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**MOBILIZATION OF SOCIAL SUPPORT IN CAREGIVERS OF DEMENTIA  
PATIENTS**

A Thesis in  
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by  
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## **ABSTRACT**

The characteristics of mobilization in five different types of social support among caregivers of dementia patients were examined in this study. The Pearlin's stress process model and Andersen's Health behavior model provided the theoretical basis for selecting sociodemographic variables, objective stressors, subjective stressors, and mental health outcomes. Five different types of mobilized social support included mobilized 1) informal instrumental support with patient help, 2) informal instrumental support with household chores, 3) emotional support, 4) formal service use, and 5) institutionalization. The data from the Caregiver Stress and Coping Study (Aneshensel, 1995) were used for the present study. The caregivers were followed longitudinally for five years with one year interval in between. During the five-year interview, caregivers were categorized into continuing care sample if they continued to provide care to their relatives at the time of the interview. If caregivers placed their relatives into nursing home at the time of the interview, caregivers were categorized into placement sample. When relatives passed away, caregivers then were placed into bereavement sample. The current analyses only used Time 1 and Time 2 data. Final sample of 452 caregivers at time 2 were used for this particular study.

The study first examined whether mobilization of social support occurred in response to the stressors and if so, whether the predictors were different for each type of social support. The study then examined the mediating effect of mobilized support on the relationship between subjective stressors and caregivers' mental health. Finally, the study attempted to analyze the moderating effect of mobilized support on caregivers' mental health under high subjective stressors. Results from the analyses indicated that not all

types of social support showed mobilization in response to the stressors. The results also suggested that some types of social support such as formal service use remained stable over time. Finally, the results from the analyses demonstrated that mediating and moderating effects of mobilized social support differed depending on the type of social support.

Conclusions were made based on the results of these findings. First, finding that not all types of social support were impacted in response to the stressors over time suggest that each type of mobilized social support has different characteristics. Secondly, it has been assumed that caregivers who experience higher stressors use more support over time. Hence, previously, the effect of social support had been investigated cross-sectionally based on this assumption although the findings were inconsistent. However, the finding that some type of social support especially the formal service use remains low contribute to the explanation why previous research may have shown the inconsistent findings.

## TABLE OF CONTENTS

List of Figures .....	vii
List of Tables .....	viii
Acknowledgements.....	x
CHAPTER 1. INTRODUCTION .....	1
1.1 Overview of Problem.....	1
1.2 Overview of Research.....	3
CHAPTER 2. LITERATURE REVIEW .....	4
2.1 Introduction.....	4
2.2 Social support: Mediators and/or Moderators in the Caregiving Stress Process .....	5
2.2.1 Definitions of social support.....	5
2.2.2 Five Models of Social Support .....	5
2.2.3 Types of social support tested in caregiving research .....	12
2.3 Limitations and Problems of existing social support studies.....	13
2.4 Factors likely to be related to Social Support .....	15
2.4.1 Sociodemographic factors.....	15
2.4.2 Objective stressors .....	19
2.4.3 Subjective stressors.....	20
2.4.4 Self-rated subjective health status.....	21
2.4.5 Mental health outcomes .....	22
2.5 Statement of the Problem.....	22
CHAPTER 3. METHODS .....	26
3.1 Procedure .....	26
3.2 Sample.....	27
3.3 Measures .....	27
3.3.1 Background characteristics .....	27
3.3.2 Mobilized Social Support .....	28
3.3.3 Mental Health Outcomes .....	31
3.3.4 Objective stressors .....	33
3.3.5 Subjective stressors.....	34
3.4 Statistical Analyses .....	35
CHAPTER 4. RESULTS .....	39

4.1 Descriptive Statistics.....	39
4.2 Predictors of Mobilized social support.....	50
4.2.1 What are the predictors of mobilized informal instrumental support with <i>patient care</i> ?.....	50
4.2.2 What are the predictors of mobilized informal instrumental support <i>with</i> <i>household chores</i> ?.....	51
4.2.3 What are the predictors of mobilized emotional support?.....	52
4.2.4 What are the predictors of mobilized formal service use?.....	54
4.2.5 What are the predictors of institutionalization at time 2?.....	54
4.3 Mediation testing of Mobilized social support.....	64
4.3.1 Mobilized instrumental support with patient care.....	65
4.3.2 Institutionalization.....	67
4.4 Moderation testing of Mobilized social support.....	74
4.4.1 Does mobilized informal instrumental support with patient care have a moderating effect on mental health outcomes under high subjective stressors?.....	74
4.4.2 Does mobilized informal instrumental support with household chores have a moderating effect on mental health outcomes under high subjective stressors?.....	75
4.4.3 Does emotional support at time 2 have a moderating effect on mental health outcomes under high subjective stressors?.....	77
4.4.4 Does mobilized formal service use have a moderating effect on mental health outcomes under high subjective stressors?.....	79
4.4.5 Does institutionalization have a moderating effect on mental health outcomes under high subjective stressors?.....	80
CHAPTER 5.DISCUSSION AND CONCLUSION.....	99
5.1 Discussion.....	99
5.2 Conclusion, Limitations and Future suggestions.....	104
REFERENCES.....	112
APPENDIX A. PEARLIN’S CAREGIVING STRESS PROCESS MODEL.....	131
APPENDIX B. MODELS OF SOCIAL SUPPORT.....	132

## LIST OF FIGURES

Figure 1 Moderating Effect of Mobilized Informal Instrumental Support with Patient Help on the Role Overload and Changes in Depression.....	95
Figure 2 Moderating Effect of Mobilized Informal Instrumental Support with Household Chores on Role captivity and Changes in Depression.....	96
Figure 3 Moderating Effect of Mobilized Informal Instrumental Support with Household Chores on Role Overload and Changes in Depression.....	97
Figure 4 Moderating Effect of Emotional Support at time 2 on Role Overload and Changes in Depression.....	97
Figure 5 Moderating Effect of Emotional Support at time 2 on Role Overload and Changes in Anxiety.....	98
Figure 6 Moderating Effect of Mobilized Formal Service Use on Role Captivity and Changes in Anxiety.....	98
Figure 7 Main Effect Model .....	132
Figure 8 Mediation Model (Stress-prevention Model) .....	132
Figure 9 Stress-Buffering Model/Moderation Model.....	133
Figure 10 Additive Effect Buffering/Support Seeking or Mobilization Model.....	133

## LIST OF TABLES

Table 1 Demographic Information for the three Samples .....	43
Table 2 Descriptive Statistics on Objective and Subjective Stressors and Mental Health Outcomes .....	46
Table 3 Correlation among Objective and Subjective Stressors.....	48
Table 4 Correlation among Mental health at time 1 and changes in Mental Health from time 1 to time 2 .....	48
Table 5 Correlation among Objective and Subjective Stressors and Mobilized Social Support.....	49
Table 6 Predictors of Mobilized Informal Instrumental Support with <i>Patient Help</i> .....	56
Table 7 Predictors of Mobilized Informal Instrumental Support with Household Chores: Spouses vs. Others .....	57
Table 8 Distribution of Emotional Support at time 1 and time 2.....	59
Table 9 Predictors of Emotional Support.....	60
Table 10 Distribution of Formal Service Use at time 1 and time 2 .....	61
Table 11 Predictors of Mobilized Formal Service Use.....	62
Table 12 Predictors of Institutionalization at time 2.....	63
Table 13 Mediation Effects of Mobilized Instrumental Support with Patient Help on the Mental Health Outcomes .....	70
Table 14 Mediation of Institutionalization at time 2 on the Mental Health Outcomes ...	72
Table 15 Moderation Effects of Mobilized Informal Instrumental Support with Patient Help on Mental Health Outcomes.....	83
Table 16 Moderation Effects of Mobilized Informal Instrumental Support with Household Chores on Mental Health Outcomes.....	85
Table 17 Moderation Effects of Emotional Support at time 2 on Mental Health Outcomes .....	88
Table 18 Moderation Effects of Mobilized Formal Service Use on Mental Health Outcomes .....	91



Table 19 Moderation Effects of Institutionalization at time 2 on the Mental health Outcomes .....	93
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## CHAPTER 1. INTRODUCTION

### 1.1 Overview of Problem

The developed countries are aging due to the increase in life expectancy (Zarit, Dave, Edwards, Femia, & Jarrott, 1998). In 2003, 35.9 million people were aged 65 and older in the United States, which is about 12% of the total population. Among the older population, 18.3 million people were aged 75 to 84, and 4.7 million were 85 and older. This group is projected to number 79 million, or 20.6% of the population, by the middle of the next century (U.S. Bureau of the Census, 2006). Furthermore, the elderly population itself is aging (U.S. Department of Health and Human Services, 2005). The “oldest old,” those aged 85 years and older, are the fastest growing segment of the population and are expected to double their present size by the year 2020 (U.S. Bureau of the Census, 2006).

These demographic trends foretell associated increases in the number of elderly persons with chronic disease, disability, and dependency upon others for assistance with activities of daily living (ADLs). Although functional loss and disability are not necessary consequences of the aging process, both tend to be the products of the demographic aging of the population, especially the rapid growth of the most highly disabled segment of the population. The elderly population is becoming increasingly more disabled over time despite biomedical and public health interventions (Kunkel & Applebaum, 1992). Consequently, there is a large population of elderly requiring a long-term assistance, and this segment of society has been, and will continue, increasing in both absolute number and as a percentage of the population (U.S. Department of Health and Human Services, 2005).

Dementia is a very good example which requires a long-term assistance. The frequency of dementia increases with rising age from less than 2 % for the 65-69 year-olds, to 5 % for the 75-79 year-olds and to more than 20 % for the 85-89 year-olds. Every third person over 90 years of age suffers from moderate or severe dementia (U.S. Health and Human services, 2006). Dementia is a progressive chronic disease. It involves serious memory loss problems and problematic behaviors. Because of its cognitively degenerative nature, providing care to a demented relative requires caregivers to devote enormous amounts of time, effort, and energy. This commitment as a caregiver can influence her/his daily life and therefore caregiving indeed is a chronic stressor which is closely associated with a caregiver's own life. In fact, Fengler and Goodrich (1979) labeled the spouses of disabled elderly men as "hidden patients." It suggests that the responsibilities of providing care for an impaired older adult can place a caregiver at risk for negative physical, emotional, and social outcomes.

Despite the burden on the family caregivers, most of the impaired elderly reside in the community, including the majority of persons with severe dementia and almost all of those with mild dementia syndromes (Day, 1985; Doty, 1986). Various researchers have found that over three-quarters of the help received by impaired elderly are provided by family members. Therefore, it is important to gain more knowledge of the factors which can help caregivers to relieve their negative psychological, emotional and social outcomes (George & Bearon, 1980; Montgomery, Gonyea, & Hooyman., 1995; Hoenig and Hanilton, 1967).

One of the most widely accepted model to explain the caregiving stress process is the Pearlin's stress process model (1990). More recently, Andersen's health behavior

model (1973) has been used widely to identify the predictors for using services such as adult day care services among caregivers of demented relatives. The following study will use these two models as its theoretical basis. While there has been some research which specifically tests the relationships described in the stress process model and health behavioral model, rather inconsistent agreements had been made when it comes to test the effect of social support in the caregiving stress process.

## **1.2 Overview of Research**

Based on the Pearlin's caregiving stress process model and the Andersen's health behavior model, current research will focus on the *mobilization* of social support in caregivers of dementia relatives. The first question will ask whether there are different predictors in predicting the mobilization in five different types of social support. Second question will ask whether mobilized social support mediates the impact of subjective stressors on caregivers' mental health especially depression, anger, and anxiety. Finally, the third question will ask whether the effect of subjective stressors on depression, anger, and anxiety are modified under mobilized social support.

This study will begin with providing some literature background on caregiving, and social support. Based on previous research, the study then discuss the problems and limitations of the existing studies which will lead to the statement of this particular study. Then, the description of procedures on how the data were collected will be discussed. Next, descriptions of measures which will be used in this study will be provided. Results of analyses will be presented by each question. Lastly, discussions and future suggestions from this study will be discussed.

## CHAPTER 2. LITERATURE REVIEW

### 2.1 Introduction

Some caregivers of dementia patients show less negative distress compared to others even when the same amount of stressors is given to them. Researchers such as Pearlin and his colleagues (1988), and Aneshensel et al. (1990) proposed that this multi-directionality of the outcomes can partially be explained by the mediators and/or moderators in the stress process. In the stress research, especially in caregiving, social support is commonly and widely treated as a moderator/mediator. More specifically, Pearlin and his colleagues (1990) suggested that through coping, or social support, caregivers' stressors can be lessened or modified. Although social support is not the only resource that caregivers can get, it is the most-studied concept in stress theories. The majority of caregiving literature has an *a priori* assumption that social support serves as a mediator/moderator of stress (Morano, 2003, Wheaton, 1983). Being a mediator indicates that social support can lessen the effect of stressors to the negative outcomes. On the other hand, being a moderator implies that social support is effective in those who are under high stressors. The next part of the chapter will discuss various models of social support and how social support was tested in caregiving research. First, the concept of social support will be discussed. Next, various models of mediation and moderation of social support will be discussed. Previous social support studies in caregiving literature will be presented next.

## **2.2 Social support: Mediators and/or Moderators in the Caregiving Stress Process**

### **2.2.1 Definitions of social support**

Social support, in general terms, is the degree to which an individual's needs for affection, approval, belonging, and security are met by significant others (Kaplan et al., 1977). According to Cohen and Syme (1985), social support can be defined as the emotional, psychological, and/or instrumental resources that are provided by other people. Conceptually, Cobb (1976) has suggested that support can be conceived as information leading the subject to believe that 1) s/he is cared for and loved, 2) s/he is esteemed and valued, and 3) s/he belongs to a network of communication and mutual obligation. Although this definition is limited to emotional support and neglects instrumental or practical aid obtained from others, it is precise and has clear implications for operationalization. House (1982) defined social support as an interpersonal transaction involving one or more of the following: 1) emotional concern (liking, love, empathy), 2) instrumental aid (goods and services), 3) information (about the environment), or 4) appraisal (information relevant to self-evaluation). Overall, social support is a help that people give or receive in various ways.

### **2.2.2 Five Models of Social Support**

#### *2.2.2.1 Main effect model (Appendix B. Figure 7)*

The main effect model proposes that social resources have beneficial effects irrespective of whether persons are under stress (Cohen, & Wills, 1985). Therefore, if a person has a high level of social support, s/he is likely to experience less psychological



disturbance. On the contrary, if a person has a lower level of social support, the person is likely to experience more psychological disturbance. Accordingly, this model suggests that stress and support have separated and opposite effects on distress, but they are also completely independent of each other. The effect of support in this model, therefore, is clearly not in response to the presence of stress. It would be appropriate to conclude that something more general is happening.

Cassel (1976), and Thoits (1983/1985) suggested that main effect of social support could be related to overall well-being rather than specific symptom-related psychological disturbance because it provides a positive effect, a sense of predictability and stability in one's life situation. In an extreme case, the main effect postulates that an increase in social support will result in an increase in well-being irrespective of the existing level of stressor. There is some evidence that the main effect of support among socially isolated people (those with very few or no social contact) on major health outcomes compared to those with moderate or high levels of support (Berkman & Syme, 1979; House et al., 1982). Although the evidence is not conclusive, the suggestion is that there may be a minimum threshold of social contact required for an effect on mortality to be observed, with little improvement in health outcomes for levels of support above the threshold.

It is very rare to find a study which tested 'only' the main effect of social support in caregiving research. Instead, moderating effects of social support had been usually examined along with the main effect. For example, Aneshensel et al (1995) discovered the independent effect of social support. The researchers explain that rather than having mediating or moderating effects between stressors and outcomes, those two sources each

had a main effect on the outcomes.

#### 2.2.2.2 *Mediation model (Stress-prevention model; Appendix B. Figure 8)*

The model suggests that social support either 1) prevents the occurrence of stressful conditions or 2) reduces the likelihood that events would be perceived as highly stressful (Avison et al, 1986; Kramer, 2001; Wheaton et al., 1982). An extremely important feature of the stress prevention model is that social support bears an *indirect* rather than a direct relationship to distress. In the Dignam et al (1986) study, the zero-order correlation between social support and perceived stress was negative and significant but social support was not related to distress.

The model involves two different mechanisms of support. In one case, the initial occurrence of events is prevented (Pearlin & Schooler, 1978). Considering the nature of dementia, caregiving research does not usually adapt this mechanism to test its effects. That is, dementia is an unpredictable disease and, therefore, it is not possible to ‘prevent’ the caregiving stressors in advance. A second mechanism is one in which social support reduces the perceived threat or the appraised stressfulness of events that have already occurred. The caregiving literature does contain studies that use this mediating model to examine negative outcomes of caregiving. Borden (1991), Lawton et al. (1991), and Noonan and Tennstedt (1997) used a series of regression analyses to develop a path model to explain the effect of social support on the outcomes of caregiving stress. Although there are some reviews of testing the mediating effect of social support, the findings are often inconsistent.

### *2.2.2.3 Alternative to stress prevention model*

A number of viable mechanisms could account for how psychological distress *causes* poor perceptions of social support. First, states of psychological distress such as depression could lead to a negative distortion of the availability or adequacy of social support. Second, individuals who show signs of psychological distress might be rejected by others (Coyne, 1976), particularly if the disorder is chronic rather than acute. Finally, personal characteristics of the distressed individual such as poor social skills (Heller, 1979) or severe psychiatric disorders could result in small networks and/or poor quality of relationships.

Little research has been conducted to investigate the effects of the alternative model in the caregiving field. However, there is one study that explains the alternative model. Rivera and her colleagues (1991) conducted a study with clinically depressed and non-depressed female caregivers. In the study, they found that depressed caregivers reported a higher incidence of negative interactions with others. In addition, non-depressed caregivers reported significantly greater use of social support.

### *2.2.2.4 Stress buffering model/moderation model (Appendix B. Figure 9)*

Many researchers such as Thoits (1986), Cohen, and Baron et al. (1986) proposed a classic moderation model, often referred to as the stress buffering hypothesis. The moderating variable plays a cushion role in a person's psychological well-being. For example, under the same stressor, a person with higher level of social support will show improvement in psychological well-being. Since this model suggests an interaction between stressor and social support, it is reasonable to posit that the model is primarily

used when people are under stress. Individuals with a strong social support system should be better able to cope with major life changes; those with little or no social support may be more vulnerable to life changes, particularly undesirable ones. The occurrence of events in the presence of social support should produce less distress than should the occurrence of events in the absence of social support. The moderating or buffering model assumes that social support changes the way in which caregivers appraise the seriousness of both the care-receivers' impairment and caregiver activities, or that support is effective mainly under conditions of high levels of stressors.

Although intuitively appealing, the research on social support as a moderating variable is far from conclusive. Much of the research has found no evidence for social support as a moderating variable in the stressor-negative outcome relationship (e.g., Parasuraman et al., 1992; Yang & Carayon, 1995) or mixed effect of support such that only a small percentage of the hypothesized interactions are demonstrated empirically (e.g., Dolan, Ameringen, & Arsenault, 1992).

In caregiving research, there are significant studies tested the moderating effect of social support on caregivers' well-being as well. However, relatively few studies of the moderating effects of informal and formal social support in the caregiving literature have identified non-uniform effects of social support that depend on different sources or different types of support at different points at the stress process (Aneshensel et al., 1995; Bass, Noelker, & Rechlin, 1996; Li et al., 1997). For example, using multiple regression analysis, Franks and Stephens (1996) researched the buffering effect of social support on caregivers' physical health. In addition, Turner (1981) found that the caregivers who experience high levels of stressors benefited from their social network whereas the

caregivers who experience low or moderate levels of stressors did not report any benefits from their social network. Despite the inconclusive findings, the moderating effect of social support continues to be the dominant hypothesis.

*2.2.2.5 Additive effect buffering (Support seeking/mobilization model: Appendix B. Figure 10)*

An essential feature of this model is that the support is dependent on the level of stress. What differentiates this model from the stress-buffering model is the concept of ‘mobilization.’ Mobilization suggests that a stressor initiates people to use support – mobilize the social support – which, in turn, reduces the overall stress level. In other words, the change in social support will influence stress level. More specifically, the model suggests that a stressor leads to an increase in support, and as a result, support ameliorates the distress. As with the previous stress-buffering model, it is the effect of the stressor that is buffered by the operation of the support (however, in this case, not just support, but mobilized support), and it is the total effect of stress that must be analyzed to discover whether buffering applies. For example, in the caregiving paradigm, the mechanism can be explained as following: as the number of stressors – such as cognitive impairment of the relative, or the caregiver’s role captivity – increase, caregivers may increase their support networks and turn to increased contact with family and friends or use of formal services (Geroge, 1996; Miller & McFall, 1991; Stoller & Pugliesi, 1988).

The idea that stressors *initiate or help caregivers’ decision to increase* the use of support in this mobilization model is, in fact, analogous to the Andersen Behavioral Model of Health Care Use in which the initial recognition of symptomatology leads to the

solicitation of medical services. Andersen's behavioral model was initially developed to assist the understanding of why families use health services. Andersen's model (1973) assumes that a sequence of conditions contributes to whether or not people use services and the volume of service they consume. The model suggests that people's use of health services is a function of 1) their predisposition to use services, 2) factors which enable or impede use, and 3) their need for care. First, predisposing characteristics include demographic factors (such as age or gender) and factors of social structure (a person's ability or availability to access to services such as education, occupation, or ethnicity). Second, enabling characteristics refer to the availability of health services in a person's community of residence. Both community and personal-enabling resources must be present for use to take place. First, health personnel and facilities must be available where people live and work. Then, people must have the means and know-how to get to those services and make use of them. Lastly, need characteristics refers to how people view their own general health and functional state, as well as how they experience symptoms of illness, pain, and worries about their health and whether or not they judge their problems to be of sufficient importance and magnitude to seek professional help. Therefore, Andersen's model is more elaborate and specific way of explain the different types of stressors or needs which lead (or initiate) caregivers to use more support than the mobilization model.

In caregiving research, it has only been about a decade that this model received attention from the researchers especially when examining the formal service use such as day care services, respite services, or nursing home. For example, some caregiving literature (Cox, 1993; Coward & Lee, 1985; Abramson, & Davis, 1991) suggests that

predisposing factors (such as the caregiver/care recipient relationship, living arrangements, gender, age, and ethnicity) and enabling factors (rural/urban location, availability of transportation, and medical insurance) may be as important as the need variables in evaluating the predictors of service utilization (caregivers' perception of the dementia patient's status, caregivers' stressors). The health service utilization literature suggests that need variables explain more variance in service need than predisposing or enabling variables (Branch, Jette, Evaschwick, Palansky, & Diehr, 1981; Wolinsky, 1990). Service utilization studies focused on persons with dementia and their caregivers also support the importance of need variables, but argue that the contribution of need, predisposing, and enabling factors deserves further clarification (Bass et al, 1992; Montgomery, 1994). Bass and colleagues (1992) for example found that different sets of variables predicted the use of health and social services.

### **2.2.3 Types of social support tested in caregiving research**

In caregiving research, the most common categories used when measuring support are informal support and formal support. Informal support refers to any type of support that is provided by relatives, friends, or neighbors of caregivers. For example, it could be emotional social support given by a husband or daughter to the caregiver. Or, it could be instrumental support provided by other family members to the caregiver. Therefore, regardless the types of social support, if the support is given by the families or friends of caregivers, researchers classify support as informal support. For example, Haley, Brown, and Bartolucci (1987) described the importance of the informal social support in their study. In the study of the predictors of caregiver outcomes, they explained that depression could be predicted by social network, contacts, and social

interaction with others.

Formal support in caregiving research refers to the use of formal services. Respite service can be described as a service or group of services that provides caregivers temporary periods of relief and rest away from the patient. Widely-used formal services for dementia patients are adult day care, in-home respite service, and nursing homes (Gaughler et al., 2001; Gottlieb, 2000). As with informal support, previous studies on formal services have contradicting results. Some researchers showed positive effects of using formal services, whereas others presented the opposite. The limitations of using formal services up to date such as Montgomery & Borgatta (1989) is that caregivers use formal services too little and too late. Many researchers suggested that in order to get benefits from the use of formal service, families need to use the services consistently and over time (Zarit, 1998; Gaughler, 2002). At the time of program enrollment, caregivers display pronounced signs of distress and relatively low levels of life satisfaction, largely as a function of their onerous responsibilities and time investment on behalf of their relatives. If not in an outright crisis state, the caregivers certainly have experienced a great deal of wear and tear by the time they commence the program. In addition, Zarit et al. (1998) suggested the possibility that day care service is a trial phase for the caregivers before they place their relatives into nursing home. However, this occurs only when families choose to utilize adult day services consistently and over time (Zarit, 1998; Gaughler, 2002).

### **2.3 Limitations and Problems of existing social support studies**

Although there have been numerous empirical social support studies in caregiving research, the effects of social support have shown conflicting results. Some studies found



that social support is beneficial to caregivers, whereas other studies found no benefits of social support. The inconsistent findings may be due to the design of the previous studies. That is, most previous studies have used a cross-sectional design where measures are assessed only once. Unlike acute stressors such as a natural disaster, caregiving produces chronic stressors which can influence and change a person's life continuously. Therefore, the degree or nature of stressors change over time, and the relationship among stressors may be modified and intertwined over the period of caregiving. According to the stress-buffering model, for instance, a higher level of social support attenuates the distress level when in high stress. However, what is exactly interacting with social support? Is it the stressor due to caregiving or depressive symptoms? In other words, is it possible that the depressed or anxious appearance of caregivers encourages other people to help them? If such is the case, it is not the actual stressors interacting with higher level of social support. Instead, it may be the depressive symptoms interacting with social support. For this reason, when studying the effects of social support in caregiving research, it is very important to separate the effect of caregivers' depressive symptoms from their stressors.

Another limitation is that very few studies actually have looked at as to whether social support actually changes over time in the caregiving stress process. As described earlier, caregiving stressors intensify over time. Therefore, a lack of information on the *changes* in social support may produce inconsistent results in the benefits of social support in caregiving research. For instance, if the level of social support remains low over time, where there is a significant increase in stressor level, it is very likely that the results of a study on buffering effect of social support may suggest the insignificant influence of social support. On the other hand, if the level of social support was high

from the beginning, then the findings show significant relationship among social support and stressors. If such is the case, then it is very difficult to conclude that social support serves as moderator or mediator in the caregiving stress process. Rather, it is more likely that the level of social support which preceded the caregiving stressors determined the relationship among the stressors and the benefits of social support. Therefore, it is necessary to examine the changes in social support over time and how it is related to the stressors. However, except for the formal service studies, almost no studies on social support have looked at the ‘*changes*’ of social support in the course of caregiving.

## **2.4 Factors likely to be related to Social Support**

Based on Pearlin et al. (1990)’s caregiving stress process model and Andersen’s Health behavioral model (1973), previous researchers have used variables in the following four domains: sociodemographic factors, objective stressors, subjective stressors, and mental health. Therefore, in this section, the most commonly used variables in those four domains will be discussed.

### **2.4.1 Sociodemographic factors**

#### *2.4.1.1 Caregiver relationship*

The most consistent finding in caregiving research is that the majority of family caregivers are women (Stone, Cafferata, & Sangl, 1987). The gender distribution of caregiving is inseparable from the family relationship of the caregiver. Among spouses, approximately 48% of care is provided by men (Stone et al., 1987). In non-spouses,

almost 90% of the caregivers are women (Stone et al., 1987). Because of this imbalance of gender distribution in spouses and non-spouses among caregivers, it is very rare to examine both gender and the relationship to the relative in caregiving research. Often, the relationship to the caregiver is used. Generally, spouses are likely to be the primary caregiver (when available), followed by daughters/in-laws (Miller & Cafasso, 1992).

In some caregiving research, it is suggested that spouses may be more distressed than adult children because age-associated health problems and functional impairment of the caregiver make the provision of care difficult (Connell et al., 2001; Schneider, Murray, Banerjee, & Mann, 1999). However, in other findings, although an age-associated decrease in health may make extensive caregiving tasks more difficult for spouses than for adult children, the latter group may be more vulnerable to distress due to conflicting demands (Baring, MacEwen, Kelloway, & Higginbottom, 1994; Reid & Hardy, 1999; Stephens, Franks, & Townsend, 1994).

#### *2.4.1.2 Race*

Because of the cultural differences in perceiving caregiving stress, race has been tested quite often in caregiving research. For example, because perceived intergenerational obligations are stronger among African-Americans than among whites (Scott & African-American, 1989), African-American caregivers report less stress and more positive experiences than white caregivers. Because of their life experiences, African-Americans may also be better able to deal with stress.

Morycz, Malloy, Bozich, and Martz (1987) examined the differential impact of caregiving strain among African-American and white caregivers of dementia patients.

The sample included 715 white and 95 African-American caregivers. Although the researchers reported that overall levels of burden did not differ between African-American and white caregivers, the predictors of burden varied between the two groups. Among African-American caregivers, being unmarried and the care recipient's level of impairment in physical activities of daily living predicted burden. For white caregivers, predictors of burden included the care recipient's diagnosis of a dementing illness and impairment in instrumental activities of daily living. Morycz et al. (1987), therefore, concluded that there were racial differences in the experience of burden or desire to institutionalize a demented family member. White caregivers of demented relatives reported higher levels of burden and were much more likely to institutionalize their relatives than African-American caregivers.

Lawton, Rajagopal, Brody, and Kleban (1992) examined the dynamics of caregiving among a large sample (472 whites and 157 African-Americans) of primary caregivers of adults with a diagnosed dementing illness that were recruited from support groups and social agencies and via the media in the Philadelphia area. The primary goal of the study was to assess the applicability of a model of caregiving to African-American and white caregivers. After accounting for socioeconomic and background differences, Lawton et al. (1992) reported that African-American caregivers expressed a greater sense of traditional caregiving ideology and caregiving mastery and satisfaction than white caregivers. African-American caregivers reported less subjective burden and depression and a lower perception of intrusion on their lives due to caregiving than white caregivers.

#### *2.4.1.3 Income and Education*

There is large body of evidence that income and education continue to be positively associated with the use of psychological services, although the gap between high and low sociodemographic groups appears to be narrowing in recent years (Gaugler et al., 2000, 2001; Kulka, Veroff, & Douvan, 1979), as it is for medical utilization generally (Davis, Gold, & Makuc, 1981; Gaugler et al., 2003). Evidence for informal sources mobilization across sociodemographic categories is mostly consistent with the use of professional services, although this literature is much less comprehensive. Eckenrode (1983), however, reported that income does not influence the mobilization of social support as much. On the other hand, in caregiving research, caregivers with lower levels of caregiver preparedness, less education, and more helpers had a greater likelihood of having confidence and trust in the use of services (Miller & Mukherjee, 1999).

#### *2.4.1.4 Employment*

Employed caregiving daughters report more difficulties than those who are not employed, especially because the available services for care receivers often are limited to the hours during which they are at work (Matthews, Werkner, & Delaney, 1989). For example, care receivers have to see health care providers when caregivers are engaged in wage labor. Employed caregiving daughters give approximately the same amount of care as those who are not employed (Matthews et al., 1989).

## **2.4.2 Objective stressors**

Objective stressors refer to the actual demands of caregiving. These conditions are designated as ‘objective’ insofar as they pertain to concrete manifestations of the patient’s impairment. The core element in this cluster of stressors is the patient’s state of cognitive impairment (which creates dependencies and the need for assistance), problem behaviors in dementia relatives, and the dependency of everyday life living (such as bathing, eating). These stressors are “objective” in the sense that they involve phenomena that may be observed independently of the caregiver’s assessment of them.

In caregiving research, objective primary stressors such as cognitive impairment and problem behaviors were found to be related to caregivers’ psychological distress, particularly depression (Biegel, Sales, & Schulz, 1991; Bedard et al., 2000). However, the results of the impact of objective stressors on psychological distress are inconsistent. Schulz et al. (1995) found a significant relationship between patient’s cognitive functioning and caregiver depression. However, some research suggests that the condition of the patient lacks a strong or consistent relationship to caregiver stress (George & Gwyther, 1986).

### *2.4.2.1 The Duration of caregiving*

There are some contradictory findings regarding the association between the duration of caregiving and psychological distress. For example, the longer caregiving is sustained, the greater the decline in psychological well-being. On the other hand, some findings suggest that caregivers adapt to the stress of caregiving over time. Therefore, negative effects may increase after taking over the caregiving role, with distress being

highest at the midpoint of care when behavior problems due to dementia are most frequent. However, negative effects will decline thereafter as a result of adaptational processes or because of a decrease in dementia relative's problem behavior.

### **2.4.3 Subjective stressors**

While objective stressors describe concrete sets of behaviors, subjective stressors refer to the caregiver's *internal responses* and to the personal meanings evoked by external stimuli. The indicators of subjective stressors bypass the conditions of the patient and speak directly to the internal responses to hardships experienced by caregivers. There are two domains in subjective stressors. First, role overload refers to the internal experience of being overwhelmed by care-related tasks and responsibilities. It addresses the feeling that the care-related tasks are too much to endure. Second, role captivity refers to the sense of being an involuntary incumbent of the caregiver role. This feeling of being trapped exists when a person feels compelled to be and to do one thing while preferring something else.

According to Lazarus (1980), stress is not simply an external force that automatically produces negative effects in all individuals who experience it, but is a relationship between an individual and his/her way of appraising stressors. For instance, some caregiving researchers have found that measures of the objective severity of dementia patients' impairment per se show little relation to outcomes, whereas the subjective stressors predict caregiver depression and burden (Coppel et al., 1985; Fiore, Becker, & Coppel, 1983; Pagel et al., 1985). Haley et al. (1987) used questionnaires asking how stressful the tasks – taking care of the dementia patient's impaired behavior

problems – were for caregivers. They found out that positive subjective appraisal was a significant predictor to decrease depression and anxiety when other caregiving-related stress variables were controlled.

A 3-year longitudinal study conducted by Aneshensel et al. (1995) also investigated whether caregivers' subjective stressors influence their psychological well-being. In the study, primary subjective stressors – role overload, and role captivity – were measured. The study demonstrated that role captivity and role overload are related to caregivers' depressive symptomology and anger.

Braithwaite (2000) also conducted a cross-sectional study testing whether role overload and role captivity predicted effects on caregivers' mental well-being. The findings suggest that role captivity was significantly related to negative psychological symptoms such as depression and anxiety. However, role overload was not a significant predictor of depression and anxiety.

#### **2.4.4 Self-rated subjective health status**

From Andersen's model, the health status is included the need characteristics which enables caregivers to use social support. For example, Draper, Poulos, Poulos, and Ehrlich (1996) conducted a cross-sectional study with 99 caregivers of dementia relatives. The purpose of their study was to investigate the relative importance of multiple risk factors in determining subjective burden and psychological distress. The findings suggested that poor caregiver self-rated health was found to be one of the risk factors for caregiver distress.



#### **2.4.5 Mental health outcomes**

Many researchers have tried to examine the consequences of caregiving burdens, especially the psychological well-being of caregivers (Anthony-Bergstone et al, 1988; George et al, 1986). In addition, many studies have indicated that caregivers of dementia patients frequently report that they are physically and emotionally distressed (Rabins, Mace, & Lucas, 1982; Zarit, et al, 1980). Anthony-Bergstone et al (1988) studied the symptoms of psychological distress among caregivers of dementia patients and they found that hostility/anger and anxiety were significant among caregivers regardless of their gender or age. Kinney and Stephens (1989) also showed that the more the caregiver feels burdened, the lower their well-being level. Aneshensel et al (1995) also discussed the consequences of primary and secondary stressors, which eventually lead caregivers into depression. Overall, depression, anger, and anxiety have thought to be most related to the caregiving stress process.

#### **2.5 Statement of the Problem**

Previously, various models of social support were used to examine its effect in stress research. For example, the main effect model posits that social support enhances well-being irrespective of stress level (Bell, LeRoy, & Stephenson, 1982; Fryman, 1981). The buffering model suggests that the beneficial effect of social support derives primarily from its protective properties in the presence of high levels of stress (Kessler & Essex, 1982; Krause, 1986). The stress prevention model assumes that social support either 1) prevents the occurrence of stressful conditions or 2) reduces the likelihood that events would be perceived as highly stressful (Avison et al, 1986; Kramer, 2001; Wheaton et al.,

1982).

However, numerous empirical caregiving studies examining the effects of social support have shown conflicting results. Some studies found that social support is beneficial to caregivers (Franks et al., 1996; Miller et al., 2001; Turner, 1981) whereas other studies found no benefits of social support (Miller et al., 2001; Yang et al., 1995). Three explanations can be made to account for the inconsistent findings of social support in caregiving research. First, it may be due to different sample selection procedures. For example, day care studies use samples of caregivers who use the services. Other intervention studies may also use specialized samples. Why is it a problem? First of all, it may be possible that the caregivers who actually use the day care services may have different characteristics – such as higher education or income, or cope better with problems – from the ones who do not use them. Next, it is also possible that those who are volunteered to involve in an intervention study may already report higher depression, or anger or they may have a personality that allow them to seek for more help when they need it than those who do not want to involve in the intervention. If such is a case, then it is difficult to define sample as a ‘randomized’ sample. Therefore, findings on benefits of social support from these samples may not be due to the social support per se, but it can be due to their characteristics described above. Hence, the non-randomized samples can produce conflicting results in the social support findings. In addition, contradictory findings may be due to the use of different measures of stressors, support, and distress outcomes.

More importantly, as described earlier, the use of cross-sectional design may produce conflicting results in caregiving studies. The degree or nature of stressors

intensifies over time, and the relationship among stressors may be modified and intertwined over the period of caregiving. According to the stress-buffering model, for instance, a higher level of social support attenuates the distress level when in high stress. However, what is exactly interacting with social support? Is it the stressor due to caregiving or depressive symptoms? In other words, is it possible that the depressed or anxious appearance of caregivers encourages other people to help them? If such is the case, it is not the actual stressors interacting with higher level of social support. Instead, it may be the depressive symptoms interacting with social support. For this reason, when studying the effects of social support in caregiving research, it is very important to separate the effect of caregivers' depressive symptoms from their stressors. Hence, assessing the measures at the same time makes it difficult for researchers to differentiate the effects of depressive symptoms from caregivers' stressors.

In addition, it is possible that the ones who use the most support and receive benefits from it may be the most distressed caregivers. Although they may get benefits and show some improvement, they still may report more distress than others who are less distressed at the baseline. Nevertheless, if all the variables, such as caregivers' depressive symptoms and their use of social support, are measured at the same time, it is difficult for researchers to investigate whether the ones who needed the most support actually 'improved' their sense of well-being.

Lastly, very few studies have actually looked at whether social support *changes* over time in the caregiving stress process. Intuitively, it is possible to assume that caregivers who experience more stressors seek for more help. In other words, social support may change as with the level or dynamics of caregiving stressors change over

time. In addition, it may be possible that depending on which way the social support changes, the effect of social support on caregivers' psychological well-being may increase or decrease. Unfortunately, up to date, the research on caregiving primarily focused on the how stressors develop throughout caregiving, and very few studies have actually looked at how social support changes in accordance with the stressors.

Taken all together, the social support seeking/receiving model (mobilization model) is an alternative model to examine the dynamics of social support and its effect over time. An essential feature of this model, as described above, is that the support is dependent on the level of stress. Conceptually, mobilization suggests that a stressor motivates people to seek and/or demand more support, which, in turn, reduces their stress level overall. Applying the concept to the caregiving situation, the stressors evolving from providing care to the demented relative can create a circumstance in a person's life that lead to use support. Accordingly, a longitudinal study is needed to examine these methodological and conceptual problems. By doing so, it is possible to 1) find out whether there is a mobilization in social support, and 2) find out if caregivers actually receive benefits by using support.

Given these methodological and conceptual issues, with using longitudinal data, the purpose of current study is to investigate 1) whether there is any changes in social support over time, 2) the predictors of different types of mobilized social support, and finally, 3) whether mobilized social support reduces/modifies the effect of subjective stressors on caregivers' mental health.

## CHAPTER 3. METHODS

### 3.1 Procedure

The current study is based on the data from the Caregiver Stress and Coping Study (Aneshensel, 1995), a longitudinal study of the caregivers of dementia patients living in Southern and Northern California. Potential participants were identified through local Alzheimer's Disease and Related Disorders Associations (ADRDA) in the San Francisco and greater Los Angeles areas and through the Family Caregiver Alliance in the San Francisco area. Participants were contacted through telephone screenings to determine whether or not an individual met the criteria of the study and was willing to participate. Eligibility criteria were as follows: (1) the care recipient had to have a confirmed physician diagnosis of Alzheimer's disease or another progressive dementing illness; (2) the caregiver had to be the spouse or adult child (including daughters- and sons-in-law) of an elderly relative suffering from dementia; and (3) the participant had to be the *primary caregiver* of a *noninstitutionalized* spouse, parent, or parent-in-law at the time of *initial screening*. Primary caregivers refers to spouses who were not suffering from a serious physical or mental debilitation that inhibited them from providing assistance, or adult children who shared a household with the debilitated care recipient, or adult children who lived in a household separate from the care recipient but had primary care responsibilities. The data were collected by means of a multi-wave panel survey. Five in-person interviews were conducted at 1-year intervals beginning in 1988. For this particular study, Time 1 (baseline) and Time 2 data were utilized.

## **3.2 Sample**

Five hundred and fifty-five primary caregivers, all of whom were caring for their relatives at home, were interviewed at Time 1 of the Caregiver Stress and Coping Study. Over the one-year period, 100 relatives with dementia were institutionalized (institutionalized by time 2 sample) and 74 died at home (bereavement sample). Over the one-year period, 29 caregivers were lost to follow up. Individuals who continued to care for their elderly relatives with dementia in the community were administered a yearly interview at time 2, creating a longitudinal sample of 352 caregivers (continuing care sample).

For the current study, continuing care sample was used when the following variables were examined: mobilized informal instrumental support, mobilized emotional support, and mobilized formal service use. Both continuing care and institutionalized samples were utilized when the institutionalization variable was examined.

## **3.3 Measures**

### **3.3.1 Background characteristics**

Current study included following background characteristics of caregivers in the analyses: relationship to relative, race of caregiver, duration of help before the baseline interview, employment status, education, and income of caregivers, respectively. The decision to include listed sociodemographic variables into the analyses were based on Pearlín's caregiving stress process model, and Andersen's health utilization model.

In addition to the background characteristics, participants were assessed on

measures of five different types of social support (informal instrumental support with patient help, informal instrumental support with household chores, emotional support, formal service use, and institutionalization at time 2), objective stressors (relative's cognitive impairments, problem behaviors, and ADL dependency), subjective stressors (role captivity, and role overload), , and negative mental health outcomes (depression, anger and anxiety). Like sociodemographic variables, the decision to select the listed measures was based on Pearlin's caregiving stress process model and Andersen's health utilization model.

### **3.3.2 Mobilized Social Support**

Five types of social support – informal instrumental social support with patient care, informal instrumental social support with household chores, socioemotional support, formal service use and institutionalization – were measured. As mentioned earlier, continuing care sample was utilized when following variables were examined: 1) informal instrumental social support with patient care, 2) informal instrumental social support with household chores, 3) socioemotional support, and 4) formal service use. Both continuing care and institutionalization samples were used when 'institutionalization' was analyzed.

When predictors of mobilized social support (research question 1) were examined, mobilized social support was used as a dependent variable. In examining whether mobilized social support mediated the relationship between subjective stressors and mental health outcomes (research question 2), mobilized social support was used as a mediator. When investigating if the effect of subjective stressors vary as a function of

mobilized social support on mental health outcomes (research question3), mobilized social support was used as a moderator variable.

#### *3.3.2.1 Informal instrumental social support with patient care*

One question was asked to measure informal instrumental social support with patient care: is there a relative or a friend who helps the caregiver with care-related matter such as bathing or dressing on a regular basis? The response categories were either yes or no. Scores for mobilized support were created by subtracting the response from time 2 to time 1. The computed score for mobilized support ranged from -1 (decreased mobilization), 0 (no change), and 1 (mobilization). The focus of this study was on the ‘mobilization’ of support, this measure was combined into two groups: whether caregivers mobilized or not.

#### *3.3.2.2 Informal instrumental social support with household chores*

One question was asked to measure informal instrumental social support with household chores: is there a relative or a friend who helps caregiver with household chores such as cleaning on a regular basis? The response categories were either yes or no. Scores for mobilized support were created by subtracting the response from time 2 to time 1, ranging from -1 (decreased mobilization) to 1 (mobilization). The focus of this study was on the ‘mobilization’ of support, this measure was combined into two groups: whether caregivers mobilized or not.

#### *3.3.2.3 Socio-emotional social support*



It is defined as affective assistance provided by relatives or friends of the caregiver. The items include 1) there is really no one who understands what you are going through, 2) the people close to you let you know they care about you, 3) you have people around you that help you to keep your spirits up, 4) there are people in your life that make you feel good about yourself, 5) you have a friend or relative in whose opinions you have confidence, 6) you have someone that you feel you can trust, 7) you have at least one friend or relative you can really confide in, and 8) you have at least one friend or relative you want to be with when you are feeling down or discouraged. For one item (“there is no one who understands what you are going through”) the scoring was reversed to match the other items in the scale. Ratings were made on a 4-point scale that ranged from “strongly disagree” (1) to “strongly agree” (4) ( $\alpha = .76$ ). Scores for socioemotional support were created by summing the responses and taking the mean item score.

Scores for mobilized emotional support were computed by subtracting a score from time 2 to the score from time 1. Computed scores ranged from -2 (less mobilized social support) to 2 (more mobilized social support).

#### *3.3.2.4 Formal service use*

The variable contains 9 different formal services. The original response categories ranged from “don’t use” (6) to “every couple of month” (5), “every month” (4), “1-2 times a week” (3), “3 times a week” (2), and “4 times or more a week” (1). To make the interpretation easier, variables were reversely recoded. After recoding, the response categories ranged from “don’t use” (0) to “4 times or more a week” (5). Scores for formal

service use were created by summing the responses. Scores for mobilized formal service use were created by subtracting a summed score at time 2 to a summed score at time 1. The computed score ranged from -15 (less utilized service use) to 15 (more utilized service use).

#### *3.3.2.5 Institutionalization by time 2*

When this particular variable was evaluated, both caregivers who continued providing care to their relatives at time 2 and who institutionalized their relatives by time 2 were combined together and used. Caregivers who placed their relatives by time 2 were coded as 1, whereas the caregivers who provided care to their relative at time 2 were coded as 0.

### **3.3.3 Mental Health Outcomes**

The burdens associated with the care of a cognitively impaired older adult may result in several negative mental health outcomes (Pearlin et al., 1990). Three negative mental health outcomes were measured in the current study.

#### *3.3.3.1 Depression*

Depression covers feelings of hopelessness, loss of appetite and energy, boredom, depressed mood, loneliness, and other indicators of depressive symptomology.

Depression was measured on a seven-item scale derived from the Hopkins Symptom Checklist (Derogatis, Covi, Lipman, & Rickels, 1971). Caregivers were asked how often symptoms of depression have occurred in the last week and responded on a four-point

scale, with four representing “5 or more days”, three referring to “3 or 4 days,” two representing “1 or 2 days,” and one referring to “no days” ( $\alpha = .85$ ).

Scores for depression were created by summing the responses and taking the mean item score. Scores for changed depression were computed by subtracting scores from time 2 from scores from time 1. The range of computed scores was from -2 (worsen in depression) to 2 (improvements in depression).

#### *3.3.3.2 Anger*

Anger was derived from the Hopkins Symptoms Checklist as a four-item scale (Derogatis et al., 1971). Items cover feelings of irritability, annoyance, and impatience ( $\alpha = .76$ ). Caregivers were asked how often these feelings have occurred in the last week, with responses ranging from “not at all” (1) to “very much” (4). Scores for anger were created by summing the responses and taking the mean item score. Scores for changed anger were computed by subtracting scores from time 2 from scores from time 1. The range of computed scores was from -3 (worsen in anger) to 3 (improvements in anger).

#### *3.3.3.3 Anxiety*

Anxiety was derived from the Hopkins Symptoms Checklist as a three-item scale (Derogatis et al., 1971). Items cover feelings of restlessness, nervousness, and tension ( $\alpha = .79$ ). Caregivers were asked how often these feelings have occurred in the last week, with responses ranging from “not at all” (1) to “very much” (4). Scores for anxiety were created by summing the responses and taking the mean item score. Scores for changed anxiety were computed by subtracting scores from time 2 from scores from time 1. The

range of computed scores was from -3 (worsen in anxiety) to 2 (improvements in anxiety).

### **3.3.4 Objective stressors**

As dementia progresses, elderly relatives may exhibit a number of physical, emotional, and behavioral problems that require assistance from family caregivers. Consequently, these increased demands for help may result in caregiver stress. Three primary objective stressors (cognitive impairments, problematic behavior, and Activity of Daily Living dependencies) were measured in this study.

#### *3.3.4.1 Cognitive impairment*

Cognitive impairment refers to the range and difficulty of relatives' memory loss, communication deficiencies, and recognition failure (Aneshensel et al., 1995). A seven item scale that measures the severity of impairment among relatives was included ( $\alpha = .86$ ). The questions asked how difficult is it for your (relative) to remember recent events, know what day of the week it is, remember his or her home address, or words, understand simple instructions, find way around the house, and speak sentences. Responses ranged from "not at all difficult" (0) to "can't do at all" (5).

#### *3.3.4.2 Problem behaviors of dementia patients*

Problem behavior of dementia patients represents the troublesome and disruptive behaviors that may occur as a result of the relative's dementia. A fourteen-item scale gauging how often care recipients exhibit behavioral problems in the past week was used

for the current analysis ( $\alpha = .78$ ). Questions considered relative's agitation, restlessness, and bladder problems. Responses ranged from "no days" (1) to "5 or more days" (4).

#### *3.3.4.3 Activity of Daily Living (ADLs)*

Activities of daily living dependencies represent the amount of assistance elderly relatives require for basic tasks (Aneshensel, 1995). Caregivers were asked how much care recipients relied on them to complete fifteen basic tasks such as bathing or showering, going to the bathroom, dressing, and cooking. Responses ranged from "not at all" (0) to "completely" (4) ( $\alpha = .89$ ). Scale scores for primary objective stressors were created by summing the responses and taking the mean item scores.

### **3.3.5 Subjective stressors**

A substantial body of caregiving studies suggests that caregivers' reactions to stressors (rather than the objective severity of dementia patients' impairments) have stronger associations with their distress. In the caregiving stress model, role captivity and role overload are presented as appraisals of stressors (subjective stressors). Accordingly, in the current study, these two variables were used to measure subjective stressors of caregiving.

#### *3.3.5.1 Role captivity*

Role captivity focuses on the involuntary aspects of caregiving: individuals are obliged to do one thing (care for a debilitated relative) when they would rather do something else (Aneshensel, 1995). What differentiates role captivity from role overload

is that role captivity refers less to the demanding responsibilities associated with care, which are captured by role overload, and more to the fact that these responsibilities are experienced as *obligatory*. The distinguishing characteristic of role captivity, therefore, is not that the role is difficult or stressful but that the role is unwanted (Aneshensel et al., 1995). Three items were asked to measure role captivity; 1) do you wish you were free to lead a life of your own, 2) do you feel trapped by your relative's illness, and 3) do you wish you could just run away. Ratings were made on a 4-point scale that ranged from "not at all" (1) to "very much" (4). ( $\alpha = .79$ )

#### *3.3.5.2 Role overload*

Role overload occurs when individuals feel overwhelmed and worn-out by caregiving responsibilities. A three-item scale was utilized to measure caregivers' feelings of emotional and physical fatigue ( $\alpha = .74$ ). The response categories ranged from "not at all" (1) to "completely" (4). Scores for the role captivity and role overload scales were created by summing responses and taking the mean item scores.

#### *3.3.5.3 Self-rated health status of caregivers*

One question was asked to the caregivers to measure self-rated health status: how do you rate your health overall? The response ranges from poor (1) to excellent (4).

### **3.4 Statistical Analyses**

The analysis for this study proceeded in four steps. First, preliminary statistics were examined to explore the characteristics of the sample and to analyze attrition of the

sample from time 1 to time 2. Series of chi-squares (if the variables were categorical) or Analysis of Variance (if the variables were continuous) were conducted to investigate the attrition. If necessary, a Hochberg's GT2 post-hoc test was used to determine which, if any, of the group means were significantly different from the others.

Second, hierarchical regression analyses were conducted to investigate the predictors of mobilization. Prior to make decision on which type of regression analysis should be used, distributions of mobilized social support (dependent variable) were examined. Depending on the distribution of the dependent variables, 1) if a dependent variable (mobilized social support) was dichotomous, hierarchical binary logistic regression analyses were used, and 2) if the dependent variable was normally distributed and continuous, hierarchical ordinary least squares regression analyses were used. All equations were estimated according to the following procedures: relationship to relative, sociodemographic variables (caregiver's race, caregiver's employment status, caregiver's education, and caregiver's income), and duration of help, respectively, were entered on Step 1, followed by the objective stressors (cognitive impairments, problem behaviors, and ADL dependencies) on Step 2. On the last step, subjective stressors (role captivity, and role overload), and the caregiver's self-rated health were entered respectively. Separate analyses for spouses and non-spouses were performed only if the 'relationship to relative' variable was significant in the analysis. Variables with the highest p-values were removed, one at a time, to develop the final model.

Next, to test whether mobilized social support mediates the effect of subjective stressors on mental health outcomes, Baron and Kenny (1986)'s mediation testing technique was used. According to Baron et al. (1986), three separate ordinary least

squares regression analyses are needed to examine the mediation: 1) mediator variable (mobilized social support) is regressed on the independent variable (subjective stressor), 2) dependent variable (mental health outcome) is regressed on the independent variable (subjective stressor), and 3) dependent variable (mental health outcome) is regressed on the mediator variable (mobilized social support) and independent variable. To establish mediation, all three equations must show statistical significance. If these conditions all hold, then the effect of the independent variable on the dependent variable must be less in the third equation than in the second.

Since the first part of the analyses on the predictors of mobilized social support provides the information for the first equation in the mediation testing, further testing of the second and third equations were carried out only if the subjective stressors significantly predicted mobilized social support from the first equation. If all three equations were significant and if the effect of the independent variable on the dependent variable was reduced once the mediator was included, the degree to which the mediator explained the direct effect of the independent variable on the dependent variable was examined by using Mackinnon and Dwyer (1993)'s equation.

Finally, hierarchical ordinary least squares regressions were used to test the moderating effect of mobilized social support. All equations were estimated according to the following procedures: relationships to relative, sociodemographic variables (caregiver's race, employment status, education, and income), duration of help, and mental health outcome at time 1 were entered on Step 1, respectively. On step 2, the objective stressors (cognitive impairments, problem behaviors, and ADL dependencies) were entered, respectively. On step 3, subjective stressors (role captivity, and role



overload), and caregiver's self-rated health were entered respectively. On the last step, the moderator variable (mobilized social support) and the interaction between subjective stressors and mobilized social support were entered. Subjective stressor variables (role captivity and role overload) and the moderator variable (mobilized social support) were centered, to reduce the problem of multicollinearity, a procedure recommended by Aiken and West (1991). The interaction term was computed by multiplying centered mobilized social support and centered subjective stressors. Separate analysis was conducted for each dependent variable (changes in depression, anger, and anxiety). Variables with the highest p-values were removed, one at a time, to develop the final model.

## CHAPTER 4. RESULTS

This chapter is composed of three parts. The first part of the chapter describes the characteristics of samples and analyzes attrition of the sample from time 1 to time 2. The second part of the chapter presents the results of predictors of five different types of mobilization; 1) mobilized informal instrumental social support with patient help, 2) mobilized informal instrumental social support with household chores, 3) mobilized emotional support, 4) mobilized formal service use, and 5) institutionalization at time 2. The last part of the chapter describes the results of the mediation and moderation effects of mobilized social support on mental health outcomes.

### 4.1 Descriptive Statistics

Among the 555 caregivers in the sample at the baseline, 100 caregivers institutionalized their relatives, and another seventy-four caregivers experienced the death of the relatives over a one-year period. Twenty nine caregivers were lost to follow up from Time 1 to Time 2. Demographic information for these three groups is shown in Table 1. For analyses of ‘mobilized social support’, the resulting sample was comprised of 352 caregivers who continued providing care to their relatives at home at Time 2. The mean age of this continuing care group was 61.30 years ( $SD = 12.58$ ). Caregivers first began caring for their relatives an average of 3.02 ( $SD = 2.16$ ) years before the baseline interview. Eighty-four percent ( $n=297$ ) were white caregivers and more than over eighty percent of caregivers received high school education and higher. Of 352 caregivers in the sample, 212 caregivers (60.2%) were spouses. Annual household incomes ranged from poverty level to affluent, with a median income of \$ 27,500.

The resulting sample for analyses of ‘institutionalization’ was comprised of 452 caregivers (352 caregivers in the continuing care and 100 caregivers who institutionalized the relatives by Time 2). The mean age was 61.09 years ( $SD = 12.95$ ). Caregivers first began caring for their relatives an average of 2.9 ( $SD = 2.33$ ) years before the baseline interview. Eighty three percent were white caregivers and more than over seventy of caregivers received high school education and higher. Of 452 caregivers in the sample, 57.5% were spouse caregivers.

Next, attrition effects were analyzed. Specifically, tests were conducted to investigate whether there is a selection trend that characterizes those who died or were institutionalized compared to the continuing care group at time 2.

To test the attrition effects, chi-square analyses were used to compare group differences in caregiver characteristics that were categorical variables (i.e., caregiver relationship to relative, race, education, and work status, respectively) among continuing care, placement, and bereavement groups. The results of chi-square analyses showed that there was a relationship between caregivers’ race and group,  $\chi^2(12, N = 555) = 22.14, p < .05$ . Caregivers in the bereavement group had the highest percentage of white caregivers (86.5%). In addition, the percentage of caregivers who were working differed by groups,  $\chi^2(10, N = 545) = 10.17, p < .01$ . Caregivers in the bereavement group had the highest percentage of non-working caregivers (74%).

Since caregiver’s age and duration of providing care to relatives before the baseline interview (in years) were continuous variables, Analysis of Variance (ANOVA) were conducted to examine if three groups differed. Because sample sizes were different among three groups, a Hochberg’s GT2 post hoc test was used to determine which, if

any, of the means were significantly different from the others. The results from the ANOVA suggested that the mean ages of caregivers were statistically different among three groups ( $F(2, 522) = 4.11, p < .05$ ). A Hochberg's GT2 post hoc test showed that caregivers in bereavement group were older ( $p < .05$ ) than other two groups. The mean of duration of help, however, did not differ among three groups,  $F(2, 520) = .265, p > .05$ .

Additional analyses of variance (ANOVAs) were conducted on objective stressors at time 1, subjective stressors at time 1, and negative mental health status to examine mean differences among three groups. Descriptive statistics are shown in Table 2. Statistically significant mean differences were found among three groups in problem behaviors ( $F(2, 522) = 10.54, p < .000$ ), ADL dependencies ( $F(2, 521) = 6.28, p < .000$ ), cognitive impairment ( $F(2, 523) = 16.70, p < .000$ ), and role captivity ( $F(2, 522) = 14.15, p < .000$ ). A Hochberg's GT2 post hoc test showed that caregivers in the bereavement group reported more cognitive impairment than other two groups ( $p < .000$ ). With regard to problem behaviors, a Hochberg's GT2 post hoc test suggested that caregivers in the institutionalization group experienced more problem behaviors than other two groups ( $p < .05$ ). A Hochberg's GT2 post hoc test confirmed that caregivers in continuing care experienced less ADL problems when compared to bereavement group ( $p < .005$ ). Lastly, a Hochberg's GT2 post hoc test illustrated that caregivers in the placement group reported the highest role captivity when compared to other two groups ( $p < .000$ ).

Overall, compared to other two groups, bereavement group had more wives who were caring for their husbands with more cognitive impairment and more ADL dependencies. Differences between continuing care sample and institutionalization

sample will be explored more in the further analyses. Correlations among predictors and mobilized social support are provided in Tables 3, 4, and 5.

**Table 1 Demographic Information for the three Samples**

Caregiver Characteristics	Time 1	Time 2		
	(%) (N=555)	Continue care (n=352)	Institutionalization (n=100)	Bereavement (n = 74)
Relationship to relative				
Wife	34.2	33.5	30.0	40.5
Husbands	24.5	26.7	18.0	23.0
Daughter	31.2	31.3	36.0	28.4
Daughter-in- law	3.2	2.3	8.0	2.7
Son	6.7	6.3	7.0	5.4
Son-in-law	0.2		1.0	
Age: Spousal caregivers				
< 65	22.8	28.8	14.6	4.3
65 – 74	45.5	49.0	47.9	38.3
> 74	31.7	21.7	37.5	55.3
Age: Adult child				
< 45	27.2	26.6	30.8	25.9
45-54	39.0	41.0	36.5	37.0
55 and older	33.8	30.2	32.7	25.9
Race				
White	83.8	84.4	81.0	86.5
African American	10.6	11.6	7.0	9.5

Caregiver Characteristics	Time 1 (%) (N=555)	Time 2 (%)		
		Continue care (n=352)	Institutionalization (n=100)	Bereavement (n = 74)
Hispanic	3.1	1.1	4.0	2.7
Asian American and other	2.5	2.8	8.0	1.4
<b>Education</b>				
< high school	13.4	11.1	12.0	20.3
High school	19.9	26.7	29.0	31.1
Some college	33.7	27.0	24.0	23.0
College or more	33.0	34.9	35.0	25.7
<b>Employment status</b>				
Employed	33.3	35.2	39.0	24.3
Not employed	66.7	62.8	59.0	74.3
<b>Income</b>				
Less than 20,000	31.1	31.5	34.7	31.4
20,000 – 40,000	36.9	35.5	35.7	48.6
40,000 – 60,000	15.1	15.1	18.4	14.3
Greater than 60,000	16.9	17.9	11.2	5.7
<b>Duration of help before the time of first interview (in years)</b>				
Less than two yrs	24.5	24.9	16.0	20.3
2 – 4 yrs	36.4	35.8	44.0	31.1

Caregiver Characteristics	Time 1 (%) (N=555)	Time 2 (%)		
		Continue care (n=352)	Institutionalization (n=100)	Bereavement (n = 74)
4 – 8 yrs	31.2	30.4	31.0	36.5
8 yrs and more	7.5	8.2	5.0	6.8



**Table 2 Descriptive Statistics on Objective and Subjective Stressors and Mental Health Outcomes**

Variables	Caregiver sample	N	Mean	Std.
Problem behaviors	continuing care	351	1.91	.57
	placement	100	2.21	.58
	bereavement	74	1.98	.61
ADL dependencies	continuing care	352	2.54	.76
	placement	99	2.71	.67
	bereavement	73	2.85	.78
Cognitive impairment	continuing care	352	2.09	.89
	placement	100	2.21	.77
	bereavement	74	2.72	.75
Role captivity	continuing care	351	2.26	1.0
	placement	100	2.81	.93
	bereavement	74	2.14	.98
Role overload	continuing care	352	2.54	.93
	placement	100	2.72	.89
	bereavement	74	2.65	.97
Caregiver's self-rated health	continuing care	352	2.96	.80
	placement	98	3.05	.76
	bereavement	74	2.97	.84
Depression at time 1	continuing care	350	1.78	.72

	placement	100	1.94	.77
	bereavement	74	1.87	.68
<hr/>				
	continuing care	350	1.54	.61
Anger at time 1	placement	100	1.64	.66
	bereavement	74	1.62	.73
<hr/>				
	continuing care	350	1.74	.75
Anxiety at time 1	placement	100	1.83	.80
	bereavement	74	1.79	.83
<hr/>				

**Table 3 Correlation among Objective and Subjective Stressors**

	1. Cognitive difficulty	2. Problem Behavior	3. Total ADLs	4. Overload	5. Captivity
1	1	.067	.614***	.075	.063
2		1	.250***	.348***	.312***
3			1	.108***	.077
4				1	.313***
5					1

**Table 4 Correlation among Mental health at time 1 and changes in Mental Health from time 1 to time 2**

	1 Depression at time 1	2 Anger at time 1	3 Anxiety at time 1	4 Changes in depression	5 Changes in anger	6 Changes in anxiety
1	1	.601***	.768***	.451***	.177***	.219***
2		1	.567***	.231***	.547***	.181***
3			1	.239***	.129**	.401***
4				1	.403***	.486***
5					1	.329***
6						1

**Table 5 Correlation among Objective and Subjective Stressors and Mobilized Social Support**

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
	Cognitive difficulty	Problem Behavior	Total ADLs	Overload	Captivity	Pt help <sup>1</sup>	Chore <sup>2</sup>	Emotional <sup>3</sup>	Formal <sup>4</sup>	Placement At time 2
1	1	.046	.621***	.087*	.034	.059	-	.048	-.057	.004
							.172***			
2		1	.232***	.331***	.267***	-.003	-.014	.044	.047	.191***
3			1	.160***	.050	.115	-.119*	.086*	-.085	.061
4				1	.304***	.228*	-.108*	.097*	-.085	.068
5					1	-.162	-.067	.021	.001	.221***
6						1	.111	.056	.053	
7							1	-.086	.035	
8								1	-.105	-.016
9									1	
10										1

<sup>1</sup> Mobilized informal instrumental support with patient care

<sup>2</sup> Mobilized informal instrumental support with household chores

<sup>3</sup> Mobilized emotional support

<sup>4</sup> Mobilized formal service use

## 4.2 Predictors of Mobilized social support

### 4.2.1 What are the predictors of mobilized informal instrumental support with *patient help*?

At time 1, all caregivers responded to the question whether they have relative or friends who help with patient care. However, at time 2, almost 67% of caregivers did not respond to the question. Therefore, for this particular question, only 32.7% of caregivers were included. Distribution of mobilized informal instrumental support with *patient care* was examined first. Among those who responded both at time 1 and time 2 (32.7%), the distribution showed that 3.7% of caregivers *increased* in the use of informal instrumental support with patient care, and 14 % of caregivers showed a decrease in using support. Fifteen percent of caregivers showed no change in using instrumental support with patient care from time 1 to time 2. Not reported in the tables is a series of multinominal regression sub-analyses. An attempt was made to analyze the data with using a multinominal regression since the dependent variable (mobilized informal instrumental support with patient care) formed three groups. However, the number of caregivers in the increased support group (n=13) and decreased support group (n=14) were too small to analyze, and so it was not possible to use multinominal regression.

Instead, multiple binary logistic regression analyses were conducted to examine the predictors for mobilized caregiver group and not-mobilized caregiver group. The results are shown in Table 6. The final model was significant ( $\chi^2(11, N = 79) = 28.69, p < .005$ ). Among the eleven variables which were included in the final model, employment status, ADLs dependency, and role overload positively predicted the mobilized use of informal instrumental

help with patients' care. Duration of providing help and role captivity negatively predicted the mobilized use of informal instrumental help with patients' care. The odds ratio of employment status was 66.35, which indicates that the odds that working caregivers mobilize social support was 66 times higher than non-working caregivers. Caregivers experiencing more ADL dependencies are 12 times more likely to mobilize instrumental support with patient care. The odds ratio for role overload was 11.19 which indicate that a one unit increase in role overload increased the odds that caregivers mobilize social support by approximately 11 times. One unit increase in duration of help, on the other hand, decreased the odds that caregivers mobilize social support. An increase in role captivity in caregivers also leads to decreased odds of caregivers' mobilization of support.

#### **4.2.2 What are the predictors of mobilized informal instrumental support *with household chores*?**

First, distribution of mobilized informal instrumental support with *household chores* was examined. The distribution showed that 21 % of caregivers decreased in the use of informal instrumental support with household chores, where as 20 % increased in use of instrumental support. More than half of caregivers showed no changes in using instrumental support with household chores (58.5%). In addition, the variability in the amount of changes was very small (SD = .60).

Multiple binary logistic regression analyses were used. The results are shown in Table 7. The final model was significant ( $\chi^2(10, N = 327) = 50.84, p < .000$ ). Among the ten variables which were included in the final model, caregiver relationship to relative and income positively

predicted the mobilized use of informal instrumental help with household chores. Cognitive impairment negatively predicted the mobilized use of informal instrumental help with household chores. Being a spouse caregiver increased the odds that caregivers mobilize social support by 2 times. The odds ratio for income was 2.16. This finding indicates that a one unit increase in income increased the odds that caregivers mobilize support approximately by 2 times. A one unit increase in cognitive impairment, however, decreased the odds of caregivers to mobilize social support.

Since the ‘caregiver relationship to relative’ variable was a significant predictor, further analyses were conducted separately for spouse caregivers and non-spouse caregivers. The final model for non-spouses was significant ( $\chi^2(10, N = 136) = 26.11, p < .005$ ). Among ten variables which were included in the final model, only cognitive impairment was significant ( $p < .30$ ). The odds ratio was .29, which indicates that increases in cognitive impairment decreased the probability of non-spouse caregivers to mobilize social support.

The final model for spouses was significant ( $\chi^2(9, N = 198) = 26.31, p < .005$ ). Among the nine variables which were included in the final model, income was the only significant predictor ( $p < .05$ ). The result suggests that as one unit increases in income increased the odds of spouse caregivers to mobilize social support by 2 times.

#### **4.2.3 What are the predictors of mobilized emotional support?**

Prior to analyze the predictors of mobilized emotional support, distribution of the change score of emotional social support from time 1 to time 2 was examined. The results are shown in Table 8. The distribution showed that 42 % of caregivers actually decreased in emotional

support, whereas 40% of caregivers increased emotional support. Eighteen percent of caregivers showed no changes in emotional support from time 1 to time 2. However, it must be noted that although there were some changes in emotional support, the variability in the amount of changes was very small ( $SD = .46$ ).

Hierarchical ordinary least squares regression analyses were used to evaluate the relationship between a set of hypothesized predictors and the dependent variable (mobilized emotional social support). The final model was not statistically significant ( $F(5, 336) = .92, p > .05$ ). Five variables were included in the final model of the analysis: caregiver relationship to relative, employment status, race, ADL dependencies, and role overload. The results are shown in Table 9. No variables reliably predicted the mobilization of emotional support.

The results, however, were not surprising. As mentioned earlier, given the stability in the data of mobilized emotional support, it was somewhat expected that it is very difficult to investigate the predictors of 'changes' in emotional support from time 1 to time 2 when in fact there is a very little change to start with. As an alternative, emotional support at time 2 was analyzed. For these analyses, emotional support at time 2 was used as a dependent variable to examine which variables at time 1 are associated with the emotional support at time 2. The results are shown in Table 9. The final model was significant ( $F(9,336) = 3.69, p < .000$ ). Among nine variables which were included in the final model, cognitive impairment and self-rated health positively predicted the emotional support at time 2. To be more specific, more cognitive impairment in a demented relative was related to higher emotional support at time 2. Likewise, better caregiver's self-rated health was associated with higher emotional support at time 2.



#### **4.2.4 What are the predictors of mobilized formal service use?**

Distribution of formal service use at time 1, formal service use at time 2, and change score of formal service use were examined. The results are shown in Table 10. Forty-nine percent of caregivers did not use formal services at all at time 1 and 38.3% of caregivers did not use formal services at all at time 2. Among 117 caregivers who did not show any changes in formal service use ( $\Delta = 0$ ), 77% did not use formal services at both times. From the distribution of the data, more than one-third of caregivers did not use services at each time point.

Hierarchical ordinary least squares regression analyses were used to evaluate the relationship between a set of hypothesized predictors and the dependent variable (mobilized formal service use). The final model was not statistically significant ( $F(8, 335) = 1.49, p > .05$ ). Role overload, however, significantly predicted mobilization of formal service use ( $B = -.50, SE = .34, p > .05$ ). More role overload was associated with less mobilization of formal support. The results are shown in Table 11.

#### **4.2.5 What are the predictors of institutionalization at time 2?**

Multiple logistic regression analyses were used. The results are shown in Table 12. The final model was significant ( $\chi^2(9, N = 422) = 52.16, p < .000$ ). Among the nine variables which were included in the final model, income, problem behaviors, and role captivity significantly predicted institutionalization. One unit increase in income increased the odds of caregivers to institutionalize relatives by approximately 2 times. The odds ratio for problem behaviors was 1.86. This finding indicates that a one unit increase in problem behavior increased the odds that

caregivers institutionalize their relatives by 1.9 times. A one unit increase in role captivity increased the odds that caregivers institutionalize their relatives by 1.7 times.

**Table 6 Predictors of Mobilized Informal Instrumental Support with *Patient Help***

Independent variables	B	SE	Exp (B)
Step 1			
Relationship to relative	3.64	1.94	38.12
Race	1.38	2.53	3.98
Duration of help	-1.02	.50	.36*
Employment status	4.19	1.67	66.35*
Education			
Income	.54	1.02	1.71
Step 2			
Cognitive impairment	-.49	.97	.62
Problem behaviors	-.88	1.43	.42
Total ADLs	2.52	1.15	12.43*
Step 3			
Role captivity	-1.77	.76	.17*
Role overload	2.42	.93	11.19**
Caregiver's self-rated health	1.98	1.20	7.23
(constant)	-20.08	8.74	.000

**Table 7 Predictors of Mobilized Informal Instrumental Support with Household Chores:  
Spouses vs. Others**

Independent variables	All (N=327)			Non-spouses (n=136)			Spouses (n=198)		
	B	SE	Exp (B)	B	SE	Exp (B)	B	SE	Exp (B)
<b>Step 1</b>									
Relationship to relative	.88	.39	2.42*						
Race	-.95	.55	.39	-	.91	.36	-1.50	.98	.22
				1.01					
Duration of help	-.05	.08	.95	-.14	.16	.87			
Employment status	-.41	.38	.66				-.44	.48	.54
Education	.08	.08	1.09	.18	.19	1.20	.07	.09	1.07
Income	.77	.25	2.16**	.60	.43	1.83	.73	.29	2.08*
<b>Step 2</b>									
Cognitive impairment	-.50	.20	.61*	-	.58	.29*	-.26	.28	.77
				1.25					
Problem behaviors	.50	.30	1.64	.43	.61	1.54	.42	.36	1.52
Total ADLs				.40	.57	1.49	-.13	.35	.88
<b>Step 3</b>									
Role captivity				-.42	.37	.55	.16	.19	1.17
Role overload	-.22	.18	.80	-.68	.39	.51	-.12	.21	.88

Independent variables	All (N=327)			Non-spouses (n=136)			Spouses (n=198)		
	B	SE	Exp (B)	B	SE	Exp (B)	B	SE	Exp (B)
Caregiver's self-rated health	.16	.22	1.17	.22	.48	1.25			
(constant)	-2.52	1.47	.08	-.03	3.86	.97	-1.14	1.55	.32

**Table 8 Distribution of Emotional Support at time 1 and time 2**

	Distribution % (number of caregivers)
Changes in emotional support from time 1 to time 2	N=349
Decreased in emotional support from time 1 to time 2	42% (147)
No changes in emotional support from time 1 to time 2	18.1 % (63)
Increased in emotional support from time 1 to time 2	40 % (139)

Changes in emotional support ( $M=-.02$ ,  $SD = .46$ )

**Table 9 Predictors of Emotional Support**

Independent variables	DV: mobilized emotional support (N=341)			DV: emotional support at time 2 (N=335)		
	B	SE	Unstandardized Beta	B	SE	Unstandardized Beta
	<b>Step 1</b>					
Relationship to relative	.05	.06	.05	-.10	.06	-.09
Race	.04	.04	.05			
Duration of help				.01	.01	.02
Employment status	.09	.06	.09			
Education				.02	.01	.09
Income						
<b>Step 2</b>						
Cognitive impairment				.10	.04	.16*
Problem behaviors				.05	.05	.05
Total ADLs	.02	.03	.04	-.07	.05	-.10
<b>Step 3</b>						
Role captivity				-.04	.03	-.07
Role overload	.03	.03	.06	-.03	.03	-.04
Caregiver's self-rated health				.11	.04	.17**
(constant)	-.26	.13		2.90	.22	

**Table 10 Distribution of Formal Service Use at time 1 and time 2**

Variables	No use	Use	Total N
	% (number of caregivers)	% (number of caregivers)	
Formal service use at time 1	49 % (171)	51 % (181)	352
Formal service use at time 2	38.3 % (134)	61.7 % (116)	352
	Decreased use	No change	Increased use
	% (number of caregivers)	% (number of caregivers)	% (number of caregivers)
Changes in use of formal services from time 1 to time 2	28.9 % (101)	33 % (117)	37.8 % (132)
Formal service use at time 1 ( $M= 2.49, SD = 3.46$ )			
Formal service use at time 2 ( $M= 2.88, SD = 3.59$ )			
Changes in use of formal services from time 1 to time 2 ( $M= .38, SD = 3.65$ )			



**Table 11 Predictors of Mobilized Formal Service Use**

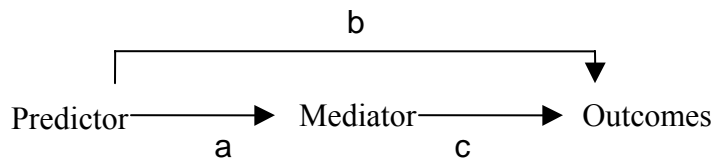
Independent variables	DV: mobilized formal service use (N= 335)		
	B	SE	Unstandardized Beta
Step 1			
Relationship to relative	.48	.42	.06
Race			
Duration of help	-.07	.09	-.04
Employment status			
Education			
Income	-.14	.28	-.03
Step 2			
Cognitive impairment	.17	.31	.04
Problem behaviors	.68	.38	.11
Total ADLs	-.63	.36	-.13
Step 3			
Role captivity			
Role overload	-.50	.34	-.13*
Caregiver's self-rated health	-.32	.27	-.07
(constant)	2.61	1.56	

**Table 12 Predictors of Institutionalization at time 2**

Independent variables	B	SE	Exp (B)
Step 1			
Relationship to relative			
Race	.30	.17	1.35
Duration of help	-.02	.06	.98
Employment status	-.26	.28	.77
Education	-.08	.07	.92
Income	.69	.20	2.00***
Step 2			
Cognitive impairment			
Problem behaviors	.62	.23	1.86**
Total ADLs	.22	.19	1.25
Step 3			
Role captivity	.53	.14	1.71***
Role overload			
Caregiver's self-rated health	.20	.17	1.22
(constant)	-6.28	1.05	.00

### 4.3 Mediation testing of Mobilized social support

To establish mediation, a model needs to meet three criteria: 1) a significant direct effect between the predictor variable (subjective stressors) and the mediator (a), 2) a significant direct relationship between the predictor variable (subjective stressors) and the dependent variables (changes in mental health outcomes) (b), and 3) a significant effect of the mediator on the dependent variable (c). If these conditions all hold, then the effect of the independent variable on the dependent variable must be less in the third equation than in the second. Full mediation holds if the independent variable has no remaining effect when the mediator is controlled. Partial mediation is found when the relation of independent and dependent variable is reduced.



From the previous analyses which examined the predictors of each mobilized social support, the results suggested that subjective stressors (role captivity, role overload) are significantly associated with 1) mobilized informal instrumental support with patient care, and 2) institutionalization. Accordingly, only these two types of mobilized social support met the first criterion (a significant relationship between predictor variables and the mediator) for mediation. Thus, further investigations of mediation testing were pursued only with mobilized instrumental support with patient care and institutionalization.

### **4.3.1 Mobilized instrumental support with patient care**

#### *4.3.1.1 Direct effects*

Change in depression was the first dependent variable assessed in this series of direct effect tests. Neither role captivity nor role overload significantly predicted changes in depression. Change in anger was the second dependent variable assessed in this series of direct effect tests. Role captivity significantly predicted the changes in anger ( $B=.12$ ,  $SE = .03$ ,  $p<.000$ ). However, role overload did not show significant relationship to the change in anger. Similarly, role captivity also predicted the changes in anxiety whereas role overload did not have significant association with the changes in anxiety when it was examined as the third dependent variable ( $B= .08$ ,  $SE = .04$ ,  $p<.05$ ). All the results for these direct effects are presented in Table 13.

#### *4.3.1.2 Mediation Models*

Testing whether mobilized instrumental support with patient care mediated the relationship between role captivity and changes in depression was not pursued because role captivity did not have any significant direct effect on the outcome. Mediation testing of mobilized instrumental support with patient care on the relationship between role overload and changes in depression, anger, and anxiety were not performed because role overload did not show significant direct effect on any of the outcomes on the previous analyses. The results from the direct effects analyses did, however, support the decision to continue testing whether mobilized instrumental support with patient care mediated the relationship between role captivity and 1) changes in anger and 2) changes in anxiety.

Change in anger was regressed on the mobilized instrumental support with patient care

with using ordinary least squares regression analysis to test the full mediation model. The result is shown in Table 13. The finding suggested that the beta weight of role captivity on the changes in anger was reduced from .12 to .08 when mobilized support was included in the model. Because the effect of independent variable on the dependent variable decreased with the inclusion of the mobilized social support, it was tentatively concluded that the mobilized support functioned as a mediator. The second step in confirming mediation was to determine the degree to which the mediator explained the direct effect of the independent variable on the dependent variable with using an equation provided by Mackinnon and Dwyer (Equation 1; 1993). For this particular model, this equation determined that 85% of the direct effect between role captivity and changes in anger was explained by mobilized instrumental social support with patient care. Although a large amount of the original effect was mediated through mobilized social support, the beta weight for the effect of role captivity on changes in anger did not get reduced completely to zero, and therefore this should be considered as an example of partial mediation as opposed to full mediation.

Equation 1:

$$\% \text{ of total effect mediated} = \frac{\beta_{\text{mediator to DV}} \times \beta_{\text{IV to mediator}}}{(\beta_{\text{mediator to DV}} \times \beta_{\text{IV to mediator}}) + (\beta_{\text{direct effect of IV to DV}})}$$

The second test of mediation was designed to determine if mobilized support mediated the relationship between role captivity and changes in anxiety. Change in anxiety was regressed on the mobilized instrumental support with patient care with using ordinary least squares regression analysis to test the full mediation model. The result is shown in Table 13. The finding suggested that the beta weight of role captivity on the changes in anxiety increased from .08 to

.16 when mobilized support was included in the model. Although role captivity continued to have a significant direct effect on the change in anxiety even after the mobilized support was included, mobilized support did not have show statistical significance in the model. Accordingly, 1) because the effect of role captivity on the change in anxiety did not decrease when mediator (mobilized social support) was introduced, and 2) the mediator was not significant in the model, it was concluded that mobilized instrumental support with patient care did not function as a mediator in this model.

### **4.3.2 Institutionalization**

#### *4.3.2.1 Direct effects*

Change in depression was the first dependent variable assessed in this series of direct effect tests. Role captivity significantly predicted the changes in depression ( $B = .10$ ,  $SE = .03$ ,  $p < .000$ ). Change in anger was the second dependent variable evaluated in the series of direct effect tests. Role captivity also showed a significant direct effect to the changes in anger ( $B = .12$ ,  $SE = .03$ ,  $p < .000$ ). Change in anxiety was the last dependent variable examined in the series of direct effect tests. Similar to previous two findings, role captivity had a significant direct effect on the changes in anxiety ( $B = .12$ ,  $SE = .03$ ,  $p < .000$ ). The results for all three direct effects are presented in Table 14.

#### *4.3.2.2 Mediation Models*

Previous analyses of direct effect of role captivity on the outcomes supported the decision to continue testing whether institutionalization mediated the relationship between role captivity and 1) changes in depression, 2) changes in anger and 3) changes in anxiety.

The first test of the presence of mediation was designed to determine if institutionalization mediated the relationship between role captivity and changes in depression. Change in depression was regressed on institutionalization with using ordinary least squares regression analysis to test the full mediation model. The result is shown in Table 14. Although the finding suggested that the beta weight of role captivity on the change in depression decreased when mediator (institutionalization) was included, the amount of reduction was very small (only .01), and institutionalization was not significant in the model. Therefore, it was concluded that institutionalization did not function as a mediator in this model.

The second test of the presence of mediation was designed to determine if institutionalization mediated the relationship between role captivity and changes in anger. Change in anger was regressed on institutionalization with using ordinary least squares regression analysis to test the full mediation model. The result is shown in Table 14. The finding suggested that the beta weight of role captivity on the change in anger did not decrease at all (from .12 to .12) even when the mediator (institutionalization) was introduced. Accordingly, it was concluded that institutionalization did not have any influence on the relationship between role captivity and the change in anger.

The last test of the presence of mediation was designed to determine if institutionalization mediated the relationship between role captivity and changes in anxiety. Change in anxiety was regressed on institutionalization with using ordinary least squares regression analysis to test the full mediation model. The result is shown in Table 14. The finding suggested that although the beta weight of role captivity on the change in depression decreased when mediator (institutionalization) was included, the amount of reduction was very small (only .02), and

institutionalization was not significant in the model. Therefore, it was concluded that institutionalization did not function as a mediator in this model.



**Table 13 Mediation Effects of Mobilized Instrumental Support with Patient Help on the Mental Health Outcomes**

Independent Variable	Direct effect (path a)			direct effect (path b)			Mediation testing (path c)		
	DV : mobilized social support			DV: depression			DV: depression		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Role captivity	-1.77	.76	.17*	.06	.03	.09			
Role overload	2.42	.93	11.19**	.01	.04	.01			
Mediator									
Mobilized support with patient help									
Independent Variable	Direct effect (path a)			direct effect (path b)			Mediation testing (path c)		
	DV : mobilized social support			DV: anger			DV: anger		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Role captivity	-1.77	.76	.17*	.12	.03	.19***	.08	.08	.12
Role overload	2.42	.93	11.19**	.02	.04	.03			
Mediator									
Mobilized support with patient help									
							-0.39	.19	-.23*

Independent Variable	Direct effect (path a)			direct effect (path b)			Mediation testing (path c)		
	DV : mobilized social support			DV: anxiety			DV: anxiety		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Role captivity	-1.77	.76	.17*	.08	.04	.11*	.16	.08	.24*
Role overload	2.42	.93	11.19**	-.03	.04	-.04			
Mediator									
Mobilized support with patient care							-.23	.19	-.13

**Table 14 Mediation of Institutionalization at time 2 on the Mental Health Outcomes**

Independent Variable	Direct effect (path a)			direct effect (path b)			Mediation testing (path c)		
	DV : institutionalization			DV: depression			DV: depression		
	B	SE	Standardized	B	SE	Standardized	B	SE	Standardized
	Beta			Beta			Beta		
Role captivity	.53	.14	1.71***	.10	.03	.16***	.09	.03	.15**
Role overload									
Mediator									
Institutionalization							.10	.07	.07

Independent Variable	Direct effect (path a)			direct effect (path b)			Mediation testing (path c)		
	DV : institutionalization			DV: anger			DV: anger		
	B	SE	Standardized	B	SE	Standardized	B	SE	Standardized
	Beta			Beta			Beta		
Role captivity	.53	.14	1.71***	.12	.03	.21***	.12	.03	.06***
Role overload									
Mediator									
Institutionalization							.08	.07	.06

Independent Variable	Direct effect (path a)			direct effect (path b)			Mediation testing (path c)		
	DV : institutionalization			DV: anxiety			DV: anxiety		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Role captivity	.53	.14	1.71***	.12	.03	.16***	.10	.03	.14**
Role overload									
Mediator									
Institutionalization							.15	.08	.08

#### **4.4 Moderation testing of Mobilized social support**

To establish moderation, 1) the direct effect of predictors, 2) the direct effect of a moderator, and 3) the interaction of the predictor and the moderator on the outcomes need to be evaluated. The moderator hypothesis is supported if the interaction is significant. There may also be significant main effects for the predictors and the moderator. However, unlike mediation where all three criteria need to be met to test mediation, main effects are not necessarily needed to be significant in order to test moderation. Therefore, the next part of chapter focused on evaluating whether each of five different types of *mobilized* social support had a moderating effect on the mental health outcomes when caregivers experienced high subjective stressors.

##### **4.4.1 Does mobilized informal instrumental support with patient care have a moderating effect on mental health outcomes under high subjective stressors?**

Hierarchical regression analyses were used and separate analysis was conducted for each dependent variable. A change in depression was the first dependent variable assessed in this series of moderation testing. The final model was significant ( $F(10, 65) = 3.62, p < .001$ ). The results are shown in Table 15. Depression at time 1 was positively related to the changes in depression ( $B = .38, SE = .10, p < .000$ ). Mobilized social support did not show a main effect on the mental health outcome. However, the interaction term for mobilized support and role overload was found to be significant ( $B = -.18, SE = .06, p < .01$ ). Figure 1 shows this moderation effect. Although the finding showed significant interaction between role overload and mobilized social support on change in depression, interaction occurred in an unexpected way. From the

previous empirical studies, it is often suggested social support has a positive buffering effect on the depression under high stressor. However, the finding from the current study was opposite of what previously researchers have found. More specifically, from the current analysis, it was found that caregivers who *mobilized* instrumental support with patient care showed a significant *increase* in depression when role overload was high, whereas caregivers who did not mobilized the social support showed *improvement* in depression when role overload was high.

Next, a set of hierarchical regression analyses was used to test the moderating effect of mobilized instrumental support with patient care on changes in anger. The results are shown in Table 15. The final model was significant ( $F(12, 63) = 4.28, p < .000$ ). Neither a main effect nor a moderating effect of mobilized social support was found. Change in anxiety was the last dependent variable assessed in this series of moderation testing. The final model was significant ( $F(12, 64) = 3.00, p < .01$ ). The results are shown in Table 15. No main effect of mobilized social support on changes in anxiety was found. Neither a main effect nor a moderating effect of mobilized social support was found.

#### **4.4.2 Does mobilized informal instrumental support with household chores have a moderating effect on mental health outcomes under high subjective stressors?**

Hierarchical regression analyses were used and separate analysis was conducted for each dependent variable. A change in depression was the first dependent variable assessed in this series of moderation testing. The model was significant ( $F(13, 310) = 9.08, p < .000$ ). The results are presented in Table 16. From the results, employment status was positively related to changes

in depression<sup>5</sup> ( $B=.15$ ,  $SE = .07$ ,  $p<.05$ ). Working caregivers were associated with the improvement in depression. Higher depression at time 1 ( $B = .51$ ,  $SE = .05$ ,  $p<.000$ ), more ADL dependency at time 1 ( $B = .15$ ,  $SE = .05$ ,  $p<.01$ ), and higher role captivity ( $B = -.21$ ,  $SE = .08$ ,  $p<.05$ ) were significantly related to the improvement in depression. No main effect of mobilized social support on changes in depression was found. The interaction of mobilized instrumental support with household chores and role captivity, however, was found to be a significant on the improvement in depression ( $B=.17$ ,  $SE = .08$ ,  $p<.05$ ). Figure 2 shows the change in depression analyzed by an interaction of role captivity and mobilized instrumental support with household chores. In the significant interaction between role captivity and mobilized social support, the improvement in depression was greatest when caregivers experienced high role captivity and mobilized instrumental support with household chores.

Although the result suggested that there is an interaction between mobilized instrumental support with household chores and role overload ( $B = -.13$ ,  $SE= .04$ ,  $p<.000$ ), the Figure 3 shows somewhat different story. In both groups (low role overload and high role overload), caregivers who did not mobilize the support remained in higher rank order in the score of change in depression compared to those who mobilized the support. In addition, caregivers reported worse in depression when role captivity was high regardless of the existence of mobilization of social support. Therefore, according to the figure, no signs of interaction were found between role overload and mobilized social support on change in depression.

Next, a set of hierarchical regression analyses was used to test the moderating effect of mobilized instrumental support with household chores on changes in anger. The results are

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<sup>5</sup> Changes in depression: Higher scores indicate improvements in depression

shown in Table 16. The final model was significant ( $F(11, 320) = 17.88, p < .000$ ). Duration of help was positively related to the changes in anger<sup>6</sup> ( $B = .03, SE = .01, p < .05$ ). Anger at time 1 ( $B = .63, SE = .05, p < .000$ ), and more ADL dependency ( $B = .07, SE = .04, p < .05$ ) were significant predictors of improvement in anger. However, neither the main effect nor the moderating effect of mobilized social support was found.

Change in anxiety<sup>7</sup> was the last dependent variable assessed in this series of moderation testing. The final model was significant ( $F(14, 308) = 5.59, p < .001$ ). The results are shown in Table 16. Anxiety at time 1 was positively related to changes in anxiety ( $B = .45, SE = .06, p < .000$ ). More ADL dependency was significantly associated with improvement in anxiety ( $B = .17, SE = .07, p < .05$ ). Higher role overload predicted increases in anxiety ( $B = -.23, SE = .11, p < .05$ ). No main effect of mobilized social support on changes in anxiety was found. Moderation effects were not found for either interaction term.

#### **4.4.3 Does emotional support at time 2 have a moderating effect on mental health outcomes under high subjective stressors?**

From the previous results on predictors of mobilized emotional support, it was found that the variability of mobilization was very small. Therefore, instead of examining the predictors of mobilized emotional support, alternate analyses were conducted to predict emotional support at time 2. In this section of the moderation analyses, in accordance with the previous analyses, emotional support at time 2 was used as a moderator.

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<sup>6</sup> Changes in anger: Higher score indicates the better improvements in anger

<sup>7</sup> Changes in anxiety: Higher score indicates the better improvements in anxiety



Hierarchical regression analyses were used and separate analysis was conducted for each dependent variable. A change in depression was the first dependent variable assessed in this series of moderation testing. The model was significant ( $F(12, 479) = 17.02, p < .000$ ). The results are presented in Table 17. From the results, employment status was positively related to improvement in depression ( $B = .16, SE = .06, p < .01$ ). Depression at time 1 was positively related to the changes in depression ( $B = .50, SE = .04, p < .001$ ). Working caregivers ( $B = .17, SE = .07, p < .05$ ), and more ADL dependency ( $B = .09, SE = .04, p < .05$ ) were related to the improvement in depression. Higher role overload was related to worsening in depression ( $B = -.08, SE = .03, p < .01$ ). The main effect of emotional support at time 2 was found to be significant. Higher emotional support at time 2 was related to improvement in depression ( $B = .28, SE = .05, p < .000$ ). An interaction between emotional support at time 2 and role overload was significant ( $B = .14, SE = .05, p < .01$ ). Caregivers who reported high emotional support at time 2 showed a significant improvement in depression when role overload was high, whereas caregivers with low emotional support at time 2 showed a significant decrease in depression when role overload was high. Figure 4 shows change in depression analyzed by the interaction between role overload and emotional support at time 2.

The second dependent variable used to test the moderating effect of emotional support at time 2 was changes in anger. The results are shown in Table 17. The final model was significant ( $F(12, 492) = 26.74, p < .000$ ). Anger at time 1 was positively related to change in anger ( $B = .64, SE = .04, p < .001$ ). A significant main effect of emotional support at time 2 was found. Higher emotional support at time 2 was related to improvement in anger ( $B = .17, SE = .05, p < .000$ ). No moderating effect of emotional support at time 2, however, was found.

Change in anxiety was the last dependent variable assessed in this series of moderation testing. The final model was significant ( $F(11, 490) = 17.16, p < .000$ ). The results are shown in Table 17. Anxiety at time 1 was positively associated with the changes in anxiety ( $B = .53, SE = .04, p < .000$ ). Higher role overload was significantly related to worsening in anxiety ( $B = -.11, SE = .03, p < .01$ ). A significant main effect of emotional support at time 2 was found. Higher emotional support at time 2 was related to the improvement in anxiety ( $B = .23, SE = .06, p < .000$ ). A moderating effect of the interaction of emotional support at time 2 and role overload was also significant ( $B = .20, SE = .06, p < .001$ ). Figure 5 shows changes in anxiety analyzed by the interaction between role overload and emotional support at time 2. Caregivers who reported high emotional support at time 2 showed a significant improvement in anxiety when role overload was high, whereas caregivers with low emotional support at time 2 showed a significant decrease in anxiety when role overload was high.

#### **4.4.4 Does mobilized formal service use have a moderating effect on mental health outcomes under high subjective stressors?**

Hierarchical regression analyses were used and a separate analysis was conducted for each dependent variable. Change in depression was the first dependent variable assessed in this series of moderation testing. The model was significant ( $F(12, 326) = 10.74, p < .000$ ). The results are shown in Table 18. Employment status was positively related to changes in depression ( $B = .19, SE = .07, p < .01$ ). Depression at time 1 was positively related to the change in depression ( $B = .51, SE = .05, p < .000$ ). More ADL dependency significantly predicted improvement in depression ( $B = .15, SE = .05, p < .01$ ). Higher role overload was related with worsening of

depression ( $B = -.14$ ,  $SE = .04$ ,  $p < .001$ ). Neither a main effect nor a moderating effect of mobilized formal service use on changes in depression was found.

Next, a set of hierarchical regression analyses was used to test moderating effects of mobilized formal service use on changes in anger. The results are shown in Table 18. The final model was significant ( $F(9, 325) = 2.45$ ,  $p < .05$ ). Employment status was negatively related to changes in anger ( $B = -.17$ ,  $SE = .08$ ,  $p < .05$ ). More specifically, working caregivers increased in anger. Anger at time 1 was positively associated with the change in anger ( $B = .19$ ,  $SE = .07$ ,  $p < .01$ ). However, no main effect or moderating effect of mobilized formal service use on changes in anger was found.

Change in anxiety was the last dependent variable assessed in this series of moderation testing. The final model was significant ( $F(11, 320) = 2.05$ ,  $p < .05$ ). The results are shown in Table 18. Higher role captivity predicted the improvement in anxiety ( $B = .09$ ,  $SE = .04$ ,  $p < .05$ ). No main effect of mobilized formal service use on changes in anxiety was found to be significant. However, the interaction of mobilized formal service use and role captivity was significant on changes in anxiety ( $B = .02$ ,  $SE = .01$ ,  $p < .05$ ). Figure 6 shows changes in anxiety analyzed by an interaction between role captivity and mobilized formal service use. Caregivers who mobilized formal service use showed a significant improvement in anxiety when role captivity was high whereas caregiver with no mobilization in service use did not show much change in anxiety.

#### **4.4.5 Does institutionalization have a moderating effect on mental health outcomes under high subjective stressors?**

Hierarchical regression analyses were used and a separate analysis was conducted for

each dependent variable. Change in depression was the first dependent variable assessed in this series of moderation testing. The results are shown in Table 19. The model was significant ( $F(14, 405) = 11.50, p < .000$ ). From the results, employment status was positively related to changes in depression ( $B = .15, SE = .06, p < .05$ ). Depression at time 1 was positively related to the change in depression ( $B = .48, SE = .04, p < .000$ ). More ADL dependency significantly predicted improvement in depression ( $B = .14, SE = .05, p < .01$ ). Higher role overload was related to worsening depression ( $B = -.11, SE = .03, p < .000$ ). No main effect or moderating effect of institutionalization on changes in depression was found.

Change in anger was the second dependent variable evaluated in this series of moderation testing. The results are shown in Table 19. The final model was significant ( $F(11, 421) = 20.33, p < .000$ ). Duration of help was positively related to changes in anger ( $B = .03, SE = .01, p < .05$ ). Anger at time 1 was a significant predictor to improvement in anger ( $B = .58, SE = .04, p < .000$ ). Higher role overload predicted improvement in anger ( $B = -.07, SE = .03, p < .05$ ). The main effect of institutionalization on changes in anger was found to be significant ( $B = .14, SE = .06, p < .05$ ). Caregivers who institutionalized their relatives showed significant improvement in anger. However, no moderating effect of institutionalization was found.

Change in anxiety was the last dependent variable assessed in this series of moderation testing. The final model was significant ( $F(11, 408) = 11.09, p < .001$ ). The results are shown in Table 19. Duration of help ( $B = .03, SE = .02, p < .05$ ), and anxiety at time 1 ( $B = .46, SE = .05, p < .000$ ) positively predicted changes in anxiety. More ADL dependency was significantly associated with improvement in anxiety ( $B = .14, SE = .06, p < .05$ ). Higher role overload predicted worsening in anxiety ( $B = -.13, SE = .04, p < .000$ ). No main effect or moderating effect

of institutionalization on changes in anxiety was found.

**Table 15 Moderation Effects of Mobilized Informal Instrumental Support with Patient Help on Mental Health Outcomes**

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized	B	SE	Standardized	B	SE	Standardized
	Beta			Beta			Beta		
Step 1									
Relationship to relative				.21	.14	.16	.16	.16	.11
Race	.13	.	.07	.33	.21	.16			
Duration of help				.03	.03	.09	.05	.04	.14
Employment status	.23	.14	.19	.11	.14	.09	.14	.18	.10
Education	.06	.03	.21	.03	.03	.11	.05	.04	.16
Income	-.07	.09	-.09	.07	.09	.09			
Depression at time 1, Anger at time 1, and Anxiety at time 1 (by each column)	.38	.10	.47***	.52	.09	.55***	.45	.10	.55***
Step 2									
Cognitive impairments	-.08	.10	-.11				.10	.10	.12

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized	B	SE	Standardized	B	SE	Standardized
	Beta			Beta			Beta		
Problem behaviors	.06	.12	.05				-.09	.15	-.07
Total ADLs	.17	.11	.22						
Step 3									
Role captivity							-.23	.21	-.33
Role overload				.18	.18	.28	.13	.21	.18
Caregiver's self-rated health				.11	.09	.13	.07	.11	.08
Step 4									
Informal instrumental support with patient help (pt help)				-.27	.18	-.16			
Pt help * role captivity	.04	.07	.07				.31	.19	.46
Pt help * role overload	-.18	.06	-.33**	-.12	.17	-.21	-.19	.19	-.29

**Table 16 Moderation Effects of Mobilized Informal Instrumental Support with Household Chores on Mental Health Outcomes**

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized	B	SE	Standardized	B	SE	Standardized
	Beta			Beta			Beta		
Step 1									
Relationship to relative	-.05	.07	-.04						
Race	.06	.05	.06						
Duration of help	.01	.01	.05	.03	.01	.11*	.02	.02	.08
Employment status	.15	.07	.12*				-.09	.09	-.06
Education	.02	.02	.07	.01	.01	.05	.02	.02	.05
Income	.05	.05	.06	.04	.04	.05	.05	.06	.05
Depression at time 1, Anger at time 1, and Anxiety at time 1 (by each column)	.51	.05	.58***	.63	.05	.63***	.45	.06	.46***
Step 2									
Cognitive impairments	-.08	.05	-.11				-.04	.06	-.04



Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Problem behaviors							-.07	.07	-.06
Total ADLs	.15	.05	.19**	.07	.04	.09*	.17	.07	.18*
Step 3									
Role captivity	-.21	.08	-.34*	-.04	.07	-.07	-.08	.11	-.11
Role overload				-.10	.08	-.16	-.23	.11	-.31*
Caregiver's self-rated health	.08	.04	.10	.06	.04	.08	.09	.05	.10
Step 4									
Mobilized instrumental support with household chores	-.11	.08	-.07	-.04	.07	-.03	.08	.10	.05
Chores help <sup>8</sup> * role	.17	.08	.28*	.03	.07	.06	.10	.10	.14

<sup>8</sup> Chore help refers to the mobilized informal instrumental support with household chores.

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized	B	SE	Standardized	B	SE	Standardized
	Beta			Beta			Beta		
captivity									
Chores help * role overload	-.13	.04	-.19***	.06	.08	.09	.10	.10	.14

**Table 17 Moderation Effects of Emotional Support at time 2 on Mental Health Outcomes**

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Step 1									
Relationship to relative	.009	.01	.03	.08	.05	.06	.08	.06	.06
Race				-.05	.03	-.05	-.04	.04	-.03
Duration of help				.02	.01	.06	.02	.01	.06
Employment status	.16	.06	.12**	.08	.05	.07			
Education	.01	.01	.04				.01	.02	.03
Income	.03	.04	.04				.06	.04	.06
Depression at time 1,	.50	.04	.57***	.64	.04	.65***	.53	.04	.57***
Anger at time 1, and Anxiety at time 1 (by each column)									
Step 2									
Cognitive impairments	-.05	.04	-.07	.03	.03	.04			

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Problem behaviors									
Total ADLs	.09	.04	.11*	.04	.04	.05	.07	.04	.08
Step 3									
Role captivity	.01	.03	.01						
Role overload	-.08	.03	-.12**	-.04	.03	-.07	-.11	.03	-.14**
Caregiver's self-rated health	.05	.03	.07	.03	.03	.04	.07	.04	.07
Step 4									
ES at time 2	.28	.05	.22***	.17	.05	.14***	.23	.06	.16***
ES at time 2 <sup>9</sup> * role				.04	.04	.03			

<sup>9</sup> ES at time 2 refers to the moderator variable "emotional support at time 2."

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
captivity									
ES at time 2 <sup>10</sup> * role	.14	.05	.10**	.06	.05	.05	.20	.06	.13***
Overload									

<sup>10</sup> ES at time 2 refers to the moderator variable “emotional support at time 2.”

**Table 18 Moderation Effects of Mobilized Formal Service Use on Mental Health Outcomes**

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Step 1									
Relationship to relative	-.05	.07	-.04						
Race	.06	.05	.06						
Duration of help				.01	.02	.03	.02	.01	.08
Employment status	.19	.07	.15**	-.17	.08	-.11*			
Education	.02	.02	.06				.02	.02	.05
Income							.02	.05	.03
Depression at time 1,	.51	.05	.59***	.19	.07	.17**	.07	.05	.09
Anger at time 1, and Anxiety at time 1 (by each column)									
Step 2									
Cognitive impairments	-.06	.04	-.09						

Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized Beta	B	SE	Standardized Beta	B	SE	Standardized Beta
Problem behaviors				-.05	.08	-.04	.03	.06	.03
Total ADLs	.15	.05	.19**	.10	.06	.11	.02	.05	.03
Step 3									
Role captivity	-.05	.03	-.08	.07	.04	.09	.09	.04	.15*
Role overload	-.14	.04	-.22***	-.07	.05	-.09	-.02	.04	-.03
Caregiver's self-rated health	.08	.04	.09	.04	.05	.05	.02	.05	.03
Step 4									
Mobilized formal service use	-.01	.01	-.08						
Use <sup>11</sup> * role captivity	.01	.01	.05				.02	.01	.12*
Use <sup>12</sup> * role overload				.01	.01	.04	-.01	.01	-.04

<sup>11</sup> Use refers to the moderator variable "mobilized formal service use."

**Table 19 Moderation Effects of Institutionalization at time 2 on the Mental health Outcomes**

Independent variables	DV: depression			DV: anger			DV: anxiety			
	B	SE	Standardized	B	SE	Standardized	B	SE	Standardized	
	Beta			Beta			Beta			
Step 1										
Relationship to relative				.04	.05	.03				
Race				-.02	.03	-.02				
Duration of help				.03	.01	.10*	.03	.02	.09*	
Employment status				.08	.06	.06	-.07	.07	-.05	
Education				.01	.01	.04	.02	.02	.06	
Income							.08	.05	.08	
Depression at time 1,				.58	.04	.59***	.46	.05	.48***	
Anger at time 1, and Anxiety										
at time 1 (by each column)										
Step 2										

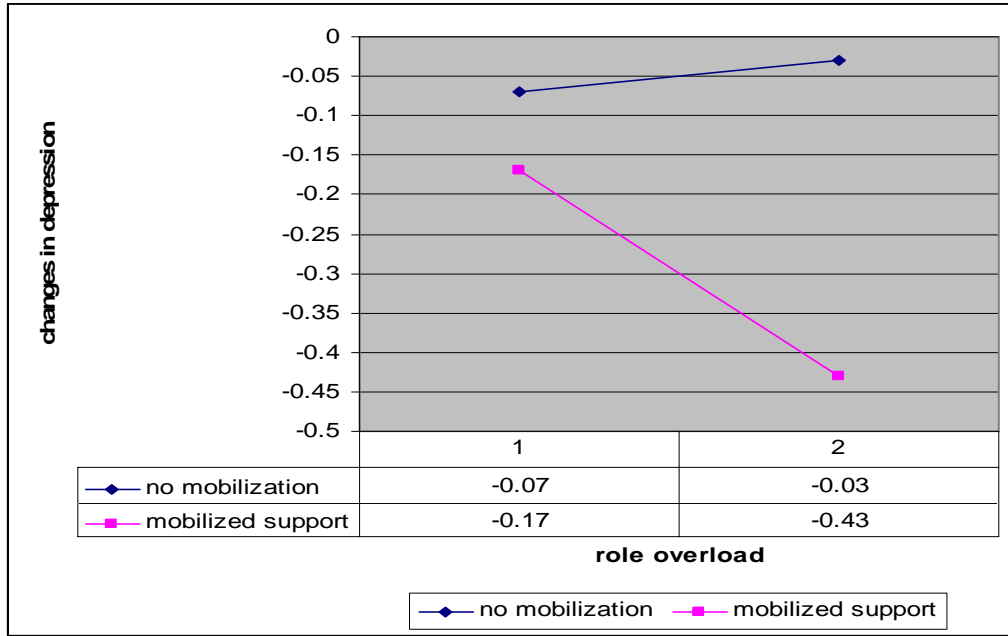
<sup>12</sup> Use refers to the moderator variable “mobilized formal service use.”



Independent variables	DV: depression			DV: anger			DV: anxiety		
	B	SE	Standardized	B	SE	Standardized	B	SE	Standardized
	Beta			Beta			Beta		
Cognitive impairments							-.04	.05	-.04
Problem behaviors									
Total ADLs				.06	.03	.08	.14	.06	.15*
Step 3									
Role captivity	.12	.03	.21***						
Role overload				-.07	.03	-.10*	-.13	.04	-.16***
CG's Self-rated health				.03	.03	.04	.07	.04	.08
Step 4									
Institutionalization				.14	.06	.09*	.15	.08	.09
Institution <sup>13</sup> * role captivity									
Institution <sup>14</sup> * role overload				-.03	.07	-.02	.15	.09	.08

<sup>13</sup> Institution refers to the moderator variable “institutionalization.”

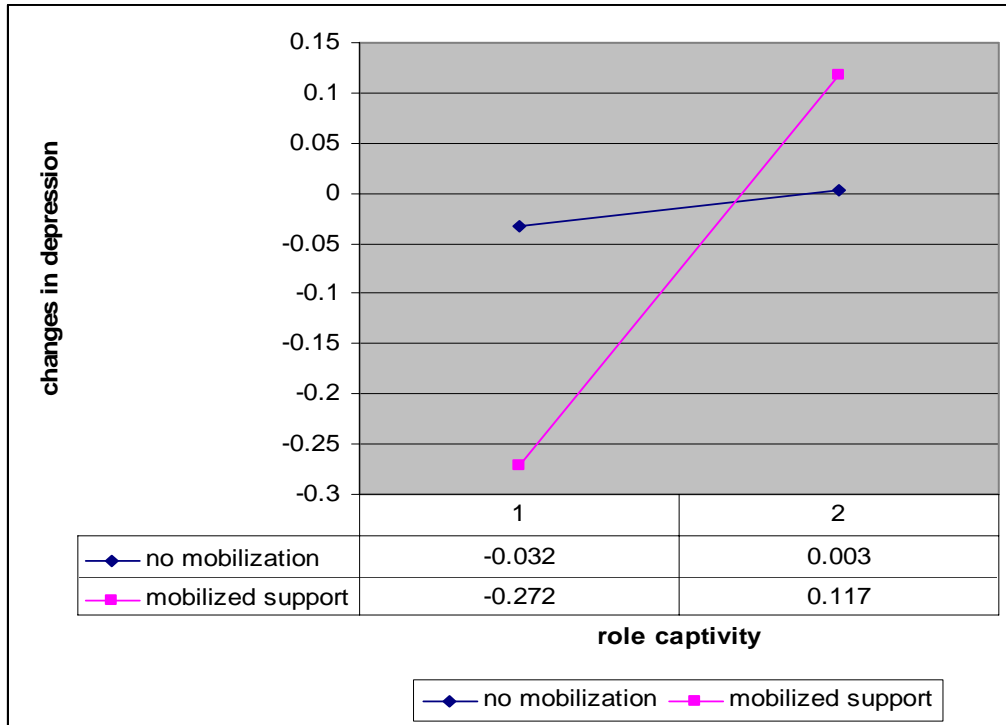
<sup>14</sup> Institution refers to the moderator variable “institutionalization.”



**Figure 1 Moderating Effect of Mobilized Informal Instrumental Support with Patient Help on the Role Overload<sup>15</sup> and Changes in Depression<sup>16</sup>**

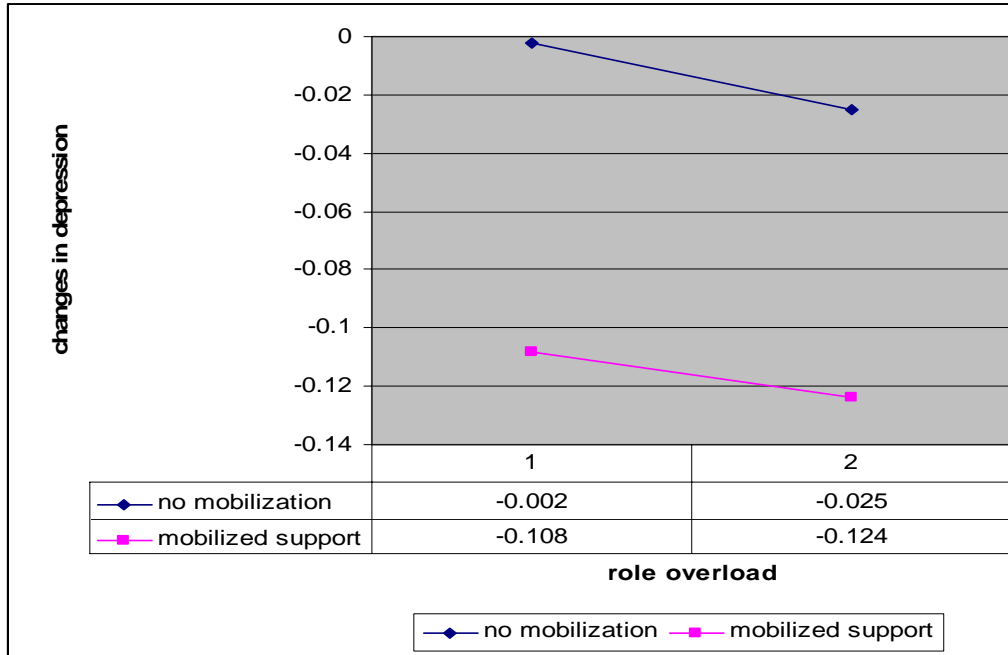
<sup>15</sup> Role Overload on X-axis: '1' refers to low role overload and '2' refers to high role overload

<sup>16</sup> Changes in Depression on Y-axis: Positive number indicates the improvements in Depression from time 1 to time 2

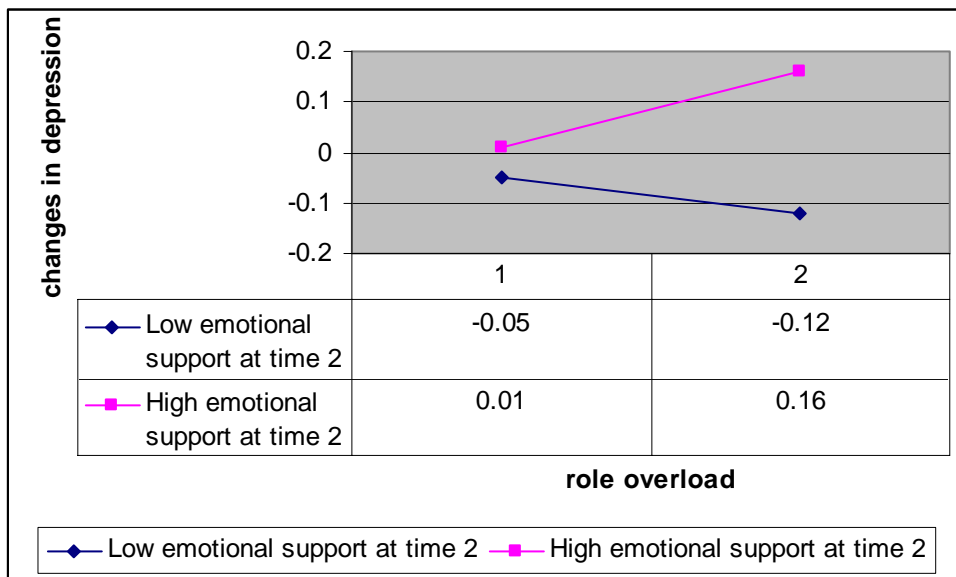


**Figure 2 Moderating Effect of Mobilized Informal Instrumental Support with Household Chores on Role captivity<sup>17</sup> and Changes in Depression**

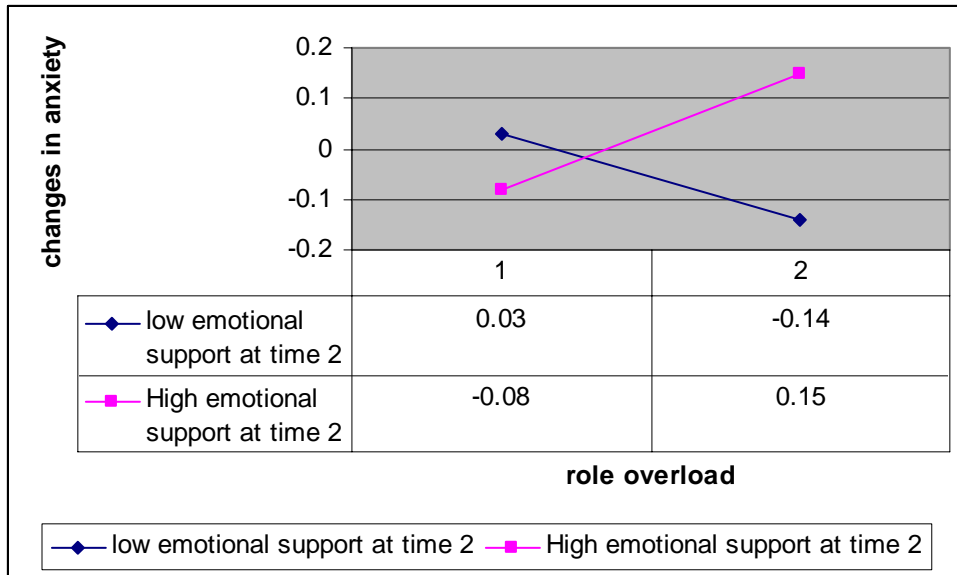
<sup>17</sup> Role captivity on X-axis: '1' refers to low role captivity and '2' refers to high role captivity



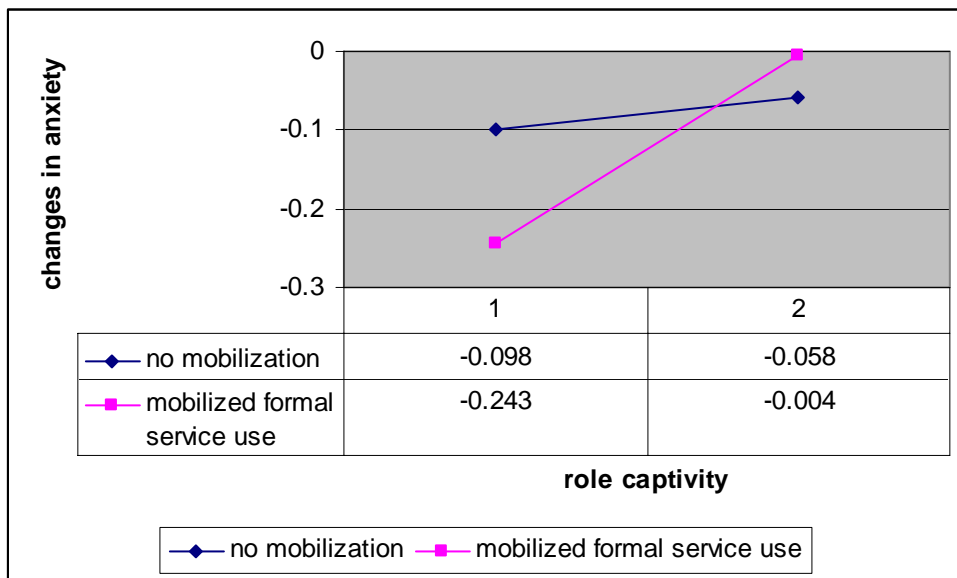
**Figure 3 Moderating Effect of Mobilized Informal Instrumental Support with Household Chores on Role Overload and Changes in Depression**



**Figure 4 Moderating Effect of Emotional Support at time 2 on Role Overload and Changes in Depression**



**Figure 5 Moderating Effect of Emotional Support at time 2 on Role Overload and Changes in Anxiety**



**Figure 6 Moderating Effect of Mobilized Formal Service Use on Role Captivity and Changes in Anxiety**

## CHAPTER 5.DISCUSSION AND CONCLUSION

### 5.1 Discussion

The current study has attempted to analyze three research questions; 1) what are the predictors of mobilized social support? 2) does mobilized social support mediate the relationship between subjective stressors and changes in mental health outcomes? and finally, 3) does mobilized social support have a moderating effect on changes in mental health outcomes under conditions of high subjective stressors? Overall, findings suggested that 1) predictors varied by the types of mobilized social support, 2) only one type of mobilized social support (instrumental support with patient care) functioned as a mediator, and 3) some but not all types of mobilized social support had moderating effect on the changes in the mental health outcomes.

Results from the regression analyses found strong evidence that predictors of mobilized social support vary by the types of social support. For example, mobilized informal instrumental support with *patient help* was related with caregivers' work status, Activity of Daily Living (ADLs) dependency from relatives, role overload, and role captivity. On the other hand, caregiver relationship to relative, caregiver's income, and cognitive impairment of relatives were associated with the mobilized informal instrumental support with *household chores*. This finding that predictors differ by the types of mobilized social support is analogous to the matching hypothesis proposed by Cohen and Wills (1990), and Cutrona & Russell (1990). The matching hypothesis suggests that the relationship between stressors and support may be strongest in their effects when there is a match between the needs created by a person and the benefits provided by specific types of support from specific sources. The focus of the present

study is not the match between the needs and the benefits of social support. However, the finding can be explained with this hypothesis, because the result showed that different needs *lead* to different types of social support. Previous studies in the caregiving literature also have illustrated the relevance of the matching between type of support and type of stressor (Hays et al., 1998; Miller et al., 2000; Miller et al., 2001).

The current study, however, failed to find any evidence of predictors for mobilized emotional support. As noted earlier, one possible reason is due to the stability in emotional support over time. From the results, the variability of changes in emotional support from time 1 to time 2 was very small among caregivers who continued providing care to their relatives at home. This finding indicates that emotional support is very stable over time. Therefore, it was not surprising to find no significant predictors for mobilized emotional support when there is little or no change to be predicted to begin with.

There was, however, an interesting finding when emotional support at time 2 was examined. Cognitive impairment of the relative at time 1 positively predicted emotional support at time 2. More specifically, caregivers who experienced more cognitive impairment of their relatives at time 1 reported higher level of emotional support at time 2. Cognitive impairment includes remembering things, home address, and words and so on. Therefore, it is possible that caregivers get frustrated with the changes in their relatives' memory, and may ask for more emotional support at time 2 to relieve their frustration. This, again, illustrates the importance of fit between the needs of caregivers that match with the types of support.

Findings from the present study were consistent with the previous research. Formal service use among caregivers was relative low over time. Gwyther (1989),

Montgomery (1995) and Zarit et al (1999) also have demonstrated the same finding in their studies. Like emotional support, very little mobilization occurred in the use of formal service. There are many contributing factors to this finding. First, it is possible that caregivers are not aware of the services available to them. Second, caregivers may feel guilty and uncomfortable about handing over the care of their relative to another individual, when they believe it is their responsibility to provide care. Another reason which should not be ignored is the expense of the service use (MaloneBeach et al., 1992; Zarit et al, 1999). In the United States, families usually pay the majority of the cost of community-based services, and therefore, some caregivers try to postpone using the services until they cannot handle the demented relative anymore on their own, or try to save the money as much as possible to pay for nursing home care. Lastly, it is possible that the quality of the service or the content of the services are not meeting the expectation or the need of caregivers.

Another consistent finding with previous studies was that role captivity predicted the relative's placement at time 2. Zarit et al. (1999) found that caregivers who had higher role captivity dropped out from day care services earlier. Researchers such as Gaugler et al. (2000), Whitlatch et al. (1999), and Zarit et al. (1986) have suggested that the next and final step for these caregivers is to place their relatives into nursing home, and the current study illustrated this phenomenon.

The results of the present study stand in contrast to those researchers (Lawton, Moss, Kleban, Glicksman, & Rovine, 1991; Mui, 1995, Dilworth-Anderson, Williams, & Gibson 2002) who argued that caregiving experiences and the caregivers' needs vary by the relationship to the relative. In fact, the present study showed that caregiver



relationship to the relative was only significant when examining the predictors for mobilized instrumental support with household chores.

The findings from the current study also showed evidence that mediation varied by the type of mobilized social support. Among five types of mobilized social support, only mobilized instrumental support with patient care functioned as a mediator. In particular, 85% of the direct association between role captivity and the changes in anger was explained by mobilized instrumental support with patient care. However, the direction of the change in anger was unexpected. Caregivers experienced *worsening* in anger when the effect of low role captivity was mediated by *mobilized support* with patient care. This result is different from previous studies. Previous researchers suggested that the use of social support would lead to better mental health outcomes; however, the present study showed opposite finding for anger.

A finding from moderation testing also showed unexpected results. When role overload was high, caregivers who *mobilized* support showed *worsening* in depression.

There are two possible contributing factors to explain these unexpected findings – which anger and depression increased with the mobilization of social support. First, as mentioned earlier, there may be a mismatch between the needs of caregivers and the benefits they get from the help. It has widely been assumed that social support has positive effects on the mental health outcomes. However, that is not always true. Some researchers have suggested that social support is not universally positive or helpful. In fact, when people receive aversive or ‘unhelpful’ behavior from other family members, the experience can actually increase tension (Dakof and Taylor, 1990; Martin et al., 1994; Koopman et al., 1998). For instance, caring for dementia relatives requires some

knowledge about the disease such as how to deal with the cognitive or behavioral problems in relatives. However, when some family members other than primary caregiver who is not familiar with the dementia provide help with the ‘patient care’ and if the care was not provided properly, it may upset the relative more or caregivers may not get enough relief from the help. If this is the case, then mobilized support may have negative effect on the caregiver’s mental health outcomes.

A second alternative explanation is that it is possible that caregivers had higher level of anger and/or depression before they actually mobilized the support. If such is a case, then a state of psychological distress such as depression or anger could lead to a negative *distortion* of the adequacy of social support. Although little research has been done with regards to this alternative explanation in the caregiving field, one study by Rivera and her colleagues (1991) showed similar findings. Rivera et al. (1991) conducted a study with clinically depressed and non-depressed female caregivers. In the study, they found that depressed caregivers reported a higher incidence of negative interactions with others. In contrast to the present findings, non-depressed caregivers reported significantly greater use of resources which in turn had a positive influence on their psychological outcomes.

Other findings from moderation testing of the current study, on the other hand, confirmed previous research on the buffering effect of social support on the mental health outcomes. For instance, mobilized instrumental support with household chores had a moderating effect on the improvements in depression when caregivers were under high role captivity. Similarly, emotional support at time 2 had a moderating effect on the improvement in anxiety under high role overload.

## 5.2 Conclusion, Limitations and Future suggestions

Several conclusions can be drawn from these analyses. Overall, using longitudinal data, this study was able to identify the characteristics of different types of *mobilized* social support. More specifically, with response to the first research question – do stressors lead caregivers to mobilize social support – the current study demonstrated the mixed results. Some types of social support (instrumental support and institutionalization) were influenced by the stressors and showed mobilization over time. On the other hand, some types of social support (emotional support and formal service use) were not impacted by the stressors and therefore, showed very little or almost no mobilization. It indicates that these two types of social support were stable over time. For instance, caregivers' emotional support stayed relatively high over time, whereas use of formal services remained consistently low over time.

The overall findings of the second and the third research questions – do mobilized social support mediate or moderate the effect of stressors on the mental health – also demonstrated the mixed results. For example, when there was a mobilization in social support over time, caregivers under high subjective stressors showed improvement in some mental health outcomes. More interestingly, although very little mobilization occurred in using formal services, the present study found that caregivers under high role captivity showed reduced levels of anxiety when they *mobilized* the support.

The finding that not all types of social support were influenced by stressors has an important implication. As mentioned earlier, the results of the effects of social support on distress from previous research were conflicting. These mixed results may have been due to the design issues specifically that most previous studies used cross-sectional data.

Using cross-sectional data makes it difficult to differentiate whether support was actually mobilized in response to high stressors or not. However, with a longitudinal dataset, this study was able to conclude that some types of social support are not influenced by the level of stressors. For example, many previous social support research were conducted based on the assumption that caregivers who experience more stressors get more support. However, finding from the current study suggested that the use of formal services was *low* and it *remained* low over time regardless of the stressors. In other words, formal service use was not influenced by the elevation of the stressors. Therefore, the finding that not all social support are influenced by the stressors demonstrated the need to investigate different types of social support separately when studying its effects on caregiving stress.

There are some limitations to the present study. One limitation concerns the fact that only two time points were used with a one year interval in between. One year may not be enough time to capture the full range of possible support patterns that caregivers may experience in the course of what is usually a lengthy disease process. One could argue that the majority of caregivers exhibited stability in emotional support and formal service use because only two time points were examined. Despite this limitation, using more than two time points may have produced problems. Caring for demented relatives is very time-sensitive matter. Since the demented relatives are very fragile, it is possible that they may either 1) be placed into nursing home, or 2) pass away unexpectedly during the course of caregiving. Therefore, if more than two time points were used, then it was very likely to lose more information about caregiving than using only two time points.

Given the nature of demented relatives – fragile and subject to change their status

suddenly, the next limitation concerns the one year interval which was used in the current study. One may argue that one year interval is too long to capture the dynamics in caregiving. For instance, during the one year, it is possible that some demented relatives may be placed into nursing home after two months from the baseline of the study whereas other demented relatives can go into nursing home after six month from the beginning of the study. It may be possible that caregivers who placed their relatives into nursing home after two months from the baseline may experience more stressors compared to those who placed their relatives into nursing home after six months or one year from the baseline. However, with using one-year interval, it is difficult to capture the ones who may have experienced the most stressors. However, the purpose of this particular study was to investigate the mobilization in various types of social support and therefore, was not specifically designed only to examine the effects of early placement of nursing home. In addition, given the finding that some types of social support were shown stable over time suggest that for this particular study, one year interval was reasonable, leaving possibility for future research to use shorter interval.

One could argue that the unexpected finding – when in high role overload, caregivers who mobilized informal instrumental support reported higher depression at time 2 – could be that caregivers who have higher depression at baseline are the ones who used more support. However, their initial level of depression was already higher than the ones who did not mobilize the support. Therefore, it may be possible that they still report higher depression at time 2. In other words, caregivers who mobilized support from time 1 to time 2 are the ones who had higher depression at time 1. If so, it is unclear as to whether it is depression or the subjective stressor (role overload) that is interacted with

mobilized social support. Unfortunately, given the time frame of the study, it was not able to separate the effect of depression at time 1 from the effect of role overload at time 1 on stress. Another explanation could be that it is also possible that depressed caregivers may *distort* the effects of mobilized support, which, in turn, leads to adverse effects on their mental health.

One may argue that stability of emotional support over time may represent that support is related to caregivers' personality or mastery. For example, it may be that people who have a higher level of mastery will adapt to caregiving stress better than those who have a lower level of mastery regardless of the stressors that caregivers are experiencing. People with higher mastery may recognize the importance of getting social support knows how to mobilize support better.

In an effort to identify whether mobilization of social support occurred or not, the current study had to rely on simplified measures of social support, especially for informal instrumental support. Caregivers were asked whether they received instrumental support with patient care from other family members or not. Accordingly, the measure did not contain information on the frequency of social support or caregivers' self-rated satisfaction with support.

Finally, one more point which must be noted is that the current analyses do not establish a pattern of causality. Menard and Elliot (1990) suggested that longitudinal data, as was used here, has advantages over cross-sectional data in the debate over causality. However, even if a regression model with numerous control variables was used, the correct temporal order could not be guaranteed. In fact, Neter et al. (1996) mentioned that "regression analysis by itself provides no information about causal patterns (p.10)."

However, this kind of analysis can at least provide information on where to look for causal relationships among variables.

Despite these limitations, there are some virtues of the current study which made it different from existing social support research. First, as described earlier, caregiving stressors increase over time. It is, therefore, assumed that people who experience more stress will mobilize support. However, does social support really change in response to the stressors? Unfortunately, almost no studies had attempted to examine this relationship previously. By testing the mobilization of social support in response to the stressors, the current study showed the relationship between the stressors and the changes in social support. More importantly, the present findings also demonstrated the variability of changes in social support depending on the types of social support. Therefore, the study illustrated the dynamics of social support in response to the caregiving stressors time to time. The focus of previous research had been on the caregiving stressors. Although many studies were conducted to examine whether social support at one time point has an effect on caregivers' psychological outcomes, very few research have looked at how social support changes, if it does, along with the stressors. This study, however, not only demonstrated that social support changes, it also presented that *not all* social support changes in the same degree and same amount and some social support were not influenced by stressors.

The current study provides a guideline for future studies. First, as discussed in the limitations, more studies need to disentangle the effects of mental health at baseline on mobilized support from the effects of stressors at baseline on the mobilization of support. In addition, when assessing social support, more efforts need to be made to measure the

frequency of social support or self-rated satisfaction with the support. By doing so, researchers would be able to examine possible discrepancies between the self-rated satisfaction of social support and the mobilization of social support, or the possible relationship between the frequencies of social support and mobilized social support, and how these discrepancies may affect a caregivers' mental health. Furthermore, it will be interesting to see if the predictors are different when examining the various trends of the changes in social support – such as whether caregivers decreased, remained or increased the use of social support over time.

Given that formal service use remained relatively low over time, future studies also need to examine whether the frequency of using formal services is high or low in different caregiving samples over time. If future studies can identify changes in formal service use, the research then can evaluate the specific stressors that lead to mobilization.

In addition to the measurement and time frame issue, the findings that 1) no mobilization had occurred in using formal services, and 2) the use of formal services was consistently low over time have implications for policy makers and government administrators. First, as previous research suggested, the frequency and timing of formal service use needs to be considered. If caregivers do not use services regularly, the benefits of services may be very low. Despite the research findings such as Zarit et al. (1998), and Kumamoto et al. (2004) which suggest that caregivers receive benefits from day care services (such as improvement in depression, feeling less overwhelmed and so on), the many caregivers come too late to use formal services and therefore, it is difficult for caregivers to get much benefits from the services. For example, Zarit et al. (1998) suggested that by the time caregivers start to use formal services, they report high levels



of depression, or anger. Therefore, although caregivers receive relief from using the services, they may still report more depression or anger compared to non-depressed caregivers. Therefore, policy makers and government administrators should consider promoting early use of community-based formal services.

Second, limited access to these services – either due to finances or lack of information– needs to be considered. For example, the results from Zarit et al. (1998)’s day care study not only emphasized the benefits of day care services if used regularly, it also showed the importance of state-wide financial support in using day care services. Samples were recruited from New Jersey and Ohio where sociodemographic variables in caregivers matched. Only difference between these two samples was the availability of financial support from the state which encourages people to use day care services more. New Jersey had a well-developed (such that New Jersey offers a subsidy to families of dementia patients to help pay for day care services) network system whereas Ohio had almost no systematic financial support system in the state. This sample selection helped to naturally compare caregivers who use day care services versus who didn’t use. In the study, Zarit et al. (1998) illustrated that caregivers who used day care services showed low role-overload and lower feelings of depression and anger compared to those who did not use day care services. The finding that caregivers those who use day care services do get benefits from the services not only suggest the effects of day care services, but also emphasize the need to develop a well-developed financial network system throughout the states. Therefore, policy makers and government administrators should consider initiating some changes in who pays for the services – for example, providing statewide subsidies to caregivers or systematically promoting that caregivers use formal services regularly for

them to get actual benefits.

Because the risk for developing dementia increases with age, it is very likely that many family members will be exposed to caregiving responsibilities and that caregiving stressors will increase over time. It is necessary to gain knowledge of the variables which seem to modify or reduce the effects of caregiving stress. One of these variables is social support. However, findings from social support studies have been contradictory and the main reason maybe due to using cross-sectional data. In an effort to overcome the downfall of the previous studies, the present study used longitudinal data. The findings discussed here has shown the complexity of the multiple dimensions of *mobilized* social support, and also indicated that the effect of mobilized support can only be examined when there are sufficient changes in the support. The present study also has shown that although it is limited to some types of social support, under high stressor, mobilized social support can modify the effect of stressors on caregivers' mental health.

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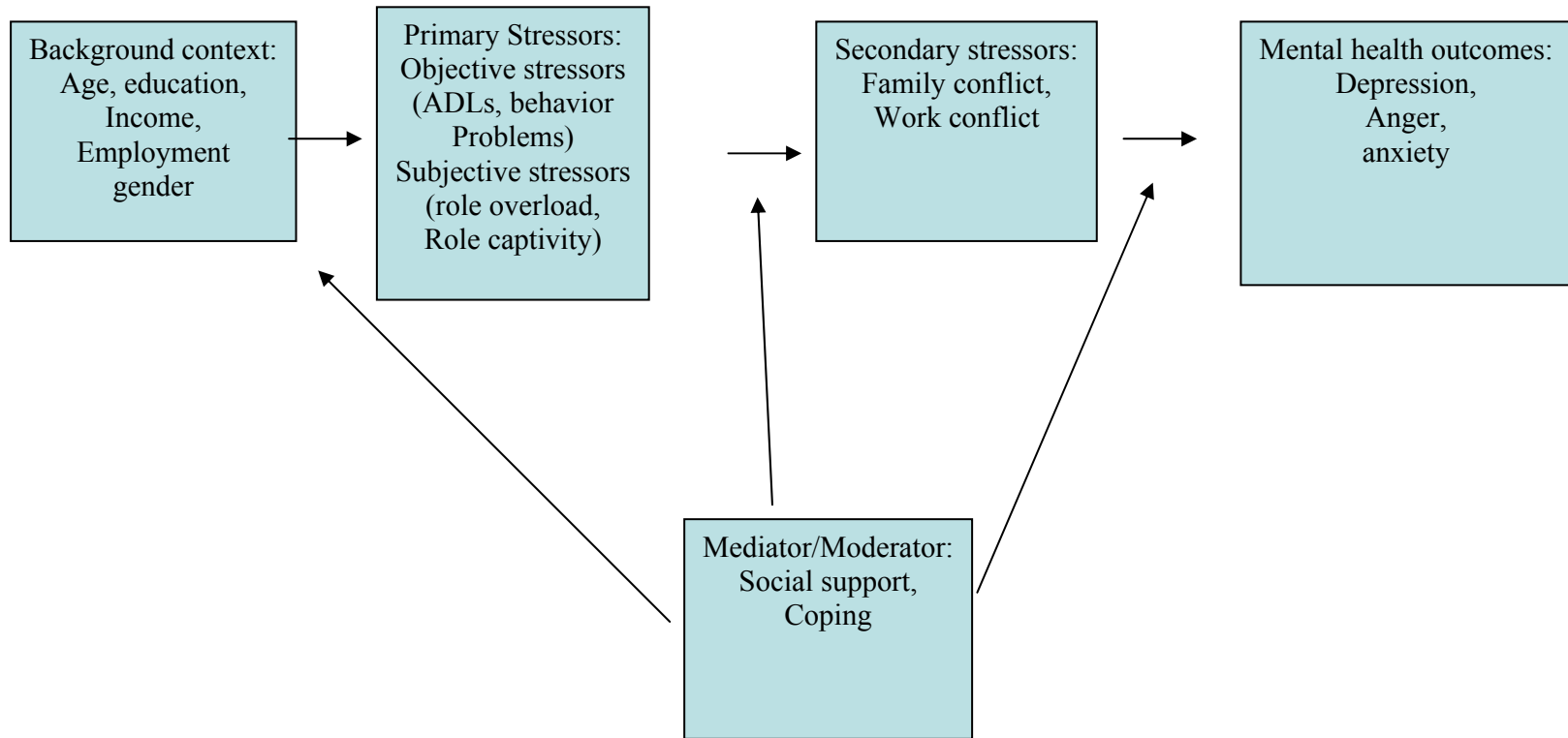
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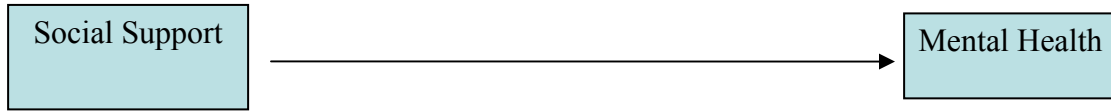
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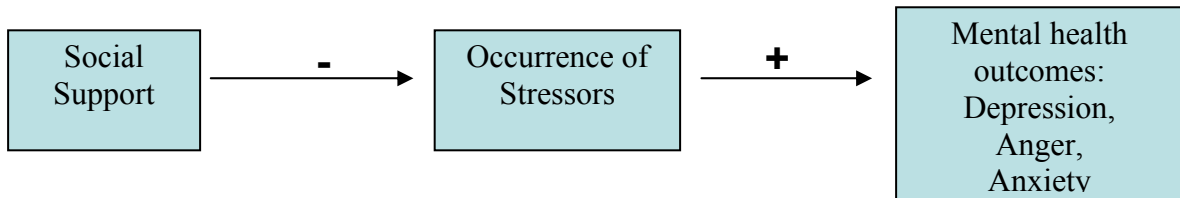
**APPENDIX A. PEARLIN'S CAREGIVING STRESS PROCESS MODEL**



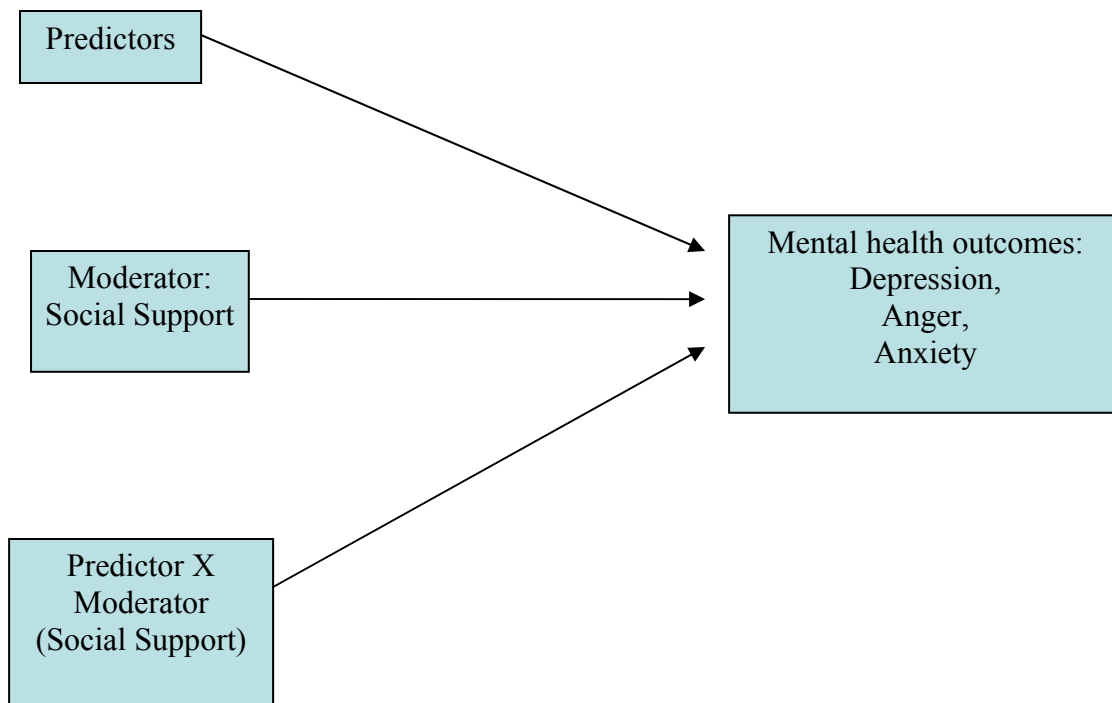
## APPENDIX B. MODELS OF SOCIAL SUPPORT



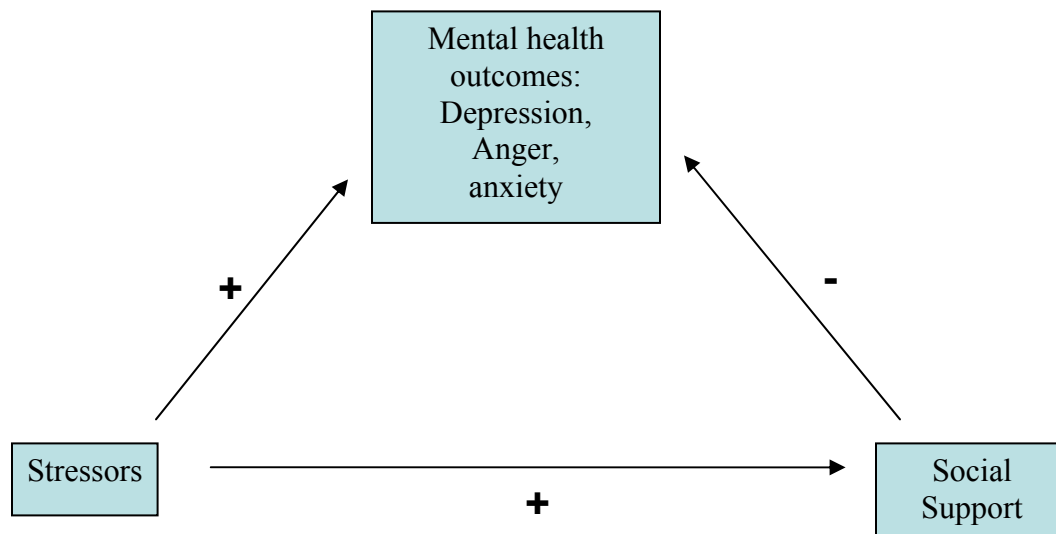
**Figure 7 Main Effect Model**



**Figure 8 Mediation Model (Stress-prevention Model)**



**Figure 9 Stress-Buffering Model/Moderation Model**



**Figure 10 Additive Effect Buffering/Support Seeking or Mobilization Model**



## **CURRICULUM VITA: SOYEON CHO, PH. D.**

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Cho, S., & Zarit, S. H. (2003, November). Poster presented at the 56<sup>th</sup> annual meeting of the *Gerontological Society of America*, San Diego, CA.

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