

Florida State University Libraries

Electronic Theses, Treatises and Dissertations

The Graduate School

2011

Social Support and Depression Among Community Dwelling Older Adults

Scharles Tinsley



THE FLORIDA STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

SOCIAL SUPPORT AND DEPRESSION AMONG
COMMUNITY DWELLING OLDER ADULTS

By

SCHARLES CERCY PETTY TINSLEY

A Dissertation submitted
to the Department of Psychology
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Degree Awarded:
Fall Semester, 2011

Scharles Cercy Petty Tinsley defended this dissertation on August 30, 2011.

The members of the supervisory committee were:

Natalie Sachs-Ericsson
Professor Directing Dissertation

John Taylor
University Representative

Thomas Joiner
Committee Member

Jeanette Taylor
Committee Member

Elizabeth A. Plant
Committee Member

The Graduate School has verified and approved the above-named committee members, and certifies that the dissertation has been approved in accordance with university requirements.

ACKNOWLEDGEMENTS

This has been a long journey, one that I have finally finished only by the grace of God, and with the unyielding support and love from friends and family. I would like to thank my husband, Phil for always believing in me, and my mother (Joyce) and father (Charles) for Everything (there is too much to name). I would like to thank my friends for allowing me to vent and to be me: Crystal Claytor, chef extraordinaire; and the Ph.D.s who came before me, Rheeda Walker, Ph.D., Teknaya Watson, Ph.D., and Iyabo Morrison, Ph.D. Finally, thank you to my dissertation chair and major professor Natalie Sachs-Ericsson, Ph.D., for teaching me, guiding me, and for sticking with me this long.

TABLE OF CONTENTS

LIST OF TABLES	v
ABSTRACT	vi
INTRODUCTION	1
METHOD	29
Procedure	29
Participants	30
Measures	33
RESULTS	41
Power Analysis	41
Preliminary Analyses and Missing Data Analyses	41
Tests of Hypotheses	44
DISCUSSION	63
APPENDICES	80
REFERENCES	87
BIOGRAPHICAL SKETCH	105

LIST OF TABLES

1. Demographic Characteristics of Participants at Baseline (n= 4162)31

2. Demographic Characteristics of Participants at Follow-up (n= 1994)32

3. Principal Components Analysis Results of Social Support Items33

4. Mean and Standard Deviation of Baseline Demographic Variables for
Participants Completing Study and Non-completers43

5. Test-Retest Reliability for Social Support Scales From Time 1 to Time 244

6. Correlations Among Social Support Scales at Time 1.....44

7. Summary of Multiple Regression Analyses of Social Support Scales Predicting
Time 2 Depressive Symptoms45

8. Summary of Multiple Regression Analyses of Initial CES-D Scores Predicting
Instrumental Support at Time 249

9. Summary of Multiple Regression Analyses of Initial CES-D Scores Predicting
Size of Social Network at Time 251

10. Summary of Multiple Regression Analyses of Initial CES-D Scores Predicting
Emotional Support at Time 2.....54

11. Change in Depressive Symptoms Predicting Change in Instrumental
Support.....58

12. Change in Depressive Symptoms Predicting Change in Emotional Support ..60

13. Change in Depressive Symptoms Predicting Change in Social Network
Size.....61

ABSTRACT

Although social support variables have long been associated with psychological well-being, and in particular, depressive symptoms, few studies have examined the causal association between social support and depressive symptoms. The present study examined two basic hypotheses: do levels of social support predict later depressive symptoms, or conversely, do depressive symptoms predict subsequent declines in social support?

Depression is the most frequent cause of emotional suffering in older adults, and thus identifying contributors to depressive symptoms among older adults has important implications for developing treatment for depressive symptoms. Two hypotheses regarding the causal relation between the association between social support and depression were identified. Lewinsohn's social skills model of depression posits that social skills deficits lead to reduced social support, which in turn produces depression. In contrast, Coyne's interpersonal theory of depression (1976), proposed that depressed individuals interact with others in a manner that is aversive and lacking in social skills (Coyne, 1976), which serves to reduce social support.

In the current study, the influence of three dimensions of social support on subsequent depressive symptoms was examined. In a modified test of the first hypothesis (low social support predicts depression), the present study examined the influence of the three dimensions of social support (i.e., emotional social support, instrumental support and size of social network), on subsequent depressive symptoms in a sample of older adults. The second hypothesis examined whether depressive symptoms negatively impacted subsequent levels of social support, that is, whether initial levels of baseline (time 1) depressive symptoms had a negative impact on indices of social support. It should be noted these were only partial test of Coyne and Lewinsohn's theories, as social skills was not measure in the current study.

A longitudinal study design based on data obtained from the Duke EPESE was employed to examine the association between dimensions of social support and depressive symptoms over a six-year period in a sample of older adults (N=2100).

The three dimensions of social support were identified based on a factor analysis of survey items included in the EPESE study. These social support measures tapped aspects of both the quality and quantity of social support. Depressive symptoms were measured by the Center for Epidemiologic Studies Depression Scale (CES-D).

A test of the first hypothesis, that social support deficits would predict subsequent depressive symptoms among older adults was not supported. Inconsistent with Lewinsohn's theory, as quality of instrumental support increased, depression increased. Therefore, it appears that individuals with more difficulty are receiving more instrumental support from family and friends.

In a test of the second hypothesis, based on Coyne's theory of depression, baseline (time 1) depressive symptoms were examined to see if they predicted any of the social support measures. Depressive symptoms measured at time 1 did not predict any of the social support measures assessed at time 2. However, there was a sex and depression interaction in the prediction of size of social networks. As depression decreased the size of social networks increased, but it increased more for men than women. Maintaining a large network of support may be more important to men than for women.

However, in partial support of a Coyne's modified theory results showed that a change in depressive symptoms did predict a change in emotional social support such that as depression decreased emotional support increased. Similarly, a change in depressive symptoms predicted a change in social network support such that as depression decreased social network support increased. Thus, these results are consistent with the modified Coyne's theory that suggests that depressed individuals have aversive styles of functioning and therefore are more likely to lower both the quality and quantity of social support.

In light of these findings, special attention should be paid to the status of social networks. Elderly individuals with fewer friends and family and less social may be at risk for developing depressive symptoms and further erosion of support networks. In addition, older adults, particularly those with depression, may benefit from interventions designed to maintain or even enhance social networks.

INTRODUCTION

Depression is the most frequent cause of emotional suffering in later life (Blazer, 2003; Cole & Dendukuri, 2003). In fact, depression and depressive symptoms have been reported as being one of the most serious and prevalent psychological problems among older adults, with estimates of 1% to 12% of community dwelling older adults suffering from diagnosable minor or major depression (Beekman et al., 1995; Blazer, Hughes, & George, 1987; Copeland et al., 1987; Weissman & Myers, 1978), while the prevalence of depressive symptoms found among older community dwelling in the United States and Europe hovers around 15% (Berkman et al., 1986; Blazer & Williams, 1980; Livingston, Hawkins, Graham, Blizard, & Mann, 1990; Murrell, Himmelfarb, & Wright., 1983; Sachs-Ericsson & Blazer, 2006).

Poor social support has been shown to be highly correlated with greater depressive disorders and depressive symptoms among older adults. Strong social support is also an important factor in the psychological well-being of older adults (Sachs-Ericsson, Plant, & Blazer, 2005) and even in mortality (Mazella et al., 2010).

The current project explored the question of whether low social support is an important vulnerability factor for the subsequent development of depressive symptoms among older adults. This theory was contrasted with an alternative (but not mutually exclusive) explanation of the association of social support and depression, specifically that depressive symptoms predict subsequent poor social support.

First, the epidemiology of late life depression is reviewed. Next, the construct of "social support" and its various definitions are examined, followed by a discussion of theories regarding the relationship of social support to depression and depressive symptoms. Evidence suggesting an association between social support and depression in older adults is reviewed, followed by a discussion of the bi-directionality of the relation between social support and depression. The literature suggesting that social support problems lead to the development of later depression is examined, and, this theory is contrasted with an alternative hypothesis that depression predicts low social support (rather than being caused by it). Finally, the statistical technique of multiple regression used to determine whether baseline (time 1) levels of social support predicted depressive

symptoms six years later in a community-based sample of older adults is discussed. In addition, this study examined whether initial levels of depressive symptoms predicted poor social support at time 2 (six years later), while controlling for initial levels of social support.

The Epidemiology of Late Life Depression

A number of community-based studies have estimated the prevalence of depressive symptoms and depressive diagnoses among older adults. Among elderly adult community samples, a series of epidemiological studies conducted in the United States reported the prevalence rate of significant depressive symptoms to range between 10% to 25% (Berkman et al., 1986; Blazer, Burchett, Service, & George, 1991; Blazer & Williams, 1980). By contrast, rates of major depression among older adults appear to be much lower. Six-month to one-year prevalence rates of major depression in community samples of older adults range between 1% and 5% (Beekman et al., 1995; Blazer, 2002; Weissman et al., 1988; Sachs-Ericsson & Blazer, 2006). The reasons for differences in reported prevalence rates of both depressive symptoms and depressive disorders among the studies include differing definitions of elderly (from age 55 to more than 85 years old), demographic characteristics of the samples, and varying measures used to assess depressive symptoms and major depression, including self-rating scales, short interviews, diagnostic criteria checklists, or structured interviews (Lepine & Bouchez, 1998).

It does not appear to be the case that aging itself is a risk-factor for depression. Studies have shown elderly individuals in good health have approximately the same or slightly decreased prevalence rates of depression as younger adults (Blazer & Williams, 1980; Lepine & Bouchez, 1998; Roberts, Kaplan, Shema, & Strawbridge, 1997). Nonetheless, depression among the elderly is not simply an uncomfortable or inconvenient emotional state, but rather an illness that has broad ramifications over a wide range of issues involving quality of life of older adults. Depressive symptoms in the elderly are associated with higher rates of morbidity, mortality, poor health, and difficulty in functioning (Abrams, Lachs, McAvay, Keohane, & Bruce, 2002; Blazer, Moody-Ayers, Craft-Morgan, & Burchett, 2002; Bruce, Seeman, Merrill, & Blazer, 1994; Unutzer, Patrick, Marmon, Simon, & Katon, 2002).

It is widely known that interpersonal context is highly correlated with psychological well-being. Three decades ago, the first studies associating the quality of one's social environment had general effects on individuals' capacity to cope were surfacing (Mechanic, 1976). Since then, numerous studies employing various research methods and definitions of social support have repeatedly found that the quality and quantity of social support are associated with psychological distress in general, and depression in particular (Brown & Harris, 1978; Holahan, Moos, Holahan, & Cronkite, 1999; Landerman, George, Campbell, & Blazer, 1989; Leavy, 1983; Oatley & Bolton, 1985). Several researchers have found that measures of perceived social support and satisfactions with social support predict subsequent depressive symptoms (Krause, Liang, & Yatomi, 1989; Russell & Cutrona, 1991). Variables related to social support, such as being widowed, never married, or living alone are also associated with an increased risk for depression among elderly individuals (Blazer, Burchett, Service, & George, 1991; Harlow, Goldberg, & Comstock, 1991; Lepine & Bouchez, 1998). Thus, marital status is one important contributor to social support.

Since the first research on the association between social support and psychological functioning began, various concepts and definitions have become associated with the term 'social support.' Therefore, before the association between social support and depressive symptoms in older adults is further examined, the construct of social support, including definitions and measurement methods will be discussed. Describing these diverse conceptualizations of social support will be the focus of the following section.

Definitions of Social Support

The interpretation of social support research is complicated due to the heterogeneity of the concept, as well as with the numerous operational definitions (Gottlieb, 1985). While there is a good deal of overlap among definitions of social support that have been used across various studies, no real consensus has emerged. Attempts have been made to discern the distinct components of social support, such as structural aspects of relationships, frequency of social contact, and involvement in social activities or in a social network. Researchers have also identified different functions that support may provide, including provision of advice, expression of emotional support,

buffering the effects of stress, or the provision of material aid (Kessler, Price, & Wortman, 1985; Krause, 2005; Loader, Muncer, Burrows, Pleace, & Nettleton, 2002).

Social support definitions vary from vague to restrictive. Social support has been defined as the provision of help by others; the perception that others are available when needed, and satisfaction with this support (Parker & Barnett, 1987; Sarason, Levine, Basham, & Sarason, 1983). Beels (1981) defined social support as “whatever factors there are in the environment that promote a favorable course of the illness;” while Lin and colleagues specified social support as: “support accessible to an individual through societal ties to other individuals, groups, and the larger community” (Lin, Simeone, Ensel, & Kuo, 1979).

More concrete definitions include Cobb’s definition of social support as information leading a person to believe that he or she is esteemed, cared for, and a member of a communication network (Cobb, 1976). Social support eventually evolved into a more specific categorical approach with descriptors. Starker explicated aspects of social support, which were adapted from the original but unpublished work of Kahn and Quinn (Starker, 1986). In that manuscript, Kahn and Quinn defined social support as involving Affect, Affirmation, and Aid. The “Affect” aspect of social support refers to the expression of intimacy and caring, while “Affirmation” involves feedback about the rightness or wrongness of an individual’s thoughts or actions. The “Aid” component of social support refers to the availability and use of direct help via time, money, and effort.

Similar to Kahn and Quinn’s delineation of social support properties, House identified four aspects of social support behavior (House, 1981). The first three-- emotional support, appraisal support, and instrumental support are almost identical to the concepts of affect, affirmation, and aid. However, the fourth aspect, informational support, refers to the provision of information or teaching a skill, which offers a solution to a problem.

Another aspect of social support involves not only qualities of social activities, but speaks to the existence of interpersonal ties themselves (Leavy, 1983) and has been referred to in the literature as social networks. A social network can be defined as the ties an individual has with a group of people and the links within that group (Broom &

Selznick, 1973). In the current study, quantity of social network was one form of social support examined.

In addition to the amount and kind of social support received, the quality of social support is an important dimension of social support. In other words, the effects of social support seem to be more closely associated with how subjectively good the support is rather than how much of it there is (Barrera, Jr., 1981; Porritt, 1979). Leavy suggested that when studying aspects of people's social environment, it is prudent to examine the structure and availability of helping relationships, as well as the content and quality of those relationships—aspects of both social support and social networks (Leavy, 1983). In the current study, measures of social support included the size of social networks as well as individuals' perception of the quality of their social support.

In addition to differences in definitions of social support, an important source of heterogeneity in the social support literature revolves around the conceptualizations and methods of measuring social support (Barrera, 1986; O'Reilly, 1988; Winemiller, Mitchell, Sutliff, & Cline, 1993). In general, social support measures include quality of social support and quantity of social support. Measures based on the former generally look at satisfaction and closeness in relationships, whereas the latter typically looks at the number of individuals in the social support network as well as the frequency of contacts.

An additional conceptualization of social support includes “social embeddedness” (Barrera, 1986). Measures of social embeddedness seek to quantify the social network by counting the number of social contacts maintained by individuals. At the most rudimentary level, social embeddedness can be measured with demographic indicators such as marital status, number of children, or number of friends. The primary limitation of this type of social support measure is the lack of a method to determine the quality and extent of the social support actually provided; thus, it provides only limited information on how social support actually affects well-being (Krause, Liang, & Yatomi, 1989).

Another category of social support measurement involves assessing frequency that specific supportive behaviors have been provided to the individuals. Researchers measuring this type of social support focus on specific types of social support, such as emotional support and instrumental support (e.g., tangible assistance) and also measure the frequency with which such support is received (Krause, Liang, & Yatomi, 1989).

Measures of the quality of instrumental support, emotional support were included in the current study.

Aside from assessing the number and frequency (quantity) of social interactions, individual variation in the need for social support can be taken into account by asking individuals if they are satisfied (quality) with the social support that they receive (Henderson, 1984). Importantly, measures of satisfaction can also assess the negative or conflictual side of social relations. Significant others are often a source of both positive and negative interactions, (Zlotnick, Kohn, Keitner, & Della Grotta, 2000). Because judgments of support adequacy represent subjective evaluations of social relations that are influenced by both positive and negative contact, these effects are more likely to be captured with measures of satisfaction with support than with other types of measures (Krause, Liang, & Yatomi, 1989).

Blazer, one of the most prominent epidemiological scientists in the area of depression and aging, and the primary investigator of the Established Populations for Epidemiological Studies of the Elderly (EPESE) project (Cornoni-Huntley et al., 1990; Cornoni-Huntley, Brock, Ostfeld, Taylor, & Wallace, 1986), identified four main constructs of support: (1) social networks, (2) social interactions, (3) perceived social support, and (4) instrumental support (Blazer, 2002). His conceptualization of social support among the elderly has been used extensively in the literature. Blazer defined each construct as follows:

*“Social network, or roles and available attachments—*the individual and groups of individuals within the social network available to the subject, such as spouse, children, and group membership.

*Social interactions—*the frequency of interactions between social network members and the subjects.

*Perceived social support—*the subjective evaluation by the individual of his or her sense of a dependable social network, ease of interaction with the network, sense of belonging to the network, and a sense of intimacy with network members.

Instrumental support—Concrete and observable services provided to the subject from the social network” (Blazer, 2002, p. 267).

One study by Pachana and colleagues, designed to examine the validity of the social support items in the EPESE, found over a 3-year period that the social network score increased among women whose life circumstances meant that they were likely to receive more support (e.g. recent widowhood). Likewise, those women at risk of becoming more socially isolated (e.g. those with sensory loss) became less satisfied with their social support. They reported their findings added construct validity to the measures (Pachana, Smith, Watson, McLaughlin, & Dobson, 2008).

As discussed in greater detail below, social support measures in the current study were based on the social support items developed by Blazer and his colleagues (2000), administered in the Established Populations for Epidemiological Studies of the Elderly (EPESE) project (Cornoni-Huntley et al., 1990; Cornoni-Huntley, Brock, Ostfeld, Taylor, & Wallace, 1986). In the current study based on factor analyses of the social support items identified, three of the four forms of social support were similar to those identified above by Blazer. These identified measures included quantity of social network, quality of relationships (perceived emotional support) and quality of instrumental support.

Several studies conducted by Blazer and colleagues (Blazer et al., 1988; Blazer & Williams, 1980) showed an association between each of their constructs of social support and rates of depression, health problems and physical functioning in older adults. Numerous published studies originated from the EPESE project, including a series examining the link between social support constructs and depressive symptoms among the elderly, which will be further explored below.

The EPESE Project and Different Operationalizations of Social Support

The EPESE data from the Duke University site have been used in several studies examining aspects of social support among the elderly (Blazer, Landerman, Hays, Simonsick, & Saunders, 1998), and social support was operationalized in several different ways. In addition to the conceptualization described by Blazer (2002; see above), a cross-sectional study employing the EPESE data set categorized social support

into three aspects (Koenig et al., 1997). These three aspects are similar to the social support measures identified in the current study. These dimensions included size of social network; instrumental support, which tapped tangible services received from network members; and subjective social support, which assessed the respondents' perceived satisfaction with the quality and quantity of social support available, and whether the support network provided support or help when needed (e.g., instrumental support).

Hays and colleagues factor analyzed some of the social support items included in the EPESE survey to create two social support scales measuring satisfaction with amount of social interaction and availability of confidants in difficult times (Hays, Saunders, Flint, Kaplan, & Blazer, 1997). In addition, they examined other social support scales created during previous studies (George, Blazer, Hughes, & Fowler, 1989; Koenig et al., 1997; Koenig et al., 1993), which measured dimensions of social support, including size of social network, frequency of social interactions, and instrumental social support. Results of the study indicated that for older adults, receiving instrumental support was associated with subsequent functional decline (thus, individuals with increasing functional difficulties may elicit more instrumental support), while having confidants and perceived adequacy of social support was associated with (or may have even protected against) declines in functional health (Hays, Saunders, Flint, Kaplan, & Blazer, 1997; Hays, Steffens, Flint, Bosworth, & George, 2001).

Still other approaches have been used to operationalize social support among EPESE participants. One study employed items related to "social network variables" to describe the structural aspects of respondent's social relationships (Mendes de Leon, Gold, Glass, Kaplan, & George, 2001). The social network variables referred to five items that pertained to size of the social network, active social participation, number of phone contacts per week, number of children seen per month, number of relatives seen per month, and number of friends seen per month. In addition, functional aspects of social relationships were employed, grouping items related to instrumental support (e.g., helping with transportation) and emotional support categories. Each category was created based on the content of the questions (i.e., face validity). Results indicated that

network size and social interaction with friends was negatively associated with risk for disability (Mendes de Leon et al., 2001).

Taylor and Lynch (2004) measured “perceived” and “received” social support in an investigation of the relationships among disability, social support, and depressive symptoms based on the EPESE data. The perceived social support measure, identical to the measure used in the current study, was based on two items, one asking participants the extent to which they had friends or family with whom they could discuss their problems and the other asking the extent to which friends or family were available for support in times of trouble. The received social support measure (e.g., instrumental support) was comprised of 12 items inquiring whether participants received support during the past year from family and friends for an array of situations (e.g., help with preparing meals, help shopping or running errands). Taylor and Lynch (2004) employed growth model analyses to demonstrate that over time, perceived social support mediated the relationship between disability and depressive symptoms among older adults, while received social support did not.

The above review of EPESE studies investigating social support provides a vivid illustration regarding the heterogeneity in the operationalization of social support constructs and measures. The variety is especially striking because these studies employ the same data set and items. In the case of social support in particular, Krause describes the concept as an “unwieldy conceptual domain.” The difficulty defining a “real” definition of social support has led to numerous operational definitions because social support may be measured in many ways (Krause, 2001). As is typical when there are no well-standardized measures available, each researcher categorized the concept according to his or her own understanding of the construct.

Instead of relying on face validity to create social support scales, in the current study, items described above related to any dimension of social support were included in a factor analysis. The items used in past studies of social support in the EPESE data were included in a factor analysis, the results of which were then used as the basis to construct different scales assessing indices of social support. These scales are described in the method section.

Poor Social Support Predicts Psychological Distress?

While measures of social functioning and operationalizations of social support have varied across studies, a consistent finding in the literature is that social functioning is associated with the physical and psychological health of individuals of all ages (Bowling, 1994; Helgeson & Cohen, 1996, Tomaka, Thompson, & Palacios, 2006). Studies linking social support and psychological functioning will be the focus of discussion in this section.

The issue of whether the quality and or quantity of social relationships serve as a vulnerability factor to psychiatric disorders has been examined with a number of different research methodologies (Kessler, Price, & Wortman, 1985). Some studies have examined the associations among social support, life stress, and mental illness in community population surveys, while others have focused on clinical population samples. Others still have employed the experimental manipulation of social support to determine its causal influence on mental distress. No matter the type of study used to elucidate the relationship between social factors and mental distress, the results have consistently shown a positive association between indices of social support and measures of psychological well-being. However, the temporal direction of the relationship is not altogether clear. Thus, the current study sought not only to clarify the types of social support, but also to examine whether depressive symptoms were predictive of subsequent levels of social support. There have been few studies examining the bi-directional nature of the relationship between social support and depression up until this point.

Regardless of age, longitudinal studies have shown one of the strongest correlates of depression and depressive symptoms is social support, with depressed people having less social support than those who are not depressed (Hobfoll, Johnson, Ennis, & Jackson, 2003; Holahan et al., 1999; Joiner & Coyne, 1999; Landerman et al., 1989; Petty, Sachs-Ericsson, & Joiner, 2004). Consistent with the hypothesis that low social support is a risk factor for depression, longitudinal studies have linked higher levels of social support with reduced risk of experiencing a major depressive episode and with a greater chance for remission in individuals in a current episode of major depression (Blazer & Hughes, 1991; George, Blazer, Hughes, & Fowler, 1989; Keitner, Ryan, Miller, & Zlotnick, 1997; Lara, Leader, & Klein, 1997). One of the first studies to report

on the link between low social support and subsequent depression was Brown and Harris' (1978) now classic study, which found the likelihood of depression in the face of stressful life events or chronic difficulties increases when an intimate relationship with a spouse is lacking. Even in the absence of stressful life events, the lack of an intimate relationship is a risk factor for depression (Oatley & Bolton, 1985).

Strong social support has obtained considerable empirical support as a protective factor that buffers against the likelihood of depression, while qualitatively poor social support serves as a risk factor (Plant & Sachs-Ericsson, 2004). For instance, perception of strong social support has been found to moderate the likelihood of depression in shy individuals (Joiner, Jr., 1997), elderly psychiatric patients (Bosworth, McQuoid, George, & Steffens, 2002; George, Blazer, Hughes, & Fowler, 1989), and cancer patients (Hann et al., 2002). Several studies have found that quality of social support networks is an important factor in predicting relapse as well as future levels of depressive symptoms (Holahan, Moos, Holahan, & Cronkite, 1999; Joiner & Coyne, 1999). In addition, subjective (perceived) social support appears to be more strongly associated with depression than more objective indicators, such as size of social support network (Blazer, 1982; Bosworth et al., 2002; George Blazer, Hughes, & Fowler, 1989).

The Association between Social Support and Depression in Older Adults

Consistent with research on social support in the general population, research on social support among older adults has also used various definitions of the construct. In addition to the EPESE studies of social support described above, the majority of studies involving older adults have used measures of social embeddedness or the frequency of support received. However, support satisfaction is perhaps a more important variable to study. Research indicates that older adults who are not satisfied with the amount of social support that has been provided to them are more likely to suffer from psychological problems, as opposed to those who feel more satisfied with the support that they have received (Krause, Liang, Yatomi, 1989).

While the association between late-life depression and impaired social support is well established in the general population, the bi-directional relationship between social support and depressive symptoms has been rarely studied, and will be a focus of the present study. In addition, in some studies poor social support has been found to be

associated with depression in the elderly. While cross-sectional studies of the association cannot clearly establish the direction of the association, nonetheless several cross-sectional studies have confirmed an association between measures of social support and depressive symptoms. For example, Prince and colleagues (1997) studied a cross-sectional sample of 654 London residents, 65 years of age or older. Their results indicated that having no supportive neighbors, seeing a relative less than once a week, having one or fewer supportive friends, and lacking satisfaction with the support received from friends were all associated with depression (Prince, Harwood, Blizard, & Thomas, 1997). Along the same lines, a cross-sectional study of 99 older adults from a retirement community demonstrated the benefits of maintaining long term friendships among the elderly (Potts, 1997). Specifically, Potts reported that lower levels of social support from friends outside of the retirement community were associated with higher levels of depression. While the previous studies clearly demonstrated an association, it is not clear the direction of the relationship between social support and depressive symptoms.

However, there have been a few longitudinal studies conducted that employed fairly small sample sizes, non-representative samples and relatively small follow-up periods. Nonetheless, the studies found a relationship between social support and subsequent depression in older adults. For example, Mutran, Reitzes, Mossey, and Fernandez (1995) found a relationship between depression and social support in a clinical sample of older adults. In a study of 219 female hip fracture surgery patients over the age of 59, they found that measures of inadequacy of social support had a significant effect on subsequent depression. Specifically, the women who felt they needed more help than they were receiving, at two months, were more likely to be depressed at six months.

Russell and Cutrona (1991) found that initial social support predicted severity of depressive symptoms 12 months later in a sample of 301 adults aged 65 or older. They found that deficiencies in social support led both directly and indirectly to subsequent depression. Social support indirectly influenced depression by increasing the incidence of minor stressful events, which in turn is a significant predictor of major depression (Russell & Cutrona, 1991).

A more recent community based prospective study (N = 1000) conducted in Japan sought to determine the association between low social support and depression in a

sample of urban Japanese residents, 70 years of age and older (Koizumi et al, 2005). They reported lack of emotional and instrumental social support was associated with a significant increase in the risk of depressive status one year later. Specifically, older adults who reported not having someone with whom they could consult when they were in trouble and who had no one to take care of them when they were bedridden were at risk for depressive status (Koizumi et al., 2005).

Some studies seem to indicate differential effects of the frequency of social support from various sources such as spouse, adult children, relatives, and friends. For example, the frequency with which older adults interact with friends has stronger effects on subjective well-being than does the frequency of interaction with adult children or other relatives (Arling, 1976; Lee & Ishii-Kuntz, 1987; Wood & Robertson, 1978).

The literature reviewed above from both cross-sectional and longitudinal studies suggests that perceptions of inadequate social support are predictors of depressive symptoms; however, these studies are not without limitations. Sample sizes were relatively small and the time frame with which participants were followed-up was limited. Further, many of the studies used non-representative samples, such as individuals seeking treatment; thus, results may not generalize to the general population of older adults. As Roberson and Lichtenberg (2003) have noted, there is the lack of consistent longitudinal data from large samples of community dwelling older adults that examines the relationship of social support indices (including measures of quantity and quality of support networks) and depressive symptoms over time (Roberson & Lichtenberg, 2003). Large community samples of elderly adults are quite expensive to follow over time, and there is typically considerable attrition due to mortality. Yet such studies are essential for investigating the association between social support and depression and in identifying causal relationship. The current study attempts to address these limitations and to complement the existing literature by examining the relationship between several indices of social support and subsequent depressive symptoms over a six-year period in a large, biracial sample of community dwelling older adults.

Whereas there has been a body of literature that has examined the influence of various indices of social support on depressive symptoms, there has been less empirical

research examining an alternative perspective: that depression negatively influences social support. This alternative hypothesis will be reviewed below.

Theoretical explanations for the association of social support and depression

With regard to the causal relationship between interpersonal functioning (e.g., social skill deficits, social support) and depression there are two main schools of thought, which are not mutually exclusive. One proposes that depression negatively influences social support, whereas the other suggests that poor social support influences subsequent depressive symptoms.

Social skills deficits result in later depression

The most widely studied social skills model of depression originated with Lewinsohn (Lewinsohn 1974; Cole & Milstead, 1989). This school of thought holds that social skills deficits result in later depression. Lewinsohn described social skills as the ability to elicit positive reinforcement from others and suggested that social skills deficits lead to reduced social support, which in turn leads to depression. Lewinsohn's (1974) original behavioral theory of depression stated that poor social skills make it difficult to avoid punishing responses and difficult to obtain positive social reinforcement in social situations (Lewinsohn, 1974). Individuals with poor social skills would come across as socially inept, which would lead to limited social reinforcement. In other words, Lewinsohn's social skills model of depression posits that social skills deficits leads to reduced social support, which in turn is a vulnerably factor for depression. It is important to note that while this study was able to assess quantity and quality of support, a measure of social skills, a concept integral to Lewinsohn's theory, was not available.

There is evidence that an individual's social skills are related to the quality and quantity of their social support and individuals with poor social skills have more difficulty developing and maintaining friendships, are more likely to alienate others, receive less positive social feedback, and to illicit negative reactions from those around them (see Segrin 2001). While there is literature suggesting low social support leads to depressive symptoms, few such studies have examined this theory empirically in late life.

Depression negatively influences social support

An alternate explanation of the association between depression and social support suggests that characteristics associated with depression lead to lower social support,

which in turn exacerbates depressive symptoms. Coyne's interpersonal theory of depression (1976) proposed that depressed individuals interact with others in a manner that is aversive and lacking in social skills (Coyne, 1976). As a result, significant others in the depressed person's social network may become frustrated and annoyed, (Coyne, Kessler, Tal, & Turnbull, 1987; Coyne, Kahn, & Gotlib, 1987), which serves to reduce social support. In addition to negative social interactive styles, depression-related symptoms such as withdrawal and lethargy are thought to increase others' aversion to interacting with depressed individuals (Coyne et al., 1987). Similarly, as suggested by Coyne, some, but not all, studies have found depressed individuals elicit social rejection, as well as to verbal and nonverbal rejection (Gurtman, 1986; Hokanson, Rubert, Welker, Hollander, et al., 1989). Again, social skills are a component of Coyne's theory. However, a measure of social skills was not available in the current study. Empirical support for Coyne's model is incomplete due to the lack of studies demonstrating that social rejection exacerbates depression.

Certain aspects of Lewinsohn's (1974) and Coyne's (1976) model have been studied, but the results do not fully explain the nature of the relationship between depression and social support or social skills (Cole & Milstead, 1989). For example, social skills deficits have been linked with depression (Cole, Lazarick, & Howard, 1987; Youngren & Lewinsohn, 1980); however, studies have typically not been able to establish a causal relation between social support deficits and depression and have not explored the causal link from social skills deficits to reduced social support to depression.

Cole and Milstead (1989) compared Lewinsohn's (1974) and Coyne's (1976) models to further examine the causal relation between social skills, social support and depression. Contrary to both Coyne and Lewinsohn's theories, there was no direct link between social support and depression. In addition, there was evidence that social skills deficits were a result, not cause of depression (Cole & Milstead, 1989).

The Bi-directional Nature of the Association between Social Support and Depression

As reviewed above, there is clearly an association between social support and depression, but research has not firmly established whether low social support serves as an antecedent or a consequence of depression (Barnett & Gotlib, 1988). One hypothesis is that low social support is a risk factor for depression, and, therefore, low social support

would predict subsequent depressive symptoms. A contrasting theory is that depressive symptoms are associated with several characteristic symptoms (e.g., social withdrawal, irritability assurance seeking) that serve to reduce social support. Although studies have linked depressive symptoms with social support problems, it is unclear whether poor social interactions precede or lead to depressive symptoms (Nezlek, Imbrie, & Shean, 1994), or if both are correct.

There is evidence, however, that among older adults who are depressed, individuals can eventually drive off potential support providers (Gurung, Taylor, & Seeman, 2003). In a longitudinal, community-based study of 439 married older adults, aged 70 to 79, Gurung, Taylor, and Seeman examined the determinants of changes (over approximately two years) in social support receipt. Gurung and colleagues discovered that participants who were initially experiencing more depression and psychological distress reported subsequent increase in negative interactions (e.g., others' making too many demands or being critical) from their families, friends, and spouses. Similarly, in a study of 78-community dwelling adults aged between 60 and 75 years of age, depressed participants reported decreased social resources as compared to non-depressed participants (Badger & Collins-Joyce, 2000). Social resources were measured by the Older Americans Resources and Services Multidimensional Functional Assessment Questionnaire, a social resources subscale (OARS-OMFAQ) (Fillenbaum, 1988), which measures the availability of close support, the amount of social contact with friends and family, and perceptions of loneliness.

There has been some research suggesting that that the behaviors (i.e., excessive reassurance seeking), of depressed individuals erodes family and outside social resources, but, there is little empirical evidence to support this hypothesis in large epidemiological studies of elderly adults. However, consistent with this framework, studies comparing depressed to non-depressed individuals have found depressed persons are more likely to be in relationships involving lack of intimacy, poor communication, blame and criticism, and to be rejected by others (Coyne & DeLongis, 1986; House, Umberson, & Landis, 1988; Joiner, Jr., 1996).

In summary, Lewinsohn (1974) postulated that a social skills deficit causes a decrease in social support, and poor social support is a vulnerability factor for depression.

In contrast, Coyne (1976) suggested that depressed individuals have poor or problematic social skills, which leads to deficits in social support. Although features of both Coyne and Lewinsohn's models have been tested in many studies, neither has received unequivocal support (Cole & Milstead, 1989).

Instrumental support and depression

Instrumental support may differ from other types of social support (such as quality of social relationships) because it is likely given to individuals who have functioning difficulties. Poor levels of functioning are closely related to depression (Blazer, Burchett, Service, & George, 1991; Taylor & Lynch 2004). Thus, the same dynamics that may govern the relationship of depression to other indices of positive social support may differ greatly for instrumental support, in which friends and family members may feel an obligation to assist.

Consistent and significant tangible support provided to friends and family is often related to disability in the family member. That is, instrumental support is likely given to those who are most distressed and in need of services. For example, Taylor and Lynch (2004) employed growth model analyses to demonstrate that over time, perceived social support mediated the relationship between disability and depressive symptoms among older adults, while instrumental support did not. This may be because those in need of instrumental support are more likely to be high on levels of depressive symptoms because they are the individuals who are functioning poorly and need assistance. Declining physical health may necessitate the availability of additional instrumental resources to carry on the usual activities of daily living (e.g., driving a car, attending to personal hygiene). As health problems and physical functioning problems increase, research has shown that depressive symptoms increase (Blazer, Burchett, Service and George (1991). Thus, regardless of the person's behavior (as outlined in Coyne's and Lewinsohn's theory), as an elderly person's physical functioning and health problems increase (which is associated with greater depressive symptoms), friends and families may need to give more instrumental support but may not give them social or emotional support. Elderly individuals may react to the onset of physical ailments with symptoms of depression and increased dependency on others (Blazer, 2002) and in turn develop the need for more instrumental social support.

The current study examined the relationship between depressive symptoms as a possible marker of overall disability, (see Colenda & Dougherty, 1990; Gurland, Wilder, & Berkman, 1988; Koster et al., 2006) and instrumental support. Specifically, it was predicted that as depression increases (perhaps in relation to poor overall health and decreased functioning) instrumental support would increase but not other forms of social support. Secondly, as instrumental support increased it was expected that depressive symptoms would increase (because of an increase in the individuals' problems in functioning).

Another aspect related to social support among older adults is that social support variables may become even more important as the individual ages, often because of the greater need for instrumental support as well as the benefits of social support in coping with increases stressors associated with aging. It has been argued that older adults are more susceptible to the deleterious effects of the social environment (Lazarus, 1966). Declines in perceptual abilities and other adaptive capacities render older individuals particularly susceptible to social influences. For example, declining physical health may necessitate the availability of additional instrumental resources to carry on the usual activities of daily living (e.g., driving a car, attending to personal hygiene).

Social Support Issues Unique to Older Adults

The relationship of individuals to the social environment varies throughout the life cycle (Pillari, 1988). Hence, results from studies of adolescents and young adults cannot easily be applied to elderly, and vice versa. The transitions of life, such as puberty, young adulthood independence, and retirement, have been of great interest to investigators and clinicians in terms of the adaptation of individuals to these transitions. Adaptation of adolescence, however, is not the same as adaptation to retirement (Blazer, 2002). Therefore, it is important to investigate the effects of social support on varied samples, as results from specific age groups are hard to generalize across the life span.

Older age is a time that may be characterized by losses in status and prestige as well as changes in professional and social roles in late life. Loss of social roles (employee, marital partner, etc.) results in the wake of retirement from positions in the workplace, and the absence of many socially prescribed roles, such as community leadership (Blazer, 2002). The loss of employment and roles is accompanied by the

parallel loss of economic status. Economic adversity secondary to a fixed retirement income coupled with rising health care expenses is common in late life (Blazer, 2002). Further, older adults are also at greater risk for loss of a spouse, siblings, and even children. Thus, the question of how social support may change over time is especially important for older adults because the social networks of older adults are at greater risk for changes in membership (Gurung, Taylor, & Seeman, 2003). Researchers have hypothesized that age specific experiences such as adult children leaving the home, retirement, the death of a spouse or close friends, relocation to institutionalized facilities, and health declines that make socialization more difficult, are among the reasons that older adults are vulnerable to a loss of social support (Bosse, Aldwin, Levenson, Spiro, & Mroczek, 1993; Miller & Cavanaugh, 1990; Morgan, 1989).

Theories of Social Support Change among Older Adults

Research has suggested that both measures of quality and quantity of social support may be important among older adults. Given that older adults face many challenges and changes to their social support networks, two main theories provide a framework for understanding social change among older adults. The first theory, the social convoy model (Antonucci, 1991; Kahn & Antonucci, 1980) provides a conceptualization for studying age-related changes in compositional and structural characteristics of social networks. According to this theory, individuals are motivated to maintain the average amount of social support received although there may be changes in who comprises those networks, the number of people in the networks, and the function of the support. People become increasingly aware of the specific strengths and weakness of particular members of their social networks, as they are continuously maintaining and constructing the networks. This awareness allows them to select network members for different functions (e.g., emotional support or instrumental support) while avoiding members who are not supportive. The social convoy model postulates that social support networks may decrease in size, due to unsupportive network members dropping out over time, but the general level of social support remains constant or may even increase, because social support is coordinated to optimize support receipt. It is important to note that in the current study the quantity of social support is measured.

A second theory, the socioemotional selectivity theory (Carstensen, 1992; Carstensen, Isaacowitz, & Charles, 1999) postulates that individuals shape their social networks depending upon their emotional needs and the amount of time that they perceive they have remaining. The goals of social interactions vary across the lifespan, such that the emphasis in late life is placed on achieving short-term emotional goals. Whereas older adults may have smaller social networks than those of younger adults, the number of close relationships is comparable (Lang, Staudinger, & Carstensen, 1998). Thus, this theory would suggest that the *quality, rather than the quantity*, of social support may be most important in the prediction of depressive symptoms. In-line with this theory quality of emotional support was examined in the current study.

Each of the previous theories has garnered some support with research showing that among the elderly, quality of social support (perceived and actual) is important to mental and physical health, as opposed to the size, membership, or structure of the network (Antonucci & Akiyama, 1994; Carstensen, Isaacowitz, & Charles, 1999; Lansford, Sherman, & Antonucci, 1998).

As reviewed above, depressive symptoms are the most frequent cause of emotional suffering in old age (Blazer, 2003; Cole & Dendukuri, 2003). There is a well-established association between social support deficits and depression (Billings & Moos, 1984; Bosworth, McQuoid, George, & Steffens, 2002; Gurung, Taylor, & Seeman, 2003), and this association has been found, to some extent, among older adults (Gurung, Taylor, & Seeman, 2003; Mutran, Reitzes, Mossey, & Fernandez, 1995; Potts, 1997; Prince, Harwood, Blizard, & Thomas, 1997; Russell & Cutrona, 1991). Older individuals are at particular risk for experiencing disruptions in social support due to loss of spouses, close friends, declining health, and adult children leaving home (Bosse, Aldwin, Levenson, Spiro, Mroczek, 1993; Miller & Cavanaugh, 1990; Morgan, 1989). While predominately clinical samples have shown an association between social support and depressive symptoms over a short period of time, large community studies of older adults investigating the association between social support and subsequent depression over an extended period of time are limited.

Sex and Social Support

Furthermore, investigators have suggested that there may be variables that might moderate the relationship between social support and depressive symptoms, in particular sex. Nonetheless, findings regarding sex differences and social support have been inconsistent (Coventry, Gillespie, Heath, & Martin, 2004). Women, regardless of age, have higher rates of depressive symptoms and some studies have suggested that women are more sensitive to the depressogenic effects of low-social support (Kendler, Myers, & Prescott, 2005; Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993; Koizumi et al., 2005; Schraedley, Gotlib, & Hayward, 1999; Stewart et al., 1989). Indeed, Kendler, Myers, and Prescott (2005) found that emotional social support is significantly more protective against major depression for women than for men. Thus, it would be expected that the association between social support and depression might be stronger for women than men.

On the other hand, some researchers have found no sex differences (Holahan & Moos, 1982; Nezu, Nezu, & Peterson, 1986), or even suggest that men are more adversely impacted by loss of social support (especially absence of a spouse) than are women (Bruce & Kim, 1992; Kendler, Thornton, & Prescott, 2001). In light of these continued inconsistencies, the current study also examined the influence of sex and social support on depressive symptoms, in addition to studying the bi-directional association between social support and depressive symptoms. Although women have been shown to have higher rates of major depression than men, there have been no reports of depressive symptoms differentially predicting future social support for men and women.

Age and Social Support

Another variable that is thought to influence social support among older adults is age. One study suggests that older age is a predictor of poorer social support networks, but does not report the impact of the reduced network on depressive symptoms (Goodwin, Junt, & Samet, 1991). Heller and Mansbach (1984) found that among older women, aging was associated with smaller social networks, less contact with relatives, and less contacts with friends; however, other characteristics of the social network such as frequency of contact with neighbors, proportion of individuals providing companionship and proportion of individuals providing problems solving support, were not associated with age (Heller & Mansbach, 1984). Similarly, Furukawa reported a

decline in perceived social support associated with aging (Furukawa, Harai, Hirai, Kitamura, & Takahashi, 1999). Conversely, others have reported that levels of perceived social support increase with age (Coventry, Gillespie, Heath, & Martin, 2004) or is not influenced at all by aging (Kitamura et al., 2002; Turner & Noh, 1988).

An additional consideration is instrumental support and aging. As an individual ages and physical functioning problems increase, friends and families may need to give more instrumental support. Age may also affect depression. A study by Blazer, Burchett, Service and George (1991) showed an increase in depressive symptoms from age 65 to 85; however, this trend was found to be due in great part to marital status, income, cognitive impairment, and disability. Although increased health problems are associated with aging, at least one study found that even the oldest adults do not necessarily experience higher rates of major depression or depressive symptoms (Blazer, Burchett, Service and George, 1991). Nonetheless, it is well documented that decreased physical activity and physical illness are associated with risk of depressive symptoms among the elderly (Colenda & Dougherty, 1990; Gurland, Wilder, & Berkman, 1988; Koster et al., 2006). Elderly individuals may react to the onset of physical ailments with symptoms of depression and increased dependency on others (Blazer, 2002), thus developing the need for more instrumental social support. Therefore, it might be expected that depressive symptoms to predict increases in instrumental support, and, instrumental support may be a marker for growing dysfunction which would be reflected in part by depression.

One additional aim of this study will be to examine whether age influences the effect of social support, (specifically, instrumental support). Disability has been shown to increase with age (Aijanseppa et al., 2005; Sachs-Ericsson, Schatschneider, & Blazer, 2006), and the need for support, in particular instrumental support will be more important as the individual ages. Therefore, it was predicted that depressive symptoms would be more influential on levels of social support for older individuals. In addition, it seems likely that as individuals age and experience more problems with physical functioning, the availability of tangible, instrumental support to assist with activities of daily living may be particularly linked with the development of subsequent depressive symptoms. Thus, it was predicted that as individuals age the availability of tangible, instrumental

support to would be linked with the development of subsequent depressive symptoms, and that the protective effects of instrumental social support on depressive symptoms would be greater for the oldest adults.

Additional Considerations SES, and, Other Demographic Variables

The primary focus of the current study was the investigation of the association between indices of social support and depressive symptoms in late life; however, it is important to note that there are several variables known to influence depression. Depressive symptoms and social support, and therefore these variables were controlled in the current study. These variables included: female sex, African American race, single marital status, low socioeconomic status (SES), and poor physical functioning (Berkman et al., 1986; Cummings, Neff, & Husaini, 2003, Gallo, Cooper-Patrick, & Lesikar, 1998; Guralnik, LaCroix, Everett, & Kovar, 1989; Hays, Steffens, Flint, Bosworth, & George., 2001; USDHHS, 2001).

Indices of socioeconomic status (SES: e.g., education level, income level and problems meeting basic needs) (Sachs-Ericsson *et al.*, 2005) Sachs-Ericsson *et al.*, 2006) have been associated with risk for depression in older adults (Blazer & et al., 1985; Holzer, Shea, Swanson, Leaf, & et al., 1986), such that lower SES is associated with increased depressive symptoms. One of the most powerful environmental factors influencing negatives outcomes is low SES. The influence of low SES on health status typically occurs throughout the life course (Lynch, Kaplan, & Salonen, 1997). In addition to the negative health outcomes and economic limitation facing elderly individuals with low SES status, low SES may place a strain on social support networks, influencing both the quantity and quality of social support. Low SES is strongly associated with depressive symptoms. For example, in another study based on the EPESE data Sachs-Ericsson and colleagues concluded that socioeconomic variables influence the size and direction of racial differences in the endorsement of depressive symptoms in community dwelling elders (Sachs-Ericsson, Plant, & Blazer, 2005). Specifically, African Americans had lower incomes than Whites and income fully mediated the association between race and depressive symptoms. In light of these findings indices of SES (e.g., education, income) were controlled in all of the analyses in the current study.

The prevalence of diagnosable depression among community dwelling dementia sufferers ranges from 5% to 38% (see Ballard, Bannister, & Oyebode, 1996). Individuals with dementia are more likely to experience depression, presumably because they experience multiple stressors and losses including cognitive deterioration, impaired adaptability, and impaired ability to process emotional responses (Gilhooly, Sweeting, Whittick, & McKee, 1994; Waite, Bebbington, Skelton-Robinson, and Orrell, 2004).

The study of social support among individuals with dementia has been limited, in particular regarding perceived quality of social support from the participants' perspective (Waite, Bebbington, Skelton-Robinson, and Orrell, 2004). Waite and colleagues speculated that social support research has further been complicated because cognitive impairment creates difficulties with utilization of social resources and makes it difficult to establish and maintain reciprocal relationships. Given these findings, it is possible that cognitive functioning of participants in the current study may influence the relationship between the social support variables and depressive symptoms. Therefore, cognitive status was controlled in analyses.

Negative life events and stressors have been studied as a risk factor for depression for many years (Bruce, 2001). That is to say, stressful events may be related to depressive symptoms and may act in concert with social support variables to increase risk of depression. In the current study negative life events were also controlled.

In light of the association between the demographic (age, sex, race) and socioeconomic variables (education, income) on both depression and social support, these factors were controlled during statistical analyses in order to better clarify the influence of social support variables on subsequent depression. In addition, there are several other health variables associated with aging, which are also associated with depression and social support (e.g., physical functioning problems, chronic health problems). It is well documented that poorer physical functioning and physical illness is associated with aging and are risk factors for depressive symptoms among the elderly (Colenda & Dougherty, 1990; Gurland, Wilder, & Berkman, 1988; Koster et al., 2006). For example, physical disability may limit the individuals' ability to participate in social activities. Physical functioning and chronic health problems were controlled for in the analyses.

Though the majority of the above reviewed studies highlight the link between social support variables and depressive symptoms, few are able to determine the causal relationship between the social support and depression association. Thus, an aim of this study was to employ longitudinal methods to examine whether social support, controlling for initial depressive symptoms as well as other relevant demographic variables, were predictive of later depressive symptoms, which would be consistent with a causal relationship (associated with Lewinsohn's theory). A second goal was to examine whether depressive symptoms, controlling, for initial levels of social support as well as demographics, predicted decrements in subsequent social support (associated with Coyne's theory). Indeed neither hypothesis is mutually exclusive. There may very likely be a bi-directional relationship between social support and depressive symptoms.

Measurement of Social Support

To measure social support there were a several items included in the survey. In the current study a factor analysis of all items pertaining to social support was completed and three dimensions of social support were identified: these measures included Instrumental Support scale, Size of Social Network, and a third scale assessing Quality of Emotional support. These measures were used in the current study examining the association of depressive symptoms and social support.

The current project:

In the current project, two primary hypotheses were examined, and a tentative third hypothesis was explored. First, the association between increased social support and subsequent fewer depressive symptoms was examined (a partial test of Lewinsohn's model), and secondly, the relationship of increased depressive symptoms on subsequent levels of lower social support was examined (a partial test of Coyne's model). It is important to note that neither hypothesis is mutually exclusive. That is, increased depressive symptoms may predict poor social support, and at the same time poor social support may lead to more depressive symptoms. Social skills were not directly assessed in the current study (but rather measures of the quality and quantity of social support); thus Lewinsohn's (1974) or Coyne's (1976) models which incorporate social skills into their models cannot be directly tested. Nonetheless, whether social support predicts

subsequent depression and conversely whether depressive symptoms predict subsequent social support were examined.

Although, as described above, it is thought that indices social support and depressive symptoms are inversely related, this study predicted that as one particular form of social support (i.e., instrumental support) increased (perhaps in response to the growing disability of the individual), subsequent depressive symptoms would increase. Similarly, as depressive symptoms decreased (possibly indicating improved functioning) subsequent instrumental support would decrease.

This project contributes to the existing literature in several ways. First, to date, there are no studies that have examined the bi-directionality of the relationship between social support and depression in a large sample of community dwelling older adults. Second, this study was longitudinal, and longitudinal data is essential in examining these hypotheses. Whether poor social support is causally related to subsequent depression, or in contrast, whether depressive symptoms lead to poor social support remains an important theoretical and empirical question. A better understanding of the association between social support and depressive symptoms among older adults is an important contribution to the understanding of the development and possibly treatment of depression among older adults; and, as stated earlier, depressive symptoms among older adults is a major public health problem. Moreover, there are unique challenges as individuals age that may make the relationship between social support and depressive symptoms more salient (e.g., death of friends, poorer health, loss of spouse, loss of independence), and these special circumstances will be discussed below.

Hypothesis 1a: Social Support Levels Predict Depressive Symptoms

Consistent in part with Lewinsohn's theory, it was predicted that measures of social support would predict subsequent lower levels of depressive symptoms among older adults. Specifically, these social support scales identified in the EPESE data at baseline would be significantly related to depressive symptoms assessed six years later such that greater baseline social support is associated with fewer depressive symptoms, while controlling for variables known to influence depressive symptoms (i.e. marital status, race, physical functioning problems, health, age, education, sex, income, cognitive functioning, negative life events, and baseline depressive symptoms).

Hypothesis 1b: Age Moderates Social Support

It was also expected that that age would moderate the effect of support on depressive symptoms, particularly support related to providing assistance. Thus, it was hypothesized that baseline instrumental social support would predict depressive symptoms and this relationship would increase as the individual ages. Therefore, age was expected to be a moderator of the relationship between instrumental social support and subsequent depressive symptoms. Exploratory analyses were also conducted to determine if age was related to the other forms of social support.

Hypothesis 1c: Sex Moderates Social Support

Based on previous research described above, it was also expected that sex would moderate the effect of social support on depression such that women would be more susceptible to the negative effects of poor social support than men.

Hypothesis 2a: Depression Symptoms Predict Social Support

In contrast, an alternate set of predictions (consistent in part with Coyne's interpersonal theory of depression) were tested concerning whether depressive symptoms, after controlling for baseline levels of social support would be predictive of social support six years later. It was expected that initial depressive scores would predict subsequent levels of social support, such that higher levels of initial depressive symptoms would be associated with lower levels of social support six years later, and, in addition, lower levels of depression would be associated with subsequent higher levels of social support.

Hypothesis: 2b: Age Moderates Depressive Symptoms

Because disability increases with age (Aijanseppa et al., 2005; Sachs-Ericsson, Schatschneider, & Blazer, 2006) the need for support, in particular instrumental support, will likely be more important as the individual ages. Therefore, it was predicted that depressive symptoms would be more influential on levels of social support for older individuals.

Hypothesis 2c: Sex Moderates the Influence of Depressive Symptoms

Because research has shown sex differences in rates of depression between older men and women, as well as inconsistent results regarding the relative importance of social support for men compared to women, exploratory analyses were conducted to

examine whether or not sex, particularly female sex, moderated the influence of depressive scores on later social support scale scores.

Hypothesis 2d: Changes in Depression Associated with Changes in SS

As Coyne's modified theory would predict, whether simple change scores in depressive symptoms from time 1 to time 2 predicted change scores in social support was examined. A modified Coyne theory might predict that an increase in depressive symptoms would be associated with less emotional support, less social networks and less instrumental support, whereas a decrease in depressive symptoms was predicted to be associated with increased emotional support, social networks, and instrumental support.

Hypothesis 3: Instrumental Support

This study considered that instrumental support would be given to those most in need. Thus, it is likely that higher levels of instrumental support would be given to individuals who are having the most difficulties, including depression, physical disability and other indicators of distress. Within the context of the above analyses, whether an increase in instrumental support (also a marker of possible dysfunction) would predict increase in depressive symptoms was examined. Also, some simple correlational analyses were conducted to examine if an instrumental support was a possible marker of general dysfunction such that it was correlated with other indices of distress.

METHOD

Procedure

These data were derived from the Duke Established Populations for Epidemiologic Studies of the Elderly (EPESE). This population survey was part of a multi-center, collaborative epidemiologic investigation of physical, psychological, and social functioning of persons 64 years of age and older. The Duke EPESE is a 10-year prospective cohort study, conducted in the north Central Piedmont region of North Carolina (Corroni-Huntley et al., 1990). Although detailed information describing the sampling design and procedures has been described in detail previously (Corroni-Huntley et al., 1990), a brief synopsis follows.

A four-stage sampling design which initially used the 1980 United States census results was employed in order to identify housing units with persons 64 years of age or older and to obtain a sample including at least 50% older black participants to assure that the final sample would be approximately equally distributed between black and non-black individuals. Screening interviews were attempted at all sample housing units to verify the age and racial composition of the inhabitants. Finally, in homes with more than one aged person 64 or older, a random deletion was made of one participant per housing unit (Corroni-Huntley et al., 1990).

Of the over 5000 eligible sample members, 4162 completed the initial interviews. Data were collected during a household interview at baseline (time 1, 1986-1987) and at a six-year follow-up (time 2, 1992-93). Interviewers were trained by staff at the Research Triangle Institute in North Carolina, in conjunction with researchers at Duke University. In order to reduce differences in the data based on interviewer characteristics, training emphasized asking questions exactly as worded, using only standardized probes, recording answers verbatim, and no agreement or disagreement with participant's responses to imply acceptance or judgment. Interviewers' records of home visits and phone calls were monitored by supervisors and a sample of participants was again contacted after interviews to verify correct interview protocol. Interviews were repeated if problems were suspected (Corroni-Huntley et al., 1990).

Data were gathered on age, sex, race, marital status, education, urban vs. rural residence, health status, cognitive status, depressive symptomology and functional status.

All data collected were approved by the institutional review board (IRB) of the Duke University Medical Center. Analysis of this archival data set was approved by the Florida State University's IRB (see Appendix D).

Participants

The current study focused on data from the baseline interviews (1986-1987) and a third wave of interviews conducted six years later (1992-1993). The baseline data and six-year follow-up were chosen to maximize follow-up time and the number of participants who remained living. While the time 1 used a probability sample of 4,162 community residents, there were 2100 of participants with usable data six years later. There were 1281 participants who died between time 1 and time 2.

The racial composition of the current sample was 54% African-American and 45% White and the average age was 73.5 years ($SD = 6.7$). All levels of SES were represented among African-Americans and Whites. Table 1 and Table 2 report detailed demographic information of sample participants and baseline and during the follow-up study.

Table 1
Demographic Characteristics of Participants at Baseline (n= 4162)

Characteristic	Frequency	Percentage
Sex		
Female	2704	65.0
Male	1458	35.0
Race^a		
Black	2261	54.3
White	1875	45.3
Age		
64-70	1163	40.0
71-75	1060	25.4
76-80	756	18.2
81-85	445	10.7
86-90	173	4.1
91-95	50	1.2
96+	15	.4
Marital Status		
Married	1590	38.2
Not Married ^b	2572	61.8
Education (years)		
0	91	2.2
1-8	2124	51
9-12	1361	32.7
13-16	398	9.6
17+	188	4.5
Yearly Income		
\$0-\$1,999	72	1.7
\$2,000-\$2,999	219	5.3
\$3,000-\$3,999	566	13.6
\$4,000-\$4,999	852	20.5
\$5,000-\$6,999	681	16.4
\$7,000-\$9,999	517	12.4
\$10,000-\$14,999	483	11.6
\$15,000-\$19,999	259	6.2
\$20,000-\$29,999	247	5.9
\$30,000-\$39,999	110	2.6
\$40,000-\$49,000	118	2.8
\$50,000+	38	.9

^a26 participants were identified as neither black nor white (.6%)

^bThe Not Married category included individuals who reported being separated, divorced and widowed.

Table 2
Demographic Characteristics of Participants at Follow-up (n= 1994)

Characteristic	Frequency	Percentage
Sex		
Female	1350	67.7
Male	644	32.3
Race		
Black	1067	53.5
White	927	46.5
Age		
71-75	811	40.6
76-80	613	30.8
81-85	358	18.1
86-90	155	7.8
91-95	46	2.3
96+	10	.7
Marital Status ^a		
Married	688	34.5
Not Married**	1158	58.2
Education (years)		
0	26	1.3
1-8	925	46.4
9-12	723	36.3
13-16	223	11.1
17+	97	4.9
Yearly Income		
\$0-\$1,999	31	1.6
\$2,000-\$2,999	77	3.9
\$3,000-\$3,999	225	11.3
\$4,000-\$4,999	375	18.8
\$5,000-\$6,999	317	15.9
\$7,000-\$9,999	255	12.8
\$10,000-\$14,999	258	12.9
\$15,000-\$19,999	155	7.8
\$20,000-\$29,999	139	7.0
\$30,000-\$39,999	67	3.4
\$40,000-\$49,000	81	4.1
\$50,000+	14	.7

^a The Not Married category included individuals who reported being separated, divorced and widowed.

^b There was missing data on marital status for 48 participants

Measures

Social Support. Twenty items included on the Piedmont Health Survey of the Elderly (PHSE) used in the Duke EPESE questionnaire, which examined social interactions with friends and relatives, were factor analyzed using the principal components analysis (PCA). Because the underlying factors should be related, an oblique rotation procedure (promax) was used to enhance interpretability of the factor solution. The number of components was estimated using both Kaiser’s (1961) criterion to retain factors with eigenvalues greater than one, prior to rotation, and a scree plot to identify the inflection on the curve where components begin to plateau.

Six factors emerged from the PCA. Of these six factors, all had unrotated eigenvalues greater than 1.0; however, examination of the scree plot revealed two indisputably strong factors and a possible third factor. The PCA was rerun specifying that only three factors be extracted, and again two undeniably strong factors were extracted and possibly a third. Table 3 displays each component, associated eigenvalue, and percentage variance explained by the component. Figure 1 displays the scree plot.

Table 3
Principal Components Analysis Results of Social Support Items

Component	Eigenvalue	% of Variance
1	3.91	20.61
2	2.51	13.23
3	1.38	7.26
4	1.28	6.76
5	1.19	6.25
6	1.01	5.32

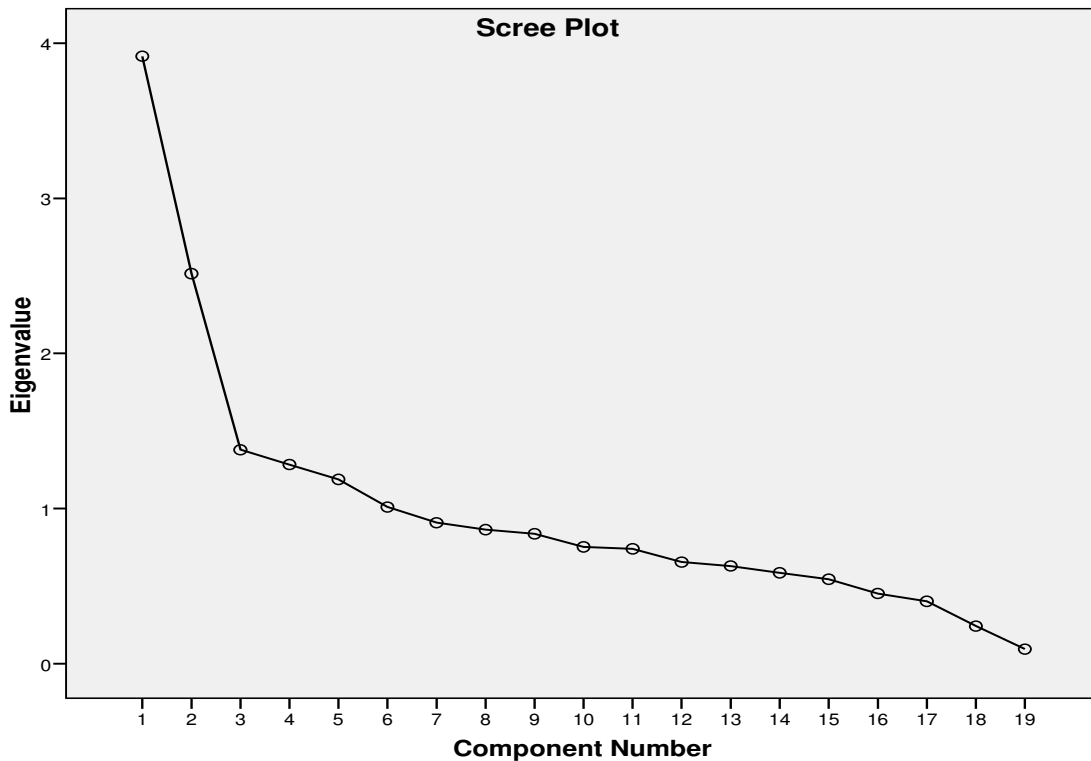


Figure 1
Scree Plot of Social Support Components

Thus, three scales were derived from the social support items. Each of the items that comprise the identified social support scales were then z-scored to form the social support scales used in regression analyses. The scales are described below.

The *Instrumental Support* scale is comprised of 10 items from the Piedmont Health Survey of the Elderly (PHSE) used in the EPESE. This scale reflects tangible support provided by friends and family members including assistance with transportation and fixing things around the home, as well as whether friends and family members listen to problems and give advice. Responses were coded 1 “no” and 2 “yes,” resulting in a summed response range of 10 to 20. Higher scores indicate better social support. The baseline Cronbach’s alpha (α) = .77, follow-up α = .81.

The *Size of Social Network* (quantity of family and friends) scale is comprised of four items, which measure number of close relatives and friends available for support and

number of relatives and friends seen in one month. Item scores ranged between 0 (no relatives or friends) to 10 (10 or more relatives or friends), resulting in a summed scale response range of 0 to 40. Higher scores indicate better social support, time 1 $\alpha=.79$, time 2 $\alpha=.86$.

The *Quality of Emotional Support* is comprised of two items, “when in trouble you can count on family or friend,” and “you can confide with a family or friend,” time 1 $\alpha=.6$, time 2 $\alpha=.6$. Nunnally (1978) has indicated 0.7 to be an acceptable reliability coefficient, but lower thresholds are sometimes used in the literature. In this case, the quality of emotional support captures an important construct of social support and is the only measure that assesses intimacy within the context of the relationship. Indeed, it is the only scale that taps one major theory of social support in aging: the socioemotional selectivity theory (Carstensen, 1992; Carstensen, Isaacowitz, & Charles, 1999), which states that, whereas older adults may have smaller social networks than those of younger adults (e.g. quantity), the number of close relationships is comparable (Lang, Staudinger, & Carstensen, 1998). Thus, this theory would suggest that the *quality, rather than the quantity*, of social support may be most important in the prediction of depressive symptoms. Furthermore, this is the same scale used in other studies that have shown discriminant validity of the scale. Specifically, Taylor and Lynch (2004) employed growth model analyses to demonstrate that over time, perceived social support mediated the relationship between disability and depressive symptoms. Therefore, despite the limitations of this scale, it was included to try to assess the important concept of quality of relationships. Please see Appendix A for a full list of scale items.

Center for Epidemiological Studies—Depression (CES-D) Scale. The Center for Epidemiological Studies Depression Scale, CES-D (Radloff, 1977) is a 20 item, self report scale that was originally developed to measure depressive symptomatology in a community population. Numerous community-based (Beekman et al., 1995; Radloff & Teri, 1986) and clinically-based studies of depression among the elderly have employed the CES-D. In general the psychometric properties are acceptable (Beekman et al., 1997), and it has been validated for use in older adults (Hertzog, Van Alsiné, Usala, Hultsch, & Dixon, 1990; Himmelfarb & Murrell, 1983; Roberts & Vernon, 1983). In Radloff’s original study internal consistency was as follows: Coefficient alpha

(Spearman-Brown, split-halves) General population = 0.85. Patient sample = 0.90 (Radloff, 1977).

There has been some research indicating that the CES-D is more a measure of general demoralization (non-specific psychological distress), rather than a measure of depression per se (Vernon & Roberts, 1981). Indeed, Orme et al. found that in addition to depression, the CES-D appears to tap aspect of self-esteem, state anxiety, and trait anxiety (Orme, Reis, & Herz, 1986). However, it should be noted that correlations between the CES-D and other measures of depression (e.g., the Hamilton Depression Scale and the Zung Depression Scale; (Hamilton, 1960; Zung, 1965) are stronger than the correlations between the CES-D and self-esteem or state anxiety (Shinar et al., 1986). Other studies have found the CES-D to be accurate in detecting major depression in samples of elderly individuals (Haringsma, Engels, Beekman, & Spinhoven, 2004). Nonetheless, it should be noted that the CES-D is not a measure of Major Depression, but rather a measure of depressive symptomatology. It is important to note that in this study symptoms of depression were assessed, not clinical depression. Because this study considered frequency of CES-D depressive symptoms, not diagnosis of major depression, the findings from this study may not generalize to clinical diagnosis of depression. Nonetheless mild to moderate depressive symptoms (not meeting the criteria for major depression) are of significant problem among older adults (Sachs-Ericsson & Blazer, 2006). Thus, studying the influence of depressive symptoms, rather than diagnosis has its merits in older adults (Radloff, 1977).

In the current study, the CES-D was administered at both baseline and follow-up. However, for ease of administration, a dichotomous response scale was used for each item coded 0 (*No*) and 1 (*Yes*). A dichotomous scale has been compared to the original CES-D (four response options) and high reliability were found (Blazer, Burchett, Service, & George, 1991). Responses across the 20 items were summed to create a CES-D scale score for baseline and follow-up, with higher scores indicating more depressive symptoms, baseline scale $\alpha = .82$ and follow-up $\alpha = .80$. See Appendix B.

Physical Functioning (PF). PF was measured by a three item scale from the Rosow-Breslau Functional Health scale (Rosow & Breslau, 1966). Respondents indicated whether or not they could, unaided, complete such tasks as heavy housework,

walking up and down stairs, and walking one-half mile. Responses were summed across items such that higher scores indicated poorer physical functioning (baseline Cronbach's $\alpha = .79$, Time 2 $\alpha = .79$). It should be noted that the physical functioning scale showed consistency in measurement over time. Specifically, time 1 PF correlated with time 2 PF, $r(3302) = .515$, $p < .01$. Supporting its construct validity, the PF scale correlated with other measures related to physical functioning such as the ability of functioning in tasks of active daily living, $r(4,053) = .638$, $p < .001$.

Indeed other researchers have found that the PF scale is as strongly related to one Katz activities of daily living (ADL) item, walking (eta-squared ranging from 0.15 to 0.33), as all of the Katz ADL items combined (eta-squared ranging from 0.21 to 0.35) (Alexander, Guire, Thelen, Ashton-Miller, Schultz, Grunawalt, & Giordani, 2000). See Appendix C for PF items.

Health Index. This index score reflected respondent's medical status based on the presence of five physical health conditions: heart problems, hypertension, stroke, diabetes, and cancer. When a condition was present, a score was given equal to the mean physicians' rating of the impact of the condition on physical health. Scores were summed to create this index. Higher scores were indicative of a stronger impact of these conditions on an individual's physical health.

Covariates

Demographics. A comprehensive demographic section assessed age, sex, educational status, family income, and race of participants. To assess income, participants were asked to select an income category that best represented their income during the last year. Categories were 1 (0 to \$1,999), 2 (\$2,000 to \$2,999), 3 (\$3,000 to \$3,999), etc. Each participant was assigned a yearly income based on the mid-point of the category (e.g., category 1 (0 to \$1,999) was given a value of \$900.50).

Negative Life Events: At Time 1. Stressful life events may affect levels of depressive symptoms over time and therefore were controlled for time 1 stressful life events in the analyses. Participants were read a list of seven stressful life events and asked if they had occurred for the participant in the last year. For example, "Has anyone close to you died in the past year?" "Have you separated or divorced in the last year?" The number of negative life events were summed and included in the regression models.

Participants had on average .67(.94), stressful events, and the range of stressful event was 0 to 7.

Cognitive Functioning. Cognitive problems predict depressive symptoms (Sachs-Ericsson, Sawyer, & Blazer, 2007) and therefore were controlled for in the analyses. Cognitive functioning was assessed by the Short Portable Mental Status Questionnaire (SPMSQ) (Pfeiffer, 1975) at Time-1 (Cronbach's alpha = .74). The SPMSQ is a brief, 10 item, measure of global cognition. For example, items assessed knowledge of date, current and previous president. Unlike some other studies that dichotomized the SPMSQ, participant's errors across items were summed to form a continuous scale (e.g. 0 to 10 errors) with higher scores indicating more difficulties. Test retest reliability has been found to be high (.83) (Pfeiffer 1975). In the current study cognitive status at time 1 was included as a control variable.

Plan of Analyses

Descriptive statistics (means, SD) and correlations were reported for all variables for which data were available from the participants at the two time points. The dependent and independent variables were screened to ensure that the basic assumptions (linearity, constant variance, and normality) of a regression analysis were met and to detect any outliers. Any serious violations were corrected if possible, by appropriate data transformations (see below). Sex, physical functioning and SES with other variables were included as covariates in the regression analyses. The baseline level of the variable that was predicted at Time 2 was included in the control analyses for the majority of the analyses. This residualizing approach to analyzing change is the approach that was used in the majority of the analyses.

A series of multiple regression analyses was performed in order to examine the effects of social support on later depressive symptoms while controlling for age, sex, race, education, income, Time-1 physical functioning, Time-1 health, and time 1 and time 2 marital status, and time 1 negative life events. Time 2 cognitive status was controlled because of the strong correlation between cognitive functioning and depressive scores. Age and sex interactions with social support were also included. Similarly, analyses were conducted to test the influence of depressive symptoms on subsequent social support, while controlling for demographic variables.

Multiple regression is an effective statistical technique provided the data adheres to three primary assumptions. They are normality, linearity, multicollinearity, and outliers. Analyses revealed that none of the assumptions were violated therefore; the results of the analyses are interpretable.

In order to assess if the assumption of normally distributed residual error was met, a *zresid histogram* of the dependent variable (CES-D depression scores frequency by the regression standardized residual was examined). Although regression is robust in the face of some deviation from this assumption, the very small skewness identified should not affect the ability to draw conclusions. In addition, a *normal probability plot* (*zresid normal p-p plot*) of normally distributed residual error of the dependent variable generated a plot close to 45-degree line, which was another indication of adequate normality (Norušis, 2006). An examination of the collinearity coefficients revealed no serious issues with multicollinearity. Scatterplots of the dependent variable and each independent variable were created in order to insure that the relationships between the variables were linear.

Hypothesis 1a-c. Prediction of Depressive Symptoms from Baseline Indices of Social Support and Interactions of Sex and Age. Multiple regression analyses were conducted to determine if social support measures predicted depressive scores six years after the initial interviews. The first model included the control measures. On the first step of the analyses demographic factors were controlled, as well as time 1 depressive (e.g., age, race, sex, year of education, income and time 1 depressive symptoms. By including time 1 depressive symptoms in the analysis the initial level of depression symptoms was controlled while predicting depressive symptoms at time 2. On the second step the health variables, the index of chronic health problems, physical functioning, cognitive functioning and negative life events were controlled for. On the third step time 1 and 2 marital status was controlled. The next step included the time 2 social support scales (e.g., Quantity friend and family, Quality of instrumental support, and quality of emotion support). On the sixth step the time 1 social support scales were included in the analyses to determine whether depressive symptoms were predicted by the social support measures over and above the control measures. In the last step the interactions of sex, and age, with each of the time 1 social support scales was included.

Hypothesis 2a-d. Depression Symptoms Predict Social Support and Interactions of sex and age. To test the second hypothesis a series of regression analyses predicting whether time 1 depressive scores predicted each of the indices of time 2 social support was conducted. In the analyses baseline social support was controlled; therefore, the relationship of depressive symptoms to subsequent social support could be determined while controlling for initial levels of support. In the last step of the analyses sex and age interactions with depressive symptoms was examined.

In a second set of analyses simple change scores are used to test the modified Coyne's theory.

Hypothesis 3. Instrumental Support. Hypothesis 3 used correlational analyses to determine the relationship of instrumental support to other key variables.

RESULTS

Power Analysis

A power analysis was conducted to estimate the necessary sample size to achieve a power of .90 (i.e., 9 out of 10 times effect will be detected) for a medium effect ($r=.30$, $R^2=.90$) at an alpha level (.05) (Cohen, 1992). For multiple regression, effect size of the population is estimated as $f^2 = R^2/1-R^2$. For $R^2 = .09$, this effect size $f^2 = .099$. For multiple regression, the necessary sample size, $n^* = L/f^2 + k = 1$, where L is obtained from Cohen & Cohen's power table (Cohen & Cohen, 1983; Table E.2, p527), and K = the number of independent variable, five in the present study. For these conditions, minimum $n^*= 166$.

Given that the current study employs a sample of more than 2000 participants, there is a need to be cautious of having too much power. By increasing the sample size, smaller effects will be found to be statistically significant, and it is possible that the statistical test will be overly sensitive (Hair, Anderson, Tatham, & Black, 1998). Therefore, the criterion of practical significance will need to be met in addition to statistical significance in interpreting the results of the current study.

Preliminary Analyses and Missing Data Analyses

Between the baseline and follow-up study periods, there were 1281 participants who died and another 781 participants who were either lost to follow-up or had some missing data required for the analyses. Thus, 2100 participants were included. Missing data analyses were performed in order to examine whether baseline characteristics of participants contributed to later attrition. To this end, One-Way Analysis of Variance (ANOVA) was employed to compare the means of the dependent variables age, baseline depressive symptoms, education, income, and physical health of those participants who remained in the study at the follow-up versus those who did not. The independent variable, follow-up status included two levels, available at follow-up or not available for follow-up. Cases were excluded analysis by analysis cases: when missing data for the dependent variable for a particular analysis individual was excluded for that analysis, but included for other analyses for which data were available.

The variables in question met the underlying ANOVA assumptions of normality and independence. However, the assumption of equal variance was violated for several of the dependent variables, which rendered the resulting p value for the overall F-test untrustworthy. Therefore, the Welch statistic was reported in order to compensate for the violation of the assumption.

The ANOVA was significant for all analyses comparing the means of the dependent variables age, baseline depressive symptoms, education, income, and physical health of those participants who remained in the study at the follow-up versus those who did not. Again, as the assumption of homogeneity of variance was violated; the Welch F-ratio is reported, as reflected by the corrected degrees of freedom. As expected there was a significant effect of age on follow-up status, $F(1, 3620.42) = 364.60, p < .001$, such that participants who were older at baseline were more likely to be unavailable for follow-up. Other demographic and social economic indices known to be associated with poorer health and higher mortality rates differed from time 1 to time 2. Participants who had fewer years of education were significantly more likely to be unavailable for follow-up, $F(1, 4095.17) = 63.94, p < .001$, as were participants with less yearly income, $F(1, 4138.55) = 51.90, p < .001$. Consistent with data reported in earlier analyses of the Duke-EPESE (Blazer, Sachs-Ericsson, Hybels, 2007; Yang & George, 2005), there were significant effects of baseline depressive symptom and physical health index on follow-up status such that participants with higher depression scores (CES-D) and higher health index scores (indicating poorer health) were less likely to be available for the follow-up study period, $F(1, 3711.90) = 47.53, p < .001$ and $F(1, 3878.39) = 89.18, p < .001$, respectively. Please see Table 4 for the mean and standard deviation of the dependent variables.

Table 4
Mean and Standard Deviation of Baseline Demographic Variables for Participants Completing Study and Non-Completers

Characteristic	Study Completers	Study Non-Completers
	M (SD)	M(SD)
Age	71.71 (5.44)	75.58 (7.38)
Education (Years)	8.95 (4.00)	7.94 (4.12)
Income (Yearly)	\$11239.92 (10583.02)	\$9057.32 (8949.12)
Baseline Depression	2.90 (3.25)	3.65 (3.58)
Health Index	33.97 (28.49)	43.14 (33.43)

In the current study sample 67.8% were female, the mean age was 71.71(5.44), and participants had in 8.95 (4.00) average years of education. The yearly income was \$11239.92 (10583.02). Among the sample, 41.6% were married at time 1 and only 15.8% were currently still working.

In addition, correlations between time 1 and time 2 social support scales were computed in order to measure test-retest reliability. This is a measure of how stable each factor was between the baseline data collection and the follow-up time period six years later. Each time 1 scale was significantly correlated with its time 2 counterpart, indicating stability of social support scores from baseline to follow-up. See Table 5 for test-retest reliability coefficients for social support.

Table 5
Test-Retest Reliability for Social Support Scales From Time 1 to Time 2

	Social Network 2	Emotional 2	Instrumental 2
Social Network 1	.349**	.091**	.064**
Emotional 1	.108**	.295**	.150**
Instrumental 1	.080**	.164**	.293**

** Correlation is significant at the 0.01 level (2-tailed).

Secondly, Table 6 shows correlations among the time 1 social support scales. They ranged from $r=.114$ to $r=.349$, representing low to moderate correlations.

Table 6
Correlations Among Social Support Scales at Time 1

	Social Network 1	Emotional 1	Instrumental 1
Social Network 1	1.0		
Emotional 1	.279**	1.0	
Instrumental 1	.114**	.349**	.10*

** Correlation is significant at the 0.01 level (2-tailed).

Tests of Hypotheses

Hypothesis 1.

In the first step, significant predictors included depressive symptoms score at time 1 $\beta=.44$, $F(5,1932)=367.93$, $p < .001$, female sex $\beta=.45$, $F(5,1932)=8.12$, $p < .01$, fewer years of education $\beta=-.075$, $F(5,1932)=15.31$, $p < .001$ and income $\beta=-.23$, $F(5,1932)=4.39$, $p = .04$. In the second step physical functioning $\beta=.25$, $F(9,1928)=9.68$,

$p \leq .002$ and negative life events $\beta = .27$, $F(9,1928) = 11.16$, $p < .01$ also predicted time 2 depressive symptoms. Cognitive functioning did not predict depressive symptoms. In the third step time 1 Marital status $\beta = -.567$, $F(11,1926) = 4.83$, $p = .03$ and time 2 marital status $\beta = -.555$, $F(11,1926) = 4.14$, $p = .042$ predicted subsequent depressive symptoms. Specifically, being married was associated with fewer depressive symptoms. In the fourth step each time 2 social support measure entered was related to depressive symptoms. Larger social networks at time 2 $\beta = -.17$, $F(14,1923) = 59.23$, $p < .001$ and more quality emotional support at time 2, $\beta = -.24$, $F(14,1923) = 59.26$, $p < .001$ was related to less depressive symptoms at time 2. Inconsistent with Lewinsohn's theory but consistent with this study's prediction, individuals who received more instrumental support were more depressed, $\beta = .06$, $F(14,1923) = 19.08$, $p < .001$. Thus, it appears that friends and family members offered concrete help to individuals who were functioning less well. On the fifth step each time 1 social support scale was entered. Only one was significant, instrumental support. Inconsistent with Lewinsohn's theory but consistent with the prediction, as quality of instrumental support increases, depression symptoms increased, $\beta = .03$, $F(17,1920) = 4.94$, $p = .026$. Therefore, it appears that individuals with more difficulty are receiving instrumental support from family and friends (see Table 7).

Table 7
Summary of Multiple Regression Analyses of Social Support Scales Predicting Time 2 Depressive Symptoms

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig
Step 1					
Depression Symptoms	.438	.023	367.93	5,1932	$p < .001$
Sex	.447	.157	8.121	5,1932	$p = .004$
Years of Education	-.075	.019	15.314	5,1932	$p < .001$
Age	.016	.014	1.46	5,1932	$p = .227$
Family Income	-0.228	.109	4.391	5,1932	$p = .036$
Step 2					
Depression Symptoms	.397	.024	275.056	9,1928	$p < .001$
Sex	.388	.157	6.115	9,1928	$p = .013$
Years of Education	-.080	.021	14.561	9,1928	$p < .001$
Age	.014	.014	1.101	9,1928	$p = .294$

Table 7-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig
Family Income	-.162	.109	2.214	9,1928	p=.137
Physical Function	.246	.079	9.681	9,1928	p=.002
Chronic Health Conditions	.171	.087	3.875	9,1928	p=.049
Negative Life Events	.267	.080	11.162	9,1928	p<.001
Cognitive Function time 1	-.064	.064	1.010	9,1928	p=.315
Step 3					
Depression Symptoms	.398	.024	275.173	11,1926	p<.001
Sex	.379	.175	4.693	11,1926	p=.030
Years of Education	-.080	.021	14.259	11,1926	p<.001
Age	.016	.014	1.268	11,1926	p=.260
Family Income	-.151	.109	1.906	11,1926	p=.168
Physical Function	.250	.079	9.967	11,1926	p=.002
Chronic Health Conditions	.180	.087	4.316	11,1926	p=.038
Negative Life Events	.268	.080	11.274	11,1926	p<.001
Cognitive Function time 1	-.063	.064	.958	11,1926	p=.328
Married time 1	-.567	.258	4.831	11,1926	p=.028
Married time 2	-.555	.273	4.138	11,1926	p=.042
Step 4					
Depression Symptoms	.352	.023	225.883	14,1923	p<.001
Sex	.463	.170	7.451	14,1923	p=.006
Years of Education	-.071	.020	11.936	14,1923	p<.001
Age	.010	.013	.549	14,1923	p=.459
Family Income	-.116	.106	1.202	14,1923	p=.273
Physical Function	.236	.076	9.549	14,1923	p=.002
Chronic Health Conditions	.156	.084	3.477	14,1923	p=.062
Negative Life Events	.246	.077	10.222	14,1923	p<.001
Cognitive Function Errors	-.084	.062	1.838	14,1923	p=.175
Married time 1	-.628	.249	6.373	14,1923	p=.012
Married time 2	-.513	.264	3.766	14,1923	p=.052
Quantity of Support time 2	-.167	.022	59.228	14,1923	p<.001
Quality of Instrumental Support time 2	.060	.014	19.077	14,1923	p<.001
Emotional time 2	-.239	.032	59.261	14,1923	p<.001
Step 5					
Depression Symptoms	.350	.024	217.764	17,1920	p<.001
Sex	.449	.170	6.987	17,1920	p=.008
Years of Education	-.068	.020	11.006	17,1920	p<.001
Age	.010	.013	.528	17,1920	p=.467
Family Income	-.111	.106	1.107	17,1920	p=.293
Physical Function	.229	.076	8.958	17,1920	p=.003
	.145	.084	2.993		
Negative Life Events	.232	.077	9.017	17,1920	p=.003
Cognitive Function Errors	-.085	.062	1.890	17,1920	p=.169

Table 7-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig
Married time 1	-.577	.250	5.355	17,1920	p=.021
Married time 2	-.514	.264	3.783	17,1920	p=.052
Quantity of Support time 2	-.176	.023	58.722	17,1920	p<.001
Quality of Instrumental Support time 2	.052	.014	13.680	17,1920	p<.001
Emotional time 2	-.244	.033	56.226	17,1920	p<.001
Quantity of Support time 1	.032	.024	1.811	17,1920	p=.179
Quality of Instrumental Support time 1	.030	.013	4.937	17,1920	p=.026
Emotional time 1	-.020	.033	.362	17,1920	p=.548
Step 6					
Depression Symptoms	.349	.024	215.525	23,1914	p<.001
Sex	.481	.172	7.856	23,1914	p=.005
Years of Education	-.068	.021	11.106	23,1914	p<.001
Age	.012	.014	.756	23,1914	p=.385
Family Income	-.106	.106	.995	23,1914	p=.319
Physical Function	.224	.077	8.545	23,1914	p=.004
Chronic Health Conditions	.149	.084	3.126	23,1914	p=.077
Negative Life Events	.233	.077	9.048	23,1914	p=.003
Cognitive Function Errors	-.082	.062	1.768	23,1914	p=.184
Married time 1	-.592	.250	5.601	23,1914	p=.018
Married time 2	-.523	.265	3.899	23,1914	p=.048
Quantity of Support time 2	-.177	.023	58.500	23,1914	p<.001
Quality of Instrumental Support time 2	.052	.014	13.347	23,1914	p<.001
Emotional time 2	-.244	.033	55.721	23,1914	p<.001
Quantity of Support time 1	.033	.025	1.662	23,1914	p=.187
Quality of Instrumental Support time 1	.032	.014	5.076	23,1914	p=.024
Emotional time 1	.060	.114	.272	23,1914	p=.602
Emotional & Age	-.100	.107	.880	23,1914	p=.348
Quality & Age	.011	.089	.015	23,1914	p=.904
Instrumental & Age	.032	.093	.122	23,1914	p=.727
Emotion x Sex	-.153	.169	.825	23,1914	p=.364
Instrumental x Sex	.082	.074	1.225	23,1914	p=.269
Social net x Sex	-.036	.071	.262	23,1914	p=.609

Hypothesis 1b. Age Moderates Depressive Symptoms

It was predicted that age would moderate the effect of social support on depressive symptoms. Specifically, it was predicted that low baseline scores on instrumental support scales would be more strongly associated with depressive symptoms as participants aged. To examine this prediction, the interaction term of each of the social support scales with age was entered on the last step of the analyses. However, there were no significant effects.

Hypothesis 1c. Sex Moderates Social Support

It was hypothesized that sex would moderate the effect of social support on depressive symptoms such that women would be more susceptible to the negative effects of poor social support than would be men. After including each of the main effects of the demographics, control variables and each of the social support scales, in the third step in addition to the interaction of the support scales and age, the interaction terms for sex and each of the social support scales were entered into the regression model, in order to determine whether sex moderated the outcome. As described in Table 7, none of the interaction terms were significant.

Hypothesis 2a. Depression Symptoms Predict Social Support

Three multiple regression analyses were conducted to determine if time 1 depressive symptoms (CES-D score) predicted scores on each of the social support indices six years after the initial interviews. Depression symptoms were expected to predict low levels of social support.

The social support measures at time 1 were control variables in three separate regression analyses. Time 1 depressive symptoms was the predictor variable in each model (See Tables 8, 9 and 10). In each of the analyses on step 1 age, income, sex, and years of education were entered into the analyses. On the second step health conditions, negative life events, and cognitive functioning were controlled while on the third step marital status at time 1 and time 2 was controlled. On step 4 time 1 social support measures were controlled, and, on the next step time 1 depression symptoms were controlled. On the last step the interaction terms were entered addressing hypotheses related to the interactions age and sex.

For each of the three multiple regression analyses depressive symptoms at time 1 did not predict time 2 instrumental support (Table 8), size of time 2 social network (Table 9), nor quality of emotional support at time 2 (Table 10), Therefore Coyne's, modified theory was not supported. The interaction of age and depressive symptoms did not predict any of the social support scales (*Hypothesis: 2b*).

Table 8
*Summary of Multiple Regression Analyses of Initial CES-D Scores
Predicting Instrumental Support at Time 2*

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Step 1					
Depressive					
Symptoms time 2	-.022	.038	.327	6,2045	p=.568
Sex	.733	.284	6.682	6,2045	p=.010
Years of Education	-.045	.036	1.594	6,2045	p=.207
Age	.061	.024	6.206	6,2045	p=.013
Family Income	-.601	.199	9.124	6,2045	p=.003
Race	.432	.278	2.414	6,2045	p=.120
Step 2					
Depressive					
Symptoms time 2	-.057	.039	2.164	10,2041	p=.141
Sex	.613	.285	4.614	10,2041	p=.032
Years of Education	-.029	.039	.579	10,2041	p=.447
Age	.053	.025	4.662	10,2041	p=.031
Family Income	-.486	.200	5.880	10,2041	p=.015
Race	.413	.281	2.154	10,2041	p=.142
Physical Function	.414	.143	8.437	10,2041	p=.004
Chronic Health					
Conditions	.282	.157	3.220	10,2041	p=.073
Negative Life Events	.208	.145	2.043	10,2041	p=.153
Cognitive Function	.053	.117	.209	10,2041	p=.647
Step 3					
Depressive					
Symptoms time 2	-.050	.039	-.030	12,2039	p=.197
Sex	1.339	.317	.107	12,2039	p<.001

Table 8-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Years of Education	-.045	.038	-.031	12,2039	p=.243
Age	.076	.025	.070	12,2039	p=.002
Family Income	-.537	.199	-.065	12,2039	p=.007
Race	.452	.280	.038	12,2039	p=.106
Physical Function	.423	.142	.070	12,2039	p=.003
Chronic Health					
Conditions	.269	.156	.038	12,2039	p=.085
Negative Life Events	.200	.144	.031	12,2039	p=.166
Cognitive Function	.072	.116	.015	12,2039	p=.536
Married time 1	.823	.464	.069	12,2039	p=.076
Married time 2	2.436	.491	.198	12,2039	p<.001
<hr/>					
Step 4					
Depressive					
Symptoms time 2	-.071	.037	3.715	13,2038	p=.167
Sex	.935	.303	9.513	13,2038	p=.002
Years of Education	-.022	.037	.349	13,2038	p=.555
Age	.068	.024	8.257	13,2038	p=.004
Family Income	-.501	.190	6.969	13,2038	p=.008
Race	.317	.267	1.411	13,2038	p=.235
Physical Function	.264	.135	3.809	13,2038	p=.051
Chronic Health					
Conditions	.151	.149	1.020	13,2038	p=.313
Negative Life Events	.026	.138	.034	13,2038	p=.853
Cognitive Function	.096	.110	.755	13,2038	p=.385
Married time 1	1.286	.444	8.392	13,2038	p=.004
Married time 2	2.271	.468	23.517	13,2038	p<.001
<hr/>					
Step 5					
Depressive					
Symptoms time 2	-.078	.039	3.869	14,2037	p=.049
Sex	.928	.303	9.348	14,2037	p=.002
Years of Education	-.021	.037	.320	14,2037	p=.572
Age	.069	.024	8.337	14,2037	p=.004
Family Income	-.492	.191	6.668	14,2037	p=.010
Race	.320	.267	1.441	14,2037	p=.230
Physical Function	.254	.137	3.437	14,2037	p=.064

Table 8-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Chronic Health					
Conditions	.147	.149	.972	14,2037	p=.324
Negative Life Events	.016	.140	.013	14,2037	p=.910
Cognitive Function	.094	.110	.720	14,2037	p=.396
Married time 1	1.277	.444	8.264	14,2037	p=.004
Married time 2	2.270	.468	23.487	14,2037	p<.001
Instrumental					
Support time 1	.312	.022	204.777	14,2037	p<.001
Depressive Symptoms time 1	.020	.044	.216	14,2037	p=.642
Step 6					
Depressive					
Symptoms time 2	-.077	.039	3.850	16,2035	p=.050
Sex	1.020	.310	10.801	16,2035	p<.001
Years of Education	-.022	.037	.347	16,2035	p=.556
Age	.067	.024	7.839	16,2035	p=.005
Family Income	-.495	.191	6.743	16,2035	p=.009
Race	.320	.267	1.441	16,2035	p=.230
Physical Function					
Chronic Health					
Conditions	.131	.150	.763	16,2035	p=.382
Negative Life Events	.022	.140	.025	16,2035	p=.873
Cognitive Function	.099	.111	.799	16,2035	p=.371
Married time 1	1.280	.444	8.305	16,2035	p=.004
Married time 2	2.271	.469	23.482	16,2035	p<.001
Instrumental					
Support	.312	.022	204.520	16,2035	p<.001
Depressive Symptoms					
time 1	-.211	.162	1.686	16,2035	p=.194
Sex X CESD	.424	.301	1.980	16,2035	p=.160
Age X CESD	-.182	.159	1.309	16,2035	p=.253

Table 9

Summary of Multiple Regression Analyses of Initial CES-D Scores Predicting Size of Social Network at Time 2

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Step 1					
Depressive Symptoms					
Time 2	-.237	.022	120.683	6,2015	p<.001
Sex	-.097	.160	.362	6,2015	p=.547
Years of Education	-.054	.020	7.085	6,2015	p=.008
Age	-.013	.014	.950	6,2015	p=.330
Family Income	-.261	.112	5.378	6,2015	p=.020
Race	-.156	.157	.989	6,2015	p=.320
Step 2					
Depressive Symptoms					
time 2	-.240	.022	117.383	10,2011	p<.001
Sex	-.116	.162	.511	10,2011	p=.475
Years of Education	-.054	.022	6.024	10,2011	p=.014
Age	-.015	.014	1.129	10,2011	p=.288
Family Income	-.251	.114	4.837	10,2011	p=.028
Race	-.150	.159	.890	10,2011	p=.345
Physical Function	.073	.081	.800	10,2011	p=.371
Chronic Health					
Conditions	-.006	.089	.005	10,2011	p=.945
Negative Life Events	.009	.082	.011	10,2011	p=.917
Cognitive Function	-.012	.066	.034	10,2011	p=.853
Step 3					
Depressive Symptoms					
time 2	-.240	.022	117.309	12,2009	p<.001
Sex	.067	.181	.138	12,2009	p=.711
Years of Education	-.057	.022	6.676	12,2009	p=.010
Age	-.008	.014	.316	12,2009	p=.574
Family Income	-.255	.114	5.007	12,2009	p=.025
Race	-.133	.159	.700	12,2009	p=.403
Physical Function	.077	.081	.904	12,2009	p=.342
Chronic Health					
Conditions	-.004	.089	.002	12,2009	p=.967
Negative Life Events	.010	.082	.014	12,2009	p=.904
Cognitive Function	-.005	.066	.006	12,2009	p=.938
Married time 1	-.331	.266	1.544	12,2009	p=.214

Table 9-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Married time 2	.097	.281	.119	12,2009	p=.730
<hr/>					
Step 4					
Depressive Symptoms					
time 2	-.212	.021	102.928	13,2008	p<.001
Sex	.122	.170	.513	13,2008	p=.474
Years of Education	-.050	.021	5.966	13,2008	p=.015
Age	-.010	.013	.610	13,2008	p=.435
Family Income	-.243	.107	5.152	13,2008	p=.023
Race	.034	.150	.052	13,2008	p=.820
Physical Function	.119	.076	2.424	13,2008	p=.120
Chronic Health					
Conditions	-.044	.084	.273	13,2008	p=.601
Negative Life Events	-.001	.077	.001	13,2008	p=.986
Cognitive Function	-.021	.062	.112	13,2008	p=.737
Married time 1	-.334	.250	1.782	13,2008	p=.182
Married time 2	-.067	.264	.063	13,2008	p=.801
Social Networks	.359	.022	264.997	13,2008	p<.001
<hr/>					
Step 5					
Depressive Symptoms					
time 2	-.216	.022	94.197	13,2007	p<.001
Sex	.117	.170	.473	13,2007	p=.492
Years of Education	-.050	.021	5.805	13,2007	p=.016
Age	-.010	.013	.585	13,2007	p=.444
Family Income	-.238	.108	4.878	13,2007	p=.027
Race	.036	.150	.059	13,2007	p=.809
Physical Function	.113	.077	2.123	13,2007	p=.145
Chronic Health					
Conditions	-.046	.084	.302	13,2007	p=.582
Negative Life Events	-.008	.078	.010	13,2007	p=.919
Cognitive Function	-.023	.062	.131	13,2007	p=.718
Married time 1	-.338	.250	1.826	13,2007	p=.177
Married time 2	-.067	.264	.065	13,2007	p=.799
Social Networks	.360	.022	263.914	13,2007	p<.001
Depressive Symptoms					
time 1	.013	.025	.272	13,2007	p=.602
<hr/>					
Step 6					
Depressive Symptoms					

Table 9-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
time 2	-.216	.022	93.981	16,2005	p<.001
Sex	.192	.174	1.218	16,2005	p=.207
Years of Education	-.050	.021	5.932	16,2005	p=.015
Age	-.011	.013	.632	16,2005	p=.427
Family Income	-.245	.108	5.155	16,2005	p=.023
Race	.036	.150	.056	16,2005	p=.813
Physical Function Chronic Health Conditions	.102	.077	1.734	16,2005	p=.188
Negative Life Events	-.051	.084	.367	16,2005	p=.545
Cognitive Function	.001	.078	.001	16,2005	p=.991
Married time 1	-.016	.062	.069	16,2005	p=.793
Married time 2	-.342	.250	1.870	16,2005	p=.172
Social Networks	-.081	.265	.093	16,2005	p=.761
Depressive Symptoms time 1	.359	.022	262.975	16,2005	p<.001
CESD X Sex	-.165	.092	3.197	16,2005	p=.074
CESD X Age	.343	.171	4.056	16,2005	p=.044
	-.023	.088	.071	16,2005	p=.790

Table 10

Summary of Multiple Regression Analyses of Initial CES-D Scores Predicting Emotional Support at Time 2

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Step 1					
Depressive symptoms time 2	-.170	.016	108.774	6,2063	p<.001
Sex	.523	.122	18.372	6,2063	p<.001
Years of Education	.059	.015	14.440	6,2063	p<.001
Age	-.008	.010	.590	6,2063	p=.443
Family Income	.055	.086	.418	6,2063	p=.518
Race	-.319	.120	7.108	6,2063	p=.008
Step 2					
Depressive symptoms time 2	-.172	.017	104.935	10,2059	p<.001
Sex	.525	.123	18.093	10,2059	p<.001

Table 10-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Years of Education	.050	.017	8.672	10,2059	p=.003
Age	-.008	.011	.545	10,2059	p=.460
Family Income	.061	.087	.490	10,2059	p=.484
Race	-.289	.122	5.653	10,2059	p=.018
Physical Function Chronic Health Conditions	.031	.061	.249	10,2059	p=.618
Negative Life Events	.034	.068	.259	10,2059	p=.611
Cognitive Function	-.008	.063	.016	10,2059	p=.898
	-.079	.051	2.375	10,2059	p=.123
Step 3					
Depressive symptoms time 2	-.170	.017	103.510	12,2057	p<.001
Sex	.785	.137	32.773	12,2057	p<.001
Years of Education	.045	.017	7.225	12,2057	p=.007
Age	.001	.011	.018	12,2057	p=.894
Family Income	.050	.086	.329	12,2057	p=.566
Race	-.268	.121	4.875	12,2057	p=.027
Physical Function Chronic Health Conditions	.036	.061	.342	12,2057	p=.559
Negative Life Events	.035	.067	.265	12,2057	p=.607
Cognitive Function	-.008	.062	.017	12,2057	p=.897
Married time 1	-.071	.051	1.951	12,2057	p=.163
Married time 2	-.117	.201	.337	12,2057	p=.562
	.481	.213	5.118	12,2057	p=.024
Step 4					
Depressive symptoms time 2	-.152	.016	86.804	13,2056	p<.001
Sex	.633	.133	22.536	13,2056	p<.001
Years of Education	.034	.016	4.296	13,2056	p=.038
Age	-.004	.010	.146	13,2056	p=.702
Family Income	-.004	.084	.002	13,2056	p=.964
Race	-.136	.118	1.328	13,2056	p=.249
Physical Function Chronic Health Conditions	.039	.059	.430	13,2056	p=.512
Negative Life Events	.005	.065	.006	13,2056	p=.940
Cognitive Function	-.028	.060	.220	13,2056	p=.639
Married time 1	-.053	.049	1.140	13,2056	p=.286
Married time 2	-.098	.195	.254	13,2056	p=.615
	.393	.206	3.645	13,2056	p=.056

Table 10-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Emotional Support	.271	.023	136.204	13,2056	p<.001
Step 5					
Depressive symptoms time 2	-.151	.017	75.425	14,2055	p<.001
Sex	.635	.134	22.532	14,2055	p<.001
Years of Education	.034	.016	4.263	14,2055	p=.039
Age	-.004	.010	.148	14,2055	p=.700
Family Income	-.005	.084	.004	14,2055	p=.952
Race	-.137	.118	1.341	14,2055	p=.247
Physical Function Chronic Health Conditions	.041	.060	.454	14,2055	p=.500
Negative Life Events	.005	.065	.007	14,2055	p=.934
Cognitive Function	-.027	.061	.189	14,2055	p=.664
Married time 1	-.052	.049	1.121	14,2055	p=.290
Married time 2	-.097	.195	.247	14,2055	p=.619
Emotional Support	.394	.206	3.649	14,2055	p=.056
Depressive symptoms time 1	.271	.023	133.649	14,2055	p<.001
	-.003	.020	.028	14,2055	p=.867
Step 6					
Depressive symptoms time 2	-.151	.017	75.528	16,2053	p<.001
Sex	.674	.137	24.143	16,2053	p<.001
Years of Education	.033	.016	4.197	16,2053	p=.041
Age	-.005	.010	.196	16,2053	p=.658
Family Income	-.006	.084	.005	16,2053	p=.944
Race	-.138	.118	1.363	16,2053	p=.243
Physical Function Chronic Health Conditions	.036	.060	.354	16,2053	p=.552
Negative Life Events	.001	.066	.001	16,2053	p=.995
Cognitive Function	-.023	.061	.140	16,2053	p=.708
Married time 1	-.049	.049	.993	16,2053	p=.319
Married time 2	-.096	.195	.244	16,2053	p=.622
Emotional Support	.392	.206	3.602	16,2053	p=.058
Depressive symptoms	.270	.023	132.425	16,2053	p<.001

Table 10-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
time 1	-.095	.072	1.745	16,2053	p=.187
Sex X CESD	-.052	.069	.571	16,2053	p=.450
Age X CESD	.172	.134	1.652	16,2053	p=.199

Hypothesis 2c. Sex moderates the influence of depressive scores.

Exploratory analyses were conducted to determine if female sex, was a moderator of the association between depressive symptoms and social support. Thus, the influence of sex as a moderator on the effect of time 1 CES-D score on later social support was also entered on the last step. None of the interactions were significant with one exception (see Table 9). After including each of the main effects of the demographics, control variables, and time 1 depressive symptoms, the interaction term of depression symptoms with sex predicted social support network size at time 2 $\beta=.34$, $F(16,2005)= 4.06$, $p= .044$. Further analyses were conducted to explore the direction of the interaction. Results indicated that as levels of depressive symptoms decreased quantity of friends increased, but this increase was greater for men than for women. Thus, while there was a significant effect, it was not in the direction that was expected.

Hypothesis 2d. Changes in Depression Associated with Changes in SS

Finally, whether a change in depressive symptoms from time 1 to time 2 would predict emotional social support, social network, and instrumental support was examined. Specifically it was thought that (1) a decrease in depressive symptoms would predict an increase in social support and (2) an increase in depression symptoms would be related to a decrease in social support. To conduct these analyses a difference score for depression symptoms between time 1 and time 2 was constructed. A difference score between social support levels at each time point was also constructed. The variables were constructed such that a positive score on any of the social support scales would indicate an increase in social support. A positive score on the depressive symptoms difference scale would indicate a decrease in depressive symptoms over time.

The same control variables as described above in the last set of regression analyses were included resulting in the following findings, described in Table 11. A change in depressive symptoms did not predict a change in instrumental support. However, a change in depressive symptoms did predict a change in emotional social support such that as depression symptoms decreased emotional support increased. Similarly, a change in depressive symptoms did predict a change in social network size such that as depression symptoms decreased social network support increased.

Hypothesis 3:

Most relevant to this hypothesis is the findings from the analyses performed for Hypothesis 1. Specifically, finding showed that inconsistent with Lewinsohn’s theory but consistent with the prediction, as quality of instrumental support increased, depression symptoms increased, $\beta=.03$, $F(17,1920)= 4.94$, $p= .026$. Therefore, it appears that individuals with more difficulty are receiving instrumental support from family and friends (see Table 7).

In addition, exploratory analyses were conducted to determine if increase in instrumental support were related to other indices of disability. Instrumental support was correlated with physical functioning $r(2106) = .134$, $p < .01$, problems in activities of daily living $r(2084)=.139$, $p < .01$ and chronic health problems $r(2104) = .084$, $p < .01$. However, it was not related to depression. In sum, instrumental support was correlated with several indices of dysfunction.

Table 11
Change in Depressive Symptoms Predicting Change in Instrumental Support

Variable	Unstandardized β	Standardized Error	F-value	DF	Sig.
Step 1					
Sex	.039	.326	.014	5,2046	p=.906
Years of Education	.028	.041	.469	5,2046	p=.493
Age	.060	.028	4.565	5,2046	p=.033
Family Income	-.236	.229	1.068	5,2046	p=.302
Race	.153	.322	.225	5,2046	p=.635

Table 11-continued:

Variable	Unstandardized β	Standardized Error	F Value	DF	Sig.
Step 2					
Sex	.101	.330	.330	9,2042	p=.760
Years of Education	.043	.045	.045	9,2042	p=.334
Age	.058	.029	.029	9,2042	p=.044
Family Income	-.345	.232	.232	9,2042	p=.137
Race	.057	.327	.327	9,2042	p=.861
Physical Functioning	-.125	.164	.164	9,2042	p=.445
Chronic Health Conditions	-.114	.182	.182	9,2042	p=.530
Negative Life Events	-.412	.167	.167	9,2042	p=.014
Cognitive Functioning	.159	.135	.135	9,2042	p=.240
Step 3					
Sex	-.031	.368	.007	11,2040	p=.932
Years of Education	.041	.045	.841	11,2040	p=.359
Age	.049	.029	2.841	11,2040	p=.094
Family Income	-.377	.231	2.653	11,2040	p=.104
Race	.017	.326	.003	11,2040	p=.957
Physical Functioning	-.142	.164	.750	11,2040	p=.386
Chronic Health Conditions	-.142	.181	.614	11,2040	p=.434
Negative Life Events	-.423	-.058	6.489	11,2040	p=.011
Cognitive Functioning	.149	.028	1.218	11,2040	p=.270
Married time 1	2.355	.173	18.977	11,2040	p<.001
Married time 2	1.968	.139	11.852	11,2040	p<.001
Step 4					
Sex	-.027	.368	.005	12,2039	p=.941
Years of Education	.040	.045	.798	12,2039	p=.372
Age	.050	.029	2.994	12,2039	p=.084
Family Income	-.368	.231	2.535	12,2039	p=.111
Race	.026	.326	.007	12,2039	p=.936
Physical Functioning	-.151	.164	.851	12,2039	p=.356
Chronic Health Conditions	-.142	.181	.610	12,2039	p=.435
Negative Life Events	-.429	.166	6.668	12,2039	p=.010
Cognitive Functioning	.143	.135	1.131	12,2039	p=.288
Married time 1	2.320	.541	18.359	12,2039	p<.001
Married time 2	1.946	.572	11.581	12,2039	p<.001
Depression Difference	.053	.042	1.591	12,2039	p=.207

Table 12
Change in Depressive Symptoms Predicting Change in Instrumental Support

Variable	Unstandardized β	Standardized Error	F- value	DF	Sig.
Step 1					
Sex	.052	.143	.129	5,2064	p=.719
Years of Education	.017	.018	.917	5,2064	p=.338
Age	-.022	.012	3.232	5,2064	p=.072
Family Income	-.062	.100	.378	5,2064	p=.539
Race	.226	.141	2.555	5,2064	p=.110
Step 2					
Sex	.068	.145	.219	9,2060	p=.640
Years of Education	.016	.020	.632	9,2060	p=.427
Age	-.023	.012	3.535	9,2060	p=.060
Family Income	-.099	.102	.946	9,2060	p=.331
Race	.217	.143	2.297	9,2060	p=.130
Physical Functioning Chronic Health Conditions	-.002	.072	.001	9,2060	p=.974
Negative Life Events	-.097	.080	1.482	9,2060	p=.224
Cognitive Functioning	-.138	.073	3.569	9,2060	p=.059
	-.004	.060	.004	9,2060	p=.950
Step 3					
Sex	.165	.162	1.033	11,2058	p=.428
Years of Education	.014	.020	.495	11,2058	p=.310
Age	-.020	.013	2.485	11,2058	p=.115
Family Income	-.104	.102	1.043	11,2058	p=.307
Race	.225	.144	2.449	11,2058	p=.118
Physical Functioning Chronic Health Conditions	.001	.072	.001	11,2058	p=.996
Negative Life Events	-.097	.080	1.494	11,2058	p=.222
Cognitive Functioning	-.138	.073	3.561	11,2058	p=.059
Married time 1	-.001	.060	.001	11,2058	p=.986
Married time 2	.003	.239	.001	11,2058	p=.991
	.223	.252	.786	11,2058	p=.375
Step 4					
Sex	.170	.161	1.111	12,2057	p=.292
Years of Education	.010	.020	.268	12,2057	p=.605
Age	-.018	.013	1.956	12,2057	p=.162

Table 12-continued:

Variable	Unstandardized β	Standardized Error	F- value	DF	Sig.
Family Income	-.092	.101	.820	12,2057	p=.365
Race	.237	.143	2.752	12,2057	p=.097
Physical Functioning Chronic Health Conditions	-.019	.072	.073	12,2057	p=.788
Negative Life Events	-.096	.079	1.473	12,2057	p=.225
Cognitive Functioning	-.152	.073	4.385	12,2057	p=.036
Married time 1	-.015	.060	.062	12,2057	p=.803
Married time 2	-.069	.237	.085	12,2057	p=.771
Depression Difference	.173	.250	.479	12,2057	p=.489
	.103	.018	31.647	12,2057	p=.001

Table 13

Change in Depressive Symptoms Predicting Change in Social Network Size

Variable	Unstandardized β	Standardized Error	F- value	DF	Sig.
Step 1					
Sex	.148	.180	.670	5,2016	p=.413
Years of Education	-.018	.023	.648	5,2016	p=.421
Age	-.014	.016	.794	5,2016	p=.373
Family Income	-.140	.126	1.230	5,2016	p=.268
Race	.327	.177	3.407	5,2016	p=.065
Step 2					
Sex	.133	.183	.528	9,2012	p=.467
Years of Education	-.023	.025	.840	9,2012	p=.360
Age	-.017	.016	1.220	9,2012	p=.270
Family Income	-.163	.128	1.606	9,2012	p=.205
Race	.342	.180	3.587	9,2012	p=.058
Physical Functioning Chronic Health Conditions	.117	.091	1.639	9,2012	p=.201
Negative Life Events	-.160	.101	2.541	9,2012	p=.111
Cognitive Functioning	-.115	.092	1.565	9,2012	p=.211
	-.049	.075	.433	9,2012	p=.510

Table 13-continued:

Variable	Unstandardized β	Standardized Error	F- value	DF	Sig.
Step 3					
Sex	.128	.204	.391	11,2010	p=.532
Years of Education	-.022	.025	.803	11,2010	p=.370
Age	-.017	.016	1.115	11,2010	p=.291
Family Income	-.157	.129	1.489	11,2010	p=.223
Race	.345	.181	3.650	11,2010	p=.056
Physical Functioning Chronic Health Conditions	.118	.091	1.685	11,2010	p=.194
Negative Life Events	-.156	.101	2.400	11,2010	p=.121
Cognitive Functioning	-.114	.092	1.536	11,2010	p=.215
Married time 1	-.048	.075	.415	11,2010	p=.520
Married time 2	-.261	.301	.752	11,2010	p=.386
	-.261	.318	.677	11,2010	p=.411
Step 4					
Sex	.130	.202	.415	12,2009	p=.519
Years of Education	-.026	.024	1.146	12,2009	p=.285
Age	-.013	.016	.687	12,2009	p=.407
Family Income	-.137	.127	1.157	12,2009	p=.285
Race	.356	.179	3.973	12,2009	p=.046
Physical Functioning Chronic Health Conditions	.093	.090	1.068	12,2009	p=.302
Negative Life Events	-.156	.100	2.447	12,2009	p=.118
Cognitive Functioning	-.131	.091	2.057	12,2009	p=.152
Married time 1	-.067	.074	.809	12,2009	p=.369
Married time 2	-.359	.299	1.443	12,2009	p=.230
Depression Difference	-.324	.315	1.057	12,2009	p=.304
	.146	.023	40.675	12,2009	p<.001

DISCUSSION

There has long been an established association between social support indicators and depressive symptoms (Brown & Harris, 1978); however the direction of the association has not been altogether clear (Barnet & Gotlib 1988; Nezelek, Imbrie & Shean, 1994). Studies have been limited in making causal conclusions due to the complexities of the methodological designs required to adequately address such causal issues. The present study sought to extend the previous literature by examining two basic hypotheses: do levels of social support predict later depressive symptoms, or conversely, do depressive symptoms predict subsequent declines in social support?

Social Support Factor Analysis

Social support is a complex construct that has been measured and operationalized in strikingly heterogeneous ways. The first task in the present study, therefore, was to factor analyze different aspects of social support based on an array of items included in the Duke EPESE survey. Rather than relying on the face validity of the items in the EPESE data to create the social support scales, items were included in a factor analysis. Three distinctive measures of social support were identified:

The *Quality Instrumental Support* scale reflects tangible support provided by friends and family members including assistance with transportation and fixing things around the home, as well as whether friends and family members listen to problems and give advice.

The *Social Network* scale measures number of close relatives and friends available for support and number of relatives and friends seen in one month.

The *Quality of Emotional support* assesses the quality of intimacy within the context of the relationship.

The current study was careful to describe the types of social support investigated and items depicting social support. This care was taken in light of inconsistencies across studies examining the association between social support and depression (Prince, Harwood, Thomas, & Mann, 1998; Schoevers et al., 2000). Such inconsistencies found across studies may reflect different measures of social support used among the studies.

An important aspect related to such inconsistencies is how social support was measured. One likely explanation for inconsistent findings could be related to the

complex nature of the construct of social support especially among older adults. Assessing social support among older adults may be even more complex. Specifically, social environments for older adults may be more vulnerable to changes in family situations, friends and relatives relocating or dying, growing limitations in the ability to socialize due to physical difficulties and problems with transportation, as well as other social changes related to aging (Bruce, 2002).

As indicated above, there has been no clear consensus on how social support is defined or measured. Different aspects of social relationships could be being tapped by each successive study, ranging from social isolation as a function of external stressors to specific characteristics of one's own social functioning (Bruce, 2002). In this study, social support scale items were derived via factor analysis to tap aspects of quantity of social support, instrumental support, as well as feelings of intimacy. In contrast recent studies related to well-being and social support have looked at social support dimensions including satisfaction with support providers, social isolation, affectionate support, positive social interactions, attachment, social integration, and reassurance of worth (Kafetsios & Sideridis, 2006; Westaway Seager, Rheeder & Van Zyl 2005; Kahn, Hessling, & Russell, 2003). Approaches to measuring social support often vary from one study to another with only general overlap in terms of the overall concept of social support.

Hypothesis 1a: Test of Lewinsohn's Theory

In the first set of analyses, it was predicted that lower levels of support would predict subsequent depressive symptoms among older adults. Inconsistent with the modified Lewinsohn's theory, findings suggest that social networks and emotional support was unrelated to depressive symptoms. Interestingly, results showed that as a specific type of social support (i.e., quality of instrumental support) increased, depressive symptoms increased. That is, people who were depressed in time 2 (six years after baseline) were receiving more instrumental support from family and friends such as money, transportation meals and advice. This is seemingly contradictory to Lewinsohn's theory. Nevertheless, it appears that individuals with poorer functioning are receiving instrumental support from family and friends. Instrumental support was indicative of lower functioning across several domains. Specifically, instrumental support also related

to poor physical functioning, problems in activities in daily living and chronic health problems. These findings are consistent with the function of instrumental support in individual's lives. Despite individuals' interpersonal styles, family members and close friends may feel an obligation to provide such support.

Surprisingly, in the initial examination of the modified Lewinsohn's theory, results did not demonstrate that social network (number of friends and relatives) is an important index in predicting later depressive symptoms. Fewer friends and relatives did not predict higher depressive scores at follow-up. One factor that this study's social scales did not capture was whether the support was from friends or family. However, it may be the case that social support from different sources may buffer against depressive symptoms. Indeed, there is evidence that relatives and non-relatives serve different social support functions in individual's lives (Crohan & Antonucci, 1989). For example, among adolescents, low perceived parental support predicted subsequent increases in depressive symptoms, while low perceived peer support did not (Stice, Ragan, & Randall, 2004). Among older adults the source of support may matter, although it was not studied directly in the current design. Felton and Berry (1992) found that reassurance of worth provided by friends was more beneficial and strongly related to well-being among older adults than when provided by relatives. In explaining their results, Felton and Berry (1992) commented that friends of older adults were more often the providers of social integration (social activities) than relatives. Similarly, Jerrome (1991) demonstrated that contact with friends (but not relatives) reduces loneliness and increases feelings of usefulness among elderly individuals. Nonetheless, in the current study, factor analyses of the social support measures did not support a separate measure for friend support and for family support. This is clearly an area worth further investigation in the context of other measures of social support.

Hypothesis 1b: Interaction with Age

The influence of increasing age on social support as a predictor of later depressive symptoms was also examined. Based on the literature review, it was thought that, as one ages it would seem that tangible assistance (e.g., instrumental) from family members and close friends may become particularly important for helping in obtaining basic needs (food, housing, transportation, etc.). Thus, it was predicted that age would act as a

moderator between instrumental social support and later depressive symptoms. It was reasoned that as individuals age and experienced more difficulties with physical functioning, instrumental support would become increasingly important for completing activities of daily living and, therefore, predictive of later depression symptoms. However, this was not the case. Age did not interact with any of the other social support measures in predicting depressive symptoms.

Nonetheless, it is known that as individuals age, physical functioning problems and cognitive problems increase (Colenda & Dougherty, 1990; Gurland, Wilder, & Berkman, 1988; Koster et al., 2006). In turn, some older adults may be in greater need of instrumental support than their younger cohorts. Nonetheless, this study's findings did not support age as a moderator the influence of the instrumental support scales on later depressive symptoms. This finding is not entirely without precedent, as Hann and colleagues (2002) also found no age effect in the relationship of social support to depressive symptoms, in a sample of cancer patients.

Hypothesis 1c: Interaction with Sex

With regard to sex differences and social support, there is a body of literature suggesting that women are more sensitive than men to the depressogenic effects of low-social support (Kendler et al., 2005; Kessler et al., 1993; Koizumi et al., 2005; Schraedley et al., 1999; Stewart et al., 1989). Indeed, in this study it was predicted that sex moderated the association between social support and depressive symptoms such that the protective effects of social support were greater for women than men. However, the findings did not support this hypothesis. There was no effect of sex. Women are often thought to value social relations more than men and, indeed, have been found in some studies to have more extensive social support networks, to be more satisfied with friendships than men, and to give and receive more social support (Antonucci 1994; Field & Minkler, 1988). A recent study found that among women with high levels of depressive symptoms, religious involvement, a unique form of social support, was most protective against cognitive decline, suggesting that social support may offer unique functions for women compared to men (Corsentino, Collins, Sachs-Ericsson, & Blazer, 2009).

Past research has also found that women are more susceptible to the effects of low social support, and poorer quality of social support in particular than are men (Kendler et al., 2005; Koizumi et al., 2005; Stewart et al., 1989), so it of interest to note that there were no sex differences among these older individuals. Perhaps over the course of the lifetime, social support becomes equally important to men and women. Indeed, in one study of older adults and the effects of social support by and large found no sex-related differences (Cheng & Chan, 2006).

Hypothesis 2a: Test of Coyne's Theory

The second hypothesis, that decreased depressive symptoms would predict subsequent increased support (i.e., modified Coyne's theory) was also examined. Coyne's interpersonal theory of depression (1976), proposed that depressed individuals interact with others in a manner that is aversive and lacking in social skills (Coyne, 1976), which serves to reduce social support. The extent to which depressive symptoms measured at time 1 predicted these measures of social support assessed at time 2 was examined. There were no significant effects. Coyne's modified theory was not supported in these current analyses.

Baseline (time 1) depressive symptoms did not predict social support assessed six years later (time 2). Other measures of social support constructs might have shown an effect. Perhaps a shorter time period would be needed to see the effect. That is, depressive symptoms may have a more immediate effect on social support.

Hypothesis 2b: Interaction with Age

Because disability increases with age (Aijanseppa et al., 2005; Sachs-Ericsson, Schatschneider, & Blazer, 2006) the need for support, in particular instrumental support, it was though that it would be to be more important as the individual ages. Therefore, for this study it was predicted that depressive symptoms would be more influential on levels of social support for older individuals. However this was not the case. In contrast, findings from this study suggest that those individuals who were most depressed and therefore perhaps more dysfunctional received more instrumental support.

Hypothesis 2c: Interaction with Sex

An interaction between sex and depression symptoms was found to predict size of social network. For both men and women, decreased depressive symptoms were related

to an increase in social network, but this increase was greater for men than women. It may be the case that bigger social support networks provide men with a better buffer against depression symptoms, whereas for women the quantity is not as important. A possible reason for this finding is supplied by finding in a study of depressive symptoms in widowed older adults (aged 55-88). Van Grootheest, Beekman, Broese van Groenou and Deeg (1999) found that widowhood was associated with depression for men and women; however, the association was stronger for men. This suggests that women may more successfully adapt to a loss in their social network than men. In other words, for men a decrease in social network size (in particular loss of a spouse) may be especially important for men and the development of subsequent depressive symptoms.

The findings in this study are inconsistent in part with research showing that depression negatively influences the quality of the individual's relationship (Coyne, 1987; (Gurtman, 1986; Hokanson, Rubert, Welker, Hollander, & Hedeem, 1989). While it was surprising that level of depressive symptoms was not predictive of the quality of social support, it may be the case that individuals with impaired interpersonal skills lack the awareness of the quality (and quantity) of their social support. They may over-estimate their support. Future research should assess family member's and friend's experiences of the quality of relationships among older adults to better understand the mechanism underlying the association between social support and depression.

Hypothesis 2d: Change Score Test of Coyne's Theory

However, one finding did support Coyne's modified theory. In the last set of regression analyses, results showed that a direct change in depressive symptoms over time did predict a direct change in emotional social support such that as depressive symptoms decreased emotional support increased. In addition, results show that as depression symptoms decreased social network support increased. Thus, these results were consistent with the modified Coyne's theory that suggests that depressed individuals have aversive styles of functioning and therefore are more likely to lower both the quality and quantity of social support.

Hypothesis 3: Instrumental Support

A consideration in this study was whether instrumental support would be given to those most in need. Therefore, it was proposed that higher levels of instrumental support

would be given to individuals who are having the most difficulties, including depression, physical disability and other indicators of distress. Within the context of the other proposed analyses, whether an increase in instrumental support (a marker possible dysfunction) would predict increase in depressive symptoms was also examined. Also, some simple correlational analyses were conducted to examine if an instrumental support was a possible marker of general dysfunction such that it was correlated with other indices of distress.

Inconsistent with Lewinsohn's theory but consistent with this study's prediction, individuals who received more quality of instrumental support were more depressed (instrumental support was correlated with several indices of dysfunction). It appears that friends and family members offered concrete help to individuals who were functioning less well. In addition, Instrumental support was correlated with physical functioning, problems in activities of daily living and chronic health.

In sum, in the current study the main hypotheses were not supported for the most part. The present study examined two basic questions: do levels of social support predict later depressive symptoms (modified Lewinsohn's theory), or conversely, do depressive symptoms predict subsequent declines in social support (modified Coyne's theory)? Neither of these theories was fully supported. However, as expected, increased instrumental support was found to be predictive of subsequent depressive symptoms, but depression did not predict subsequent instrumental support (or any other social support scale). However, results did not suggest that as depression decreased over time levels of emotional support and social support networks increased. This finding lends some support to the modified Coyne's theory.

Discussion of Results for Control Variables

It is of interest to note that, in this study, marital status was related to lower levels of depression, even when other sources of social support were included in the analyses. Marriage clearly affords a specific source of support that cannot easily be replicated by other sources of social support. Indeed, marriage is also associated with better health and better health is associated with less depression. For example, a study of biological markers and health showed positive effects of marriage among men for biological markers for health. Data from the National Social Life, Health, and Aging Project

(NSHAP), a population-based study of community-dwelling older adults in the United States, were used to study C-reactive protein (CRP) levels (CRP) elevations in married and non-married men. Across the entire NSHAP sample, married men demonstrated the lowest levels of CRP. Even after adjusting for the competing predictors, marriage remained a unique protective factor against elevated CRP for men (odds ratio = 0.56, 95% Confidence Interval = 0.39–0.79). Remaining married in late adulthood affords men unique and robust protection against elevated levels of CRP (Sbarra, 2009).

Despite this finding, it does not appear that marriage by itself ensures that individuals are not social isolated or lonely. One study showed between 1 in 4 and 5 older adults who were married exhibited moderate or strong emotional or social loneliness. Interestingly, the effect was greater in women than in men. In addition, as would be expected, smaller social networks and less contact with children also increased emotional and social loneliness in later life (de Jong Gierveld, Broese van Groenou, Hoogendoorn, & Smit, 2009).

Marriage is also related to health, as illustrated by a study which found that the occurrence of negative spousal behaviors was consistently associated with poorer physical health. The negativity effect observed regarding the costs and benefits of social support in general also applies to the context of marriage in that negative spousal behaviors outweigh positive spousal behaviors in contributing to older adults' physical health (Bookwala, 2005).

In this study, cognitive functioning at time 1 did not predict time 2 depressive symptoms or time 2 social support measures. However, it is important to consider the role of social support among cognitively impaired depressed elderly. The prevalence of diagnosable depression among community dwelling dementia sufferers ranges from 5% to 38% (see Ballard, Bannister, & Oyebode, 1996). Individuals with dementia are more likely to experience depression, presumably because they experience multiple stressors and losses including cognitive deterioration, impaired adaptability, and impaired ability to process emotional responses (Gilhooly, Sweeting, Whittick, & McKee, 1994; Waite, Bebbington, Skelton-Robinson, and Orrell, 2004).

The study of social support among individuals with dementia has been limited, in particular regarding perceived quality of social support from the participants' perspective

(Waite et al., 2004). One study found that perceived emotional isolation was associated with more than double the risk for Alzheimer's disease, that more frequent social activity was associated with reduced AD risk, and that social network size was not related to risk (Wilson, et al., 2007). Waite and colleagues (2004) speculated that social support research has further been complicated because cognitive impairment makes it difficult to establish and maintain reciprocal relationships and creates difficulties with utilization of social resources. In light of this complication of studying social support among cognitively impaired older adults, an interesting area for future investigation involves examining how measures of perceived social support are affected by cognitive impairment.

Despite the difficulty of studying the relationship between social support and well-being among cognitively impaired older adults, at least two comparative studies of cognitively impaired older individuals with in-patient treatment used a control group design to examine whether increased social support would have a positive effect on the well-being. Interventions included volunteer visitors for dementia patients. In both studies, a positive association was found between increased social support by volunteer assistants and well-being. The investigations concluded that social support and attention are generally registered and perceived as creating a pleasant feelings in cognitively impaired people (Oppikofer, Albrecht, & Martin, 2009).

While the data to examine young adults versus older adults was not available in the current data set, theoretically the literature suggests some potential differences in size of social networks regardless of depression status. In considering differences between young and older adults in relation to social networks, the socioemotional selectivity theory (Carstensen, Isaacowitz, Charles 1999) would posit that older people would be very selective about whom they would include in their social network, and their networks would be smaller than younger adults. In contrast, younger adults would be much more future oriented and take a lot of time to develop a large social network. Thus, younger adults would have larger social networks than older adults.

Socioemotional selectivity theory posits that the perception of time plays a fundamental role in the selection and pursuit of social goals. The profound association between time left in life and one's chronological age results in age-related consequences

to social goals (Carstensen, Isaacowitz, Charles 1999). Older adults focus on the present whereas younger adults focus on the future. When time is limited, present orientation is likely to involve goals related to feeling states, deriving emotional meaning, and experiencing emotional satisfaction. In this theory they postulate that relieved of concerns about the future, attention shifts to experiences occurring in the moment. When emotion regulation is the primary goal, the older adults are highly careful in their selection of social partners, preferring social partners who are familiar to them, because with these social partners emotions are predictable and often quite positive.

In contrast the socioemotional selectivity theory (Carstensen, Isaacowitz, Charles 1999) would posit that young adults have more future oriented social goals. Carstensen and colleagues (Carstensen, Isaacowitz, Charles 1999) give the example of a new college student investing much time and energy in developing new friends. In contrast to the present oriented emotional goals of the older adult, the younger adult will adaptively prioritize their goals when the future is seen as expansive. This will be the case when knowledge related goals entail the delay of emotional rewards and emotional costs. As stated above, on average, it was expected that younger adults would have a larger social network than older adults. This being the case, one might speculate that among depressed older adults (who already have a smaller social network) compared to younger adults a decrease in social support would have a greater effect.

Implications

The above findings have implications for the treatment of depressed individuals. Decreasing depressive symptoms and increasing social skills may contribute to larger social networks, more emotional intimacy and general overall well-being. Fortunately, the identification of the importance of instrumental support as a factor related to depression suggests possible avenues for addressing the needs of older adults. It seems likely that interventions geared toward maintaining contact with friends or family members could increase the support received by individuals who are depressed. For example, in an intervention designed to improve friendships, older women reported improvements in the quality of their friendships and improvements in subjective well-being, including experiencing more pleasure and less distress than before participating in the program (Martina & Stevens, 2006).

However, interventions designed to improve social support among the elderly have not always been successful, as was the case in one study involving elderly women with low perceived social support who were provided 10 weeks of friendly staff telephonic contact. The women in the intervention condition showed no significant differences on measures of depression, moral or perceived social support when compared with the individuals who received no support (Heller, Thompson, Trueba, Hogg, & et al., 1991). Another intervention designed to provide older adults with the opportunity to form ties with same age-peers (receive support) while nurturing another person (giving social support) was implemented to determine gains of psychological well-being (Rook & Sorkin, 2003). Although participation in this volunteer Foster Grandparents program did foster more contact with peers, no significant gains in emotional well-being (e.g., depression, loneliness, self-esteem) were reported.

After an extensive review of the literature regarding interventions designed to decrease social isolation and improve aspects of health, Findlay (2003) concluded there is a dearth of evidence that such interventions improve social support and well-being among older adults. This argues for the need for more studies examining whether social support interventions are most effect and the active variable for change (i.e., type of social support which should be targeted). As such, Findlay provided several guidelines for development of future programs, including: careful selection, training, and support of program facilitators; involving the older individuals in the planning, implementation, and evaluation of the interventions; and, utilizing existing community resources (activities that are readily available in the elder's environments).

Aside from the few studies described above, there is a tremendous need for more research to identify specific social interventions that may prevent depression among elders (Blazer, 2005). Research has not yet definitively shown the types of social interventions, the quantity, or the nature of the activities, which could serve as protective factors against depression. Thorough examination of such information, not only may contribute to preventing depressive symptoms, but also depression among older adults may be effectively treated through means other than or adjunct to medications and psychotherapy.

The results of this study can inform investigators of the importance of social support, and, in particular, instrumental support. For example, it may be beneficial to foster environments that encourage older adults to maintain interactions with friends and relatives, as opposed to focusing on providing activities. However, this study raises questions regarding caregiver burden. That is, there are a number of participants who were depressed and functioning poorly, who required and received instrument support. This places a burden on family and friends. Indeed, studies have found that family members of depressed older adults experience the moderate to high levels of general caregiver burden that dementia caregivers often report (e.g., Hinrichsen, 1991; Scazufca, Menezes, & Almeida, 2002; Sewitch, McCusker, Dendukuri, & Yaffe, 2004). It will be important for healthcare workers to be sensitive to the needs of the caregivers, identifying sources of additional support for the depressed individuals, and to help caregivers to problem solve and make resources available to lessen caregiver burden.

Despite the potential problems associated with caring for depressed individuals, the importance of social support is highlighted by Martire and colleagues' (2008) findings that close family members such as spouses and adult sons or daughters are critical influences in the process of recovering from later life depression. Therefore, it seems reasonable that providers treating depressed older adults take a family systems approach by enlisting in the support of family members as well as providing members with educational resources to assist with maintaining their own well-being.

Depression among the elderly is a significant problem not only because of the emotional suffering involved, but also due to other health and living problems associated with depressive symptoms. For example, depressive symptoms among the elderly have been shown to be a risk factor for self-neglect (Abrams et al., 2002). When the influence of social support among depressed older adults is ignored, the consequences are serious and harmful. VanDerHorst and McLaren (2005) found that decreased social support among elders with symptoms of depression was associated with suicidal ideation. As discussed above, depression symptoms have also been linked with a three-fold increase in hospitalizations for elderly men (Huang, 2003)

Limitations/Future Research

A few caveats concerning this study should be noted. The design of the EPESE project did not involve diagnostic information associated with Major Depression, (or any other psychiatric disorder). Because prevalence rates of depressive symptomatology (measured in this study) are much higher than the rates of diagnosable depressive disorders, it is possible that the results may differ if analyses were to have focused on clinical depression. Depressive symptoms were measured using the CES-D; therefore, conclusions cannot be drawn about the link between social support dimensions and clinical depression. The CES-D is commonly used highly validated instrument used to assess depressive risk factors, depressive symptoms or syndromes, (Blazer, 2002). It would be prudent to follow-up this project with longitudinal projects involving older adults with clinically measured depressive disorders in order to examine whether social support levels are predictive of subsequent clinical depression.

The current study examined self-reported perceived quantity and quality social support variables. Some have argued that using self-reported, perceived social support measures can be problematic because they are subject to individual differences in perceptual, judgment, and memory processes, which may result in differing interpretations of supportive events (Lakey & Drew, 1997; Sarason, Sarason & Pierce, 1995). In addition, at least one study has shown the effect of induced mood on self-reported perceived social support. Specifically, depressed mood was shown to have a significant effect on perceived social support, with participants having an induced depressed mood reporting the lowest perceived social support scores. (Cohen, Towbes, & Flocco, 1988).

Nonetheless, *perceived* social support can only be measured by self-report as outsiders are not privy to these perceptions. However, despite its subjectivity studies have shown perceived quality of social support is more strongly related to psychological health than to the actual structure of social network (Billings & Moos, 1984, George, Blazer, Hughes, & Fowler, 1989; Krause, Liang, & Yatomi, 1989; Steffens, Hays, George, Krishnan & Blazer 1996). Further, perceived instrumental support (e.g., received support) may have more impact on adjustment and having needs met than actual observed instrumental social support (Helgeson, 1993). For these reasons, self-reported perceived social support is a meaningful way to examine the relationship between social

support, as experienced by the participant, and depressive symptoms in the context of the current study.

Another caveat is that the sample of older adults was obtained from a biracial sample of elderly living in North Carolina. It is not clear if the results would generalize to all older adults. Moreover, the current study did not examine whether or not support for the studies hypotheses would differ by race. Some evidence suggests that there may be racial difference in the quality of social support such that African Americans have better quality of social support than Whites. African American cultures often derived from collectivistic cultures that place more emphasis on the group and thus have stronger social ties. In contrast, Caucasian cultures which are derived from European culture places more importance on the individual. Indeed studies have found that African American race may be associated with higher social support, including the Plant and Sachs-Ericsson (2004) study which found that minorities (including African Americans and Hispanics) to have better quality of social support than whites. Thus, race is an important variable to consider in examining the association between social support and subsequent depressive symptom.

Studies results may be limited by how social support was defined. Other aspects of social support not measured in the current study may have shown greater support for the proposed hypotheses. For example, religious attendance has been thought to be related to increased social support. Indeed in a study based on the current data, religious activity was correlated with both social support and good physical health but was unrelated to depression (Koenig et al., 1997).

The differential outcomes among the social support scales (i.e., only instrumental support indices predict later depression) point to the need for further analysis to determine exactly what aspects of social support are most related to and influenced by depressive symptoms. This should also provide useful information for developing intervention programs for older adults designed to bolster social support (in particular instrumental support) among depressed individuals.

There are additional reasons for variability in findings. Social support does not always provide positive benefits on overall well-being. In particular, the measures of social support fail to assess the degree of interpersonal conflict among family members as

well as friends. Such conflict has been shown to be an important risk factor for relapse in mood disorders. Specifically, the construct of expressed emotion (EE), is a measure of the emotional attitudes of key relatives towards bipolar, depressed, and schizophrenic individuals (Miklowitz et al 1986; Hooley & Miklowitz, 1995; Simoneau, Miklowitz & Saleem, 1998). High levels of EE indicated by criticism, hostility, or emotional over involvement by relatives, is strongly associated with relapse among individuals with mood disorders (Hooley & Miklowitz 1995; Kim & Miklowitz, 2004).

Further conflicted family interactions have adverse consequences such as feelings of loss of control, loss of autonomy, and loss of self-reliance (Henderson, Byrne, & Duncan-Jones, 1981). These previous findings suggest that, if older adults' relationships with friends and/or family members are characterized by frequent disagreements, the individuals may benefit by limiting such social contacts rather than continued interactions. Moreover there have been a number of studies showing that negative family interactions influence depression (e.g., Hooley 1986, Hooley & Teasdale, 1989; Miklowitz, Goldstein, Nuechterlein, Snyder, & Mintz, 1988), which suggests that there may be nuances of social support interactions that were not measured or captured by the this study. The differential influence of different indices of social support on the influence of depressive symptoms is an important avenue for future studies.

Moreover, the EPESE data were collected almost 20 years ago, therefore there is no certainty that the results of this study would be comparable with younger cohorts. Further, the possibility that the effects of social support on depression and vice versa is mediated by a third factor, perhaps stress and expressed emotion, cannot be ruled-out.

There are several directions that may suggest fruitful areas of further study. For example, stress has been identified as a contributor to depression when other vulnerability factors for depression are present. Stressful life events occur more often in individuals who are experiencing depression. This phenomenon is known as stress generation (Hammen, 1991). Stress generation, is the notion that depressed individuals experience more stressful life events than do non-depressed individuals. This is theorized to be the result of the depressed individuals own actions and behaviors precipitating such problems. In other words, depressed individuals contribute to the level of stress in their environments. This has been empirically shown to be the case in adults (Hammen, 1991;

Harkness, Kassel, & Thase, 1999), children and adolescents (Patton, Coffey, Posterino, Carlin, & Bowes, 2003; Rudolph & Hammen, 1999) and college students (Hankin, Kassel, & Abela, 2005; Joiner, Jr., Wingate, Gencoz, & Gencoz, 2005). In turn these stressful events combined with other risk factors may increase depressive symptoms as suggested in the current study. Researchers have found that social support may buffer individuals against negative life events. Indeed results of structural equation analyses showed that social support was associated with fewer daily hassles. Social support was also indirectly related to daily hassles—that is, by increasing proactive coping (Fiksenbaum, Greenglass, & Eaton, 2006).

In the current study, the interaction of social support and negative life events was not examined. This is a promising area for future research. Negative life events and stressors have been studied as a risk factor for depression for many years (Bruce, 2001). That is to say, stressful events may be related to depressive symptoms and may act in concert with social support variables to increase risk of depression. For example, Brown and colleagues found that lack of social support from a close support person was associated with a greatly increased risk of subsequent depression once a stressor occurred (Brown, Andrews, Harris, Adler & Bridge, 1986).

In particular, individuals experiencing depressive symptoms also generate “interpersonal stress” because factors such as excessive reassurance seeking, hostility, and irritability. These factors have been shown to be associated with negative interpersonal effects across a variety of samples (Gurung, Taylor & Seeman, 2003; Joiner, Alfano, & Metalsky, 1992; Moos, Cronkite, & Moos, 1998).

Specifically, it may be the case that individuals with depressive symptoms generate more interpersonal stress in their lives (assessed in this study by negative life events), which may act in concert with lower social support, and serve as a further vulnerability factor for depression. One might reason that among those who generate interpersonal stress, quantity and quality of relations would diminish. This is consistent with the last set of analyses in which an increase in depressive symptoms was related to a decrease in social network and emotional support. But other sources of support may be less affected ---such as instrumental support. One can only speculate that relatives as well as friends may continue to provide tangible support in relation to providing for the

individual's basic needs (e.g., instrumental support) no matter how unpleasant the relationship. This is what was shown in the current study in which the most depressed individuals received the most instrumental support.

Future explorations of the bi-directionality of the depression/social support link would benefit from exploring different constructs of social support and also include measures of stress as well as an assessment of family emotional climate (i.e., expressed emotion).

The current study is important in that it demonstrates that social support's effects appear to be limited over time. The study is also important in identifying the long-term commitment friends and family may need to make in relation to providing instrumental support to individuals with poor health functioning or depression. Finally, changes in depressive symptoms affect changes in social support networks years later.

APPENDIX A

Social Support Scale Items [EPESE questionnaire item number]

Instrumental Support:

In the last year, did your family (including your spouse) or friends ever help you out in the following ways? [218a-d, f-j, m]

1. listen to your problems?
2. give you advice about life's problems?
3. prepare or provide meals for you?
4. help you out with money?
5. fix things around the house?
6. provide transportation for you?
7. help with housework or household chores?
8. shop or run errands for you?
9. give you advice on business or financial matters?
10. help you out when you are sick?

Size of Social Network (Quantity of Family and Support):

1. How many close relatives do you have that you feel close to—that you feel at ease with, can talk to about private matters, or can call on for help? (INCLUDE SIBLINGS, EXCLUDE SPOUSE AND CHILDREN.) [207]
2. How many of these relatives do you see at least once a month? [208]

Size of Social Network (Quantity of Family and Support)-continued:

3. Other than members of your family, how many close friends do you have—people that you can feel at ease with, can talk to about private matters, or can call on for help? [209]
4. How many of these close friends do you see at least once a month? [210]

Quality of Emotional Support:

1. When in trouble you can count on family or friend.
2. You can confide with a family or friend.

APPENDIX B

Center for Epidemiological Studies—Depression (CES-D) scale

Interviewer-read Instructions: Now I have some questions about your feelings during the past week. For each of the following statements tell me if you felt that way in the past week. [114-133]

Would you say that...

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

Center for Epidemiological Studies—Depression (CES-D) scale

- 17. I had crying spells.
- 18. I felt sad.
- 19. I felt that people disliked me.
- 20. I could not get going.

APPENDIX C

Physical Functioning (PF) items

1. Are you able to do heavy work around the house like washing windows, walls, or floors, without help? [164]
2. Are you able to walk up and down stairs to the second floor without help? [165]
3. Are you able to walk half a mile without help? That's about 8 ordinary blocks.
[166]

APPENDIX D

Human Subjects Committee Approval Memorandum

Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 • FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 3/14/2008

To: Scharles Tinsley

Address: c/o Natalie Sach Ericsson, Department of Psychology, Florida State University,
Tallahassee, FL 32306-1270
Dept.: PSYCHOLOGY DEPARTMENT

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research

Psycho-social risk and protective factors that influence the onset and course of depressive symptoms, cognitive and health functioning among community dwelling older adults.

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Exempt per 45 CFR § 46.101(b)4 and has been approved by an expedited review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 3/12/2009 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks

to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB0000446.

Cc: Natalie Sach-Ericsson, Ph.D., Advisor
HSC No. 2008.1135

REFERENCES

- Abrams, R. C., Lachs, M., McAvay, G., Keohane, D. J., & Bruce, M. L. (2002). Predictors of self-neglect in community-dwelling elders. *American Journal of Psychiatry*, *159*(10), 1724-1730.
- Aijanseppa, S., Notkola, I. L., Tjihuis, M., Van Staveren, W., Kromhout, D., & Nissinen, A. (2005). Physical functioning in elderly europeans: 10 year changes in the north and south: The hale project. *J Epidemiol Community Health*, *59*(5), 413-419.
- Alexander, N. B., Guire, K. E., Thelen, D. G., Ashton-Miller, J. A., Schultz, A. B., Grunawalt, J.C., & Giordani, B. (2000). Self-reported walking ability predicts functional mobility performance in frail older adults. *J Am Geriatr Soc.*, *48*(11):1408-13.
- Antonucci, T. C. (1991). Attachment, social support, and coping with negative life events in mature adulthood. In E. M. Cummings & A. L. Greene (Eds.), *Life-span developmental psychology: Perspectives on stress and coping* (pp. 261-276). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.
- Antonucci, T. C. (1994). A life-span view of women's social relations. In B. F. Turner & L. E. Troll (Eds.), *Women growing older* (pp. 239-269). Thousand Oaks, CA: Sage Publications.
- Antonucci, T. C., & Akiyama, H. (1994). Convoys of attachment and social relations in children, adolescents, and adults. In F. Nestmann & K. Hurrelmann (Eds.), *Social networks and social support in childhood and adolescence. Prevention and intervention in childhood and adolescence*, *16* (pp. 37-52). Oxford, England: Walter De Gruyter.
- Arling, G. (1976). The elderly widow and her family, neighbors, and friends. *Journal of Marriage and the Family*, *38*, 757-768.
- Badger, T. A., & Collins-Joyce, P. A. (2000). Depression, psychosocial resources, and functional ability in older adults. *Clinical Nursing Research*, *9*(3), 238-255.
- Ballard, C.G., Bannister, C., & Oyebode, F. (1994). Depression in dementia sufferers. *International Journal of Geriatric Psychiatry*, *11*, 507 – 515.
- Barnett, P. A., & Gotlib, I. H. (1988). Psychosocial functioning and depression: Distinguishing among antecedents, concomitants, and consequences. *Psychological Bulletin*, *104*(1), 97-126.
- Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology*, *14*(4), 413-445.

- Barrera, M., Jr. (1981). Social support in the adjustment of pregnant adolescents: assessment issues. In B. H. Gottlieb (Ed.), *Social networks and social support* (pp. 69-96). Beverly Hills: Sage.
- Beekman, A., Deeg, D., van Tilberg, T., Smit, J., Hooijer, C., & van Tilberg, W. (1995). Major and minor depression in later life: A study of prevalence and risk factors. *Journal of Affective Disorders*, *36*, 65-75.
- Beekman, A. T. F., Deeg, D. J. H., Van Limbeek, J., Braam, A. W., De Vries, M. Z., & Van Tilburg, W. (1997). Criterion validity of the Center for Epidemiologic Studies Depression scale (CES-D): Results from a community-based sample of older subjects in the Netherlands. *Psychological Medicine*, *27*(1), 231-235.
- Beels, C. (1981). Social networks and the treatment of schizophrenia. *International Journal of Family Therapy*, Winter, 310-315.
- Berkman, L., Berkman, C., Kasl, S., Freeman, D., Leo, L., Ostfeld, A., et al. (1986). Depressive symptoms in relation to physical health and functioning in the elderly. *American Journal of Epidemiology*, *124*, 372-388.
- Billings, A. G., & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. *Journal of Personality & Social Psychology*, *46*(4), 877-891.
- Blazer, D., George, L. K., Landerman, R., Pennybacker, M., Melville, M., Woodbury, M., & et al. (1985). Psychiatric disorders: A rural/urban comparison. *Archives of General Psychiatry*, *42*(7), 651-656.
- Blazer, D. G. (2002). *Depression in Late Life* (Third ed.). New York: Springer.
- Blazer, D. G. (2003). Depression in Late Life: Review and Commentary. *J Gerontol A Biol Sci Med Sci*, *58*(3), M249-265.
- Blazer, D. G. (2005). Depression and social support in late life: A clear but not obvious relationship. *Aging & Mental Health*, *9*(6), 497-499.
- Blazer, D. G., Burchett, B., Service, C., & George, L. K. (1991). The association of age and depression among the elderly: An epidemiologic exploration. *Journals of Gerontology*, *46*(6), M210-M215.
- Blazer, D. G., Hughes, D., & George, L. (1987). The epidemiology of depression in an elderly community population. *The Gerontologist*, *27*, 281-287.
- Blazer, D. G., & Hughes, D. C. (1991). Subjective social support and depressive symptoms in major depression: Separate phenomena or epiphenomena. *Journal of Psychiatric Research*, *25*(4), 191-203.

- Blazer, D. G., Landerman, L., Hays, J., Simonsick, E., & Saunders, W. (1998). Symptoms of depression among community-dwelling elderly African-American and White older adults. *Psychological Medicine*, 28, 1311 - 1320.
- Blazer, D. G., Moody-Ayers, S., Craft-Morgan, J., & Burchett, B. (2002). Depression in diabetes and obesity: Racial/ethnic/gender issues in older adults. *Journal of Psychosomatic Research*, 52, 1-4.
- Blazer D. G., Sachs-Ericsson, N., Hybels, C. F. (2007). Perception of unmet basic needs as a predictor of depressive symptoms among community-dwelling older adults. *Journal of Gerontology: Medical Sciences*, 62A, 191-195.
- Blazer, D. G., Swartz, M., Woodbury, M., Manton, K., Hughes, D., & George, L. (1988). Depressive symptoms and depressive diagnoses in a community population. *Archives of General Psychiatry*, 45, 1078-1084.
- Blazer, D. G., & Williams, C. (1980). The epidemiology of dysphoria and depression in an elderly population. *American Journal of Psychiatry*, 137, 439-444.
- Bookwala, J. (2005). The Role of Marital Quality in Physical Health During the Mature Years. *Journal of Aging and Health*, 17(1), 85-104.
- Bosse, R., Aldwin, C. M., Levenson, M. R., Spiro, A. III, & Mroczek (1993). Change in social support after retirement: Longitudinal findings from the Normative Aging Study. *Journals of Gerontology Psychological Science*, 48(4), 210-217.
- Bosworth, H., McQuoid, D., George, L., & Steffens, D. (2002). Time-to-remission from geriatric depression. *American Journal of Geriatric Psychiatry*, 10, 551-559.
- Bowling, A. (1994). Social networks and social support among older people and implications for emotional well-being and psychiatric morbidity. *International Review of Psychiatry*, 6(1), 41-58.
- Broom, L., & Selznick, P. (1973). *Sociology*. New York: Harper & Row.
- Brown, G. W. , Andrews, B., Harris, T., Adler, Z., & Bridge, L. (1986). Social support, self-esteem and depression. *Psychological Medicine*, 16, 813-831.
- Brown, G., & Harris, T. (1978). *Social Origins of Depression: A Study of Psychiatric Disorder in Women*. New York: Free Press.
- Bruce, M. L. (2001). Depression and disability in late life: Directions for future research. *American Journal of Geriatric Psychiatry*, 9(2), 102-112.
- Bruce, M. L. (2002). Psychosocial risk factors for depressive disorders in late life. *Biological Psychiatry*, 52(3), 175-184.

- Bruce, M. L., & Kim, K. M. (1992). Differences in the effects of divorce on major depression in men and women. *American Journal of Psychiatry*, *149*(7), 914-917.
- Bruce, M. L., Seeman, T. E., Merrill, S. S., & Blazer, D. G. (1994). The impact of depressive symptomatology on physical disability: MacArthur Studies of Successful Aging. *American Journal of Public Health*, *84*(11), 1796-1799.
- Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology & Aging*, *7*(3), 331-338.
- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, *54*(3), 165-181.
- Cheng, S. T., & Chan, A. C. (2006). Social support and self-rated health revisited: is there a gender difference in later life? *Soc Sci Med.*, *63*(1), 118-22.
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, *38*(5), 300-314.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*, 155-159.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlational analysis for the behavioral sciences* (Second ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen L.H., Towbes L.C., Flocco R. (1988). Effects of induced mood on self-reported life events and perceived and received social support. *Journal of Personality and Social Psychology*, *55*(4), 669-74.
- Cole, D. A., Lazarick, D. L., & Howard, G. S. (1987). Construct validity and the relation between depression and social skill. *Journal of Counseling Psychology*, *34*, 315-321.
- Cole, D. A., & Milstead, M. (1989). Behavioral correlates of depression: Antecedents or consequences? *Journal of Counseling Psychology*, *36*(4), 408-416.
- Cole, M. G., & Dendukuri, N. (2003). Risk factors for depression among elderly community subjects: a systematic review and meta-analysis. *American Journal of Psychiatry*, *160*(6), 1147-1156.
- Colenda, C. C., & Dougherty, L. M. (1990). Positive ego and coping functions in chronic pain and depressed patients. *Journal of Geriatric Psychiatry and Neurology*, *3*(1), 48-52.
- Copeland, J., Dewey, M., Wood, N., Searle, R., Davidson, I., & McWilliam, C. (1987). Range of mental illness among the elderly in the community: prevalence in the Liverpool area using the GMS-AGECAT package. *British Journal of Psychiatry*, *150*, 815-823.

- Cornoni-Huntley, J., Blazer, D., Lafferty, M., Everett, D., Brock, D., & Farmer, M. (Eds.). (1990). *Established Populations for Epidemiologic Studies of the Elderly: Resource Data Book* (Vol. II). Bethesda, MD: National Institute on Aging.
- Cornoni-Huntley, J., Brock, D., Ostfeld, A., Taylor, J., & Wallace, R. (Eds.). (1986). *Established Populations for Epidemiologic Studies of the Elderly: Resource Data Book*. Bethesda, MD: National Institute on Aging.
- Coventry, W. L., Gillespie, N. A., Heath, A. C., & Martin, N. G. (2004). Perceived social support in a large community sample: Age and sex differences. *Social Psychiatry and Psychiatric Epidemiology*, *39*(8), 625-636.
- Coyne, J., Kessler, R., Tal, M., & Turnbull, J. (1987). Living with a depressed person. *Journal of Consulting and Clinical Psychology*, *55*, 347-352.
- Coyne, J. C. (1976). Toward an interactional description of depression. *Psychiatry: Journal for the Study of Interpersonal Processes*, *39*(1), 28-40.
- Coyne, J. C., & DeLongis, A. (1986). Going beyond social support: The role of social relationships in adaptation. *Journal of Consulting & Clinical Psychology*, *54*, 454-460.
- Coyne, J. C., Kahn, J., & Gotlib, I. H. (1987). Depression. In T. Jacob (Ed.), *Family interaction and psychopathology: Theories, methods, and findings. Applied clinical psychology* (pp. 509-533). New York, NY: Plenum Press.
- Crohan, S. E., & Antonucci, T. C. (1989). Friends as a source of social support in old age. In Adams, R. G. & Blieszner, R. (Eds.), *Older adult friendship: Structure and process*. Newbury Park, London: Sage Publications.
- Cronbach, J. L., & Furby, L. (1970). How should we measure “change”—or should we?
- Cummings, S. M., Neff, J. A., & Husaini, B. A. (2003). Functional impairment as a predictor of depressive symptomatology: the role of race, religiosity, and social support. *Health Social Work*, *28*, 23-32.
- de Jong Gierveld, J., Broese van Groenou, M., Hoogendoorn, A. W., & Smit, J. H. (2009). Quality of Marriages in Later Life and Emotional and Social Loneliness. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *64B*(4), 497-506.
- Felton, B. J., & Berry, C. A. (1992). Do the sources of the urban elderly's social support determine its psychological consequences? *Psychology and Aging*, *7*, 89-97.
- Field, D., & Minkler, M. (1988). Continuity and change in social support between young-old and old-old or very-old age. *Journals of Gerontology*, *43*, 100-106.

- Fillenbaum, G. (1988). *Multidimensional functional assessment of older adults: The Duke older Americans resources and service procedures*. Hillsdale, N.J.: Lawrence Erlbaum.
- Fiksenbaum, L. M., Esther R. Greenglass, E. R., & Eaton, J. (2006). Perceived social support, hassles, and coping among the elderly. *Journal of Applied Gerontology, 25(1)*, 17-30.
- Findlay, R. A. (2003). Interventions to reduce social isolation amongst older people: Where is the evidence? *Aging & Society, 23(5)*, 647-658.
- Furukawa, T. A., Harai, H., Hirai, T., Kitamura, T., & Takahashi, K. (1999). Social Support Questionnaire among psychiatric patients with various diagnoses and normal controls. *Social Psychiatry and Psychiatric Epidemiology, 34(4)*, 216-222.
- Gallo, J. J., Cooper-Patrick, L., & Lesikar, S. (1998). Depressive symptoms of Whites and African Americans aged 60 years and older. *Journal of Gerontology: PSYCHOLOGICAL SCIENCES, 53B(5)*, P277-P286.
- George, L. K., Blazer, D. G., Hughes, D. C., & Fowler, N. (1989). Social support and the outcome of major depression. *British Journal of Psychiatry, 154*, 478-485.
- Gilhooly, M. L. M., Sweeting, H. N., Whittick, J. E., & McKee, K. (1994). Family care of the dementing elderly. *International Review of Psychiatry, 6*, 29-40.
- Goodwin, J. S., Junt, W. C., & Samet, J. M. (1991). A population-based study of functional status and social support networks of elderly patients newly diagnosed with cancer. *Archives of Internal Medicine, 151*, 366-370.
- Gottlieb, B. H. (1985). Social networks and social support: An overview of research, practice, and policy implications. *Health Education Quarterly, 12(1)*, 5-22.
- Guralnik, J. M., LaCroix, A. Z., Everett, D. F., & Kovar, M. G. (1989). *Aging in the eighties: the prevalence of comorbidity and its association with disability* (Vol. No. 170). Hyattsville, MD: DHHS Publication NO (PHS)89 - 1250.
- Gurland, B. J., Wilder, D. E., & Berkman, C. (1988). Depression and disability in the elderly: Reciprocal relations and changes with age. *International Journal of Geriatric Psychiatry, 3(3)*, 163-179.
- Gurtman, M. B. (1986). Depression and the response of others: Reevaluating the reevaluation. *Journal of Abnormal Psychology, 95*, 99-101.
- Gurung, R. A. R., Taylor, S. E., & Seeman, T. E. (2003). Accounting for changes in social support among married older adults: Insights from the MacArthur Studies of Successful Aging. *Psychology & Aging, 18(3)*, 487-496.

- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate analysis* (Fifth ed.). Upper Saddle River, NJ: Prentice Hall.
- Hamilton, M. (1960). A rating scale for depression.
- Hammen, C. (1991). The generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology, 100*, 555-561.
- Hankin, B. L., Kassel, J. D., & Abela, J. R. Z. (2005). Adult Attachment Dimensions and Specificity of Emotional Distress Symptoms: Prospective Investigations of Cognitive Risk and Interpersonal Stress Generation as Mediating Mechanisms. *Personality and Social Psychology Bulletin, 31*(1), 136-151.
- Hann, D., Baker, F., Denniston, M., Gesme, D., Reding, D., Flynn, T., et al. (2002). The influence of social support on depressive symptoms in cancer patients: Age and gender differences. *Journal of Psychosomatic Research, 52*(5), 279-283.
- Haringsma, R., Engels, G. I., Beekman, A. T. F., & Spinhoven, P. (2004). The criterion validity of the Center for Epidemiological Studies Depression Scale (CES-D) in a sample of self-referred elders with depressive symptomatology. *International Journal of Geriatric Psychiatry, 19*(6), 558-563.
- Harkness, K. L., Kassel, J. D., & Thase, M. (1999). The generation of life events in recurrent and non-recurrent depression. *Psychological Medicine, 29*(1), 136-151.
- Harlow, S. D., Goldberg, E. L., & Comstock, G. W. (1991). A longitudinal study of the prevalence of depressive symptomatology in elderly widowed and married women. *Archives of General Psychiatry, 48*(12), 1065-1068.
- Hays, J. C., Saunders, W. B., Flint, E. P., Kaplan, B. H., & Blazer, D. G. (1997). Social support and depression as risk factors for loss of physical function in late life. *Aging & Mental Health, 1*(3), 209-220.
- Hays, J. C., Steffens, D. C., Flint, E. P., Bosworth, H. B., & George, L. K. (2001). Does social support buffer functional decline in elderly patients with unipolar depression? *American Journal of Psychiatry, 158*(11), 1850-1855.
- Helgeson, V. S. (1993). Two important distinctions in social support: kind of support and perceived versus received. *Journal of Applied Social Psychology, 23* (10), 825-845.
- Helgeson, V. S., & Cohen, S. (1996). Social support and adjustment to cancer: Reconciling descriptive, correlational, and intervention research. *Health Psychology, 15*(2), 135-148.
- Heller, K., & Mansbach, W. E. (1984). The multifaceted nature of social support in a community sample of elderly women. *Journal of Social Issues, 40*(4), 99-112.

- Heller, K., Thompson, M. G., Trueba, P. E., Hogg, J. R., & et al. (1991). Peer support telephone dyads for elderly women: Was this the wrong intervention? *American Journal of Community Psychology*, *19*(1), 53-74.
- Henderson, A. S. (1984). Interpreting the evidence on social support. *Social Psychiatry*, *19*(2), 49-52.
- Henderson, S., Byrne, D. G., & Duncan-Jones, P. (1981). *Neurosis and the social environment*. Australia: Academic Press.
- Hertzog, G., Van Alstine, J., Usala, P. D., Hulstsch, D. F., & Dixon, R. (1990). Measurement properties of the Center for Epidemiological Studies Depression Scale (CES-D) in older populations. *Psychological Assessment*, *2*, 64-72.
- Himmelfarb, S., & Murrell, S. A. (1983). Reliability and validity of five mental health scales in elderly people. *Journal of Gerontology*, *38*, 333-339.
- Hinrichsen, G. A. (1991). Adjustment of caregivers to depressed older adults. *Psychology and Aging*, *6*, 631-639.
- Hobfoll, S. E., Johnson, R. J., Ennis, N., & Jackson, J. P. (2003). Resource loss, resource gain, and emotional outcomes among inner city women. *Journal of Personality and Social Psychology*, *84*, 632-642.
- Hokanson, J. E., Rubert, M. P., Welker, R. A., Hollander, G. R., & Hedeem, C. (1989). Interpersonal concomitants and antecedents of depression among college students. *Journal of Abnormal Psychology*, *98*(3), 209-217.
- Holahan, C. J., & Moos, R. H. (1982). Social support and adjustment: Predictive benefits of social climate indices. *American Journal of Community Psychology*, *10*(4), 403-415.
- Holahan, C. J., Moos, R. H., Holahan, C. K., & Cronkite, R. C. (1999). Resource loss, resource gain, and depressive symptoms: a 10-year model. *Journal of Personality and Social Psychology*, *77*, 620-629.
- Holzer, C. E., Shea, B. M., Swanson, J. W., Leaf, P. J., Myers, J. K., George, L., & et al. (1986). The increased risk for specific psychiatric disorders among persons of low socioeconomic status. *American Journal of Social Psychiatry. Special Issue: Psychiatric epidemiology*, *6*(4), 259-271.
- Hooley, J. M. (1986). Expressed emotion and depression: Interactions between patients and high-versus low-expressed-emotion spouses. *Journal of Abnormal Psychology*, *95*, 237-246.
- Hooley, J. M. & Miklowitz, D. J. (1995). Expressed emotion and depression in Egypt (letter). *American Journal of Psychiatry*, *152*(8), 1240.

- Hooley, J. M., & Teasdale, J. D. (1989). Predictors of relapse in unipolar depressives: Expressed emotion, marital distress, and perceived criticism. *Journal of Abnormal Psychology, 98*, 229-235.
- House, J. S. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley.
- House, J. S., Umberson, D., & Landis, K. R. (1988). Structures and processes of social support. *Annual Review of Sociology, 14*(293-318).
- Jerrrome, D. (1991). Social bonds in later life. *Social & Psychological Gerontology Reviews in Clinical Gerontology, 1*, 297-306.
- Joiner, T., & Coyne, J. C. (1999). *The interaction nature of depression: Advances in interpersonal approaches*. Washington, DC: American Psychological Association.
- Joiner, T. E., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: Reassurance seeking, self-esteem, and rejection of depressed college students by their roommates. *Journal of Abnormal Psychology, 101*(1), 165-173.
- Joiner, T. E., Jr. (1996). Depression and rejection: On strangers and friends, symptom specificity, length of relationship, and gender. *Communication Research. Special Issue: Communication and Psychopathology, 23*(4), 451-471.
- Joiner, T. E., Jr. (1997). Shyness and low social support as interactive diatheses, with loneliness as mediator: Testing an interpersonal-personality view of vulnerability to depressive symptoms. *Journal of Abnormal Psychology, 106*(3), 386-394.
- Joiner, T. E., Jr., Wingate, L. R., Gencoz, T., & Gencoz, F. (2005). Stress generation in depression: Three studies on its resilience, possible mechanism, and symptom specificity. *Journal of Social & Clinical Psychology, 24*(2), 236-253.
- Kafetsios, K., & Sideridis, G. (2006). Attachment, social support, and well being in younger and older adults. *Journal of Health Psychology, 11*(6), 867-879
- Kahn, R. L., & Antonucci, T. C. (1980). Convoys over the life course: Attachment, roles, and social support. In P. B. Baltes & O. G. Brim (Eds.), *Life span development and behavior* (Vol. 3, pp. 103-123). New York: Academic Press.
- Kahn, J. H., Hessling, R. M., & Russell, D. W. (2003). Social support, health, and well-being among the elderly: What is the role of negative affectivity? *Personality and Individual Differences, 35*, 5-17.
- Kaiser, H. (1961). A note of Guttman's lower bound for the number of common factors. *Multivariate Behavioral Research, 1*, 249-276.

- Keitner, G. I., Ryan, C. E., Miller, I. W., & Zlotnick, C. (1997). Psychosocial factors and the long-term course of major depression. *Journal of Affective Disorders, 44*(1), 57-67.
- Kendler, K. S., Myers, J., & Prescott, C. A. (2005). Sex Differences in the Relationship Between Social Support and Risk for Major Depression: A Longitudinal Study of Opposite-Sex Twin Pairs. *American Journal of Psychiatry, 162*(2), 250-256.
- Kendler, K. S., Thornton, L. M., & Prescott, C. A. (2001). Gender differences in the rates of exposure to stressful life events and sensitivity to their depressogenic effects. *American Journal of Psychiatry, 158*(4), 587-593.
- Kessler, R. C., McGonagle, K. A., Swartz, M., Blazer, D. G., & Nelson, C. B.. (1993). Sex and depression in the National Comorbidity Survey: I. Lifetime prevalence, chronicity and recurrence. *Journal of Affective Disorders. Special Issue: Toward a new psychobiology of depression in women, 29*(2-3), 85-96.
- Kessler, R. C., Price, R. H., & Wortman, C. B. (1985). Social factors in psychopathology: Stress, social support, and coping processes. *Annual Review of Psychology, 36*, 531-572.
- Kim, E.Y., & Miklowitz D.J. (2004). Expressed emotion as a predictor of outcome among bipolar patients undergoing family therapy. *Journal of Affective Disorders, 82*, 343-352.
- Kitamura, T., Watanabe, K., Takara, N., Hiyama, K., Yasumiya, R., & Fujihara, S. (2002). Precedents of perceived social support: Personality, early life experiences and gender. *Psychiatry and Clinical Neurosciences, 56*(2), 169-176.
- Koenig, H. G., Hays, J. C., George, L. K., Blazer, D. G., Larson, D. B., & Landerman, L. R. (1997). Modeling the cross-sectional relationships between religion, physical health, social support, and depressive symptoms. *American Journal of Geriatric Psychiatry, 5*(2), 131-144.
- Koenig, H. G., Westlund, R. E., George, L. K., Hughes, D., Blazer, D. G., & Hybels, C. F. (1993). Abbreviating the Duke Social Support Index for use in chronically ill elderly individuals. *Psychosomatics, 34*, 61-69.
- Koizumi, Y., Awata, S., Kuriyama, S., Ohmori, K., Hozawa, A., Seki, T., et al. (2005). Association between social support and depression status in the elderly: Results of a 1-year community-based prospective cohort study in Japan. *Psychiatry and Clinical Neurosciences, 59*(5), 563-569.
- Koster, A., Bosma, H., Kempen, G. I. J. M., Penninx, B. W. J. H., Beekman, A. T. F., Deeg, D. J. H., et al. (2006). Socioeconomic differences in incident depression in older adults: The role of psychosocial factors, physical health status, and behavioral factors. *Journal of Psychosomatic Research, 61*(5), 619-627.

- Krause, N. (2001). Social support. In R. H. Binsotck & L. K. George (Eds.), *Handbook of aging and the social sciences*, 5th edition (pp. 273-294). San Diego, California: Academic Press.
- Krause, N. (2005). Exploring Age Differences in the Stress-Buffering Function of Social Support. *Psychology and Aging. Special Issue: Emotion-Cognition Interactions and the Aging Mind*, 20(4), 714-717.
- Krause, N., Liang, J., & Yatomi, N. (1989). Satisfaction with social support and depressive symptoms: A panel analysis. *Psychology & Aging*, 4(1), 88-97.
- Lakey, B., & Drew, J. B. (1997). A social-cognitive perspective on social support. In G. R. Pierce, B. Lakey, I. G. Sarason, & B. R. Sarason (Eds.), *Sourcebook of theory and research on social support and personality*. New York: Plenum.
- Landerman, R., George, L. K., Campbell, R. T., & Blazer, D. G. (1989). Alternative models of the stress buffering hypothesis. *American Journal of Community Psychology*, 17, 625-642.
- Lang, F. R., Staudinger, U. M., & Carstensen, L. L. (1998). Perspectives on socioemotional selectivity in late life: How personality and social context do (and do not) make a difference. *Journals of Gerontology: Series B: Psychological Sciences & Social Sciences*, 53B(1), P21-P30.
- Lansford, J. E., Sherman, A. M., & Antonucci, T. C. (1998). Satisfaction with social networks: An examination of socioemotional selectivity theory across cohorts. *Psychology & Aging*, 13(4), 544-552.
- Lara, M. E., Leader, J., & Klein, D. N. (1997). The association between social support and course of depression: Is it confounded with personality? *Journal of Abnormal Psychology*, 106(3), 478-482.
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.
- Leavy, R. L. (1983). Social support and psychological disorder: A review. *Journal of Community Psychology*, 11(1), 3-21.
- Lee, G. R., & Ishii-Kuntz, M. (1987). Social interaction, loneliness, and emotional well-being among the elderly. *Research on Aging*, 9, 459-482.
- Lepine, J. P., & Bouchez, S. (1998). Epidemiology of depression in the elderly. *International Clinical Psychopharmacology*, 13(Suppl 5), S7-S12.
- Lewinsohn, P. (1974). A behavioral approach to depression. In R. Friedman & M. Katz (Eds.), *The Psychology of Depression: Contemporary Theory and Research* (pp. 157-185). New York: John Wiley & Sons.

- Lin, N., Simeone, R. S., Ensel, W. M., & Kuo, W. (1979). Social support, stressful life events, and illness: A model and an empirical test. *Journal of Health & Social Behavior, 20*(2), 108-119.
- Livingston, G., Hawkins, A., Graham, N., Blizard, B., & Mann, A. (1990). The Gospel Oak Study: Prevalence rates of dementia, depression and activity limitation among elderly residents in Inner London. *Psychological Medicine, 20*(1), 137-146.
- Loader, B. D., Muncer, S., Burrows, R., Pleace, N., & Nettleton, S. (2002). Medicine on the line? Computer-mediated social support and advice for people with diabetes. *International Journal of Social Welfare, 11*(1), 53-65.
- Lynch, J. W., Kaplan, G. A., & Salonen, J. T. (1997). Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stages of the socioeconomic lifecourse. *Social Science & Medicine, 44*(6), 809-819.
- Martina, C. M. S., & Stevens, N. L. (2006). Breaking the cycle of loneliness? Psychological effects of a friendship enrichment program for older women. *Aging & Mental Health, 10*(5), 467-475.
- Martire, L. M., Schulz, R., Reynolds III, C. F., Morse, J. Q., Butters, M. A., & Hinrichsen, G. A. (2008). Impact of close family members on older adults' early response to depression treatment. *Psychology and Aging, 23* (2), 447-452.
- Maxwell, S. E., & Delaney, H. D. (2004). *Designing Experiments and Analyzing Data* (Second Edition). Mahwah, NJ: Lawrence Erlbaum Associates.
- Mazzella, F., Cacciatore, F., Galizia, G., Della-Morte, D., Rossetti, M., Abbruzzese, R., Langellotto, A., Avolio, D., Gargiulo, G., Ferrara, N., Rengo, F., & Abete, P. (2010). Social support and long-term mortality in the elderly: Role of comorbidity. *Archives of Gerontology and Geriatrics, 51*(3), 323-328.
- Mechanic, D. (1976). Stress, illness, and illness behavior. *Journal of Human Stress, 2*(2), 2-6.
- Mendes de Leon, C. F., Gold, D. T., Glass, T. A., Kaplan, L., & George, L. K. (2001). Disability as a function of social networks and support in elderly African Americans and Whites: The Duke EPESE 1986-1992. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 56B*(3), S179-S190.
- Miklowitz, D.J., Goldstein, M.J., Nuechterlein, K.H., Snyder, K.S., and Mintz, J. (1988). Family factors and the course of bipolar affective disorder. *Archives of General Psychiatry, 45*, 225-231.

- Miklowitz, D.J., Strachan, A.M., Goldstein, M.J., Doane, J.A., Snyder, K.S., Hogarty, G.E., & Falloon, I.R.H. (1986). Expressed emotion and communication deviance in the families of schizophrenics. *Journal of Abnormal Psychology, 95*(1), 60-66.
- Miller, S. S., & Cavanaugh, J. C. (1990). The meaning of grandparenthood and its relationship to demographic, relationship, and social participation variables. *Journals of Gerontology, 45*(6), P244-P246.
- Moos, R. H., Cronkite, R. C., & Moos, B. S. (1998). The long-term interplay between family and extrafamily resources and depression. *Journal of Family Psychology, 12*(3), 326-343.
- Morgan, D. L. (1989). Adjusting to widowhood: Do social networks really make it easier? *Gerontologist, 29*(1), 101-107.
- Murrell, S. A., Himmelfarb, S., & Wright, K. (1983). Prevalence of depression and its correlates in older adults. *American Journal of Epidemiology, 117*, 173-185.
- Mutran, E. J., Reitzes, D. C., Mossey, J., & Fernandez, M. E. (1995). Social support, depression, and recovery of walking ability following hip fracture surgery. *Journals of Gerontology: Series B: Psychological Sciences & Social Sciences, 50B*(6), S354-S361.
- Nezlek, J. B., Imbrie, M., & Shean, G. D. (1994). Depression and everyday social interaction. *Journal of Personality and Social Psychology, 67*(6), 1101-1111.
- Nezu, A. M., Nezu, C. M., & Peterson, M. A. (1986). Negative life stress, social support, and depressive symptoms: Sex roles as a moderator variable. *Journal of Social Behavior & Personality, 1*(4), 599-609,
- Norusis, M. J. (2006). *SPSS 14.0 guide to data analysis*. Upper Saddle River, NJ: Prentice-Hall, Inc.
- Nunnally, J. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Oatley, K., & Bolton, W. (1985). A social-cognitive theory of depression in reaction to life events. *Psychological Review, 92*(3), 372-388.
- Oppikofer, S., Albrecht, K., Martin, M. (2009). Effect of increased social support on the well-being of cognitively impaired elderly people. *Z Gerontol Geriatr. 2009 Sep 13*. [Epub ahead of print].
- O'Reilly, P. (1988). Methodological issues in social support and social network research. *Social Science & Medicine, 26*(8), 863-873.
- Orme, J. G., Reis, J., & Herz, E. J. (1986). Factorial and discriminant validity of the Center for Epidemiological Studies Depression (CES-D) scale. *Journal of Clinical Psychology, 42*(1), 28-33.

- Pachana, N., Smith, N., Watson, M., McLaughlin, D., & Dobson, A. (2008). Responsiveness of the Duke social support sub-scales in older women. *Age & Aging, 37*(6), 666-672.
- Parker, G., & Barnett, B. (1987). A test of the social support hypothesis. *British Journal of Psychiatry, 150*, 72-77.
- Patton, G. C., Coffey, C., Posterino, M., Carlin, J. B., & Bowes, G. (2003). Life events and early onset depression: Cause or consequence? *Psychological Medicine, 33*(7), 1203-1210.
- Petty, C., Sachs-Ericsson, N., & Joiner, T. (2004). Interpersonal functioning deficits: temporary or stable characteristics of depressed individuals? *Journal of Affective Disorders, 81*(2), 115-122.
- Pfeiffer E: A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *Journal of the American Geriatrics Society 1975; 23:433 - 441*
- Pillari, V. (1988). *Human behavior in the social environment*. Belmont, California: Brooks/Cole Publishing.
- Plant, E. A., & Sachs-Ericsson, N. (2004). Racial and Ethnic Differences in Depression: The Roles of Social Support and Meeting Basic Needs. *Journal of Consulting & Clinical Psychology, 72*(1), 41-52.
- Porritt, D. (1979). Social support in crisis: Quantity or quality? *Social Science & Medicine, 13A*, 715-721.
- Potts, M. K. (1997). Social support and depression among older adults living alone: The importance of friends within and outside of a retirement community. *Social Work, 42*(4), 348-362.
- Prince, M. J., Harwood, R. H., Blizard, R. A., & Thomas, A. (1997). Social support deficits, loneliness and life events as risk factors for depression in old age. The Gospel Oak Project VI. *Psychological Medicine, 27*(2), 323-332.
- Prince, M. J., Harwood, R. H., Thomas, A., & Mann, A. H. (1998). A prospective population-based cohort study of the effects of disablement and social milieu on the onset and maintenance of late-life depression: The Gospel OAK Project VII. *Psychological Medicine, 28*(2), 337-350.
- Radloff, L. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measures, 1*, 385-401.
- Radloff, L. S., & Teri, L. (1986). Use of the Center for Epidemiological Studies-Depression Scale with older adults. *Clinical Gerontologist, 5*(1-2), 119-136.

- Roberson, T., & Lichtenberg, P. A. (2003). Depression, social support, and functional abilities: Longitudinal findings. *Clinical Gerontologist, 26*(3-4), 55-67.
- Roberts, R. E., Kaplan, G. A., Shema, S. J., & Strawbridge, W. J. (1997). Does growing old increase the risk for depression? *American Journal of Psychiatry, 154*(10), 1384-1390.
- Roberts, R. E., & Vernon, S. W. (1983). The Center for Epidemiological Studies Depression Scale: Its use in a community sample. *American Journal of Psychiatry, 140*, 41-46.
- Rook, K. S., & Sorkin, D. H. (2003). Fostering social ties through a volunteer role: Implications for older-adults' psychological health. *International Journal of Aging & Human Development, 57*(4), 313-337.
- Rosow, I., & Breslau, N. (1966). A Guttman health scale for the aged. *Journal of Gerontology, 21*, 556 - 559.
- Rudolph, K. D., & Hammen, C. (1999). Age and gender as determinants of stress exposure, generation, and reactions in youngsters: A transactional perspective. *Child Development, 70*(3), 660-677.
- Russell, D. W., & Cutrona, C. E. (1991). Social support, stress, and depressive symptoms among the elderly: Test of a process model. *Psychology & Aging, 6*(2), 190-201.
- Sachs-Ericsson, N., & Blazer, D. (2006). *Depression in Late Life: Etiology, Diagnosis and Treatment*. Philadelphia: Lippincott Williams & Wilkins.
- Sachs-Ericsson, N., Plant, E. A., & Blazer, D. G. (2005). Racial differences in the frequency of depressive symptoms among community dwelling elders: The role of socioeconomic factors. *Aging and Mental Health*.
- Sachs-Ericsson, N., Sawyer, K., & Blazer, D. G. (2007). Depression with Dementia: Differential diagnosis and treatment. *Clinician's Research Digest: Briefings in Behavioral Science, (37)* 1-2.
- Sachs-Ericsson, N., Schatschneider, C., & Blazer, D. G. (2006). Perception of Unmet Basic Needs as a Predictor of Physical Functioning Among Community-Dwelling Older Adults. *Journal of Aging and Health, 18*(6), 852-868.
- Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: The Social Support Questionnaire. *Journal of Personality & Social Psychology, 44*(1), 127-139.
- Sarason, I. G., Sarason, B. R., & Pierce, G. R. (1995). Stress and social support. In S. E. Hobfoll & M. W. de Vries (Eds.), *Extreme stress and communities: Impact and Intervention* (pp. 179–197). New York: Plenum.

- Sbarra, D. A. (2009). Marriage Protects Men from Clinically Meaningful Elevations in C-Reactive Protein: Results from the National Social Life, Health, and Aging Project (NSHAP). *Psychosom Med*, 71(8), 828-835.
- Scazufca, M., Menezes, P. R., & Almeida, O. P. (2002). Caregiver burden in an elderly population with depression in Sao Paulo, Brazil. *Social Psychiatry and Psychiatric Epidemiology*, 27, 416-422.
- Schoevers, R. A., Beekman, A. T. F., Deeg, D. J. H., Geerlings, M. I., Jonker, C., & Van Tilburg, W. (2000). Risk factors for depression in later life: Results of a prospective community based study (AMSTEL). *Journal of Affective Disorders*, 59(2), 127-137.
- Schraedley, P. K., Gotlib, I. H., & Hayward, C. (1999). Gender differences in correlates of depressive symptoms in adolescents. *Journal of Adolescent Health*, 25(2), 98-108.
- Segrin, C. (2001). Social skills and negative life events: Testing the deficit stress generation hypothesis. *Current Psychology: Developmental, Learning, Personality, Social*, 20, 19-35.
- Sewitch, M. J., McCusker, J., Dendukuri, N., & Yaffe, M. J. (2004). Depression in frail elders: Impact on family caregivers. *International Journal of Geriatric Psychiatry*, 19, 655-665.
- Shinar, D., Gross, C. R., Price, T. R., Banko, M., Bolduc, P. L., & Robinson, R. G. (1986). Screening for depression in stroke patients: The reliability and validity of the Center for Epidemiologic Studies Depression Scale. *Stroke*, 17, 241-245.
- Simoneau, T. L., Miklowitz, D. J., & Saleem, R. (1998). Expressed emotion and interactional patterns in the families of bipolar patients. *Journal of Abnormal Psychology*, 107, 497-507.
- Starker, J. (1986). Methodological and conceptual issues in research on social support. *Hospital & Community Psychiatry*, 37(5), 485-490.
- Steffens, D. C., Hays, J. C., George, L. K., Krishnan, K. R., & Blazer, D. G. (1996). Sociodemographic and clinical correlates of number of previous depressive episodes in the depressed elderly. *Journal of Affective Disorders*, 39(2), 99-106.
- Stewart, A. L., Greenfield, S., Hays, R. D., Wells, K., Rogers, W. H., Berry, S. D., et al. (1989). Functional status and well-being of patients with chronic conditions. Results from the Medical Outcomes Study. *JAMA*, 262(7), 907-913.
- Stice, E., Ragan, J., & Randall, P. (2004). Prospective Relations Between Social Support and Depression: Differential Direction of Effects for Parent and Peer Support? *Journal of Abnormal Psychology*, 113(1), 155-159.

- Taylor, M. G., & Lynch, S. M. (2004). Trajectories of Impairment, Social Support, and Depressive Symptoms in Later Life. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences*, 59B(4), S238-S246.
- Tomaka, J., Thompson, S., & Palacios, R., (2006). The relation of social isolation, loneliness, and social support to disease outcomes among the elderly, *18(3)*, 359-384.
- Turner, R. J., & Noh, S. (1988). Physical disability and depression: A longitudinal analysis. *Journal of Health and Social Behavior*, 29(1), 23-37.
- Unutzer, J., Patrick, D. L., Marmon, T., Simon, G. E., & Katon, W. J. (2002). Depressive symptoms and mortality in a prospective study of 2,558 older adults. *American Journal of Geriatric Psychiatry. Special Issue: Depression in late life*, 10(5), 521-530.
- USDHHS. (2001). *Mental Health: Culture, race, and ethnicity: A supplement to mental health: A report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services.
- VanDerHorst, R. and McLaren, S. (2005) Social relationships as predictors of depression and suicidal ideation in older adults. *Aging & Mental Health*, 9, 517-525.
- van Grootheest, D. S., Beekman, A. T., Broese van Groenou, M. I., & Deeg, D. J. (1999). Sex differences in depression after widowhood. Do men suffer more? *Soc Psychiatry Psychiatr Epidemiol.*,34(7), 391-398.
- Vernon S. W., Roberts R. E. (1981). Measuring nonspecific psychological distress and other dimensions of psychopathology. Further observations on the problem, *Archives of General Psychiatry*, 38(11), 1239-47.
- Waite, A., Bebbington, B., Skelton-Robinson, M., Orrell M., (1994). Social factors and depression in carers of people with dementia. *International Journal of Geriatric Psychiatry*, 19, (6), 582-587.
- Weissman, M. M., Leaf, P. J., Tischler, G. L., Blazer, D. G., Karno, M., Bruce, M. L., & Florio, L. P. (1988). Affective disorders in five United States communities. *Psychological Medicine*, 18(1), 141-153.
- Weissman, M. M., & Myers, J. K. (1978). Affective disorders in a US urban community: The use of Research Diagnostic Criteria in an epidemiological survey. *Archives of General Psychiatry*, 35(11), 1304-1311.

- Westaway, M. S., Seager, J. R., Rheeder, P. & Van Zyl, D. G. (2005) The effects of social support on health, well-being and management of Diabetes Mellitus: a black South African perspective. *Ethnicity and health*, 10(1):73-89.
- Winemiller, D. R., Mitchell, M. E., Sutliff, J., & Cline, D. J. (1993). Measurement strategies in social support: A descriptive review of the literature. *Journal of Clinical Psychology*, 49(5), 638-648.
- Yang, Y., & George, L. K. (2005). Functional disability, disability transitions, and depressive symptoms in late life. *Journal of Aging and Health*, 17, 263-292.
- Wood, V., & Robertson, J. F. (1978). Friendship and kinship interaction: differential effect on morale of the elderly. *Journal of Marriage and the Family*, 40, 367-374.
- Youngren, M., & Lewinsohn, P. M. (1980). The functional relation between depression and problematic interpersonal behavior. *Journal of Abnormal Psychology*, 89, 331-341.
- Zlotnick, C., Kohn, R., Keitner, G., & Della Grotta, S. A. (2000). The relationship between quality of interpersonal relationships and major depressive disorder: Findings from the National Comorbidity Survey. *Journal of Affective Disorders*, 59(3), 205-215.
- Zung, W. W. (1965). A self-rating depression scale.

BIOGRAPHICAL SKETCH

EDUCATIONAL HISTORY

- The Florida State University, Tallahassee, FL
Degree Sought: Ph.D. 2003-Current
Major: Clinical Psychology
Major Professor: Natalie Sachs-Ericsson, Ph.D.
- The Florida State University, Tallahassee, FL
Degree: M.S. May 2003
Major: Psychology
Major Professor: Natalie Sachs-Ericsson, Ph.D.
- University of Virginia, Charlottesville, Virginia
Degree: B.A. with Distinction May 1999
Major: Psychology
Title of Distinguished Majors Thesis: “Racial Identity as it Relates to Sexual Risk-taking and Depression in Black Women at Howard University and the University of Virginia.”

HONORS AND AWARDS

- Leslie N. Wilson Graduate Assistantship—Florida State University 1999-2003
Distinguished Graduate—University of Virginia
University Achievement Scholar – University of Virginia 1995-1999
Psi Chi Honor Society
Listed in 1998 APA publication “Minority Undergraduate Students of Excellence”
Dean’s List

PUBLICATIONS

- Joiner, T., **Petty, S.**, Perez, M., Sachs-Ericsson, N., & Rudd, M.D., (2008). Depressive symptoms induce paranoid symptoms in narcissistic personalities (but not narcissistic symptoms in paranoid personalities). *Psychiatry Research*, 159(1), 237-244.
- Wingate, L.R., Bobadilla, L., Burns, A., Cukrowicz, K., Hernandez, A., Ketterman, R., Minnix, J., **Petty, S.**, Richey, J., Sachs-Ericsson, N., Stanley, S., Williams, F., & Joiner, Jr., T. (2005). Suicidality in African American men: The roles of southern residence, religiosity, and social Support. *Suicide and Life-Threatening Behavior*, 35(6), 615-629.
- Petty, S.C.**, Sachs-Ericsson, N., Joiner, T.E. (2004). Interpersonal functioning deficits: Temporary or stable characteristics of depressed individuals? *Journal of Affective Disorders*, 81, 115-122.

- Gerhardstein, R.R., Ketterman, R., & **Petty, S.C.** (2004). Parents of children diagnosed with behavior disorders. In K. Driscoll, K. Cukrowicz, M. Lyons-Reardon, & T. Joiner (Eds.), *Simple treatment for complex problems: A flexible cognitive behavior analysis system to psychotherapy* (pp. 119-137). Mahwah, New Jersey: Erlbaum.
- Lyons-Reardon, M., **Petty, S.C.** & Joiner, T.E. (2004). Schizotypal personality disorder. In K. Driscoll, K. Cukrowicz, M. Lyons-Reardon, & T. Joiner (Eds.), *Simple treatment for complex problems: A flexible cognitive behavior analysis system to psychotherapy* (pp. 15-32). Mahwah, New Jersey: Erlbaum.
- Driscoll, K.A., Cukrowicz, K.C., Reitzel, L.R., Hernandez, A, **Petty, S.C.** & Joiner, T.E. (2003). The effect of trainee experience in psychotherapy on client treatment outcome. *Behavior Therapy*,34, 165-177.