familiar to you because they are similar to questions that you responded to approximately one year ago. We are interested in how you may have changed or remained the same in comparison to a year ago. In order to help us interpret any changes we may find, it would be helpful to know if your living situation is the same, or if changes have taken place.

1. My spouse is currently (please check one of the following):

- living at home
- living in a nursing home
- deceased
- other (please specify)

2. The functioning of my spouse now as compared to one year ago is:

- better
- about the same
- worse

The rest of this page is blank so that IF there have been events in your life over the past year that have affected your responsibilities to your spouse you can list them here:

When you are finished with the questionnaires, please return them to Dr. Hooker in the enclosed envelope which is already addressed and stamped for your convenience. Please try to answer each question; it is important that we get complete information. If you have any questions, do not hesitate to call Dr. Hooker at: **(315) 443-3737**

Social Support Appraisals (SSA) Scale

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

(Circle one number in each row)

	Strongly Agree	Agree	Disagree	Strongly Disagree
My friends respect me.	1	2	3	4
My family cares for me very much.	1	2	3	4
My family holds me in high esteem.	1	2	3	4
I can rely on my friends.	1	2	3	4
I am really admired by my family.	1	2	3	4
I am loved dearly by my family.	1	2	3	4
My friends don't care about my welfare.	1	2	3	4
Members of my family rely on me.	1	2	3	4
I can't rely on my family for support.	1	2	3	4
I feel a strong bond with my friends.	1	2	3	4
My friends look out for me.	1	2	3	4
My family really respects me.	1	2	3	4
My friends and I are really important to each other.	1	2	3	4
I don't feel close to members of my family.	1	2	3	4
My friends and I have done a lot for one another.	1	2	3	4

Thank you for taking the time to answer these questions, your effort is greatly appreciated.

Perceived Stress Scale (PSS)

1. In the last month, how often have you felt that you were unable to control the important things in your life? (Please check one of the following):

- _____ 0 never
- _____ 1 almost never
- _____ 2 sometimes
- _____ 3 fairly often
- _____ 4 very often

2. In the last month, how often have you felt confident about your ability to handle your personal problems?

- _____ 0 never
- _____ 1 almost never
- _____ 2 sometimes
- _____ 3 fairly often
- _____ 4 very often

3. In the last month, how often have you felt that things were going your way?

- _____ 0 never
- _____ 1 almost never
- _____ 2 sometimes
- _____ 3 fairly often
- _____ 4 very often

4. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- _____ 0 never
- _____ 1 almost never
- _____ 2 sometimes
- _____ 3 fairly often
- _____ 4 very often

Center for Epidemiologic Studies Depression Index

WEEKLY MOOD RATING

Please indicate how often you have felt this way during the past week.

- 0 Rarely or none of the time (less than once a week)
1 Some or a little of the time (1 – 2 days a week)
2 Occasionally or a moderate amount of the time (3 – 4 days a week)
3 Most or all the time (5 – 7 days a week)

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

Bradburn Affect Balance Scale

DURING THE PAST FEW WEEKS, DID YOU EVER FEEL
Check YES or NO

	YES	NO
1. ...pleased about having accomplished something?		
2. ...on top of the world?		
3. ...bored?		
4. ...particularly excited or interested in something?		
5. ...proud because someone complimented you on something you had done?		
6. ...depressed or unhappy?		
7. ...that things were going your way?		
8. ...upset because someone criticized you?		
9. ...very lonely or remote from other people?		
10. ...so restless that you couldn't sit long in a chair?		