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Social networks, support perceptions, and depressive symptomatology in dementia family caregivers and noncaregivers

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The Ohio State University, 1993
SOCIAL NETWORKS, SUPPORT PERCEPTIONS, AND
DEPRESSIVE SYMPTOMATOLOGY
IN DEMENTIA FAMILY CAREGIVERS AND NONCAREGIVERS

DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in the Graduate School of
The Ohio State University

by

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* * * * *

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ACKNOWLEDGMENTS

I would like to express my sincere respect and gratitude to Dr. J. Kiecolt-Glaser for her guidance and support throughout my graduate studies. A special thanks is extended to Dr. B. Andersen and Dr. S. Beck, members of my advisory committee, for their time and helpful suggestions. To my husband, family, and friends, I want to say thank you for your unending faith and confidence in me.
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INTRODUCTION

Long-term caregiving of an individual with dementia has been termed a chronic or persistent stress with economic, social, and psychological consequences (Fiore, Becker, & Coppel, 1983; Pearlin, Mullan, Semple, & Skaff, 1990). Findings have shown that caregivers often experience depression, anger, guilt, worry, grief, isolation, helplessness, embarrassment, marital stress, and fatigue (Anthony-Bergstone, Zarit, & Gatz, 1988; Haley, Levine, Brown, Berry, & Hughes, 1987; Mace & Rabins, 1981; Morris, Morris, & Britton, 1988; Pruncho & Potashnik, 1989). However, caregivers appear to be particularly "at risk" for depression and demoralization due to the stresses of caregiving (Fiore et al., 1983; George & Gwyther, 1986; Kiecolt-Glaser, Dyer, & Shuttleworth, 1988; Pagel, Erdly, & Becker, 1987).

During the past 20 years, a number of studies investigating the effects of social relationships on psychological and physical well-being have been conducted (Berg & McQuinn, 1989; Berkman & Syme, 1979; Blazer, 1982; Cutrona, 1986a; Goldberg, Van Natta, & Comstock, 1985; Thoits, 1982). The above studies have suggested that
Integration in a social network is related to a person's well-being, and may be especially important in the mitigation and/or causation of depressive symptomatology (Cohen & Wills, 1985). A number of studies have examined the role of social networks in caregiving and their association with depressive symptoms (Fiore, Coppel, Becker, & Cox, 1986; George & Gwyther, 1984, 1986; Haley et al., 1987; Poulshock & Deimling, 1984).

Social relationships have two components: a structural component and a functional component, with the former commonly called social networks and the latter social support (Chappell & Badger, 1989; Sarason, Sarason, Potter, & Antoni, 1985). An important issue that remains unresolved in this literature is how social networks and social support are related to each other, as well as how they are related to psychopathology (Cohen & Wills, 1985; Cutrona, 1986a). It has been hypothesized that understanding the role of social networks in well-being is incomplete without also understanding the role of social support perceptions (Cohen & Wills, 1985; Cutrona, 1986a; Heitzman & Kaplan, 1988). The identification of social network characteristics important in social support perceptions has been suggested as a means of clarifying the above issues (Cohen & Wills, 1985; Cutrona, 1986a; Seeman & Berkman, 1988).
The present study explored social networks, social support perceptions, and depressive symptomatology in dementia caregivers and noncaregivers. The literature review first addresses relevant caregiving literature. Second, research on social networks is discussed, followed by a review of social network studies using caregivers as subjects. Next, the role of social support perceptions in relationship to social networks and depressive symptomatology is reviewed. Following the above, there is a synthesis of the literature and the hypotheses are outlined. Finally, the methods for conducting the present study, the results of statistical analyses, and a discussion of the results and their implications are presented.
CHAPTER I
LITERATURE REVIEW

Relevant Caregiving Information

**Defining Dementia.** According to the American Psychiatric Association's (1987) *Diagnostic and Statistical Manual of Mental Disorders-Revised (3rd ed.)*, dementia involves "impairment in short- and long-term memory, abstract thinking, impaired judgment, other disturbances of higher cortical function, or personality change" (p. 103). The most prominent symptom of dementia is memory impairment. Other problems often evidenced by dementia sufferers include impaired impulse control, inappropriate affect, and vulnerability to physical and psychological stresses that increase cognitive losses (American Psychiatric Association, 1987). Dementia is typified by a chronic progressive course with no cure, and is currently the fourth leading cause of adult death in the United States (Evans et al., 1989).

An estimated 17% of adults over the age of 65 have some degree of dementia (Reisburg, Ferris, de Leon, & Crook, 1982), with approximately 6.5 million suffering from mild to severe dementia (U.S. Congress, Office of
Severe dementia diagnoses alone are projected to become as high as 4.5 million by the year 2040 (Evans et al., 1989). Specific progressive dementias such as Alzheimer’s Disease, Multi-Infarct Dementia, and Parkinson’s Disease have already been diagnosed in over two million adults in this country ( Heckler, 1985). Thus, this increasing number of dementia sufferers requires a growing population of people to care for them.

The Caregivers. The majority of caregivers are unpaid family members who assume responsibility for their demented relative (Fitting & Rabins, 1985; Gallo, 1990). More specifically, family caregivers are predominantly female, the wives and daughters of those afflicted with dementia (Barusch & Spaid, 1987; Brody, 1985; Fitting & Rabins, 1985). Spousal caregivers, especially wives, have been called "hidden patients" because, like their husbands, they also experience a number of associated problems in living (Fengler & Goodrich, 1979). Furthermore, daughters have been characterized as "women in the middle," since they serve as caregivers to both children and parents (Siegel & Taeuber, 1986). These family members provide care to impaired relatives for extended periods of time before placing them into long-term care facilities, often at the expense of their own well-being (Brody, 1985; Pearlin et al., 1990; Shanas,
Because the likelihood of developing a dementia increases with age, people who live longer are more likely to develop a dementia and need care (Gallo, 1990; Pearlin et al., 1990). As society ages, the number of both dementia sufferers and caregivers is expected to increase. As a result, caregiving, while previously considered a novel experience, is now being conceptualized as a normative life-event (Gallo, 1990; Pearlin et al., 1990). Thus, caregiver research is very much needed as more and more people are expected to become dementia caregivers, at some point in their lives, and experience the stresses of caregiving.

The Caregiving Experience. Depending on the type of dementia (e.g., Alzheimer's Disease, multi-infarct dementia, Parkinson's disease), a dementia sufferer can be expected to live anywhere from 8 to 20 years after disease onset (Butler & Lewis, 1982). The progressive cognitive impairments that are characteristic of dementia require increasing levels of care for dementia sufferers over the disease's course. For instance, in the early stages of dementia, the sufferer generally requires help with telephone numbers, messages, and/or directions (Reisburg et al., 1982). During the middle stage, the afflicted person may not be able to recognize familiar people, remember recent events or know the time or day (Reisburg
et al., 1982). By the late stage, the dementia sufferer is incapable of decision-making and needs assistance with activities of daily living such as dressing, bathing, eating, and toileting (Reisburg et al., 1982). Therefore, progressive impairment in the dementia sufferer leads to increasing work and time demands for caregivers (Gallo, 1990; Kiecolt-Glaser et al., 1988). In fact, caregiving has been likened to a "36-hour day" due to the extent of care dementia sufferers need, especially in later disease stages (Mace & Rabins, 1981).

Dementia caregiving is a unique chronic stressor because the combination of cognitive impairment and behavioral disorder found in dementia does not generally occur in other diseases (i.e., caregivers for cancer patients; Gwyther & George, 1986; Pearlin et al., 1990; Schulz, Williamson, Morycz, & Biegel, 1992). In addition, the fact that caregiving is burdensome has been well-documented over the last decade (See editorial by Zarit, 1989). Studies indicate that caregivers of dementia sufferers tend to experience emotional and physical fatigue (Fitting & Rabins, 1985; Zarit, Todd, & Zarit, 1986), increasing health problems (Kiecolt-Glaser et al., 1987; Pruchno & Potashnik, 1989; Snyder & Keefe, 1985), and significant decrements in social and recreational activities (George & Gwyther 1984; 1986) over the course of caregiving.
Spousal caregivers, who tend to be older and non-working, tend to be more isolated than adult child caregivers. In addition, spousal caregivers face the loss of a lifelong partner and companion, resulting in disruptions in social activities and sexual behavior; these losses tend to intensify the stresses of caregiving (DeLongis & O'Brien, 1990). As such, research has indicated that spousal caregivers are more distressed than adult child caregivers (Anthony-Bergstone et al., 1988; George & Gwyther, 1986). However, other research has suggested that adult child caregivers may be more resentful and unhappy with caregiving responsibilities due to "role overload" (Barusch & Spaid, 1989; Fitting & Rabins, 1985).

Research results suggest that residence of the dementia sufferer is also an important variable associated with caregiver well-being. Those caregivers whose relative lives with them report greater stress, burden, and depressive symptoms than caregivers whose relative has been institutionalized (Clipp & George, 1990; George & Gwyther, 1986). In-home care requires 24-hour supervision while those caregivers of institutionalized dementia sufferers have some respite from caregiving responsibilities, especially in the opportunity to sleep undisturbed.
Evidence has clearly established that characteristics of the caregiving situation (i.e., dementia sufferer residence and caregiver type) are more important factors in caregiver well-being than are characteristics of the dementia sufferer (i.e., duration of care/illness, type of dementia, patient symptoms; George & Gwyther, 1986; Haley et al., 1987; Morris et al., 1988; Pruchno & Resch, 1989). Severity of impairment in the dementia sufferer has shown minimal relationships to caregiver well-being (Barusch & Spaid, 1989; George & Gwyther, 1986; Schulz et al., 1992; Snyder & Keefe, 1985). Perhaps increases in dementia sufferer impairment may show a stronger relationship to caregiver well-being. However, there appears to be no research exploring this variable.

Caregiving and Depressive Symptomatology. A number of studies have examined depressive symptomatology in caregivers (Anthony-Bergstone et al., 1988; Coppel, Burton, Becker, & Fiore, 1985; Gallagher, Rose, Rivera, Lovett, & Thompson, 1989; Haley et al., 1987; Schulz et al., 1992; Schulz, Vistainer, & Williamson, 1990). Rates of depression as high as 83% have been found in at least one caregiver sample (Drinka, Smith, & Drinka, 1987), although most caregiver studies have an average prevalence rate around 40% (Gallagher et al., 1989; Haley et al., 1987). Still, the results indicate that the incidence of caregiver depression is significantly higher
than that of the general population, which is approximately 15% (Gallagher et al., 1989; Haley et al., 1987; Prunchno & Potashnik, 1989; Schulz et al., 1990). There is evidence that most caregivers experience symptoms of depression and demoralization and that some caregivers experience diagnosable clinical disorders, such as major depression and dysthymia (Gallagher et al., 1989; Schulz et al., 1990; Schulz et al., 1992).

In particular, the Gallagher et al. study (1989) examined the extent of diagnosable clinical depression in family caregivers. Two groups of caregivers were used: caregivers who sought help to increase their coping skills (n = 158) and caregivers who volunteered for a study of Alzheimer's disease but were not seeking to increase their coping skills (n = 58; Gallagher et al., 1989). They used both self-report and interview data, the Beck Depression Inventory (BDI) and the Schedule for Affective Disorders and Schizophrenia (SADS), respectively. Overall, 46% of the help-seekers and 18% of the non-help-seekers met Research Diagnostic Criteria for a depressive disorder, with women being more depressed than men (Gallagher et al., 1989).

Caregiving Research Methodological Issues. During the past 12 years, research on caregivers and caregiving has been conducted in high numbers (Pearlin et al., 1990; Zarit, 1989). Much of this research has been descriptive,
emphasizing the caregiving experience and its associated stresses (Brody, 1985; Cantor, 1983; Mace & Rabins, 1981; Rabins, Mace, & Lucas, 1982; Zarit, Reever, & Bach-Peterson, 1980). Therefore, knowledge that caregiving can lead to social, psychological, physical, and financial strains is well documented (Schulz et al., 1990; Zarit, 1989). However, most of these studies have used cross-sectional designs, with self-report measures, in relatively small samples limited to caregivers (Clipp & George, 1990; Gallagher et al., 1989; Gallo, 1990; Pruchno & Potasnik, 1989; Zarit, 1989). These problems may limit the generalizability of results. In addition, few longitudinal studies have been conducted, resulting in less attention being given to the long-term effects of dementia caregiving (Gallo, 1990; Zarit, 1989; Schulz et al., 1990). Longitudinal designs help make possible the exploration of cause and effect relationships among variables.

**Summary.** Dementia is a chronic and increasingly debilitating illness that requires higher levels of care for those afflicted as the illness progresses (Gallo, 1990; Kiecolt-Glaser et al., 1988; Snyder & Keefe, 1985). Caregiving for a dementia sufferer is a unique long-term stressor (Gwyther & George, 1986; Pearlin et al., 1990; Schulz et al., 1992). It is accompanied by a variety of negative consequences for well-being, especially
depressive symptomatology (Coppel et al., 1985; Haley et al., 1987; Gallagher et al., 1989; Schulz et al., 1990). Additional research applications and more effective methods of study could expand our understanding of the caregiving experience and the depressive symptoms often associated with it. In particular, the study of social relationships, which have been associated with depressive symptoms, appeared to be particularly useful in expanding this understanding.

Social Network Research

Defining Social Networks. Two basic elements of social relationships have been studied: the number of other people available to a person, and the degree of satisfaction with those available (Sarason et al., 1985). The former is commonly referred to as an individual’s social network; the latter as social support. In general, social networks represent the structural dimension of social relationships, while social support refers to the functional dimension (Chappel & Badger, 1989; Fiore et al., 1986; Heitzman & Kaplan, 1988). The structural dimension is generally considered to be the more objective, and focuses on the number or frequency of contacts. The functional dimension considers the perceptions of the adequacy and availability of support, and tends to be more subjective.
Social Network Research and Psychological Well-Being.

A variety of studies have shown that social networks play a role in psychological well-being (Berg & McQuinn, 1989; Cohen, Teresi, & Holmes, 1985; Fiore et al., 1983; 1986; Goldberg et al., 1985; Morgan, 1989). Positive aspects of relationships include access to information, understanding, companionship, financial aid, and physical assistance (Cohen & Wills, 1985). Thus, it is not surprising that a responsive social network with resources has beneficial effects on adjustment (Clipp & George, 1990; Fiore et al., 1986). Access to other people appears to increase coping and adjustment because social contacts connect one with resources (Auslander & Litwin, 1990). Therefore, people with fewer contacts have a poorer chance of finding resources that facilitate adjustment than those with more contacts (Rook & Pietromonaco, 1987).

Well-being has clearly been correlated with greater numbers of close friends and relatives (Cohen et al., 1985; Cohen, Teresi, & Holmes, 1987; Cohen & Wills, 1985; Morgan, 1989). Basically, larger social networks provide better opportunities to fulfill various needs (Seeman & Berkman, 1988). People with few contacts may experience decreases in coping, a poorer sense of self-efficacy, greater variability in mood, and more psychiatric symptoms and dysfunctional behavior (i.e., depression,
alcoholism) than individuals with more contacts (Rook & Pietromonaco, 1987). Moreover, higher numbers of psychological and physical symptoms have been reported by people with the fewest number of acquaintances (Broadhead et al., 1983).

Goldberg et al. (1985) specifically examined the association between depressive symptomatology and social network size, using a sample of elderly women, aged 65-75 years. They found that women with high levels of depressive symptomatology had smaller social networks than those women who had lower levels of depression. In particular, the social networks of the more depressed women included few or no friends of similar age or religion as well as the absence of a spousal confidant (Goldberg et al., 1985). Cutrona (1986b) has reported similar findings using college students as subjects. She found that people with more contacts reported less depression than people with fewer contacts. These results suggest that similar findings exist across age groups.

A comprehensive literature review of social support/networks revealed that 17 studies examining social network variables had been conducted (Cohen & Wills, 1985). Of these 17 studies, 15 used depressive symptomatology as a dependent variable. Eleven of the 15 found a significant negative relationship between social networks and depression (Cohen & Wills, 1985). The
authors of this review concluded that "the extent of embeddedness in a social network is important for well-being" (p. 327). Embeddedness refers to regular social interaction or social integration, often measured as social network size or number of contacts (Cohen & Wills, 1985; Gottleib, 1985).

Other Social Network Research. In particular, social networks have been found to play a role in recovery from major injuries (e.g., hip fracture; Magaziner, Simonsick, Kashner, Hebel, & Kenzora, 1990; Mossey, Mutran, Knott, & Craik, 1989), illnesses (i.e., stroke; Norris, Stephens, & Kinney, 1990; Stephens, Kinney, Norris, & Ritchie, 1987), and in significant life events (i.e., bereavement; Ferraro, 1984; Morgan, 1989). For example, the Magaziner et al. (1990) study examined predictors of functional recovery one year following hospital discharge for hip fracture, using 536 patients aged 65 or older as subjects. Functional recovery was measured as a combination of several factors, including walking ability and level of dependence on others. They found increased contact with one's social network was associated with greater recovery. Age and rehospitalization predicted poorer outcome one year after hip fracture. However, social network contact and cognitive status were significantly related to functional recovery more so than serious concomitant disease, type of fracture, length of hospital stay, and
marital status (Magaziner et al., 1990).

There is evidence linking social relationships with ongoing physical health as well (Berkman & Syme, 1979; Blazer, 1982; Kiecolt-Glaser et al., 1987; Seeman & Syme, 1987; Thomas, Goodwin, & Goodwin, 1985). Increased morbidity and mortality rates have been associated with smaller social networks (Broadhead et al., 1983). House, Landis, and Umberson (1988) suggest that evidence exists for the causal impact of social relationships on health. They discuss a variety of research results suggestive of "an increased risk of death among persons with a low quantity (social networks) and sometimes low quality (social support) of social contacts" (p. 540); these relationships hold even when baseline levels of support and health are controlled. However, while some results indicate that social isolation may play a role in increasing mortality risk (Berkman & Syme, 1979; Blazer, 1982; House et al., 1988), research in this area remains inconclusive due to inconsistent results (Schulz et al., 1990).

Social Network and Social Support Research. A number of researchers have examined the relationship between social support and social networks and found that smaller networks provide less interaction and, therefore, fewer possibilities for support (Goldberg et al., 1985). Cohen et al. (1987) and Cutrona (1986a) report that larger
networks generally offer more resources to recipients than smaller networks. Also, if one or more support options are unavailable, a larger network would more likely be able to offer needed sources of help (Cutrona, 1986a).

Social networks have beneficial effects on well-being, although contact with people does not always mean support. For example, potential sources of support may be related to higher expectations of support, such that people with larger networks may expect more help than they receive (Dean, Kolody, Wood, & Ensel, 1989). However, larger networks are generally associated with the greater availability of support (Cohen et al., 1987; Seeman & Berkman, 1988). Social contact can also be a source of stress and tension. The negative aspects include contact with network members who are difficult to get along with, bothersome, quarrelsome, meddlesome, or fail to keep promises (Norris, Stephens, & Kinney, 1990; Pagel et al., 1987). Some studies indicate that negative aspects of relationships may be important in well-being and depression (Morgan, 1989; Okun, Melichar, & Hill, 1990; Rook, 1984).

Social Network Research Methodological Issues. Literature documenting the effects of social networks and social support on well-being is available. However, a variety of problems exist with this literature. Numerous measures of varying length, focus, and approach exist for
assessing social relationships (Heitzman & Kaplan, 1988). Sarason et al. (1985) claim the diversity of these measures is comparable "to the diversity of conceptualizations concerning social relationship ingredients" (p.157). For instance, researchers have defined social networks as number of roles, number of contacts, and/or frequency of contact (Heitzman & Kaplan, 1988; Sarason et al., 1985). Meanwhile, social support has been defined as the type of help received (i.e., emotional versus instrumental), perceived satisfaction with support, and perceived availability of support (Heitzman & Kaplan, 1988; Sarason et al., 1985). Therefore, varying definitions of both social networks and social support have been proposed by researchers.

With little consensus on the definitions, the results have been inconsistent, due to measurement variance from study to study (Heitzman & Kaplan, 1988), and to the use of overlapping items within measures (Goldberg et al., 1985). Thus, it has been difficult to compare studies and their results. Other problems involve the degree to which social networks may be related to variables such as age, race, and economic status (Blazer, 1982). Reliance on cross-sectional studies and self-report data are other possible problems in this research (House et al., 1988). In addition, many studies of social networks use a retrospective design that limits confidence in determining
causality (Cohen et al., 1985; House et al., 1988). House et al. (1988) claim that many studies have only examined the association between social relationships and well-being without distinguishing between buffering and main effects. Therefore, these methodological problems have limited research conclusions.

In particular, the issue of causality has remained problematic in social relationship research. The association between stress and psychological well-being has been linked causally to social relationships in some studies (Aneshensel & Frerichs, 1982; Cohen et al., 1987; Schaefer, Coyne, & Lazarus, 1981), suggesting that social relationships directly impact mental health. However, other studies have suggested that social relationships "buffer" people from stressful events (Cutrona, 1986a; Eaton, 1978; Okun et al., 1990). This buffering hypothesis postulates that social bonds help to protect or insulate people from stress and subsequent psychological and, possibly, physical illness. In two literature reviews on the connections among social relationships and well-being, Cohen and Wills (1985) and House et al. (1988) found support for both a causal and a buffering role. Specifically, these reviews of the literature have confirmed an association between social relationships and well-being, although the exact nature of this relationship remains unclear.
Another reason for complexity in this area of research concerns the relationship between social networks and social support. While social networks are not the same as social support (Heitzman & Kaplan, 1988), the two are correlated (Fiore et al., 1986), such that social networks may determine the extent to which people receive or even perceive social support. However, the majority of research suggests that social networks and social support variables are only weakly associated and represent distinct dimensions of social relationships (Jennings, Stagg, & Pallay, 1988; Seeman & Berkman, 1988). Still, there is no simple association between social networks and social support variables (Jennings et al., 1988; Seeman & Berkman, 1988). The nature of these associations require further research for clarification (Cohen & Wills, 1985; Cutrona, 1986a; Dean et al., 1989; Pagel et al., 1987). The present study attempted to clarify one aspect of the association between social networks and social support.

**Summary.** Social networks represent the more structural characteristics of social relationships (Heitzman & Kaplan, 1988; Sarason et al., 1985). Research has indicated that being a member of a social network enhances psychological and possibly physical well-being (Cohen & Wills, 1985; Goldberg et al., 1985; House et al., 1988; Morgan, 1989). In particular, social network research points to a relationship between social
integration and depressive symptomatology, with greater integration associated with fewer depressive symptoms (Cohen et al., 1985; Goldberg et al., 1985; Cutrona, 1986b).

Currently, this research area has a variety of complex as well as some inconsistent findings. Such findings may be indicative of the complex nature of social relationships themselves, studies attempting to examine too many variables in possibly poor research designs, or both (Heitzman & Kaplan, 1988; Sarason et al., 1985). Nonetheless, the possible impact of social relationships on psychological well-being, whether causal or buffering, has been well documented (Cohen & Wills, 1985; House et al., 1988). Given this documentation, a few researchers have examined the social networks of dementia caregivers.

Social Network Research in Dementia Caregiving

The Research. Some studies suggest that caregivers are more likely to become isolated from their usual companions and social activities because of caregiving responsibilities (George & Gwyther, 1984; 1986). George and Gwyther (1986) conducted a study that examined four possible dimensions responsible for caregiver well-being. The dimensions included: physical health, mental health, financial resources, and social participation. They found that relative to comparison subjects, caregivers
experience more problems with mental health and social participation. In particular, caregivers reported overall lower levels of participation, fewer phone calls, fewer visits, and less time for recreational activities. Even caregivers of institutionalized patients reported experiencing significant problems with social participation (George & Gwyther, 1986). These results and others indicate that caregivers compared with noncaregivers have less time for socializing and decreased frequency of social contact (Clipp & George, 1990; Gallo, 1990; George & Gwyther, 1986; Haley et al., 1987).

Other studies have also indicated the role of social networks in both caregiver psychological and physical well-being (Haley et al., 1987; Kiecolt-Glaser et al., 1987; Poulshock & Deimling, 1984). A recent study examined changes in depression, immune function, and health over the course of one year, using 69 spousal caregivers and 69 matched comparison subjects (Kiecolt-Glaser, Dura, Speicher, Trask, & Glaser, 1991). Results of this study found that caregivers with lower levels of social support at baseline had the greatest amount of negative change in immune function at one year follow-up. In this study, lower levels of support were, in actuality, characterized as fewer people in social networks and fewer contacts with network members (Kiecolt-Glaser et al., 1991).
The literature on caregivers' social networks, however, has inconsistent findings. Fiore et al. (1986) explored four support/network operations and their relationship to caregiver depression and general psychopathology: network frequency, support satisfaction, support availability, and support use. Network frequency, defined as the number of contacts with others and how often caregivers received help, was not significantly related to depression (Fiore et al., 1986). Of the four operations, only support satisfaction was found to be predictive of depression and general psychopathology. Of particular interest was the finding that compared to less depressed caregivers, the most depressed caregivers were not reporting less contact, less use, or even less availability of their social networks, only less satisfaction (Fiore et al., 1986).

In addition, Golden-Kreutz, Kiecolt-Glaser, and Dura (1990) found no differences in the number of contacts or roles comprising the social networks of 50 spousal caregivers relative to 50 matched comparison subjects. However, caregivers reported significantly more depressive symptoms. Despite both groups having similar network characteristics, caregivers were less satisfied with their network contact and had fewer expectations of receiving help from network members (Golden-Kreutz et al., 1990). Haley et al. (1987) has reported similar findings. They
compared caregivers with matched control subjects. Results indicated that caregivers had similar sized social networks, but less expressed satisfaction, and less participation in social activities (Haley et al., 1987).

Caregiving Social Network Research Methodological Issues. Social network research is limited in the caregiving literature for several reasons. First, as discussed earlier, most caregiver studies have been descriptive (Zarit, 1989). Therefore, little importance has been given to analyzing the structural characteristics of caregiver's social networks (Barer & Johnson, 1990). Also, many of the existing studies in this area have only examined partial networks (i.e., number of friends, number of relatives, presence of spouse, or presence of a confidant; Barer & Johnson, 1990). A systematic study exploring the total social network and its relevant characteristics on psychological well-being has been absent from the literature.

Summary. The importance of social networks has received little systematic attention in dementia caregivers. Those few studies done have produced inconsistent results (Fiore et al., 1986; George & Gwyther, 1986; Haley et al., 1987; Kiecolt-Glaser et al., 1991). Research on the characteristics of caregiver's social networks as well as possible differences between the social networks of caregivers and noncaregivers is
needed. Further research may indicate that the social networks of caregivers and noncaregivers are indeed similar, but that perceptions of their social networks may differ due to the effects of stress (Fiore et al., 1986; Golden-Kreutz et al., 1990; Haley et al., 1987). Therefore, an examination of social support perceptions appeared important.

Social Support Perception Research

Role of Social Support. Research suggests that social support may play a larger role in the well-being of individuals than social networks (Cohen & Wills, 1985; Gallo, 1990; Heitzman & Kaplan, 1988; Sarason, Shearin, Pierce, & Sarason, 1987). In particular, perceived support (a functional characteristic of support), defined as the subjective evaluation that support is available or adequate, has been identified as a critical variable in predicting depressive symptomatology (Dean et al., 1989; Gallo, 1990; Goodman & Pynoos, 1990; Sarason et al., 1987). Some studies indicate that the actual number of contacts in a social network is not as relevant to well-being as are subjective appraisals of such contacts (Chappell & Badger, 1989; Heitzman & Kaplan, 1988; Sarason et al., 1987). In fact, one confidant or close friend may be perceived as more supportive than a number of acquaintances (Cohen & Wills, 1985; Goldberg et al., 1985).
Sarason et al. (1987) assessed relations between four social relationship measures and loneliness. The relationship measures included: perceived available social support, social network characteristics (size, density, and number), perceived received support, and family social environment (who provides support). Their subjects were 217 undergraduate students in an introductory psychology course. Results indicated that who provides social support (family or friends) and social network characteristics were not as important in loneliness as is the perception that one can rely on others (Sarason et al., 1987). For caregivers, the Fiore et al. (1986), Golden-Kreutz et al. (1990) and Haley et al. (1987) studies, discussed earlier, point out the possible importance of support perceptions as well.

Social Support Determinants. However, little is known about the determinants of support perceptions. Both Cohen and Wills (1985) and Gottlieb (1985), as pointed out by Cutrona (1986a), have expressed the need to identify objective characteristics that contribute to "a psychological sense of support". Cutrona (1986a) has further stated that an "understanding of the mechanisms through which social support serves protective functions against stress cannot advance until we better understand the conditions that engender a sense of support" (p. 349). In other words, until supportive elements of social
relationships are identified our understanding of their benefits is incomplete. Nonetheless, few studies have actually examined the contribution of social networks in perceptions of social support (Cutrona, 1986a).

Seeman and Berkman (1988) conducted a study examining the structural characteristics of social networks and their relationship with social support in a sample of 2806 community dwelling older adults. They studied seven structural characteristics: network size, number of proximal ties, number of nonproximal ties, number of direct face-to-face contacts, and number of indirect nonvisual contacts. Proximal ties refer to geographic closeness, while indirect contacts refer to contact by phone or mail. Using regression models and adjusting for age, gender, race, and income, results indicated that network size, number of face-to-face contacts, and number of proximal ties were associated with greater availability of support (Seeman & Berkman, 1988). More importantly, they found that perceived adequacy of support was most strongly related to number of face-to-face contacts. Thus, while network size and number of proximal ties were correlated with support perceptions, direct contact was most important in perceiving adequate levels of support (Seeman & Berkman, 1988).

Simply the presence of another person has been found to be comforting (Henderson, Byrne, & Duncan-Jones, 1981).
Therefore, it may be that in time of stress a phone call or letter just cannot take the place of face-to-face interaction. This association between face-to-face contact and support perception may be particularly important for stressed individuals. People who are experiencing a chronic stressor, such as persons caring for a relative with a dementing illness, may find face-to-face contact a necessary component in perceiving support. In turn, face-to-face contact may also be related to a sense of psychological well-being. Since caregivers frequently experience isolation over time (Clipp & George, 1990; George & Gwyther, 1984, 1986; Gallo, 1990), face-to-face contact may become increasingly salient to perceptions of support and well-being. Fiore et al. (1986) has suggested that a loss of contact means caregivers lose the physical comfort of a hug, hand shake, and/or nods of empathy. However, the importance of face-to-face contact for caregivers has not been previously explored.

**Social Support Perception Research Methodological Issues.** The methodological concerns in support perception research are similar to those issues discussed earlier in social network research. For instance, researchers have measured support perceptions as perceptions of satisfaction, availability, helpfulness, or upset (Fiore et al., 1986; Heitzman & Kaplan, 1988; Sarason et al.,
Therefore, inconsistent results have been found, as has been in social network research, due to multiple definitions (Cohen & Wills, 1985; Heitzman & Kaplan, 1988). Another concern is that by studying perceptions the chances that subjects bias or provide inaccurate reporting may be increased (Seeman & Syme, 1987).

**Summary.** Subjective appraisals of support are associated with well-being (Dean et al., 1989; Gallo, 1990; Goodman & Pynoos, 1990; Sarason et al., 1987). However, those social network characteristics that are related to support perceptions remain unidentified (Cohen & Wills, 1985; Cutrona, 1986a). For dementia caregivers, identifying the social network characteristics that are important in perceiving support may be crucial in understanding the development and/or maintenance of depressive symptoms. The study of face-to-face contacts appears to be an avenue toward identifying a social network characteristic related to support perceptions and depressive symptomatology.

**Synthesis of Literature**

The above introduction has addressed three topics. First of all, the reason why the study of caregivers is important was discussed. Dementia caregiving is a unique chronic stressor for caregivers (George & Gwyther, 1986; Pearlin et al., 1990; Schulz et al., 1992). The number of
dementia caregivers is increasing (Evans et al., 1989), so that more people will experience the stresses of caregiving (Gallo, 1990; George & Gwyther, 1986; Pearlin et al., 1990; Zarit et al., 1986). Furthermore, and perhaps more importantly, caregivers are a population "at risk" for depressive symptomatology (Fiore et al., 1983; Gallagher et al., 1989; Pagel et al., 1987; Schulz et al., 1990; Schulz et al., 1992). Therefore, a need for research to examine the development and maintenance of such symptoms was needed in order to better understand caregiving's stresses and provide appropriate intervention.

The second topic discussed was the relevance of social relationship variables to caregivers. Researchers have found connections between social relationships and depressive symptomatology (Cohen & Wills, 1985; Cutrona, 1986b; Goldberg et al., 1985). For instance, studies suggest that those people with larger social networks or more social contacts have fewer depressive symptoms (Cutrona, 1986b; Goldberg et al., 1985). The connections between social relationships and depressive symptoms appear particularly salient for people under stress, such as caregivers, and are worthy of research. However, these variables have received little, if any, systematic exploration in caregivers.
Third, connections among face-to-face contacts, support perceptions, and depressive symptoms were also discussed. Research indicates that social relationships have structural and functional components (Chappel & Badger 1989; Heitzman & Kaplan, 1988; Sarason et al., 1985), and support perception, a functional component, may be a more important factor in depressive symptoms than structural components (Cohen & Wills, 1985; Dean et al., 1989; Gallo, 1989; Sarason et al., 1987). However, it is unclear what structural components of social relationships are related to perceptions of support (Cohen & Wills, 1985; Cutrona, 1986a). The need to link social structures to support functions is important (Dean et al., 1987). Face-to-face contacts (Seeman & Berkman, 1988), a structural component, may be the key to better understanding the basis of support perceptions and depressive symptoms. This area of research, in particular, has received little attention from researchers, especially in regards to dementia caregivers.
CHAPTER II
THE PRESENT STUDY

Clipp and George (1990) suggest that what makes dementia caregiving research valuable is the opportunity to study people under severe chronic stress, and the impact of that stress on their well-being and coping ability. Therefore, of particular interest was the study of two groups: dementia caregivers, who are very likely to be experiencing considerable stress, and noncaregiving comparison subjects.

To date, much of the research on caregivers lacks data on control subjects (Gallo, 1990; Pruchno & Potashnik, 1989; Zarit, 1989). A strength of the present study was its inclusion of control subjects, allowing a direct comparison between caregivers and similar individuals who do not provide such care. In addition, the present study had a longitudinal design consisting of two data collection points about one year apart.

The majority of caregivers are people who have never experienced significant depressive symptoms during their lifetime until the onset of caregiving (Dura, Stukenberg, & Kiecolt-Glaser, 1990; Schulz et al., 1990). In fact,
rates of depression in caregivers and comparison subjects are similar prior to caregiving (Dura et al., 1990). The present study was, therefore, able to analyze what social support variables may play a casual role in the development of depressive symptoms in dementia caregivers.

In conclusion, the goal of the present study was to identify social network characteristics important in social support perceptions and to examine how both social networks and social support perceptions were related to depressive symptomatology within caregiving and comparison samples. See Figure 1 for a diagram of the proposed longitudinal relationships among structural and functional support characteristics and depressive symptomatology; and Figure 2 for a diagram of how social support characteristics, along with other variables, were hypothesized to be related to caregiver depressive symptoms. In both figures, the solid lines indicate strong associations between variables, while the dotted lines represent weak associations. The arrows represent the hypothesized direction of the relationships. The present study attempted to advance psychological knowledge in two areas simultaneously: dementia caregiving and social relationships.
SOCIAL SUPPORT CHARACTERISTICS

STRUCTURAL

- Face-to-Face Contact
- Non-Face-to-Face Contact

FUNCTIONAL

- Perceived Support
- Depressive Symptomatology

OUTCOME

Time A ———— Time B

Figure 1. Proposed Longitudinal Relationships among Structural and Functional Characteristics of Social Support in Depressive Symptomatology.
Figure 2. The Proposed Role of Social Support Characteristics, other variables, and Caregiving Stressors in Caregiver Depressive Symptomatology.
Hypotheses

Based on the above literature review, the following were hypothesized:

A. Group Hypotheses

1. Consistent with previous literature, caregivers, as compared with noncaregivers, will report more depressive symptoms (Fiore et al., 1983; Gallagher et al., 1989; Pagel et al., 1987; Schulz et al., 1990; Schulz et al., 1992) and lower levels of perceived support (Fiore et al., 1986; Golden-Kreutz et al., 1990; Haley et al., 1987; Poulshock & Deimling, 1984) at both Time A and Time B.

2. While caregivers and control subjects may or may not differ in the respective size or total number of contacts of their social networks (Fiore et al., 1986; George & Gwyther, 1986; Golden-Kreutz et al., 1990; Haley et al., 1987; Kiecolt-Glaser et al., 1991), caregivers will have fewer face-to-face contacts than control subjects at both Time A and Time B.

3. Among caregivers, residence of the dementia sufferer and impairment increase in the dementia sufferer will be associated with fewer face-to-face contacts, lower perceived support, and more depressive symptoms (Barusch & Spaid, 1989; Clipp & George, 1990; George & Gwyther, 1986; Schulz et al., 1990). Moreover, spousal caregivers will also have fewer face-to-face contacts, lower perceived support, and more depressive symptoms than adult child
caregivers (Anthony-Bergstone et al., 1988; George & Gwyther, 1986; DeLongis & O'Brien, 1990). These differences between caregivers will occur at both Time A and Time B.

B. Model Hypotheses

1. Lower perceived support will be associated with higher numbers of depressive symptoms at both Time A and Time B. Furthermore, level of perceived support at Time A will be predictive of number of depressive symptoms at Time B. In addition, perceived support will be a stronger predictor of depressive symptoms than face-to-face contacts indicating that functional aspects of support are more important in depression than structural aspects (Cohen & Wills, 1985; Gallo, 1990; Heitzman & Kaplan, 1988; Sarason et al., 1987).

2. Number of face-to-face contacts, in contrast to number of non-face-to-face contacts, will be more strongly related to level of perceived support at both Time A and Time B. (Non-face-to-face contacts are defined as contact by phone or through letters.) In addition, number of face-to-face contacts at Time A will be predictive of level of perceived support at Time B.
CHAPTER III
METHODS

Subjects

The subjects were primary caregivers for progressive dementia sufferers and age, education, gender, and income matched comparison subjects (noncaregivers). Both caregivers of spouses and caregivers of parents (adult children) were used as subjects, since both have been found to experience the stresses of caregiving (Brody, 1985; Pearlin et al., 1990; Shanas, 1979). In addition, caregivers who provided care for either dementia sufferers who lived with them or who lived in long-term care facilities were included as subjects. Evidence indicates that regardless of the dementia sufferer's residence, caregivers can experience significant problems with well-being (Anthony-Bergstone et al., 1988; George & Gwyther, 1986).

Caregivers were recruited from a number of sources including the Columbus Chapter of the Alzheimer's Disease and Related Disorders Association, area hospitals' short-term evaluation units, adult day care centers, senior citizen centers, and referrals from neurologists.

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Comparison subjects were recruited from newspaper stories, advertisements, and notices on bulletin boards in senior citizen centers and area hospitals.

The subjects used in the present study were taking part in a larger five year longitudinal study examining the connections between chronic stress and psychological and physical well-being at The Ohio State University. The average caregiver, upon entry into the larger study, had already been caregiving for five years and, at least, five hours per week. Therefore, first participation into the larger study did not coincide with the beginning of caregiving. The larger study has finished its fifth year of data collection. The two data points used in the present study were years three and four because the variable face-to-face contact was not inserted into the larger study until year three. Thus, Time A and Time B, the longitudinal points of the present study, were respectively year three and year four of the larger study.

Evidence from the larger study has indicated that sample bias is an important issue to consider when conducting research with dementia caregiving samples. In one study comparing subjects assessed at the university (n = 68) and those assessed in their homes (n = 46), it was found that caregivers assessed at home were caregiving for more impaired dementia sufferers (Dura & Kiecolt-
Glaser, 1990). The dementia sufferers cared for at home were reported to have increased behavioral problems, increased personality changes and, as a result, required more hours of care per day. In addition, the caregivers assessed at home reported more depressive symptoms than those caregivers assessed at the university (Dura & Kiecolt-Glaser, 1990). In another study comparing study participants \( (n = 18) \) with nonparticipants \( (n = 18) \), it was found that the nonparticipants were providing care to more impaired dementia sufferers (Dura & Kiecolt-Glaser, 1990). There were no differences between groups in age, education, gender, or income in either of these two studies.

The above studies indicate that research participation based on assessments at a central location are biased to less depressed caregivers who are providing care for less impaired dementia sufferers with fewer behavioral and personality problems (Dura & Kiecolt-Glaser, 1990). Therefore, it is important that research projects provide home interviews to subjects or else those caregivers who are likely to be more depressed and burdened with caregiving will not be represented in research samples (Dura & Kiecolt-Glaser, 1990). These findings can also be applied to older adult subjects, who due to physical limitations and/or medical conditions, may find traveling uncomfortable or difficult but would be
willing to participate in research if offered a home assessment (Dura & Kiecolt-Glaser, 1990).

**Procedures**

Annually, each subject in the larger study completed a two hour session that included an interview and questionnaires about interpersonal, psychological, and physical functioning. The sessions were conducted at either The Ohio State University or the subjects' homes, with the latter available for those subjects unable to travel to the university. For caregivers and older subjects, as stated above, home sessions were particularly important for research participation and the attainment of a representative sample (Dura & Kiecolt-Glaser, 1990). Data were collected by graduate students in clinical psychology or a psychology postdoctoral fellow.

**Measures**

**Demographics.** Through a background questionnaire, standard information about age, highest level of education achieved, gender, and yearly income was obtained. These variables have been related to components of social relationships, as well as depression (Clipp & George, 1990).

Age was important because research results suggest that number and frequency of contacts may be more important for older adults (Armstrong & Goldsteen, 1990; Clipp & George, 1990; Cutrona, 1986b). Contacts may be
more important for aging adults due to increasing disability (i.e., health, strength) and needs for assistance (i.e., chores, house care; Seeman & Berkman, 1988). In addition, older caregivers tend to report more problems in well-being than younger caregivers (George & Gwyther, 1986; Montgomery, Gonyea, & Hooyman, 1985).

Examination of gender differences was important also, primarily because women tend to report more depressive symptoms than men (American Psychiatric Association, 1987). In addition, educational level was assessed according to the educational index of the Four Factor Index of Social Status (Hollingshead, 1975). This index utilizes a seven point scale comprised of the following: 1- graduate professional training, 2- undergraduate degree, 3- some college training, 4- high school graduate, 5- partial high school training, 6- eighth grade graduate, and 7- less than seven years of school.

Information on yearly income was also collected from each subject. Thirteen categories were used, ranging from 1- less than $500 per year to 13- more than $40,000 per year. Income was an important variable to account for because of its association with depression and isolation (Blazer, 1982; Goldberg et al., 1985). In addition, for caregivers, financial resources can "cushion" caregiving demands through the purchase of paid help while poor financial resources can cause additional stress, worry,
and burden (Clipp & George, 1990; Dura, Stukenberg, & Kiecolt-Glaser, 1991; Gallo, 1990).

Another issue to examine was if differences in depressive symptoms between caregivers and noncaregivers were related to previous history of psychological functioning. In other words, do caregivers experience more depressive symptoms because they have a previous history of depression. While previous research from the larger study, using a lifetime psychological interview (i.e., Structured Clinical Interview for the DSM-III-R; SCID), found no differences in the history of Axis I psychological disorder diagnoses or in family history diagnoses between comparison subjects and caregivers prior to the onset of caregiving (Dura et al., 1990; Dura et al., 1991), possible group differences in the present study's sample were specifically explored.

**Depressive Symptoms.** In the present study, two instruments were used to measure depressive symptomatology. One was a self-report instrument, the other an interview measure. It has been recommended that when depressive symptoms are being measured that two outcome measures should be used (Steer, Beck, Riskind, & Brown, 1987). This was especially important because some evidence indicates that caregivers as well as older adults may tend to under-report affective symptoms on self-report instruments but not during an interview (Becker &
Morrissey, 1988; Haley et al., 1987; Toner, Gurland, & Teresi, 1988; Zarit & Toseland, 1989). Therefore, the use of two methodologically different instruments guarded against possible biases that could occur if only one instrument were used.

Subjects completed the 21-item version of the Beck Depression Inventory, a self-report measure of depressive symptoms (BDI; Beck, Word, Mendelson, Mock, & Erbaugh, 1961; Beck, Rush, Shaw, & Emery, 1979). The items assess symptoms and attitudes most often associated with depression. This form of the BDI has a total scoring range of 0 to 63, with each individual item rated for severity of depressive symptoms on a scale of 0 to 3. Higher scores are indicative of greater depressive symptomatology. The time frame of the BDI is the current week, including the day the inventory is answered.

The BDI is currently one of the most widely used instruments for assessing severity of depressive symptoms in both psychiatric and "normal" populations (Beck, Steer, & Garbin, 1988; Gallagher, Nies, & Thompson, 1982). The BDI has high internal consistency with a mean coefficient alpha of .87 (Beck et al., 1988). In over ten reliability studies, test-retest correlations have been on average, greater than .60 (Beck et al., 1988). In addition, concurrent validity of the BDI with clinical assessments of depression as well as with other measures of depression
(both interview and self-report) are also high (> .60; Beck et al., 1988).

In addition to its psychometric strengths, the BDI was also chosen because it is sensitive to mild and moderate levels of depression, and somewhat less sensitive to physical ailments or problems compared to depression scales more biologically based (Hammen, 1981). Depression scales more biologically based can elicit falsely elevated scores in older individuals (Bolla-Wilson & Bleecker, 1989); the sample of subjects in the present study was composed of some older adults who are more likely to suffer from physical concerns resulting from age instead of mood. Previous research has indicated that the BDI is a reliable instrument when used with people over the age of 60 (Gallagher et al., 1982), as well as with caregivers (Gallagher et al., 1989; Schulz et al., 1990).

The interview measure was the Hamilton Rating Scale of Depression (HRSD; Hamilton, 1960; Guy, 1976). This instrument is composed of 24-items which assess the severity of various depressive symptoms. The HRSD has a total score ranging from 0 to 72; individual items have either three- or five-point ratings (i.e., 0- absent, 1- mild, 2- moderate, 3- severe, and 4- incapacitating; or 0- absent, 1- mild, and 2- severe). Higher scores are associated with more severe depressive symptoms. The time frame of the HRSD, like the BDI, is the current week,
including the day the inventory is answered. Inter-rater reliabilities of greater than .80 using the HRSD have been reported (Knesevich, Biggs, Clayton, & Ziegler, 1977; Steer et al., 1987). In addition, concurrent validity of the HRSD with psychiatrist's global ratings of depression is high (.89; Knesevich et al., 1977).

The HRSD is best administered by a trained interviewer who is able to differentiate depressive symptoms from physical ones. In the present study, all interviewers had extensive training in the administration and scoring of the HRSD. Interrater reliability of the HRSD was assessed in the larger study by comparing ratings made by the original interviewer with those of a reliability rater. The reliability rater used audiotapes of the interview and was blind to the ratings given by the original interviewer. Reliability ratings were made for 175 subjects (12% of the total sample) over a five-year period. A Pearson Product Moment Correlation calculated between the original interviewer and the reliability rater revealed a coefficient of .84, (Year 3: \( r = .84, n = 35 \); Year 4: \( r = .88, n = 35 \)) suggesting the interviewers in the present study were reliably rating level of depressive symptoms using the HRSD.

Social Networks. Each subject was asked to respond to the Social Network Index Interview (SNII; Cohen, 1991), a measure of the number of people the subject currently
sees or talks with at least once every two weeks including family, friends, workmates, and neighbors. This interview also inquires about organizational participation in activities such as church; social, recreational, and professional groups; employment, and educational coursework. Examples of the questions on the SNII follow: How many close friends do you have? How many of these friends do you see or talk to at least once every two weeks? Do you belong to any kinds of groups (social or recreational group, trade union, commercial group, professional organization, a group concerned with children <boy scouts>, a community service or charity group)? During the last month, how many times have you attended group functions or meetings? How many members of the group (or groups) that you belong to do you see or talk to at least once every two weeks?

The SNII has three subscale scores: number of roles, network size (possible contacts), and number of high contact roles (actual contacts). Higher scores are representative of larger social networks. For the present study, the third subscale, number of high contact roles, was used. This subscale examines whether or not a subject has regular contact (i.e., mail, telephone, in person) given their roles (i.e., parent, spouse, friend, neighbor). For example, a woman may be a mother of two adult children, both of whom live across the country. She
may, therefore, only talk to them about once every two
months. While this woman does have the role of a mother,
she does not have regular contact with her children.
Thus, for her the role of parent is not a high contact
role.

The subscale, face-to-face contacts, was added to the
SNII for the present study. This subscale was easily
inserted into the SNII by dividing the high contact role
subscale into two subscales. The first is non-face-to-
face contacts which involves regular contact over the
phone or through letters (range 0-61). The second is
face-to-face contacts which asks only about direct in
person contact with others (range 0-61). As a result,
after subjects are asked, for example, how many friends or
how many groups they are a member of, they are asked how
often they have had non-face-to-face contact and face-to-
face contact with these relevant others during the average
two week period. Again, higher scores indicate more
contact.

The SNII is an easily administered instrument because
subjects rate only actual contact and roles. Therefore,
perceptions and feelings may less readily confound the
results as in other social support measures (Seeman &
Syme, 1987). Currently, there are no published
reliability data on the SNII. However, test-retest
reliability over six months is greater than .80 (S. Cohen,
personal communication, March 1991). The reliability of this interview is high because many of the items are the very kinds of counting things that are unlikely to change, and are easy for subjects to assess, such as whether or not they are married (i.e., roles) and number of certain kinds of contacts (i.e., number of contacts with children, groups, etc.; S. Cohen, personal communication, March 1991). Other researchers have found that people are reliable reporters of social relationship characteristics over time (Clipp & George, 1990; Jennings et al., 1988).

Social Support Perceptions. Cohen and Wills (1985) report that the perception of support availability provides a "good indirect measure of the effective support people are actually receiving." Sarason et al. (1987) claim that all support perception questions (i.e., satisfaction, adequacy) are, in fact, questions based on the availability of support. That is, subjects' answers about helpfulness and satisfaction are in truth based on availability of others, and that just knowing someone is available is perceived as supportive (Clipp & George, 1990; Sarason et al., 1987). In other words, adequate support is available support.

Therefore, perceptions of social support were measured using the six item version of the Interpersonal Support Evaluation List (ISEL; Cohen, Marmelstein,
The ISEL, short form, is a measure of the perceived availability of social resources. Each item of the ISEL is scored on a four point scale of 1- definitely false, 2- probably false, 3- probably true, and 4- definitely true. Scores range from 6 to 24 with lower scores associated with lower perceived support. Items are counterbalanced for desirability. The items include: 1- When I feel lonely, there are several people I can talk to; 2- I hardly ever meet with family or friends (reverse scored); 3- If I were too sick to do my daily chores, I could easily find someone to help me; 4- When I need suggestions on how to deal with a personal problem, I know someone I can turn to, 5- There really is no one whose advice I can really trust (reversed scored); and 6- If I had to go out of town for a few week, it would be difficult to find someone who would look after my house or apartment while I'm gone (reverse scored).

Cohen et al. (1985) have reported a variety of studies examining the psychometric properties of the ISEL. In particular, test-retest reliability, measured over a six month period, found correlations of .72 and .74 in samples of college students and the general population, respectively. The ISEL also significantly accounted for depressive symptoms above and beyond social anxiety, indicating that the ISEL is not measuring personality
factors such as social skills or social anxiety (Cohen et al., 1985). Based on the above, Cohen et al. (1985) claim strong support for the reliability and validity of the ISEL. In addition, Sarason et al. (1987) examined correlations between the ISEL and several other measures of social support. They found correlations ranging from .45 to .90, with a mean correlation of .64, suggesting that the ISEL is an appropriate measure of the construct of perceived social support. Recently, S. Cohen (personal communication, March 1991) has reported ISEL test-retest reliabilities, over a four week period, to be .87.

Caregiving. In addition to the above measures, caregivers were interviewed about their caregiving experiences and responsibilities as well as the dementia sufferer’s illness history and current functioning. For the present study, three caregiving variables were assessed: caregiver type (i.e., spouse versus adult child), dementia sufferer residence (i.e., in-home of caregiver versus long-term care facility), and impairment change in the dementia sufferer. The above information was gathered through the caregiver interview.

The Blessed Dementia Scale (BDS; Blessed, Tomlinson, & Roth, 1968) was used to rate impairment level of the dementia sufferer. The BDS was developed to detect how much change has occurred in the memory, behavior (emphasizing self-care), and personality of the dementia
sufferer. Scores on the BDS range from 0-28, with higher scores associated with greater impairment. There are 22 items in which the caregiver rates degree of change. Examples of these items include: ability to perform household tasks; ability to find way about familiar streets; tendency to dwell in the past; ability to feed, dress, and toilet self; increased egocentricity; laughing or smiling at inappropriate times; diminished emotional responsiveness; and growing apathy.

The BDS significantly correlates with senile plaque count measured during postmortem histological examinations, as well as with neuropsychological testing of cognitive functioning (Blessed et al., 1968; Erkinjuntti, Hokkanen, Sulkava, & Palo, 1988). In addition, the BDS is capable of differentiating among normal, mildly demented, and severely demented patients (Blessed et al., 1968; Erkinjuntti et al., 1988). Caregivers have been found to be reliable reporters of patient impairment. Pearlin et al. (1990) report correlations of .65 between ratings made by caregivers about dementia sufferer's cognitive functioning and those made by clinical workers.
CHAPTER IV
RESULTS

Preliminary Analyses

Group Demographics. There were 156 subjects in the present investigation (78 caregivers and 78 noncaregivers), with 19 male and 59 female caregivers and the equivalent numbers of gender, age, education, and income matched comparison subjects. Unequal numbers of female and male caregivers were expected because women are more likely to be caregivers than are men (Fitting et al., 1986; Miller, 1987). In addition, 93% (n = 145) of the subjects were white and 7% (n = 11) were black; of these 11, 5 were caregivers and 6 were controls.

At Time 3 the average caregiver was 61.36 (SD = 12.38) years old and the average comparison subject was 62.09 (SD = 11.69) years old. There were no differences in age between caregivers and noncaregivers or an interaction, Fs < 1. However, male subjects were significantly older than female subjects, F(1, 155) = 6.14, p < .02. At Time 3 the average male subject was 65.87 (SD = 11.12) years old and the average female subject was 60.39 (SD = 12.02) years old. Age data are
presented in Table 1.

In terms of education, 40% (n = 62) of the subjects had graduated from college; 21 of those subjects had either graduate or professional degrees. Of the remaining subjects, 27% (n = 42) had several years of college training, 25% (n = 38) graduated from high school, and 8% (n = 14) had below 12 years of education. There were no significant differences between caregivers and noncaregivers or males and females, Fs < 1, and the interaction was not significant, F(1, 154) = 1.82.

Another sociodemographic variable examined was annual income. Ten subjects declined reporting income. Five percent (n = 8) of the subjects had incomes less than $9,999 per year, 38% (n = 55) between $10,000-19,999 per year, 21% (n = 30) between $20,000-29,999 per year, 15% (n = 22) between $30,000-39,999 per year, and 21% (n = 31) $40,000+ per year. There were no significant differences in income between caregivers and comparison subjects, females and males, or an interaction between group and gender, all Fs < 1. The mean annual income for both groups at Time 3 and Time 4 was between $20,000 and $29,999.

Chi square analyses examined lifetime psychological disorder diagnoses by group and gender. Similar results to those found in the larger study were found in the present study. No differences in previous psychological
Table 1

Age Means and Standard Deviations for Caregivers, Caregiver Subgroups, and Comparison Subjects at Time 3

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregivers</td>
<td>78</td>
<td>61.36</td>
<td>(12.38)</td>
</tr>
<tr>
<td>Male</td>
<td>19</td>
<td>63.89</td>
<td>(14.06)</td>
</tr>
<tr>
<td>Female</td>
<td>59</td>
<td>60.54</td>
<td>(11.81)</td>
</tr>
<tr>
<td>Spouses</td>
<td>46</td>
<td>68.59</td>
<td>(8.37)</td>
</tr>
<tr>
<td>Male</td>
<td>14</td>
<td>69.71</td>
<td>(9.34)</td>
</tr>
<tr>
<td>Female</td>
<td>32</td>
<td>68.09</td>
<td>(8.02)</td>
</tr>
<tr>
<td>Adult Children</td>
<td>32</td>
<td>50.97</td>
<td>(9.50)</td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>47.60</td>
<td>(12.46)</td>
</tr>
<tr>
<td>Female</td>
<td>27</td>
<td>51.59</td>
<td>(9.04)</td>
</tr>
<tr>
<td>Comparison Subjects</td>
<td>78</td>
<td>62.09</td>
<td>(11.69)</td>
</tr>
<tr>
<td>Male</td>
<td>19</td>
<td>67.84</td>
<td>(6.95)</td>
</tr>
<tr>
<td>Female</td>
<td>59</td>
<td>60.24</td>
<td>(12.33)</td>
</tr>
<tr>
<td>Total</td>
<td>156</td>
<td>61.72</td>
<td>(12.01)</td>
</tr>
</tbody>
</table>
functioning existed among the caregivers and comparison subjects, $X^2(1, 156) = 2.68$, or among the females and males, $X^2(1, 156) = .12$. Table 2 lists the types and numbers of Axis I disorders diagnosed prior to caregiving by group.

The average time interval between subjects' Time 3 and Time 4 interviews was 11.15 months ($SD = 2.25$). A 2 X 2 ANOVA examining time between interviews by group and gender revealed no significant main effects for caregivers versus comparison subjects, $F(1, 155) = 2.71$, males versus females, $F < 1$, or an interaction between group and gender, $F < 1$.

Place of assessment (i.e., The Ohio State University, caregivers' homes, or other) varied among subjects. "Other" place of assessment refers to those subjects who were interviewed at work or at a nursing home. For instance, some caregiver support groups met at nursing homes and were interviewed there by project personnel. Chi square analyses were used to examine place of assessment by group and gender at Time 3. These analyses revealed significant differences between caregivers and comparison subjects, $X^2(2, 155) = 9.60, p < .01$, and between males and females, $X^2(2, 155) = 9.99, p < .01$. Therefore, caregivers and females had more home or other place of assessments than comparison subjects or males. Caregivers are more likely to be providing care in their
Table 2

Cases of Axis I Psychological Disorders Diagnosed Prior to Caregiving by Group

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Caregivers (n = 78)</th>
<th>Comparison Subjects (n = 78)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Disorder</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>Anxiety-Based Disorder</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Alcohol or Drug Abuse/Dependence Disorder</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Other Axis I Disorder</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Note. No significant group or gender differences were found in Axis I Psychological disorders diagnosed prior to caregiving.
homes and need home assessments in order to participate in research (Dura & Kiecolt-Glaser, 1990). Similarly, women often experience a number of conflicting roles which place demands on their time (e.g., employee; caretaker to parents, children, and grandchildren; Fengler & Goodrich, 1979; Siegel & Taeuber, 1986), and thus require home assessments for research participation. Only 4% ($n = 7$) subjects changed their place of assessment from Time 3 to Time 4. See Table 3 for a breakdown of place of assessment by group and gender at Time 3.

Overall, the matching procedures were successful in producing groups that did not differ on gender, age, education, income, or history of psychological disorder diagnoses. The average subject was female, was 61.72 ($SD = 12.01$) years old at Time 3 and 62.66 ($SD = 11.93$) years old at Time 4, had several years of college training, and an annual income of $20,000-29,999.

**Caregiver Demographics.** The caregiver group was comprised of 46 spouses (14 male and 32 female) and 32 adult children (5 male and 27 female). See Table 1. All caregivers had primary responsibility for the care of their relative. Fifty-eight percent ($n = 45$) of caregivers were providing care for Alzheimer's Disease sufferers, 26% ($n = 20$) for Parkinson's Disease with dementia sufferers, and the remaining 16% ($n = 13$) for sufferers with other progressive dementia diagnoses.
Table 3

Place of Assessment by Group and Gender at Time 3

<table>
<thead>
<tr>
<th>Place of Assessment</th>
<th>Caregivers Time 1 (n = 78)</th>
<th>Comparison Subjects Time 1 (n = 77)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSU</td>
<td>55</td>
<td>69</td>
</tr>
<tr>
<td>Home</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place of Assessment</th>
<th>Males Time 1 (n = 38)</th>
<th>Females Time 1 (n = 117)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSU</td>
<td>37</td>
<td>87</td>
</tr>
<tr>
<td>Home</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

Note. Significant differences were found between caregivers and comparison subjects and between males and females in place of assessment.
(i.e., multi-infarct dementia, Pick's disease, and Huntington's chorea). None of the dementia sufferers in the present study died between Time 3 and Time 4.

At Time 3 the average caregiver had been caregiving for 6.56 years (SD = 2.54). A 2 X 2 ANOVA examining gender and type of caregiver (e.g., spousal versus adult child) at Time 3 revealed no significant differences in time spent caregiving between male and female caregivers, F(1, 76) = 1.02, or an interaction, F < 1. However, differences between spousal and adult child caregivers in time spent caregiving did approach significance, F(1, 76) = 3.45, p < .07. Spousal caregivers were more likely to have provided care for a longer period of time than adult child caregivers; the respective means were 7.38 years (SD = 5.03) and 5.33 (SD = 2.58).

Caregivers were providing care for moderately to severely impaired dementia sufferers. Blessed Dementia Scale (BDS) total scores averaged 20.31 (SD = 5.34) at Time 3 and 21.76 (SD = 4.80) at Time 4, out of a possible 28 points. Results of a 2 X 2 X 2 repeated measures ANOVA examining impairment level (BDS scores) by type of caregiver, gender, and time revealed no significant between subject effects, Fs < 1. Of the within subject effects, only time was significant, F(1, 72) = 4.57, p < .04, indicating that caregivers were reporting increases in dementia sufferer impairment across time.
The majority of dementia sufferers (90% at Time 3 and 94% at Time 4) were living either in the caregiver’s home or a nursing home. Table 4 provides further information about dementia sufferer’s residence at Time 3 and Time 4. There were 14 cases of the dementia sufferer changing residence between Time 3 and Time 4. All of these changes were in the direction of moving from the community to a nursing home, with two exceptions; in one case the dementia sufferer moved from a nursing home back into the caregiver’s home and in the other case the dementia sufferer moved from the caregiver’s home to the home of another relative.

Overall, the average caregiver was a female who at Time 3 had been caregiving for 6.56 (SD = 2.54) years. In addition, the average caregiver was providing care for a moderately impaired dementia sufferer diagnosed with Alzheimer’s Disease and by Time 4 the dementia sufferer was most likely living in a nursing home.

Primary Longitudinal Group Analyses

Depressive Symptoms. Pearson Product Moment Correlations revealed correlations between the BDI and HRSD at Time 3 were .64 (n = 149, p < .0001) and at Time 4, .60 (n = 147, p < .0001). The above correlations are similar to those obtained in other research (Beck et al., 1988). Therefore, it appears that the BDI and HRSD were measuring a similar construct, depressive symptoms.
Table 4

Dementia Sufferer Residence at Time 3 and Time 4

<table>
<thead>
<tr>
<th>Residence</th>
<th>Time 3</th>
<th></th>
<th>Time 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Caregiver's Home</td>
<td>35</td>
<td>45%</td>
<td>28</td>
<td>35%</td>
</tr>
<tr>
<td>Other Relative's Home</td>
<td>3</td>
<td>4%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Alone</td>
<td>3</td>
<td>4%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Nursing Home</td>
<td>35</td>
<td>45%</td>
<td>46</td>
<td>59%</td>
</tr>
<tr>
<td>Hospital</td>
<td>2</td>
<td>2%</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Totals 78 100% 78 100%

Note. None of the dementia sufferers in the present study died between Time 3 and Time 4.
In order to test differences between caregivers and control subjects in number of depressive symptoms, a 2 X 2 repeated measures MANOVA was used. The independent variables were group, gender, and time, and the dependent variables were BDI and HRSD scores. Since depression is more commonly reported by and diagnosed in females than males (DSM-III-R, American Psychiatric Association, 1987; Schulz et al., 1990), gender was included in this analysis. Results indicated that caregivers were significantly more depressed than comparison subjects, $F(2, 140) = 16.45, p < .0001$, all other $F$s < 1.

Because group differences were found, individual 2 X 2 (group and time) repeated measures ANOVAs were conducted to examine the effects of the two scales more systematically. These follow-up analyses did not include gender as a variable since no significant differences or interactions involving gender were found in the above MANOVA. In the follow-up analyses, no significant time or interaction effects were found for either the BDI or HRSD. However, caregivers reported significantly more depressive symptoms than comparison subjects on both the BDI, $F(1, 141) = 18.03, p < .0001$, and the HRSD, $F(1, 152) = 37.35, p < .0001$. Table 5 provides mean scores by group.

**Social Relationship Variables.** The majority of caregivers experience some level of depressive symptoms,
Table 5

Means and Standard Deviations of Depressive Symptoms and Social Relationship Variables by Group at Time 3 and Time 4

<table>
<thead>
<tr>
<th>Variables (Measure)</th>
<th>Caregivers</th>
<th>Comparison Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time 3</td>
<td>Time 4</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questionnaire*** (BDI)</td>
<td>145</td>
<td>9.03 (5.72)</td>
</tr>
<tr>
<td>Interview*** (HRSD)</td>
<td>156</td>
<td>6.94 (5.73)</td>
</tr>
<tr>
<td>Social Relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Contacts* (SNII)</td>
<td>153</td>
<td>17.74 (7.00)</td>
</tr>
<tr>
<td>Non-face-to-face Contacts (SNII)</td>
<td>153</td>
<td>2.26 (3.04)</td>
</tr>
<tr>
<td>Face-to-face** Contacts (SNII)</td>
<td>153</td>
<td>15.48 (7.31)</td>
</tr>
<tr>
<td>Perceived*** Support (ISEL)</td>
<td>138</td>
<td>20.17 (3.35)</td>
</tr>
</tbody>
</table>

Note. Significant group differences were found.

a* p < .04, b** p < .03, c*** p < .0001.
if not actual depressive disorders (Gallagher et al., 1989; Schulz et al., 1990; Schulz et al., 1992). Since depressive symptoms are so strongly associated with caregiving to covary their effects in analyses would, in effect, control for group membership. Thus, depressive symptoms were not covaried in the following analyses.

Differences in the number of total contacts were investigated. Total contacts were the combination of face-to-face contacts and non-face-to-face contacts. A group by time repeated measures ANOVA indicated no changes across time, $F < 1$, or an interaction, $F(1, 151) = 2.26$. However, caregivers had significantly fewer total contacts with other people than did comparison subjects, $F(1, 151) = 4.64, p < .04$.

A repeated measures MANOVA assessed differences between groups and gender in face-to-face contacts, non-face-to-face contacts, and perceived support. The results indicated significant differences between caregivers and comparison subjects, $F(3, 129) = 5.33, p < .002$, all other $Fs < 1$. In follow-up repeated measures ANOVAs examining group differences, no significant time effects or interactions between time and the other variables were found. In addition, no group differences were found in number of non-face-to-face contacts, $F < 1$. However, caregivers had both fewer face-to-face contacts and lower perceived support than comparison subjects, $F(1, 151) =$
5.47, \( p < .03 \) and \( F(1, 136) = 19.49, \ p < .0001 \), respectively. Refer to Table 5.

**Primary Longitudinal Model Analyses**

Two multivariate techniques were used to investigate relationships between depressive symptoms, perceived social support, and the social network variables. Canonical correlation analysis (CANOVA) was used to examine general relationships among the social relationship variables themselves as well as their association with depressive symptoms. In particular, CANOVA examines how sets of multiple dependent and multiple independent variables are related to one another (Hair, Anderson, Tatham, & Grablowsky, 1984).

Hierarchical multiple regression (HMR) which analyzes the relationship between a single dependent variable and several independent variables (Hair et al., 1984), was used to identify predictors of depressive symptoms at Time 4 and perceived support at Time 4. HMR is used when there are reasons for the ordering of variables in a regression equation, such as theoretical relevance and/or the removal of confounding relationships (Cohen & Cohen, 1983).

Only the HRSD scores were used in these analyses. This was done to simplify interpretation of the results by decreasing the number of instruments measuring the same construct, i.e. depressive symptoms. The HRSD was chosen
over the BDI because interview measures are less prone to bias than are questionnaire measures (Haley et al., 1987; Toner et al., 1988; Zarit & Toseland, 1989).

**Canonical Correlation.** CANOVA involves "the derivation of a linear combination of variables from each of two sets of variables, so that the correlation between the two linear combinations is maximized" (Hair et al., 1984, p. 182). In other words, the set of dependent variables are correlated to create a new single dependent variable, the same is done for the set of independent variables, and then the two new variables are correlated. These linear combinations are commonly referred to as canonical variates, and the correlation among these canonical variates is called the canonical correlation. The number of linear combinations derived is a function of which set of variables, the independent or dependent set, has the fewest number of variables (Hair et al, 1984; Tabachnick & Fidell, 1989). For example, in an analysis with 3 dependent and 5 independent variables, 3 canonical functions would be calculated; each function would have a dependent and independent canonical variate, correlations of the variates with the individual variables, and a canonical correlation.

CANOVA results were interpreted in the following manner (Hair et al., 1984; Tabachnick & Fidell, 1989): First, the significance level and magnitude of the
canonical correlations were considered. The minimum significance level for interpretation of canonical functions is the .05 level (Hair et al., 1984). While the squared canonical correlation represents the shared variance between the canonical variates, in CANOVA the redundancy analysis is used as a more conservative estimate of the shared variance. Redundancy is the average of the squared correlations between the independent canonical variate and the dependent variables. Finally, an examination of the canonical variates as well as the correlations between the canonical variates and the individual variables occurred. Magnitude of CANOVA correlations are interpreted similarly to factor loadings in factor analysis (Hair et al., 1984; Tabachnick & Fidell, 1989). Factor loadings greater than ±.30 are generally considered significant, although loadings greater than ±.50 are desirable (Hair et al., 1984).

**Depressive Symptoms.** The first CANOVA examined the relationship between the social relationship variables and depressive symptoms. Of particular interest was the relationship between face-to-face contact and perceived support to depressive symptoms. The independent variables included group, age, education, gender, income, non-face-to-face and face-to-face contact, and perceived support. Values of non-face-to-face and face-to-face contact, and perceived support were entered for both Time 3 and Time 4.
The dependent variables were HRSD scores at Time 3 and Time 4.

Two canonical functions were calculated. The canonical correlation of the first canonical function was .63, p < .0001 (40% of variance) and the canonical correlation of the second canonical function was .23, p < .72 (6% of variance). Given the above significance and magnitude of the canonical correlations, only the information generated by the first canonical function was interpretable (Hair et al., 1984). The redundancy analysis indicated that a more conservative amount of shared variance in the interpreted canonical function was 30% rather than 40%. In addition, the individual dependent variables, i.e. depressive symptoms at Time 3 and Time 4, and the canonical dependent variable were highly correlated (Time 3 and canonical variate, r = .84; Time 4 and canonical variate, r = .91). The direction and magnitude of these correlations indicated that the dependent canonical variate represented a weighted sum or average of the two dependent variables.

With a cutoff of .30, correlations between the independent variables and the independent canonical variate indicated that caregiver group membership (-.76), lower age (Time 3 = -.32), lower numbers of face-to-face contact (Time 3 = -.42, Time 4 = -.51), and lower perceived support (Time 3 = -.70, Time 4 = -.70) were
significantly associated with higher numbers of depressive symptoms. Group membership and perceived support at Time 3 and Time 4 were especially important in level of depressive symptoms, accounting for 73% of the variance in the independent canonical variate. Thus, perceived support was more strongly related to depressive symptoms than face-to-face contacts. The CANOVA data are presented in Table 6.

HMR was used to explore predictors of depressive symptoms at Time 4. Of particular importance was the investigation of relationships between perceived support at Time 3 and depressive symptoms at Time 4. Variables were entered into the regression equation in the following order: depressive symptoms at Time 3, group, sociodemographic variables (age, education, gender, income), non-face-to-face and face-to-face contact, perceived support, and the interaction of perceived support and group. Depressive symptoms at Time 3 were entered first because the best predictor of future depressive symptoms is a history of past symptoms (Schulz, Tompkins, & Rau, 1988). The interaction among group and perceived support was entered since perceived support may vary in importance by group. Again, values of non-face-to-face and face-to-face contact, perceived support, and the interactions were entered at both Time 3 and Time 4.
Table 6

Canonical Correlation Analysis examining the Relationship between Depressive Symptoms and Social Relationship Variables

<table>
<thead>
<tr>
<th>Canonical Variate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Dependent Set</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Dep. Symptoms</td>
</tr>
<tr>
<td>Time 3</td>
</tr>
<tr>
<td>Time 4</td>
</tr>
<tr>
<td>Independent Set</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Group</td>
</tr>
<tr>
<td>Age Time 3</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Income Time 3</td>
</tr>
<tr>
<td>NF-to-F Contact</td>
</tr>
<tr>
<td>Time 3</td>
</tr>
<tr>
<td>Time 4</td>
</tr>
<tr>
<td>F-to-F Contact</td>
</tr>
<tr>
<td>Time 3</td>
</tr>
<tr>
<td>Time 4</td>
</tr>
<tr>
<td>Perceived Support</td>
</tr>
<tr>
<td>Time 3</td>
</tr>
<tr>
<td>Time 4</td>
</tr>
<tr>
<td>Canonical R</td>
</tr>
<tr>
<td>Canonical R²</td>
</tr>
<tr>
<td>Redundancy</td>
</tr>
</tbody>
</table>

Note. Abbreviations include: SCC-Standardized Canonical Coefficients; R-Correlations; R²-Squared Correlations; %SR²- Percentage Sums of Squared Correlations.
In all, the regression model accounted for 43% of the variance in depressive symptom scores at Time 4 (Table 7). Depressive symptoms at Time 3 were the most significant predictor of depressive symptoms at Time 4, accounting for 28% of the variance. The remaining variables added 15% variance to the full model. Specifically, group membership significantly added 7% variance to depressive scores at Time 4. Perceived support added another 3% variance which approached significance, \( p < .06 \). The other variables in the model failed to account for significant variance in depressive symptoms at Time 4. In fact, the remaining 10 variables, only accounted for an additional 5% variance in the regression model. Thus, the best predictors of depressive symptoms at Time 4 were depressive symptoms at Time 3 and caregiver status, followed closely by level of perceived support.

Because the demographic variables and the interactions did not add significant variance to the full model, the model was repeated without these variables to examine the variables of interest (group, non-face-to-face and face-to-face contact, and perceived support). The results were similar to the first HMR model. Also, presented in Table 7. Depressive symptoms at Time 3 were again the best predictor of depressive symptoms at Time 4. Other predictors included caregiver status (7%) and level of perceived support (3%), both
Table 7

Hierarchical Multiple Regression exploring Predictors of Depressive Symptoms at Time 4

<table>
<thead>
<tr>
<th>Step-Predictor</th>
<th>MR</th>
<th>TR²</th>
<th>F(TR²)</th>
<th>CR²</th>
<th>F(CR²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Dep. Symptoms Time 3</td>
<td>.53</td>
<td>.28</td>
<td>52.10**</td>
<td>.28</td>
<td>52.10**</td>
</tr>
<tr>
<td>2-Group</td>
<td>.59</td>
<td>.35</td>
<td>35.29**</td>
<td>.07</td>
<td>13.47**</td>
</tr>
<tr>
<td>3-Demographics</td>
<td>.61</td>
<td>.37</td>
<td>12.31**</td>
<td>.02</td>
<td>.88</td>
</tr>
<tr>
<td>4-NF-to-F Contact</td>
<td>.63</td>
<td>.39</td>
<td>7.87**</td>
<td>.02</td>
<td>1.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Dep. Symptoms Time 3</td>
<td>.53</td>
<td>.28</td>
<td>54.22**</td>
<td>.28</td>
<td>54.22**</td>
</tr>
<tr>
<td>2-Group</td>
<td>.60</td>
<td>.35</td>
<td>36.28**</td>
<td>.07</td>
<td>13.32**</td>
</tr>
<tr>
<td>3-NF-to-F Contact</td>
<td>.61</td>
<td>.38</td>
<td>12.95**</td>
<td>.02</td>
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<td></td>
</tr>
</tbody>
</table>

Note. Abbreviations include: MR-Multiple Regression; TR²- Squared Multiple Correlation for Total Equation; F(TR²)- Value and Significance of Squared Multiple Correlation for Total Equation; CR²- Change in Squared Multiple Correlation; F(CR²)- Value and Significance of Change in Squared Multiple Correlation.

a* p < .04     b** p < .0001
accounting for a significant amount of variance in the specific model.

**Social Relationship Variables.** CANOVA was also used to examine how social network variables were related to perceived support, specifically to examine if face-to-face contact was more strongly related to perceived support than non-face-to-face contact. The dependent variables included perceived support at Time 3 and Time 4, and the independent variables were group, age, education, gender, income, and non-face-to-face and face-to-face contact. Values of non-face-to-face and face-to-face contact were entered for both Time 3 and Time 4.

Two canonical functions were calculated. The canonical correlation of the first canonical function was \(0.53, p < 0.0001\) (28% of variance). The second canonical function had a canonical correlation of \(0.26, p < 0.35\) (7% of variance). Based on the significance and magnitude of the canonical correlations, only the information calculated by the first canonical function was interpreted. The redundancy analysis revealed that the shared variance between variates was more accurately 23%. Furthermore, perceived support at Time 3 and Time 4 were highly correlated with the canonical variate; 0.81 and 0.99 respectively. The direction and magnitude of these correlations indicated that the dependent canonical variate was calculated as a weighted sum or average of the
two dependent variables.

Interpretation of the correlations between the independent covariates and the independent canonical variate indicated that noncaregiver group membership (+.74) and greater number of face-to-face contacts (Time 3 = +.46, Time 4 = +.68) were significantly related to higher perceived support. The three variables, group and face-to-face contact at Time 3 and Time 4, alone accounted for 90% of the variance in the independent canonical variate. Thus, face-to-face contact was more strongly associated with perceived support than non-face-to-face contact. See Table 8 for CANOVA data.

HMR was used to investigate if face-to-face contact at Time 3 was predictive of perceived support at Time 4. Variables entered in the regression equation included, in order: perceived support at Time 3, group, sociodemographic variables (age, education, gender, income), non-face-to-face contact, face-to-face contact, and lastly the interaction of group and face-to-face contact. Again, perceived support at Time 3 was entered first since it is most likely the best predictor of perceived support at Time 4. The interaction of group and face-to-face and was also entered since number of face-to-face contacts may vary by group membership. Values of non-face-to-face contact, face-to-face contact, and the interactions at both Time 3 and Time 4 were included in
Table 8

Canonical Correlation Analysis examining the Relationship between Perceived Support and Face-to-Face Contact

<table>
<thead>
<tr>
<th>Canonical Variate</th>
<th>Variables</th>
<th>SCC</th>
<th>R</th>
<th>R²</th>
<th>%SR²</th>
</tr>
</thead>
</table>

**Dependent Set**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>SCC</th>
<th>R</th>
<th>R²</th>
<th>%SR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Support Time 3</td>
<td>.18</td>
<td>.81</td>
<td>.66</td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>Perceived Support Time 4</td>
<td>.86</td>
<td>.99</td>
<td>.98</td>
<td>.60</td>
<td></td>
</tr>
</tbody>
</table>

**Independent Set**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>SCC</th>
<th>R</th>
<th>R²</th>
<th>%SR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>.63</td>
<td>.74</td>
<td>.55</td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>Age Time 3</td>
<td>-.06</td>
<td>.06</td>
<td>.00</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>.11</td>
<td>-.01</td>
<td>.00</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.23</td>
<td>-.18</td>
<td>.03</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Income Time 3</td>
<td>.09</td>
<td>.15</td>
<td>.02</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>NF-to-F Contact Time 3</td>
<td>.12</td>
<td>.16</td>
<td>.03</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>NF-to-F Contact Time 4</td>
<td>.26</td>
<td>.25</td>
<td>.06</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>F-to-F Contact Time 3</td>
<td>-.04</td>
<td>.46</td>
<td>.21</td>
<td>.16</td>
<td></td>
</tr>
<tr>
<td>F-to-F Contact Time 4</td>
<td>.61</td>
<td>.68</td>
<td>.46</td>
<td>.34</td>
<td></td>
</tr>
</tbody>
</table>

| Canonical R²           | .53      |
| Canonical R²           | .28      |
| Redundancy             | .23      |

**Note.** Abbreviations include: SCC-Standardized Canonical Coefficients; R-Correlations; R²-Squared Correlations; %SR²-Percentage Sums of Squared Correlations.
the regression equation.

The total model accounted for 61% of the variance in perceived support at Time 4. Perceived support at Time 3 was the most significant predictor of perceived support at Time 4, accounting for 54% of the variance. The remaining variables in the regression equation accounted for an additional 7% of the variance. Of this 7%, group membership and face-to-face contacts accounted for significant increases in variance; 3% and 2%, respectively. The remaining 8 variables added only 2% variance to the regression model. See Table 9 for additional information.

Again, because the demographic variables and the interactions accounted for so little variance in the HMR model, the model was repeated without these variables. The results of this regression equation were similar to the full model, again results presented in Table 9. Perceived support at Time 3 was the best predictor of perceived support at Time 4. In addition, group membership and number of face-to-face contacts accounted for significant variance.

Caregiver Analyses

Among caregivers, it was hypothesized that increased depressive symptoms, lower perceived support, and fewer face-to-face contacts would be associated with increased impairment in the dementia sufferer, residence of the
Table 9

Hierarchical Multiple Regression exploring Predictors of Perceived Support at Time 4

<table>
<thead>
<tr>
<th>Step-Predictor</th>
<th>MR</th>
<th>TR²</th>
<th>F(TR²)</th>
<th>CR²</th>
<th>F(CR²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Perceived Support Time 3</td>
<td>.73</td>
<td>.54</td>
<td>151.74***</td>
<td>.54</td>
<td>51.74***</td>
</tr>
<tr>
<td>2-Group</td>
<td>.75</td>
<td>.56</td>
<td>83.43***</td>
<td>.03</td>
<td>7.52**</td>
</tr>
<tr>
<td>3-Demographics</td>
<td>.76</td>
<td>.57</td>
<td>27.91***</td>
<td>.01</td>
<td>.63</td>
</tr>
<tr>
<td>4-NF-to-F Contact</td>
<td>.77</td>
<td>.59</td>
<td>21.84***</td>
<td>.01</td>
<td>2.12</td>
</tr>
<tr>
<td>5-F-to-F Contact</td>
<td>.78</td>
<td>.61</td>
<td>18.88***</td>
<td>.02</td>
<td>3.50*</td>
</tr>
<tr>
<td>6-GroupXF-to-F Contact</td>
<td>.78</td>
<td>.61</td>
<td>15.66***</td>
<td>.00</td>
<td>.65</td>
</tr>
<tr>
<td><strong>Specific Model</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Perceived Support Time 3</td>
<td>.72</td>
<td>.52</td>
<td>146.47***</td>
<td>.52</td>
<td>146.47***</td>
</tr>
<tr>
<td>2-Group</td>
<td>.74</td>
<td>.55</td>
<td>79.29***</td>
<td>.02</td>
<td>6.29**</td>
</tr>
<tr>
<td>3-NF-to-F Contact</td>
<td>.75</td>
<td>.56</td>
<td>41.41***</td>
<td>.01</td>
<td>2.14</td>
</tr>
<tr>
<td>4-F-to-F Contact</td>
<td>.76</td>
<td>.57</td>
<td>30.07***</td>
<td>.02</td>
<td>3.82*</td>
</tr>
</tbody>
</table>

**Note.** Abbreviations include: MR-Multiple Regression; TR²- Squared Multiple Correlation for Total Equation; F(TR²)- Value and Significance of Squared Multiple Correlation for Total Equation; CR²-Change in Squared Multiple Correlation; F(CR²)-Value and Significance of Change in Squared Multiple Correlation.

a* p < .03    b** p < .01     c*** p < .0001
dementia sufferer in the caregiver's home, and status as a spousal caregiver. Repeated measures MANOVAs were used to investigate these possible differences. In addition, because group status (caregiver versus noncaregiver) was found to be predictive of depressive symptoms and perceived support, HMR was used to examine which of the above caregiver variables were predictive of depressive symptoms, perceived support, and face-to-face contact.

Dementia sufferer impairment was investigated by examining those caregivers who reported a significant increase in impairment from Time 3 to Time 4, at the .05 level, and those who did not report a significant change. Approximately 51% (n = 40) of the caregivers reported a significant increase, while 46% (n = 36) did not. In order to examine if caregiver depression was influencing ratings of dementia sufferer impairment, Pearson correlations were computed between BDS scores and depressive symptom scores (BDI and HRSD) at Time 3 and Time 4. These correlations ranged from -.20 to +.10, and none were significant at the .05 level. Therefore, ratings of dementia sufferer impairment made by caregivers were not related to caregiver depression.

To study dementia sufferer residence across time three categories were formed, these were: 1- residence change from Time 3 to Time 4 (n = 14), 2- residence in a nursing home at both Time 3 and Time 4 (n = 34), and
3- residence in caregiver's home at both Time 3 and Time 4 \((n = 26)\). Data from four subjects were not used because dementia sufferer residence was either with another relative \((n = 2)\) or the dementia sufferer was living alone \((n = 2)\) at both Time 3 and Time 4. In addition, the MANOVAs used to investigate differences between spousal and adult child caregivers also included gender as a variable in order to examine if differences existed between male and female caregivers.

**Depressive Symptoms.** Caregivers who reported significant increases in dementia sufferer impairment did not have more depressive symptoms than caregivers who did not report such increases, nor were there changes over time or an interaction, all \(Fs < 1\). Caregivers providing care at home were not significantly more depressed than those caregivers whose demented relative was in a nursing home or had a change in residence, \(F(4, 126) = 1.95\). In addition, there were no changes across time, \(F(2, 62) = 1.43\), or an interaction between residence and time, \(F(4, 126) = 2.28\). Spousal caregivers did not differ on number of depressive symptoms from adult child caregivers, \(F < 1\). Also, no significant differences between male and female caregivers, changes across time, or interactions were found, all \(Fs < 1.24\).

HMR was used to examine if any of the caregiver variables of interest were predictive of depressive
symptoms at Time 4. Variables in the regression equation were entered in the following order: depressive symptoms at Time 3, demographics (age, gender, education, and income), and the caregiving variables (dementia sufferer residence, impairment change, and caregiver type). Depressive symptoms at Time 3 were the best predictor of depressive symptoms at Time 4, accounting for 20% of the variance. Neither the demographic nor the caregiving variables added significant variance to the regression model; 5% variance total. In fact, when the caregiving variables were added to the regression model, the model became insignificant. Table 10 contains regression results.

Social Relationship Variables. Caregivers who reported significant increases in dementia sufferer impairment did not have lower perceived support or fewer face-to-face contacts than caregivers who did not report such increases, $F(3, 58) = 1.55$. In addition, no changes across time, $F(3, 58) = 1.31$, or an interaction, $F(3, 58) = 1.21$, were found. Caregivers providing care at home were not significantly different than those caregivers whose demented relative was in a nursing home or had changed dementia sufferer residence, $F(6, 118) = 1.85$. There were no significant changes across time, $F(3, 58) = 1.35$, or an interaction between residence and time, $F < 1$. Finally, there were no significant
Table 10
Hierarchical Multiple Regression exploring Caregiving Variables as Predictors of Depressive Symptoms, Perceived Support, and Face-to-Face Contact at Time 4

<table>
<thead>
<tr>
<th>Step-Predictor</th>
<th>MR</th>
<th>TR²</th>
<th>F(TR²)</th>
<th>CR²</th>
<th>F(CR²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable - Depressive Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Dep. Symptoms Time 3</td>
<td>0.44</td>
<td>0.20</td>
<td>15.27***</td>
<td>0.20</td>
<td>15.27***</td>
</tr>
<tr>
<td>2-Demographics</td>
<td>0.46</td>
<td>0.22</td>
<td>3.17**</td>
<td>0.02</td>
<td>0.31</td>
</tr>
<tr>
<td>3-Caregiving Variables</td>
<td>0.50</td>
<td>0.25</td>
<td>2.24</td>
<td>0.03</td>
<td>0.76</td>
</tr>
<tr>
<td>Dependent Variable - Perceived Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Per. Support Time 3</td>
<td>0.81</td>
<td>0.66</td>
<td>114.04***</td>
<td>0.66</td>
<td>114.04***</td>
</tr>
<tr>
<td>2-Demographics</td>
<td>0.82</td>
<td>0.68</td>
<td>22.76***</td>
<td>0.02</td>
<td>0.64</td>
</tr>
<tr>
<td>3-Caregiving Variables</td>
<td>0.84</td>
<td>0.70</td>
<td>14.77***</td>
<td>0.02</td>
<td>1.15</td>
</tr>
<tr>
<td>Dependent Variable - Face-to-Face Contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-F-to-F Contact Time 3</td>
<td>0.57</td>
<td>0.33</td>
<td>30.37***</td>
<td>0.33</td>
<td>30.37***</td>
</tr>
<tr>
<td>2-Demographics</td>
<td>0.62</td>
<td>0.39</td>
<td>7.39***</td>
<td>0.06</td>
<td>1.44</td>
</tr>
<tr>
<td>3-Caregiving Variables</td>
<td>0.69</td>
<td>0.48</td>
<td>6.34***</td>
<td>0.09</td>
<td>3.19</td>
</tr>
</tbody>
</table>

Note. Abbreviations include: MR-Multiple Regression; TR²-Squared Multiple Correlation for Total Equation; F(TR²)-Value and Significance of Squared Multiple Correlation for Total Equation; CR²-Change in Squared Multiple Correlation; F(CR²)-Value and Significance of Change in Squared Multiple Correlation.

a* p < .03    b** p < .02    c*** p < .0001
differences between caregiver type, caregiver gender, or an interaction between caregiver type and gender, all Fs < 1. There were also no significant changes across time, F(3, 57) = 1.95, or significant interactions between time and the respective variables, all Fs < 1.92. Thus, spousal caregivers did not have significantly lower perceived support or fewer face-to-face contacts than adult child caregivers.

HMR was used to examine possible caregiving variables as predictors of perceived support at Time 4 and face-to-face contact at Time 4. In both regressions, the respective variable at Time 3 was entered first, then demographics (age, education, gender, and income), and the caregiving variables (dementia sufferer residence, impairment change, and caregiver type). In the regression equation examining perceived support at Time 4, only perceived support at Time 3 was a significant predictor, accounting for 66% of the variance. None of the other variables added significant variance to the regression model. In the other regression examining face-to-face contact at Time 4, face-to-face contact at Time 3 was a significant predictor, accounting for 33% of the variance. The demographics added no significant variance to the regression model. However, the caregiving variables did add significant variance to the model (9%). Of the three caregiving variables, change in impairment (p < .02) and
caregiver type \( (p < .05) \) were significant predictors of face-to-face contact at Time 4 (see Table 10). In particular, fewer face-to-face contacts were associated with caregivers who reported an increase in dementia sufferer impairment or who were spousal caregivers. Mean scores provided in Table 11.

**Secondary Analyses**

An important secondary analysis involved looking at possible differences in depressive symptoms, perceived support, and face-to-face contact by place of assessment. Research involving the larger study had previously found that caregivers assessed at home were more depressed than those assessed at the university (Dura & Kiecolt-Glaser, 1990). In order to test place of assessment in the present study, three categories were created: 1- assessment at the university at both Time 3 and Time 4 \( (n = 122) \), 2- assessment at home at both Time 3 and Time 4 \( (n = 20) \), and 3- assessment at "other" location both Time 3 and Time 4 \( (n = 7) \). A repeated measures MANOVA revealed no significant differences in depressive symptoms by place of assessment, changes across time, or an interaction, all \( F_s < 1 \). In addition, no significant differences in perceived support and face-and-face contact, \( F < 1 \), changes across time, \( F(3, 125) = 1.05 \), or an interaction, \( F < 1 \), were found. Thus, place of assessment was not associated with the variables of
Table 11

Means and Standard Deviations of Face-to-Face Contacts by the Caregiving Variables of Impairment Level and Caregiver Type

<table>
<thead>
<tr>
<th>Caregiving Variable</th>
<th>Time 3</th>
<th>Time 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Impairment Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase</td>
<td>40</td>
<td>15.20 (7.36)</td>
</tr>
<tr>
<td>No Increase</td>
<td>36</td>
<td>15.97 (7.35)</td>
</tr>
<tr>
<td>Caregiver Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spousal</td>
<td>46</td>
<td>15.33 (7.37)</td>
</tr>
<tr>
<td>Adult Child</td>
<td>31</td>
<td>15.71 (7.34)</td>
</tr>
</tbody>
</table>

Note. Differences between impairment level and caregiver type were not significant.
interest.

The proposed relationships between the major variables of interest (i.e., depressive symptoms, perceived support, and face-to-face contact) were tested longitudinally, allowing for an examination of change over time as well as predictors over time. In the last set of analyses, these relationships were tested cross-sectionally, serving as a test-retest of the proposed relationships among the variables. These cross-sectional analyses were done similarly to the longitudinal group analyses (i.e., using MANOVAs and follow-up ANOVAs) and longitudinal model analyses (i.e., using HMR).

**Depressive Symptoms.** A 2 X 2 MANOVA examining depressive symptoms at Time 3 by group and gender revealed no significant differences between males and females, $F(2, 145) = 1.68$, or an interaction, $F < 1$. However, caregivers had significantly more depressive symptoms than comparison subjects, $F(2, 145) = 11.15$, $p < .0001$. Follow-up ANOVAs revealed significant group differences in both BDI scores, $F(1, 149) = 23.68$, $p < .0001$, and HRSD scores, $F(1, 149) = 23.77$, $p < .0001$. A similar pattern of results were found at Time 4: Caregivers had significantly more depressive symptoms than noncaregivers, $F(2, 143) = 14.95$, $p < .0001$, and there were no differences between males and females, $F(2, 143) = 2.07$, or an interaction, $F < 1$. In addition, the followup
ANOVAs found significant differences between caregivers and noncaregivers in BDI scores, $F(1, 147) = 19.06$, $p < .0001$, and HRSD scores, $F(1, 155) = 37.47$, $p < .0001$.

Individual HMR equations were used to explore predictors of depressive symptoms at Time 3 and at Time 4. Variables were entered into the regression equations in the following order: group, demographics (age, education, gender, and income), non-face-to-face contact, face-to-face contact, perceived support, and the interaction of group and perceived support. At Time 3, the best predictors of depressive symptoms were group status accounting for 14% of the variance, and face-to-face contact accounting for 5%. Other variables which added significant variance to the regression model were demographics (7%), non-face-to-face contact (3%), and perceived support (2%). Of the demographic variables, age was the only significant predictor of depressive symptoms ($p < .02$). However, at Time 4, the only variables to add significant variance to the regression model were group status (20%) and perceived support (4%). Face-to-face contact did approach significance ($p < .06$), accounting for 2% of the variance. See Table 12 for regression results.

**Social Relationship Variables.** At Time 3, no significant differences between caregivers and comparison subjects in the number of total contacts were found,
Table 12

Cross-Sectional Examination of Depressive Symptoms at both Time 3 and Time 4 using Hierarchical Multiple Regression

<table>
<thead>
<tr>
<th>Step-Predictor</th>
<th>MR</th>
<th>TR²</th>
<th>F(TR²)</th>
<th>CR²</th>
<th>F(CR²)</th>
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<tbody>
<tr>
<td><strong>Depressive Symptoms at Time 3</strong></td>
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<tr>
<td>1-Group</td>
<td>.37</td>
<td>.14</td>
<td>22.33**</td>
<td>.14</td>
<td>22.33**</td>
</tr>
<tr>
<td>2-Demographics</td>
<td>.45</td>
<td>.21</td>
<td>6.99***</td>
<td>.07</td>
<td>2.87*</td>
</tr>
<tr>
<td>3-NF-to-F Contact</td>
<td>.48</td>
<td>.24</td>
<td>6.72***</td>
<td>.03</td>
<td>4.49*</td>
</tr>
<tr>
<td>4-F-to-F Contact</td>
<td>.53</td>
<td>.29</td>
<td>7.65***</td>
<td>.05</td>
<td>10.44**</td>
</tr>
<tr>
<td>5-Perceived Support</td>
<td>.55</td>
<td>.31</td>
<td>7.42***</td>
<td>.02</td>
<td>4.45*</td>
</tr>
<tr>
<td>6-Group X Perceived Support</td>
<td>.56</td>
<td>.32</td>
<td>6.85***</td>
<td>.01</td>
<td>1.86</td>
</tr>
</tbody>
</table>

| **Depressive Symptoms at Time 4** |    |     |           |     |        |
| 1-Group                | .45| .20 | 34.04***  | .20 | 34.04***|
| 2-Demographics         | .51| .25 | 8.98***   | .05 | 2.37   |
| 3-NF-to-F Contact      | .51| .26 | 7.67***   | .01 | 1.09   |
| 4-F-to-F Contact       | .53| .28 | 7.27***   | .02 | 3.86   |
| 5-Perceived Support    | .57| .32 | 7.52***   | .04 | 6.90** |
| 6-Group X Perceived Support | .58| .34 | 7.15***   | .02 | 3.15   |

Note. Abbreviations include: MR-Multiple Regression; TR²- Squared Multiple Correlation for Total Equation; F(TR²)- Value and Significance of Squared Multiple Correlation for Total Equation; CR²-Change in Squared Multiple Correlation; F(CR²)-Value and Significance of Change in Squared Multiple Correlation.

a* p < .05    b** p < .01    c*** p < .0001
F(1, 154) = 3.09. A 2 X 2 MANOVA assessed differences between groups and gender in non-face-to-face contacts, face-to-face contacts, and perceived support. The results indicated significant differences between caregivers and comparison subjects, F(3, 143) = 3.44, p < .02, but no differences between males and females, F(3, 143) = 1.07, or an interaction, F < 1. In the follow-up analyses, no differences in non-face-to-face contacts were found, F(1, 154) = 1.32. However, caregivers had both fewer face-to-face contacts, F(1, 154) = 4.46, p < .04, and lower perceived support, F(1, 149) = 15.14, p < .0002, than noncaregivers.

Similar results were found at Time 4, including significant differences in total contacts, F(1, 152) = 5.05, p < .03. The MANOVA revealed significant group differences in the social relationship variables, F(3, 133) = 5.26, p < .002, but no gender differences or an interaction, Fs < 1. Follow-up analyses found no group differences in non-face-to-face contact, F < 1. There were significant differences in face-to-face contacts, F(1, 152) = 5.29, p < .03, and in perceived support, F(1, 140) = 19.64, p < .0001.

Individual HMR equations also were used to explore predictors of perceived support at Time 3 and at Time 4. Variables were entered into the regression equations in the following order: group, demographics (age, education,
gender, and income), non-face-to-face contact, face-to-face contact, and the interaction of group and face-to-face contact. At both Time 3 and Time 4 the only significant predictors of perceived support were group status and face-to-face contact. None of the other variables, at either Time 3 or Time 4, added significant variance to the regression model. Table 13 provides the regression results. Thus, the results of the cross-sectional analyses were not only highly consistent at Time 3 and Time 4, they were also consistent with the results of the longitudinal analyses.
Table 13
Cross-Sectional Examination of Perceived Support at both Time 3 and Time 4 using Hierarchical Multiple Regression

Regression Statistics

<table>
<thead>
<tr>
<th>Step-Predictor</th>
<th>MR</th>
<th>TR²</th>
<th>F(TR²)</th>
<th>CR²</th>
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<td>4.26**</td>
<td>.05</td>
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<td>4.12**</td>
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<td>Perceived Support at Time 4</td>
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<td>1-Group</td>
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<td>2-Demographics</td>
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Note. Abbreviations include: MR-Multiple Regression; TR²-Squared Multiple Correlation for Total Equation; F(TR²)-Value and Significance of Squared Multiple Correlation for Total Equation; CR²-Change in Squared Multiple Correlation; F(CR²)-Value and Significance of Change in Squared Multiple Correlation.

a* p < .01   b** p < .0001
CHAPTER V
DISCUSSION

In the present study, four broad questions were examined: Were there differences between caregivers and noncaregivers in face-to-face contact, perceived support, and depressive symptomatology? How was face-to-face contact, a social network characteristic, related to the perception of support? What were the relationships between face-to-face contact, perceived support, and depressive symptomatology? Finally, to what extent did caregiving characteristics influence face-to-face contact, perceived support, and depressive symptomatology?

Group Differences. Consistent with previous literature, caregivers reported more depressive symptoms, on both questionnaire and interview measures of depression (Fiore et al., 1983; Gallagher et al., 1989; Pagel et al., 1987; Schulz et al., 1990; Schulz et al., 1992), and lower perceived support (Fiore et al., 1986; Golden-Kreutz et al., 1990; Haley et al., 1987; Poulshock & Deimling, 1984) than noncaregivers. Some research has suggested that caregivers have the same number of contacts as noncaregivers but perceive that contact differently (Fiore
et al., 1986; Golden-Kreutz et al., 1990; Haley et al., 1987). However, data from the present study indicated that caregivers not only perceive less support, but that they also have fewer people to receive support from and have fewer in-person contacts. Thus, in terms of group differences, caregivers reported fewer total contacts, fewer face-to-face contacts, lower perceived support, and more depressive symptoms than noncaregivers.

Relationships among Face-to-Face Contact, Perceived Support, and Depressive Symptomatology. Face-to-face contact was more strongly correlated with perceived support than non-face-to-face contact, and while the best predictor of future perceived support was past support and status as a caregiver, face-to-face contact did predict perceived support over time. Seeman and Berkman (1988) reported similar findings: direct contact was more important in both perceiving available and adequate support than was non-direct contact. Therefore, in-person contact was more salient in the perception of support than contact received over the telephone or through the mail. This salience appears to be based on qualitative differences between seeing a friend or relative and talking to them on the telephone.

It may be that face-to-face contact was perceived as more supportive because it provides an opportunity for reassurance (i.e., hug, kiss, nods of empathy) not
available through non-face-to-face contact. Previous research indicates that people with higher numbers of in-person contacts are more likely to obtain companionship (Connidis & Davies, 1990), receive physical comfort (Henderson et al., 1981; Fiore et al., 1986), and feel satisfied with their relationships (Seeman & Berkman, 1988) than people with fewer contacts. It appears that the physical presence of seeing or being near another person may be important in perceiving support.

Perceived support was more strongly correlated with depressive symptoms than face-to-face contacts, indicating that functional aspects of support may be more important in depression than structural aspects. The above is similar to some studies that found number of contacts were not as relevant in psychological well-being as subjective appraisals of such contacts (Chappell & Badger, 1989; Heitzman & Kaplan, 1988; Sarason et al., 1987). However, contrary to one hypothesis in the present study, perceived support did not predict depressive symptoms over time. The best predictors of future depression were past depression and status as a caregiver. The data suggest that lower perceived support was associated with increased depressive symptoms, but that perceived support, in and of itself, did not predict depression over time in the context of other variables.
Influence of Caregiving Variables. Among the three caregiving variables examined in the present study (spousal versus adult child; dementia sufferer residence in caregiver's home versus nursing home; increase versus no increase in severity of dementia sufferer impairment), there were no relationships between residence of the dementia sufferer and depressive symptoms, perceived support, or face-to-face contact. These findings were consistent with some research indicating that caregivers are impacted by caregiving regardless of whether the dementia sufferer lives with them or in a nursing home, (Anthony-Bergstone et al., 1988; George & Gwyther, 1986). However, there are other findings that suggest caregivers with the dementia sufferer in their home may experience greater stress (Clipp & George, 1990; George & Gwyther, 1986).

There were also no differences in depressive symptoms, perceived support, or face-to-face contact based on whether the caregiver was a spouse or an adult child. This is in contrast to the suggestion that spousal caregivers are more affected by caregiving than adult child caregivers (Anthony-Bergstone et al., 1988; Delongis & O'Brien, 1990; George & Gwyther, 1986) but similar to research indicating that both spouses and adult children experience the stresses of caregiving (Brody, 1985; Pearlin et al., 1990; Shanas, 1979).
Characteristics of the dementia sufferer, such as severity of dementia sufferer impairment, tend to have minimal relationships to caregiver well-being (George & Gwyther, 1986; Haley et al., 1987; Morris et al., 1988; Pruchno & Resch, 1989). Therefore, the present study examined differences in face-to-face contact, perceived support, and depressive symptoms as a function of whether the dementia sufferer's severity of impairment increased or remained stable over the one year time period of the present study. No differences in the above were found, although being a spousal caregiver or caregiving for a dementia sufferer with increasing impairment predicted decreased face-to-face contact.

The Preliminary Model. Caregivers reported more depressive symptoms than noncaregivers. However, the fact that caregivers and noncaregivers did not differ sociodemographically (i.e., age, education, gender, and income) or by previous history of Axis I disorder diagnoses, suggests that caregiving elicits depression. Therefore, these data suggest that caregiving is causally linked to depressive symptomatology. Other research of chronic stress have found relationships between a stressor, perceived support, and psychological distress (Lepore, Evans, & Schneider, 1991; Quittner, Glueckauf, & Jackson, 1990). In particular, both Lepore et al. (1991) and Quittner et al. (1990) suggest that chronic stressors
(i.e., household crowding, parenting for a deaf child) appear to initiate changes in perceived support that ultimately lead to psychological distress. In other words, perceptions of support are dynamic and change as a result of being exposed to chronic stressors (Lepore et al., 1991). The results of the present study provide a preliminary model for understanding how caregiver depression may occur as part of a developmental process initiated by the chronic stress of caregiving.

Because the caregiving variables were only related to face-to-face contact and not directly with depressive symptoms indicates that their influence on caregiver well-being is most likely through social networks. Thus, caregiving initiates a chain of events, perhaps beginning by decreasing face-to-face contact and cumulating in depressive symptoms. The chain of events is theorized as follows: a family member begins caregiving for a demented relative and, over time, the caregiver becomes hindered by caregiving responsibilities and is no longer able to continue his/her social activities. Specifically, they begin to have less opportunity to socialize and, as a result, become isolated (Clipp & George, 1990; George & Gwyther, 1986; Gallo, 1990). Contacts which are more superficial or based on social interaction (i.e., clubs/organizations, church) are discontinued. Meanwhile, caregivers may maintain contact with relatives and close
friends by increasing reliance on the telephone and mail. The above illustrates the finding that caregivers have both fewer total contacts and fewer face-to-face contacts than noncaregivers.

Those caregivers who are especially prone to losses in face-to-face contact may be spousal caregivers or those caregivers providing care to increasingly impaired dementia sufferers. Remember, spousal caregivers tend to be older than adult child caregivers, nonworking, and cannot rely on their demented spouse for support (Anthony-Bergstone et al., 1988; DeLongis & O'Brien, 1990). Thus, spouses may be more isolated than younger working adult child caregivers. When dementia sufferers decline in functioning, caregivers may be more likely to stay closer to home or visit the nursing home more frequently in order to provide increased care. Therefore, increased care would most likely result in fewer contacts with other people as well.

Caregiver's losses in face-to-face contact subsequently lead to losses in perceived availability of support. Perceived social support can change in response to type of social connections (Blazer 1982; Goodman & Pynoos, 1990). Thus, as social connections change so may perceptions of support. In particular, these changes in perceived support may occur because caregivers, under the stresses of caregiving, develop a heightened sensitivity
to social relationships (Blazer, 1982; Kiecolt-Glaser et al., 1988). In other words, they recognize whether or not support is received because they are in need of support. Unfortunately, increasing need generally does not promote the availability or the reception of support (Enright, 1991; Gottleib, 1985).

Finally, as a result of losses in face-to-face contact and concomitant losses in perceived support, depressive symptoms develop. The negative alterations in social relationships leave caregivers without a valuable coping resource - other people (Clipp & George, 1990; Cohen et al., 1987; Cohen & Wills, 1985; Rook & Pietromonaco, 1987). Because caregivers can expect to provide care for a dementia sufferer an average of 8-20 years (Butler & Lewis, 1982), they may be particularly vulnerable to seeing changes in their social relationships (loss of contact and support) as being long-term. This may further add to the development of depressive symptoms (i.e., hopelessness, helplessness, fatigue, agitation, resentment, anger, etc.) because caregivers may not be able to foresee a time of improvement or relief.

An actual caregiver example may be helpful. An elderly gentleman had been caregiving for his wife for over 5 years. He reported that during the earlier stages of her illness, they had been able to maintain their social activities. These activities included going to
church, Bible study, and dining out. He commented that his wife would quietly sit during these activities. However, as his wife's condition progressed, she became verbally abusive and often used obscenities. Therefore, he stopped dining out. Then the dementia sufferer became incontinent. The caregiver became very embarrassed not only by his wife's behavior but also by his inability to control that behavior. At this point, he discontinued all social activity. He commented that he now had virtually no contact with other people with the exception of a few Bible study friends who telephoned from time to time. The caregiver reported feeling very lonely, without help, resentful of his current situation, and experiencing depressive symptoms. Both the above example and the study's results clearly illustrate the developmental nature of social relationship change and subsequent depressive symptomatology in caregivers.

**Strengths of the Present Study.** One of the major strengths of this study was the attention and sensitivity shown to assessing potential influences of sociodemographics, past history of Axis I disorder diagnoses, and place of assessment. The lack of significant differences and absence of relationships between the above variables and face-to-face contact, perceived support, and depressive symptoms indicates that sociodemographics, past history of Axis I disorder
diagnoses, and place of assessment were not important as possible contributing and/or biasing factors in the interpretation of the present study's results.

A few words about place of assessment are worthwhile. It has been shown that caregivers who travel to a central location in order to participate in research are less depressed than those caregivers assessed at home (Dura & Kiecolt-Glaser, 1990). Efforts to bring subjects to the university by offering to pay bus/cab fare and providing valet parking have increased the number of interviews conducted on campus. Apparently, subjects are more willing to travel to the university if they do not need to worry about driving and/or locating available parking. This may explain why no differences by place of assessment were found in the present study. Tennestedt, Dettling, and McKinlay (1992) suggest that longitudinal studies do increase participation and retention of older and/or disabled subjects with greater attention to subjects' needs.

Another important strength of the present study was the inclusion of both caregivers and matched comparison subjects. Previous caregiving literature has been criticized for not including control subjects and, therefore, lacking the ability to determine the relevance of findings (Gallo, 1990; Pruchno & Potashnik, 1989; Zarit, 1989). In addition, social networks and social
support have not typically been assessed simultaneously in the same population (Fiore et al., 1986). The inclusion of both social networks and perceptions of support was very important in determining how these variables were related to each other and depressive symptoms.

The present study also examined the proposed hypotheses both longitudinally and cross-sectionally. While emphasis was placed on relationships of and longitudinal changes in face-to-face contact, perceived support, and depressive symptomatology, the cross-sectional analyses permitted a "test-retest" evaluation of the hypotheses. The cross-sectional analyses revealed that face-to-face contact was consistently predictive of perceived support at both Time 3 and Time 4. In fact, at Time 4 this association was stronger, supporting a previous suggestion that face-to-face contact may become more salient across time in perceptions of support.

In addition, perceived support at Time 4 was predictive of depressive symptoms at Time 4. However, at Time 3 the results were not as hypothesized. Demographics, non-face-to-face contact, face-to-face contact, and perceived support were all predictive of depressive symptoms, with face-to-face contact more highly related to depression than perceived support. In none of the other analyses, longitudinal or cross-sectional, were such results found. One explanation is that these results
were due to chance. An alternative explanation is that depressive symptoms were influenced by a number of variables initially (especially face-to-face contact) and, over time, perceived support became more important, possibly having a major role in maintaining depressive symptoms over time. The above conclusion is supported by Murrell, Norris, and Chipley (1992) who in a longitudinal study of 1,031 older adults found that functional support, defined as perceived support availability, was directly related to positive affect (i.e., feeling excited, interested, proud, pleased, etc.) two years later, while structural support, measured as strength of social integration, had only transitory direct effects, of about 6 months, on positive affect. In their study, subjects were assessed 5 times, once every 6 months for 2 years (Murrell et al., 1992). Thus, applying Murrell et al.'s (1992) results to the present study suggest that face-to-face contact may be initially related to the development of depression but that perceptions of support (also influenced by face-to-face contact) maintain depression.

Limitations of the Present Study and Suggestions for Future Research. While many of the hypotheses in the present study were supported, no significant changes over time in any of the variables were found. It is possible that the longitudinal time frame of one year was not sufficient to obtain these changes. Several researchers
have suggested that one year is not long enough to observe changes in social relationships and depressive symptomatology because these variables tend to be relatively stable in any one year period (Aneshanel & Frerichs, 1982; Clipp 1990; Clipp & George, 1990; Jennings et al., 1988). Therefore, suggestions for future research would include using a longer time frame to examine changes.

A number of recent studies have questioned the usefulness of the concept "perceived support" and its relationship with psychological well-being/distress (Bolger & Eckenrode, 1991; Pierce, Sarason, & Sarason, 1991; Pierce, Sarason, & Sarason, 1992). For instance, Bolger and Eckenrode (1991) pointed out that research exists showing that perceptions of support are confounded with personality characteristics and premorbid mental health. In particular, they comment that personality characteristics and premorbid mental health are "mood-induced biasers" which influence how people rate support perceptions (Bolger & Eckenrode, 1991). When controlling for the personality traits of extraversion and neuroticism, and prior anxiety in a sample of 226 college students, Bolger and Eckenrode (1991) found that social integration (number of contacts) was related to protecting against increases in anxiety when under the stress of an examination, while perceived support was not.
Besides the research of Bolger and Eckenrode (1991), Hooker, Monahan, Shifren, and Hutchinson (1992) in examining the role of personality on the mental and physical health of spousal caregivers found that those caregivers high in the trait of neuroticism (i.e., worry, insecure, inadequate) or low in dispositional optimism (i.e., calm, insecure, satisfied) rated themselves as more depressed, under greater stress, and less physically healthy. They have argued, that given the known stability of adult personality traits, including caregiver's personality traits in future studies is essential in advancing knowledge of the caregiving process (Hooker et al., 1992). Therefore, the present study, as in past studies, may have relied too heavily on perceived support and not enough on personality characteristics as a means of understanding psychological well-being/distress (Bolger & Eckenrode, 1991).

In addition, the research of Pierce et al. (1991) and Pierce et al. (1992) have also questioned the usefulness of perceived support availability in studying psychological well-being/distress. They suggest that perceived support is best thought of as two constructs rather than one construct: general support perceptions versus specific relationship-based support perceptions (Pierce et al., 1991; Pierce et al., 1992). Specific-based perceptions are determined by an individual's unique
experiences with another person and are only moderately related to general perceptions of available support (Pierce et al., 1991; Pierce et al., 1992). They further argue that general support impressions are most likely the result of personality characteristics and that those studies using a measure of general support perceptions are "likely underestimating the potential contribution of perceived available support by failing to consider the contribution of both aspects of perceived support" (Pierce et al., 1991, p. 1037). It is possible that perceived support did not predict depressive symptoms over time, in the present study, due to perceived support being confounded with personality factors and/or that perceived support was underestimated by not considering the contribution of specific-based perceptions.

A final suggestion involves the use of a more complex model that includes feedback loops. In the present study, the development of caregiver depressive symptoms was explained as a linear process. Caregiving variables initiate the process, leading to decreased face-to-face contact, then to decreased perceived support, and the process ends in increased depressive symptoms. While a unidirectional model is simple to follow and may aid in explaining depression in stressed individuals, the fact remains that many variables have a reciprocal effect on each other (Lepore et al., 1991; Quittner et al., 1990).
It is certainly possible that at any point in the hypothesized linear chain, feedback loops are needed. For example, decreases in face-to-face contact lead to decreases in perceived support which may then lead to further losses in contact and so on and so on. A possible caregiving scenario follows: caregivers' lowered perceived support leaves them more irritable and/or demanding and, as a result, their remaining contacts may not feel capable of dealing with them or their needs, contact is then further minimized, and perceived support decreases again. Thus, a more complex model and more sophisticated statistical procedures (i.e., path analyses, causal modeling) are needed to better understand the possible relationships among face-to-face contact, perceived support, and depressive symptomatology (Quittner et al., 1990).

Clinical Applications. While the present study was largely theoretical in nature, clinical applications are possible. For example, reducing or even preventing caregiver depressive symptoms may be accomplished by replacing face-to-face contacts and/or enhancing remaining contacts (Gottleib, 1985). This can be achieved through the use of support groups, social service care, volunteer home visitors, and even phone-care hotlines. These interventions have been associated with increasing coping skills of stressed individuals (Goodman & Pynoos, 1990;
Korte & Gupta, 1991). In fact, a recent meta-analytic review of caregiver interventions which focused on alleviating psychological burden and distress revealed that individual psychosocial interventions and respite care were, at least, moderately effective in reducing caregiver stress (Knight, Lutzky, & Macofsky-Urban, 1993). One of the mechanisms through which these interventions work may be by increasing face-to-face contact.
CHAPTER VI
CONCLUSIONS

In the present study the relationships among social networks, perceptions of support, and depressive symptomatology were examined in dementia family caregivers and well matched comparison subjects. Face-to-face contact was identified as a social network characteristic important in determining level of perceived support, in which fewer face-to-face contacts were related to lower levels of perceived support over time. However, while perceived support was more strongly related to depressive symptoms than face-to-face contact, perceived support did not predict depression over time. Spousal caregiving and caregiving for a dementia sufferer with increasing impairment predicted fewer face-to-face contacts. Therefore, caregiving variables may have their greatest influence on the development of depressive symptoms through changes in social networks.

Strengths of the study include the use of sociodemographically matched comparison subjects, awareness of possible biasing factors, and testing hypotheses both longitudinally and cross-sectionally.
Most importantly, the present study provided a preliminary model for understanding both the relationship of social network variables in perceptions of support and the development of caregiver depressive symptomatology. Thus, contributions were made in two research areas simultaneously: social relationships and dementia caregiving.

Suggestions for future research include extending the data points of longitudinal studies past one year, identifying other variables which may impact social relationships and depressive symptomatology, exploring better operationalization of perceived support, and examining the reciprocal influence of face-to-face contact, perceived support, and depressive symptoms with more complex models and statistical procedures. The use of individual psychosocial interventions and respite care are two effective means of not only increasing caregiver contact with other people but also of decreasing their distress.
APPENDIX

MEASURES
BECK DEPRESSION INVENTORY (BDI)

Instructions: Listed below are a group of statements. Please read the entire group of statements in each category. Pick out the one statement in each group that best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY. Circle the number beside the statement you have chosen. If several statements in the group seem to apply equally as well, circle each one.

BE SURE TO READ ALL STATEMENTS IN EACH GROUP BEFORE MAKING A CHOICE.

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

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

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

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

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

6. 0 I don't feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.
7. 0 I don't feel disappointed in myself.
   1 I am disappointed with myself.
   2 I am disgusted with myself.
   3 I hate myself.

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

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

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

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

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

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

14. 0 I don't feel that I look any worse than I used to.
    1 I am worried that I am looking unattractive.
    2 I feel that there are permanent changes in my appearance that make me look unattractive.
    3 I feel that I am ugly or repulsive looking.
15. 0 I can work about as well as before.
   1 It takes extra effort to get started at doing something.
   2 I have to push myself very hard to do anything.
   3 I can't do any work at all.

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

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

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

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

   I am purposely trying to lose weight by eating less?
   ___ yes   ___ no

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

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

TOTAL SCORE ______
The BDS is a caregiver interview during which questions about the patient are asked. The goal of the interview is to detect how much change has occurred in the memory, behavior, and personality of the patient over the course of the disease. The interviewer is to circle the number corresponding with the description of the patient. At the end, a total score is calculated.

## A. Changes in patient memory

<table>
<thead>
<tr>
<th>Change Description</th>
<th>Large</th>
<th>Some</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to perform household tasks</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. Ability to cope with small sums of money</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. Ability to remember a short list of items-(for example, shopping)</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. Ability to find way about indoors</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. Ability to find way about familiar streets( for example, recognize whether in a hospital or at home; discriminate between people, relatives, doctors, friends)</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7. Ability to recall recent events</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8. Tendency to dwell in the past</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

## B. Changes in patient hygiene

1. **Eating**
   - Patient eats with proper utensils, can use knife and fork effectively............0
   - Patient needs some assistance in eating-(for example, needs to have food cut) ....1
   - Patient rarely uses utensils, eats with fingers, can only eat certain foods .......2
   - Patient cannot feed self, has to be fed ..................................3

2. **Dressing**
   - Patient dresses self unaided .................................................0
   - Patient has problems with buttons, zippers ..................................1
   - Patient needs to have clothes laid out, forgets items (for example, socks, underwear), puts items on in wrong order or inside out ..................2
   - Patient unable to dress self, needs to be dressed ..........................3
3. Bladder and bowel control
   Patient has normal complete control ............. 0
   Patient occasionally wets self-
      (for example, 1 to 4 times per month) ........ 1
   Patient frequently wets self-
      (for example, several times a week) .......... 2
   Patient lacks bladder and bowel control
      (for example, wets self daily) ............. 3

C. Changes in patient personality and interests

   CHANGE
   Present  Absent

1. Increased rigidity, diminished flexibility
   (for example, patient deals with matters
   in a fixed or stereotyped manner) ........... 1  0
2. Increased self-concern, self-focus, or
   self-centeredness (egocentricity) ........... 1  0
3. Impaired or diminished regard for the
   feelings of others ....................... 1  0
4. Coarsening of emotion (for example,
   being rude, rough, unrefined) ............ 1  0
5. Impairment of emotional control (for
   example, bouts of crying, bursts of
   anger, any loss of control) .............. 1  0
6. Laughing or smiling at inappropriate
   times ...................................... 1  0
7. Diminished emotional responsiveness,
   patient reacts little or not at all
   emotionally (for example, never smiles) .  1  0
8. Sexual misbehavior or inappropriateness
   (for example, undressing in front of
   others, making inappropriate advances
   or comments) ............................. 1  0
9. Hobbies given up because patient can
   no longer do or has lost interest in ....... 1  0
10. Diminished initiative, growing apathy
    (for example, sitting around, not
    starting or doing anything) ............. 1  0
11. Purposeless hyperactivity, excessive
    activity ................................... 1  0

TOTAL SCORE ______
DEMGRAPHICS

EDUCATION

Based on number of years of education:

1- Graduate professional training
2- Undergraduate degree
3- Some college training
4- High school graduate
5- Partial high school training
6- Eighth grade education
7- Less than seven years of school

INCOME

How much income do you (and your husband/wife) have a year? REFER TO ANNUAL INCOME LADDER BELOW AND CIRCLE THE LETTER WHICH IDENTIFIES EITHER YEARLY OR MONTHLY INCOME CATEGORY:

<table>
<thead>
<tr>
<th>YEARLY</th>
<th>MONTHLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. $ 0 - $ 499</td>
<td>$ 0 - $ 41</td>
</tr>
<tr>
<td>B. 500 - 999</td>
<td>42 - 83</td>
</tr>
<tr>
<td>C. 1,000 - 1,999</td>
<td>84 - 166</td>
</tr>
<tr>
<td>D. 2,000 - 2,999</td>
<td>167 - 249</td>
</tr>
<tr>
<td>E. 3,000 - 3,999</td>
<td>250 - 333</td>
</tr>
<tr>
<td>F. 4,000 - 4,999</td>
<td>334 - 416</td>
</tr>
<tr>
<td>G. 5,000 - 5,999</td>
<td>417 - 583</td>
</tr>
<tr>
<td>H. 6,000 - 9,999</td>
<td>584 - 833</td>
</tr>
<tr>
<td>I. 10,000 - 14,999</td>
<td>834 - 1249</td>
</tr>
<tr>
<td>J. 15,000 - 19,999</td>
<td>1250 - 1666</td>
</tr>
<tr>
<td>K. 20,000 - 29,999</td>
<td>1667 - 2499</td>
</tr>
<tr>
<td>L. 30,000 - 39,999</td>
<td>2500 - 3333</td>
</tr>
<tr>
<td>M. 40,000 or more</td>
<td>3334 or more</td>
</tr>
</tbody>
</table>

PLACE OF ASSESSMENT

1- Ohio State University
2- Caregiver’s Home
3- Other Location
HAMILTON RATING SCALE OF DEPRESSION (HRSD)

DATE: _______________ TOTAL SCORE: __________

FOR EACH ITEM SELECT THE "CUE" WHICH BEST CHARACTERIZES THE PATIENT.

1. Depressed Mood. (Sadness, hopeless, helpless, worthless)
   0 Absent
   1 These feeling states indicated only on questioning.
   2 These feeling states spontaneously reported verbally.
   3 Communicates feeling states nonverbally--ie, through facial expression, posture, voice, and tendency to weep.
   4 Patient reports VIRTUALLY ONLY these feeling states in his spontaneous verbal and nonverbal communication.

2. Feelings of Guilt.
   0 Absent
   1 Self-reproach, feels s/he has let people down.
   2 Ideas of guilt or rumination over past errors or sinful deeds.
   3 Present illness is a punishment. Delusions of guilt.
   4 Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations.

3. Suicide.
   0 Absent
   1 Feels life is not worth living.
   2 Wishes s/he were dead or any thoughts or possible death to self.
   3 Suicide ideas or gesture.
   4 Attempts at suicide (any serious attempt rates 4).

4. Insomnia early.
   0 No difficulty falling asleep.
   1 Complains of occasional difficulty.
   2 Complains of nightly difficulty falling asleep.
5. Insomnia middle.

0  No difficulty.
1  Patient complains of being restless and disturbed during the night.
2  Waking during the night--any getting out of bed rated 2 (except for purposes of voiding).

6. Insomnia late.

0  No difficulty.
1  Waking in early hours of the morning but goes back to sleep.
2  Unable to fall asleep again if gets out of bed.

7. Work and Activities.

0  No difficulty.
1  Thoughts and feelings of incapacity, fatigue or weakness related to activities; school, work or hobbies.
2  Loss of interest in activity; school, hobbies or work--either directly reported by patient, or indirect in listlessness, indecision and vacillation (feels s/he has to push self to study, work on activities.
3  Decreases in actual time spent in activities or decrease in productivity. In hospital, rate 3 if patient does not spend at least three hours a day in activities exclusive of ward chores.
4  Stopped working, studying or school attendance because of present illness. In hospital, rate 4 if patient engages in no activities except ward chores, or if patient fails to perform ward chores unassisted.

8. Retardation.

0  Normal speech and thought
1  Slight retardation at interview.
2  Obvious retardation at interview.
3  Interview difficult.
4  Complete stupor.


0  None.
1  "Playing with" hands, hair, etc.
2  Hand-wranging, nail-biting, hair-pulling, biting of lips.
10. Anxiety, Psychic.

0  No difficulty.
1  Subjective tension and irritability.
2  Worrying about minor matters.
3  Apprehensive attitude apparent in face or speech.
4  Fears expressed without questioning.

11. Anxiety, Somatic.

0  Absent
1  Mild
2  Moderate
3  Severe
4  Incapacitating

Physiological concomitants of anxiety, such as gastrointestinal (dry mouth, wind, indigestion, diarrhea, cramps, belching); Cardiovascular (palpitations, headaches); hyperventilation, sighing, sweating, frequent urination.


0  None.
1  Loss of appetite but eating without staff encouragement. Heavy feeling in abdomen.
2  Difficulty eating without staff urging. Requests or requires laxatives or medication for bowels or GI symptoms.


0  None.
1  Heaviness in limbs, back or head. Backaches, headaches, muscle aches.
2  Any clear-cut symptom rates 2.


0  Absent
1  Mild
2  Severe
0  Not ascertained

Symptoms such as loss of interest in opposite sex; menstrual disturbances.
15. Hypochondriasis.
   0 Not present.
   1 Self-absorption (bodily).
   2 Preoccupation with health.
   3 Frequent complaints, requests for help, etc.
   4 Hypochondriacal delusions.

16. Loss of weight.

   WHEN RATING BY HISTORY:
   0 No weight loss.
   1 Probably weight loss associated with present illness.
   2 Definite (according to patient) weight loss.

   WHEN RATING BY WARD STAFF, ACTUAL WEIGHT CHANGES:
   0 Less than 1 lb. weight loss in week.
   1 Greater than 1 lb. weight loss in week.
   2 greater than 2 lbs. weight loss in week.

17. Insight.

   0 Acknowledges being depressed and ill. If not depressed rate 0.
   1 Acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, etc.
   2 Denies being ill at all.

18. Diurnal variation.

   AM   PM
   0   0   Absent
   1   1   Mild
   2   2   Severe

   Rate severity of symptoms in the morning and evening.

19. Depersonalization and derealization.

   0 Absent
   1 Mild
   2 Moderate
   3 Severe
   4 Incapacitating

   Feelings of unreality; nihilistic ideas.
20. Paranoid symptoms.

0 None.
1 Suspicious.
2
3 Ideas of reference.
4 Delusions of reference and persecution.


0 Absent
1 Mild
2 Severe

22. Helplessness.

0 Not present.
1 Subjective feelings which are elicited only by inquiry.
2 Patient volunteers his/her helpless feelings.
3 REQUIRES urging, guidance and reassurance to accomplish ward chores or personal hygiene.
4 Requires physical assistance for dress, grooming, eating, bedside tasks or personal hygiene.

23. Hopelessness.

0 Not present.
1 Intermittently doubts that "things will improve" but can be reassured.
2 Consistently feels "hopeless" but accepts reassurances.
3 Expresses feelings of discouragement, despair, pessimism about future which cannot be dispelled.
4 Spontaneously and inappropriately perseverates "I'll never get well" or its equivalent.

24. Worthlessness.

Ranges from mild loss of esteem, feelings of inferiority self-depreciation to delusional notions of worthlessness.

0 Not present.
1 Indicates feelings of worthlessness (loss of self-esteem) only on questioning.
2 Spontaneously indicates feelings of worthlessness (loss of self-esteem).
3 Different from 2 by degree: Patient volunteers that he is "no good, inferior" etc.
4 Delusional notions of worthlessness—ie, "I am a heap of garbage" or its equivalent.
INTERPERSONAL SUPPORT EVALUATION LIST (ISEL)

Each of these statements may or may not be true about you. For each statement, please circle the response that reflects your feelings.

1. When I feel lonely, there are several people I can talk to.
   4 Definitely true
   3 Probably true
   2 Probably false
   1 Definitely false

2. I hardly ever meet with family or friends.
   4 Definitely true
   3 Probably true
   2 Probably false
   1 Definitely false

3. If I were too sick to do my daily chores, I could easily find someone to help me.
   4 Definitely true
   3 Probably true
   2 Probably false
   1 Definitely false

4. When I need suggestions on how to deal with a personal problem, I know someone I can turn to.
   4 Definitely true
   3 Probably true
   2 Probably false
   1 Definitely false

5. There really is no one whose advice I can really trust.
   4 Definitely true
   3 Probably true
   2 Probably false
   1 Definitely false

6. If I had to go out of town for a few weeks, it would be difficult to find someone who would look after my house or apartment while I’m gone.
   4 Definitely true
   3 Probably true
   2 Probably false
   1 Definitely false

TOTAL SCORE ______
QUESTIONS REGARDING CAREGIVING

Patient: _____ Caregiver: _____

1 = wife
3 = daughter
5 = mother
7 = daughterinlaw

2 = husband
4 = son
6 = father
8 = soninlaw

Present living arrangement: _____

1 = home of caregiver
2 = home of other family member
3 = alone
4 = nursing home
5 = hospital

Dementia Sufferer Diagnosis: _____

1 = Alzheimer’s Disease
3 = Parkinson’s disease
5 = Huntington’s disease

2 = multiinfarct dementia
4 = Pick’s Disease
6 = Other

How long have you been caregiving for your relative, in months?

_____ _____
SOCIAL NETWORK INDEX INTERVIEW (SNII)

Instructions: This questionnaire is concerned with how many people the subject sees or talks with on a regular basis including family, friends, workmates, neighbors, etc. Please ask the questions as written.

1. Which of the following best describes your marital status?
   1  never married and never lived with someone in a marital-like relationship
   2  currently married or living with someone in a marital-like relationship
   3  separated
   4  divorced
   5  widowed

2. How many children do you have?
   ____ none  ____ 1  ____ 2  ____ 7 or more
   ____ 4  ____ 5  ____ 6

   IF 1 OR MORE:

   a. Do any of your children live at home (with you)?
      ____ none  ____ 1  ____ 2  ____ 3
      ____ 4  ____ 5  ____ 6  ____ 7 or more

   b. How many of your children do you see or talk to on the telephone at least once every two weeks?
      ____ none  ____ 1  ____ 2  ____ 3
      ____ 4  ____ 5  ____ 6  ____ 7 or more

   c. How many of your children do you have face to face contact with at least once every two weeks?
      ____ none  ____ 1  ____ 2  ____ 3
      ____ 4  ____ 5  ____ 6  ____ 7 or more

3. Are either of your parents living?
   1  neither
   2  mother only
   3  father only
   4  both mother & father

   (IF NEITHER PARENT IS LIVING, PLEASE GO ON TO QUESTION 4)

   a. Do you see or talk to either of your parents at least once every two weeks?
      1  neither
      2  mother only
      3  father only
      4  both mother & father
b. Do you have face to face contact with either of your parents at least once every two weeks?

1  neither  2  mother only  3  father only  4  both mother & father

4. If you are married, are either of your spouse's parents living?

1  neither  2  mother only  3  father only  4  both mother & father  5  not applicable

(IF NOT MARRIED, OR NEITHER SPOUSE'S PARENTS ARE LIVING, PLEASE GO TO NEXT QUESTION)

a. Do you see or talk to your spouse's parents at least once every two weeks?

1  neither  2  mother only  3  father only  4  both mother & father

b. Do you have face to face contact with your spouse's parents at least once every two weeks?

1  neither  2  mother only  3  father only  4  both mother & father

5. How many other relatives (other than your spouse, parents & children) do you feel close to?

none  1  2  3  4  5  6  7 or more

a. How many of these relatives do you see or talk to at least once every two weeks?

none  1  2  3  4  5  6  7 or more

b. How many of these relatives do you see face to face at least once every two weeks?

none  1  2  3  4  5  6  7 or more

6. How many close friends do you have? (People that you feel at ease with, can talk to about private matters, and can call on for help.)

none  1  2  3  4  5  6  7 or more

a. How many of these friends do you see or talk to at least once every two weeks?

none  1  2  3  4  5  6  7 or more
b. How many of these friends do you have face to face contact with at least once every two weeks?

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<th>3</th>
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<tr>
<td>4</td>
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</table>

7. Do you belong to a church, temple, or other religious group?

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<thead>
<tr>
<th></th>
<th>no</th>
<th>yes</th>
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</thead>
</table>

**IF YES:**

a. During the last month, how many times have you attended religious services?

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<tr>
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<th>none</th>
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<th>3</th>
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<tbody>
<tr>
<td>4</td>
<td></td>
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</table>

b. How many members of your church or religious group do you talk to at least once every two weeks?

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<th>3</th>
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<tbody>
<tr>
<td>4</td>
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</table>

8. Do you belong to any other kinds of groups? (for example, social or recreational group, trade union, commercial group, professional organization, a group concerned with children <PTA, Boy Scouts>, a group concerned with community betterment, charity, or service.)

<table>
<thead>
<tr>
<th></th>
<th>no</th>
<th>yes</th>
</tr>
</thead>
</table>

**a.** During the last month, how many times have you attended group functions or meetings?

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<thead>
<tr>
<th></th>
<th>none</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>4</td>
<td></td>
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</tbody>
</table>

**b.** How many members of the group (or groups) that you belong to do you see or talk to at least once every two weeks?

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<tr>
<th></th>
<th>none</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
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</table>

**c.** How many members of the group (or groups) that you belong to do you talk to face to face at least once every two weeks?

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<tr>
<th></th>
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<th>1</th>
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<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
9. Are you currently employed (full or part-time)?
   __ no   __ yes, self-employed
   __ yes, employed by others

IF YES:
   a. If you supervise others, how many people do you manage?
      __ none   __ 1   __ 2   __ 3
      __ 4   __ 5   __ 6   __ 7 or more
   b. How many people at work (other than those you supervise) do you talk to at least once a week?
      __ none   __ 1   __ 2   __ 3
      __ 4   __ 5   __ 6   __ 7 or more
   c. How many people at work (other than those you supervise) do you talk to face to face at least once a week?
      __ none   __ 1   __ 2   __ 3
      __ 4   __ 5   __ 6   __ 7 or more

10. Do you attend any classes (school, university, technical training, or adult education) on a regular basis?
    __ no   __ yes

IF YES:
   a. How many fellow students or teachers do you talk to at least once every two weeks?
      __ none   __ 1   __ 2   __ 3
      __ 4   __ 5   __ 6   __ 7 or more
   b. How many fellow students or teachers do you talk to face to face at least once every two weeks?
      __ none   __ 1   __ 2   __ 3
      __ 4   __ 5   __ 6   __ 7 or more

11a. How many of your neighbors do you visit or talk to at least once every two weeks?
     __ none   __ 1   __ 2   __ 3
     __ 4   __ 5   __ 6   __ 7 or more

11b. How many of your neighbors do you visit or talk to face to face at least once every two weeks?
     __ none   __ 1   __ 2   __ 3
     __ 4   __ 5   __ 6   __ 7 or more

TOTAL CONTACTS ______
TOTAL FACE-TO-FACE CONTACTS ______
TOTAL NON-FACE-TO-FACE CONTACTS ______
LIST OF REFERENCES


Stephens, M., Social networks as assets and liabilities in recovery from stroke by geriatric patients. Psychology and Aging, 2, 125-129.


