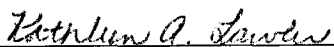
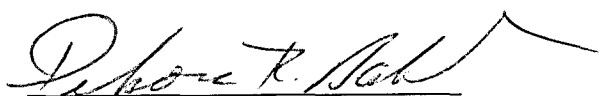


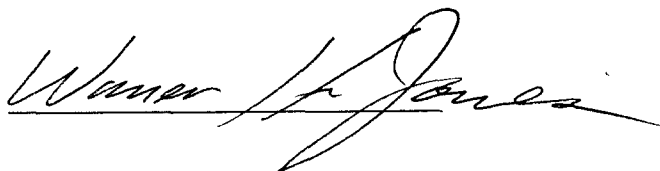
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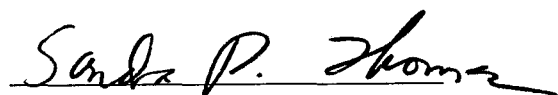
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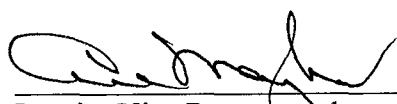
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Accepted for the Council:


Interim Vice Provost and
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GIVING SOCIAL SUPPORT TO OTHERS: PSYCHOSOCIAL AND
AMBULATORY BLOOD PRESSURE CORRELATES

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

Rachel Anderson Piferi
May, 2001

DEDICATION

This dissertation is dedicated to my son, Luke Alexander Piferi, who is the accomplishment of which I am most proud. He has blessed my life in countless ways. This dissertation is also dedicated to my husband, Silvano Piferi, who has encouraged and supported me as I achieved this goal.

ACKNOWLEDGEMENTS

I owe thanks to a number of individuals who have guided me in the completion of this dissertation. I would like to express my gratitude to Dr. Kathleen A. Lawler for her guidance, assistance, and friendship. She has been my mentor and my friend during the past five years. Without her constant encouragement, constructive feedback, and advice, I would not be the researcher that I am today. I would also like to thank committee members, Dr. Warren Jones, Dr. Debora Baldwin, and Dr. Sandra Thomas for their encouragement, feedback, and kind words which have been appreciated as I completed this project.

I also would like to thank Kim Edmondson, Rebecca Jobe, and Ashley Vickers for their assistance as I collected data. Their assistance has been valuable as I juggled motherhood and data collection.

Finally, I would like to thank the National Institute of Mental Health for the National Research Service Award which funded this project.

ABSTRACT

The relationship between the social network and physical health has been studied extensively. Research suggests that individuals live longer, have fewer physical symptoms of illness, and have lower blood pressure when they are a member of a social network than when they are isolated. However, much of the research to date has focused on the benefits of receiving social support from the network and the effects of giving to others within the network have been neglected. Limited research of the elderly and volunteers suggests that giving to others is beneficial to the giver. However, research has not been done to investigate the effects of giving on cardiovascular health. The present research explores the effects of giving to others on ambulatory blood pressure, reported physical health, and mental health. Participants completed a questionnaire packet that measured one's level of giving to others, receipt of support from others, self esteem, self efficacy, perceived stress, mood, and depression. Additionally, participants wore an ambulatory blood pressure monitor for 24 hours. Systolic blood pressure, diastolic blood pressure, mean arterial pressure, and heart rate were recorded every thirty minutes during the day and every sixty minutes at night. Analyses revealed that males who reported a high tendency to give social support to others had lower blood pressure at night than males who reported a low tendency to give social support to others. Furthermore, male and female participants who reported a high tendency to give social support to others had significantly more nighttime dipping of blood pressure (daytime levels minus nighttime levels) than participants who reported a low tendency to give social support to others. Correlational analyses revealed that participants with a higher tendency to give social support reported greater received social support, self efficacy, vigor, and self esteem than

participants with a lower tendency to give social support to others. These individuals with a higher tendency to give support also reported less depression and less stress than those with a lower tendency to give support. The relationship between reported physical symptoms of illness and tendency to give social support was marginally significant with those reporting a higher tendency to give social support reporting fewer physical symptoms of illness than those with a lower tendency to give support to others. Therefore, it seems that having a high tendency to give support to others is related to physical and mental health.

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CHAPTER 1: INTRODUCTION

The association between social relationships and health has been much studied over the past twenty-five years. In separate reviews, Cobb (1976) and Cassell (1976) were among the first to detail the relationship between social support and physical health. Both asserted that a supportive social environment protects an individual from the damaging health effects of stressful life events. In addition to their assertions that social support benefits physical health by buffering individuals from stress, they also proposed the need for longitudinal research in this area of health promotion.

In response to these reviews, many prospective studies began to demonstrate that a lack of social relationships was, in fact, a risk factor for mortality. These prospective studies have shown consistently that individuals who are socially integrated (e.g. marital, community or organizational involvement) have a lower risk of premature all-cause mortality than those who are not well integrated (Berkman & Syme, 1979; Blazer, 1982; Hanson, Isacson, Janzon, Lindell, & Rastam, 1988; House, Robbins, & Metzner, 1982; Kaplan, Salonen, Cohen, et al., 1988; Orth-Gomer & Johnson, 1997; Schoenbach, Kaplan, Freedman, et al., 1986; Seeman, Berkman, Kohout, et al., 1993; Welin, Tibblin, Svardsudd, et al., 1985). While considerable variation exists among these studies in measurement of social integration, length of follow-up, and samples used, it is consistently shown that those who are socially disconnected are at increased risk for mortality from all causes. Berkman & Syme (1979) found that men and women who lacked social ties (based on marital status, contacts with friends and relatives, and church/group membership) were 1.9 to 3.1 times more likely to die in a 9-year period

than those who reported social ties. Using a similar measure of social connectedness, Kaplan et al. (1988) also found that all cause mortality during a five year period was greater in participants who were socially disconnected than for participants who were socially integrated. Since these early prospective studies, extensive research has been conducted in attempts to explain the underlying mechanism(s) by which the social network may lead to lower mortality and morbidity. While early studies showed mortality rates were greater among socially isolated individuals than among socially integrated individuals, these original studies did not clearly demonstrate where, on the continuum of disease, social factors had their influence. For example, does social connectedness delay the onset and progression of disease or do social ties exert their influence on physical health during recovery from illness?

Coronary heart disease is the leading cause of death in the United States; thus much of the follow-up research on social relationships has focused on death from cardiovascular disease. Research on recovery from coronary-related events shows enhanced recovery in supported individuals integrated (Ell & Haywood, 1984; Fontana, Kerns, Rosenberg, & Colonese, 1989; Helgeson, 1991; King, Reis, Porter, & Norsen, 1993; Kleman, Bickert, Karpinski, Wantz, & Jacobsen, 1993). Laboratory research has shown, fairly consistently, a relationship between received social support and lower acute blood pressure (Bland, Krogh, Winkelstein, & Trevisan, 1991; Cottingham, Brock, House, & Hawthorne, 1985; Dressler, 1980; Dressler, 1983; Dressler, 1991; Dressler, Mata, Chavez, Viteri, & Gallagher, 1986; Dressler, Dos Santos, & Viteri, 1986; Dressler, Grell, Gallagher, & Viteri, 1992; Gilksman, Lazarua, Wilson, & Leeder, 1995). Furthermore, cardiovascular reactivity to a stressor is lower when one is supported by another than

when not supported (Fontana, Diegnan, Villeneuve, & Lepore, 1999; Gerin, Peiper, Levy, & Pickering, 1992; Kamarck, Manuck, & Jennings, 1990; Kiecolt-Glaser & Greenberg, 1984; Lepore, Allen, & Evans, 1993; Thorsteinsson, James, & Gregg, 1998; Uchino & Garvey, 1997). Thus, it seems that social support may exert its influence through aiding in recovery from coronary-related events and through delaying the onset of cardiovascular disease (through maintaining lower blood pressure).

While this research on underlying mechanisms has shown a relationship between the receipt of social support and cardiovascular health, a critical element to the social network has been neglected. The original research on the social network documented the benefits of being socially integrated (defined often by group involvement, marriage) and most follow-up studies have explained this relationship through a focus on the receipt of social support within the social network. In explaining the benefits of social integration through what one receives from the network, the provision of social support to others within that social network has been neglected in research on cardiovascular health. While clear health benefits emerge due to receiving support from one's network, we propose that positive health effects of giving social support to others also exist within the social network. It is proposed that the mental health benefits of giving to others (increased satisfaction, self-esteem, and self-efficacy) can lead to better physical health in those who give to others.

Definition of Social Support

Social support has been defined as “the interpersonal exchange of emotional concern, instrumental aid, information, and interpersonal appraisal” (House, Landis, &

Umberson, 1988) and as “persons, behaviors, relationships, or social systems leading an individual to believe that (s)he is esteemed, valued, and cared for as a member of a network of mutual obligations” (Cobb, 1976; Veiel & Baumann, 1992). A significant distinction in researchers’ measurement of social support can be seen in the research on social support and health. The main distinction made is between structural and functional support. Structural support is the existence of social network measured frequently by number of social contacts in one’s life (e.g. number of friends, community organizations involved with). Measurement of functional support includes the receipt of various types of support (e.g. emotional support, information/advice support, recreational support). Early prospective studies examined structural support, while more recent studies have examined functional support.

Social Support and Cardiovascular Health

Among the original research identifying a relationship between the social network and cardiovascular health are the studies which demonstrated a relationship between being socially isolated and an increased risk of incidence of coronary related events (Blumenthal, Burg, Barefoot, Williams, Haney, & Zimet, 1987; Case, Moss, Case, McDermott, & Eberly, 1992; Hedblad, Ostergren, Hanson, & Janzon, 1992; Seeman & Syme, 1987; Strogatz & James, 1986; Venters, Jacobs, Pirie, Luepker, Folsom, & Gillum, 1986; Vogt, Mullooly, Ernst, Pope, & Hollis, 1992; Winnefield, 1982). Furthermore, mortality from coronary related events is higher for socially isolated individuals than those who are socially integrated (Chandra, Szklo, Goldberg, et al, 1983; Friedmann & Thomas, 1995; Irvine, Basinkski, Baker, Jandciu, Paquette, Cairns, Connolly, Roberts,

Gent, & Dorian, 1999; Jenkinson, Madeley, Mitchell, & Turner, 1993; Kawachi, Colditz, Ascherio, Rimm, Giovannucci, Stampfer, & Willett, 1996; Olsen, Olsen, Gunner-Svensson, & Waldstom, 1991; O'Reilly & Thomas, 1989; Orth-Gomer & Johnson, 1987; Orth-Gomer, Rosengren, & Wilhelmsen, 1993; Orth-Gomer, Unden, & Edwards, 1988; Oxman, Freeman, & Manheimer, 1995; Reed, McGee, & Yano, 1984; Ruberman, Weinblatt, Goldberg, & Chaudhary, 1984; Schoenbach, Kaplan, Freedman, & Kleinbau, 1986; Welin, Larsson, Svardsudd, Tiblin, & Tiblin, 1992; Wiklund, Oden, Sanne, et al, 1988; Williams, Barefoot, Califf, et al, 1992). And, recovery from coronary related events is often quicker and more complete in those with a supportive network than in individuals who report social isolation (Ell & Haywood, 1984; Fontana, Kerns, Rosenberg, & Colonese, 1989; Helgeson, 1991; King, Reis, Porter, & Norsen, 1993; Kleman, Bickert, Karpinski, Wantz, & Jacobsen, 1993; Kulik & Mahler, 1989, 1993; Lynch, Thomas, & Paskewitz, 1977; Yates, 1995).

Studies of cardiovascular morbidity consistently demonstrate that individuals who are socially isolated have greater risk of heart attacks, coronary artery disease, and stroke. Case et al (1992) studied 1234 males for 1-4 years following a myocardial infarction finding that individuals who were socially isolated (measured by living alone versus with a companion) had a greater risk of recurrent cardiac events than those who were not socially isolated. Similarly, in their study of 394 men, Hedblad et al (1992) found that having little material, informational, and emotional support was predictive of cardiac events (fatal or nonfatal myocardial infarction or death due to chronic ischaemic heart disease). Irvine et al (1999) also found that the psychosocial predictors of increased sudden cardiac death risk among 671 myocardial infarction patients were few social

contacts and low social participation. Seeman & Syme (1987) assert that instrumental support and feelings of love from friends and family is more important in predicting cardiovascular health than network size. In their study, 119 men and 40 women undergoing coronary angiography were interviewed concerning personality and social support network among other physical variables. Results from this study revealed that coronary atherosclerosis was predicted by instrumental and loving support more than by network size. Thus, the number of people in one's network may not be as important a variable as the actual support one receives from that network.

In addition to studies on social integration and incidence of cardiovascular illness, research has found that recovery and mortality from coronary-related events also is related to social support. Individuals who are socially integrated have greater recovery and lower mortality rates due to a cardiac event than individuals who are not socially integrated. In their study of 1401 individuals who had experienced acute myocardial infarction, Chandra et al. (1983) found a relationship between survival and marriage. Their study compared in-hospital fatality rates and 10-year survival rates for supported and unsupported individuals (operationalized by marital status). Their results showed a significantly higher rate of in-hospital fatality among unmarried participants than married participants and a significantly greater 10-year survival rate for married participants compared to unmarried patients. Friedmann & Thomas (1995) obtained 1-year survival data from 369 post-myocardial infarction patients with varying levels of social support. High social support was predictive of survival in these patients one year after a heart attack. Similarly, Orth-Gomer et al. (1988) investigated the rate of mortality during an 8-year period among 150 men. Psychosocial questionnaires assessed their levels of social

activities, personality, and other health variables at the commencement of the study.

Three independent predictors of mortality within the 8-year period emerged: a low level of social activities, high frequency of ventricular arrhythmias, and a depressive emotional personality.

Following the establishment of a relationship between social integration and cardiovascular longevity, many researchers began to focus on acute cardiovascular responses in order to predict cardiovascular longevity. Among this research are studies that examine resting blood pressure in socially isolated and integrated individuals. Many researchers have examined blood pressure and heart rate measurements taken in a laboratory or at home in high and low socially integrated individuals (Bland, Krogh, Winkelstein, & Trevisan, 1991; Cottington, Brock, House, & Hawthorne, 1985; Dressler, 1980; Dressler, 1983; Dressler, 1991; Dressler, Mata, Chavez, Viteri, & Gallagher, 1986; Dressler, Dos Santos, & Viteri, 1986; Dressler, Grell, Gallagher, & Viteri, 1992; Gillsman, Lazarua, Wilson, & Leeder, 1995; Graham, Kaplan, Cornoni-Huntley, 1978; Horsten, Ericson, Perski, Wamala, Schenck-Gustafsson, & Orth-Gomer, 1999; Janes, 1990; Janes & Pawson, 1986; Knox, 1985; Knox, 1993; Lercher, Hortnagl, & Kofler, 1993; Livingston, Levine, & Moore, 1991; Malcolm & Janisse, 1991; Stavig, Igra, & Leonard, 1984; Uchino, Cacioppo, Malarkey, Glaser, & Kiecolt-Glaser, 1995; Uchino, Holt, Uno, Betancourt, & Garvey, 1999). Consistent results have emerged among these studies, such that socially integrated individuals display significantly lower blood pressure and heart rate than those who are not socially integrated. Bland et al (1991) interviewed 1,409 adults at home. During each interview, blood pressure, health related behaviors, and the social network were measured. The social network was assessed by

the sum of the number of members in the household, number of siblings, number of clubs and meetings attended, and marital status. After adjustment for traditional physical covariates (body mass index, smoking), social network scores were negatively correlated with systolic blood pressure (SBP) and diastolic blood pressure (DBP). Separate analyses for individual social network components revealed that the number of people in the household and participation in clubs was negatively related to SBP in men only, while number of siblings was negatively related to SBP and DBP in women. Dressler, Mata, Chavez, Viteri, & Gallaher (1986) measured blood pressure and perceived support from relatives and neighbors during six problem situations (e.g. illness, debt, job difficulties) in 147 Mexican participants. After controlling for age, education, and occupational status, perceived support from relatives and friends was negatively correlated with SBP and DBP in men. For women, perceived support was positively related to DBP in younger women, but negatively correlated to DBP in older women. In a study of 94 Samoan men and women, Janes (1990) found that social resources (e.g. church attendance, close friends in the area, number of visits with relatives) and instrumental support (number of times a friend/relative has babysit, helped with job searches) were negatively correlated with SBP and DBP. Furthermore, Janes (1990) found that an interaction existed between stress and instrumental support for mean arterial pressure (MAP) in female participants. Women who reported high levels of stress and social support demonstrated lower MAP than women who reported high levels of stress and no social support. No significant relationship between social support and MAP existed for women who reported low stress levels. It is suggested that social support exerts a stress-buffering effect such that support moderates the negative reactions to daily stressors. This stress-buffering effect of social

support also can be seen in a study of a naturally occurring stressor by Kasl & Cobb (1980). Systolic blood pressure and diastolic blood pressure among 174 men was measured at five time periods: anticipation of a job loss, termination, 6 months after job loss, 12 months after job loss, and 24 months after job loss. Both SBP and DBP changes following a job loss were negatively associated with perceived social support from wife, friends, and relatives. Similar to Janes (1990), it seems that social support buffers an individual from the potentially health damaging effects of stress.

In addition to the studies which examine baseline blood pressure measured at home or in office/laboratory settings, many studies have focused on ambulatory blood pressure levels during a working day (Benotsch, Christensen, & McKelvey, 1997; Brownley, Light, & Anderson, 1996; Carels, Blumenthal, & Sherwood, 1998; Linden, Chambers, Maurice, & Lenz, 1993; Spitzer, Llabre, Ironson, Gellman, & Schneiderman, 1992; Steptoe, Lundwall, & Cropley, 2000; Unden, Orth-Gomer, & Elofsson, 1991). Spitzer et al (1992) found that social situations affected participants' blood pressure throughout a normal day. During an average day, they found blood pressure levels were highest when participants were among strangers and lowest among family members. Unden et al (1991) also assessed ambulatory blood pressure in 148 individuals throughout a 24-hour period. Perceived social support at work was associated with lower HR during sleep, work, and leisure time. Furthermore, perceived social support was associated with lower overall systolic blood pressure. Similarly, Carels et al (1998) found high perceived support from others to be associated with lower systolic blood pressure and diastolic blood pressure at work, home, and during sleep.

Additionally, Steptoe (2000) found that social support was associated with lower ambulatory blood pressure throughout a working day. This result was qualified, however, by an interaction with stress such that those with high social support had equal systolic blood pressure in low and high stress situations while those with low reported social support had significantly higher systolic blood pressure during high stress situations than low stress situations. This research is explained in terms of the stress-buffering effect of social support. As seen in this study, individuals with high social support are shielded from the physiological increases due to stress.

The above research firmly demonstrates that being part of a social network is associated with cardiovascular health, recovery from coronary related illnesses, lower resting blood pressure levels, and lower ambulatory blood pressure levels. In an attempt to explain the underlying processes involved in the relationship between social support and cardiovascular health, many studies have proposed the cardiovascular reactivity hypothesis. This hypothesis can be explained two ways: the personality or individual difference definition and the situational definition. The personality or individual difference approach asserts that individuals who possess a trait of heightened cardiovascular and neuroendocrine responding are at a greater risk for developing cardiovascular disorders. The situational approach maintains that circumstances that induce high levels of cardiovascular responses place individuals at risk for cardiovascular illness. Researchers initially began to explore cardiovascular reactivity using the situational approach, through studies in which individuals endured stressful situations with and without support from a bystander. It has been proposed that the stress of certain

situations can produce heightened physiological reactivity and that social support can moderate the effects of stress, thus lowering these physiological reactions.

Among the research demonstrating the effect of social support on acute laboratory reactivity are studies that show reduced reactivity to a stressor when support is present (Fontana, Diegnan, Villeneuve, & Lepore, 1999; Gerin, Peiper, Levy, & Pickering, 1992; Kamarck, Manuck, & Jennings, 1990; Kiecolt-Glaser & Greenberg, 1984; Lepore, Allen, & Evans, 1993; Thorsteinsson, James, & Gregg, 1998; Uchino & Garvey, 1997). Gerin et al. (1992) monitored participants engaged in a group discussion of a controversial issue. Participants were challenged by two members of the group and either received support or neutral responses from the third member of the group. Systolic blood pressure, diastolic blood pressure, and heart rate were higher in participants when they were not supported by the third member of the group than when they were supported. Similarly, Kamarck et al. (1990) found reduced heart rate and systolic blood pressure reactivity among participants when supported during a stressful interview than when not supported. Lepore et al. (1993) also found less systolic blood pressure reactivity among participants during a speech stressor when they were supported than when they were alone or unsupported. Uchino & Garvey (1997) also found that having support available (if needed) reduced participant's cardiovascular reactivity to a speech stressor. Participants who were told that the experimenter would be available to help if they needed assistance displayed lower systolic blood pressure and diastolic blood pressure than participants who were not told that assistance was available.

Research of the social network and cardiovascular health is fairly consistent: social support benefits one's cardiovascular health. However, investigation of the

research studies conducted to date reveals differences in methodology employed. The major difference is in the measurement of social support. Many of the early studies demonstrating a relationship between social support and incidence of heart attack, stroke, and cardiovascular illness measure social support structurally. And, it is consistently shown that mere presence of a social network (e.g. number of siblings, number of friends, number of clubs/organizations enrolled in) is related to cardiovascular longevity and health. Studies which have explored the mechanism(s) underlying this finding have measured social support functionally (e.g. perceived love from others, instrumental support and tangible assistance received). While studies of cardiovascular longevity demonstrate the benefits of being social integrated, most researchers seem to have explained this relationship with regard to receiving support from the network. Both Berkman (1995) and Cohen et al. (1994) outlined their theories of social support in terms of receiving information, tangible assistance, and self-esteem from the support network. Few have acknowledged the potential benefits of the social network in terms of what one gives to others in their network. Early studies report that being a part of a network is health promoting and yet researchers have focused only on what one receives from the network. Recall that social support has been defined as “interpersonal *exchange* of emotional concern, instrumental aid, information, and interpersonal appraisal” (House, Landis, & Umberson, 1988) and as “persons, behaviors, relationships, or social systems leading an individual to believe that (s)he is esteemed, valued, and cared for as a member of a network of *mutual* obligations” (Cobb, 1976; Veiel & Baumann, 1992). These definitions emphasize the interpersonal exchange and mutual obligations between members of the network and yet, current research focuses only on receiving. Research

now must investigate the health and cardiovascular correlates of giving to others in one's network in order to completely understand the relationship between the social network and cardiovascular health.

The present study was conducted in order to investigate the cardiovascular health correlates of giving to others. We propose that the enhanced self-esteem and self-efficacy described by Berkman (1995) and Cohen et al (1994) as a result of being socially integrated could be a result of satisfaction in one's provision of support to others, in addition to resulting from receiving support. Research has shown that individuals who help others experience satisfaction, happiness, and esteem from giving (Simmons, 1991; Switzer, Simmons, Dew, & Regalski, 1996; Williams, Haber, Weaver, & Freeman, 1998). It seems likely that the mental health benefits received from giving may lead to physical health benefits. The increased confidence, self-esteem, and self-efficacy felt by givers may lead an individual to feel less depression and stress, both of which have been associated with illness. In fact, research examining giving social support to others reveals a positive relationship between giving to others, self-esteem, self-efficacy, and a negative relationship between giving to others and depression, stress, and physical symptoms of illness (Litwin, 1998; Piferi & Lawler, submitted; Schwartz & Sendor, 1999). Furthermore, individuals who have a high tendency to give social support to others exhibit lower resting systolic blood pressure, diastolic blood pressure, and heart rate than individuals who report a low level of giving to others (Piferi & Lawler, submitted). Thus, it seems likely that giving to others can produce mental health benefits that aid an individual in dealing with stress. And through this reduction of stress,

individuals who give to others may demonstrate better physical health than those who do not give to others.

Some benefits of giving to others have been shown in various populations such as the elderly and volunteers. Litwin (1998) investigated the personality and health correlates of social support provision in his study of 140 elderly residents of an assisted living facility. He found social support provision scores to be positively correlated with physical health and mental health. Individuals who reported advising or helping others frequently also reported fewer stressors, fewer physical symptoms of disease, and greater overall positive affect. While one cannot infer causality from cross-sectional correlations, it is possible that by giving to others, these individuals experienced the positive mental and physical health benefits. This is consistent with earlier literature which states that elderly individuals report greater life satisfaction (Antonucci, Fuhrer, & Jackson, 1990; Black, 1985; Stevens, 1992), greater happiness (Antonucci & Akiyama, 1987), and greater self-esteem (Hawley & Chamley, 1986; Wentkowski, 1981) when they reciprocate the support that they receive from others.

Research examining volunteers also suggests that improvements in an individual's mental and physical health emerge from giving to others. Musick, Herzog, & House (1999) studied volunteerism among older adults and found several positive effects of volunteering. Most importantly, Musick et al (1999) found effects for mortality among this sample such that those who volunteered for an organization part time had lower mortality rates than those who did not volunteer. Additionally, they found that the mortality effects were strongest for the individuals who reported low levels of informal social interaction in their lives. It seems that giving to others can benefit the health and

mortality of individuals, especially in those who are lacking social interaction.

Schwartz & Sendor (1999) also investigated the effects of giving to others in 67 multiple sclerosis patients. Through a peer telephone support program, the patients who gave support to other patients showed significant increases in confidence, self-awareness, self-esteem and significant decreases in depression over a period of 2 years. They contend that a “response shift” occurred in these patients such that they began to focus on someone other than themselves, and in doing so, ceased focusing on their own illness.

Research Question and Hypotheses

The primary goal of the present research was to examine whether providing informal social support to others is a health benefit due to its association with increased self-esteem and efficacy, and decreased perceived stress. While an extensive social support literature exists, research examining the informal provision of social support is limited. This project explored the informal social network, from the provider's perspective, as a possible moderator of the stress-illness (physical or mental) relationship. We propose that giving to others results in many mental health benefits. Satisfaction with one's giving leads an individual to feel efficacious, resulting in increased self-esteem and less depression. Furthermore, through the feelings of self-efficacy and self-esteem, these individuals can deal more effectively with stress. And, through a reduction of stress, individuals who give to others should display lower blood pressure than those who do not give to others (and consequently, those who have not received the mental health benefits of giving).

Recent research suggests that individuals with a giving personality style experience greater self-esteem and self-efficacy and less depression, stress, and physical illness. Furthermore, those who report a tendency to give to others have a lower resting blood pressure than those who do not give to others (Piferi & Lawler, submitted). Therefore, it seems that giving may be a health-promoting personality characteristic. This project intends to examine this relationship between the tendency to give to others and mental (self-efficacy, self-esteem, depression, stress) and physical health (ambulatory blood pressure and physical symptoms of illness).

The following hypotheses are proposed:

- (a) Participants who report a high tendency to give social support to others will display lower ambulatory blood pressure levels than participants who report a low tendency to give social support to others.
- (b) Participants who report a high tendency to give social support to others will display greater nighttime blood pressure dipping than those who report a low tendency to give social support to others.
- (c) Giving social support to others will be associated with greater positive mood, greater self-esteem, greater self-efficacy, greater received social support, less depression, and less stress.
- (d) A higher tendency to give social support to others will be associated with fewer symptoms of general physical ailments.

CHAPTER 2: METHOD

This study involved the measurement of ambulatory blood pressure, self-reported stress, esteem, depression, and mood, in individuals scoring high and low on tendency to give social support, in order to determine whether a relationship exists between one's giving behavior and mental and physical health.

Participants

The participants were ninety-two undergraduates (38 males, 54 females) from a large southern university. In addition to a free assessment of their cardiovascular health, participants were awarded extra credit in their psychology course for participation. Participants ranged in age from 17 years to 25 years, with a mean age of 19.2, $sd = 1.4$. Seventy-four of the participants were Caucasian (81%), 10 were African-American (11%), 5 were Asian (6%), and 2 were Hispanic (2%).

Procedure

Participants arrived individually at the Health Psychology Laboratory between 7:30 and 9:00 a.m. on a regular school day to begin the experiment. Each subject participated in the experiment on a school day (Monday through Thursday) to maintain consistency in the activities among participants. Upon arrival, participants completed the informed consent, a questionnaire assessing demographics and health behaviors (smoking, alcohol, exercise, etc.), and personality trait measures. The personality trait measures included in the packet were the Tendency to Give Social Support Scale (Piferi

& Lawler, submitted), the Perceived Stress Scale (Levenstein, Prantera, Varvo, Scribano, Luzi, & Andreoli, 1993), the Self-Esteem Scale (Rosenberg, 1965), the Centers for Epidemiological Studies Depression Scale (Radloff, 1978), the Self-Efficacy Scale (Sherer et al., 1982), the Cohen and Hoberman Inventory of Physical Symptoms (Cohen & Hoberman, 1983), the Social Provisions Scale (Cutrona, 1984), and the Inventory of Socially Supportive Behaviors (Barrera, Sandler, & Ramsay, 1981).

Following completion of the questionnaire packet, each participant was fitted for the ambulatory blood pressure monitor (*DynaPulse 5000A Ambulatory Blood Pressure Monitor, Pulse Metrics, Inc.*). The monitor was placed on the non-dominant arm and participants were fully instructed on the use of the ambulatory blood pressure monitor. They were told that the monitor would inflate and deflate regularly throughout the day and that they did not need to operate the monitor. They were also told to contact the experimenter throughout the 24-hour period if they thought the monitor was operating incorrectly (i.e., if it hadn't inflated for a long period off time, if it made strange noises). Participants were instructed to wear the monitor/cuff for the entire 24-hour period. They were instructed to remove the cuff only when bathing or exercising.

Following instruction on use of the monitor, each participant also was given a diary to complete throughout the day. They were instructed to complete a page in the diary every thirty minutes during the day (each time the blood pressure cuff inflates). When sleeping, participants did not record their activities in the diary. Each page asked the subject to record the time, their location, their body position (sitting, standing, lying down), their food or drink consumption since the last reading, their social company (alone, with others), and what they were doing at the time of the reading (such as taking a

test, walking across campus, etc.). Each eight-item diary page was completed with each cuff inflation in order to get a concurrent record of physical and social activity.

Participants also completed a brief questionnaire packet prior to going to bed (see Appendix). This questionnaire packet included the Profile of Mood States (McNair, Lorr, & Droppleman, 1971), the Perceived Stress Questionnaire (Levenstein, Prantera, Varvo, Scribano, Luzi, & Andreoli, 1993), the Self-Esteem Scale (Rosenberg, 1965), and two items asking them how much support they felt that they provided for others and how much support they felt that they received from others during the day. Participants completed this questionnaire packet based on their feelings about that day.

Participants returned at approximately 9:00 a.m. the following morning to return the diary, questionnaire packet, and monitor.

Personality Measures

Tendency to Give Social Support (Piferi & Lawler, submitted). The Tendency to Give Social Support Scale is a 30-item scale that assesses an individual's tendency to provide support to others (see Appendix A). The Tendency to Give Social Support Scale requires participants to respond to items such as "I lend people money when they need it" and "I call those I know to see if they are doing well" on a 5-point scale ranging from "Almost never" to "Almost always." The scale has been shown to be valid through positive correlations with relational trust and interpersonal orientation and negative correlations with social reticence and loneliness. is a reliable measure with an alpha reliability coefficient of .94.

Perceived Stress Questionnaire (Levenstein, Prantera, Varvo, Scribano, Luzi, & Andreoli, 1993). The Perceived Stress Questionnaire is a 30-item scale that assesses an individual's perceived stress. Participants are required to rate how often each item applies to them on a 4-point Likert scale ranging from "Almost never" to "Usually." The scale contains items such as "You have too many decisions to make," "You feel tense," and "Your problems seem to be piling up" that are reported to measure how tense and pressured an individual feels. The scale has been shown to be reliable with a reported alpha coefficient of .92. Validity of the scale has been shown through positive correlations between the Perceived Stress Scale and depression, self-rated stress, and stressful life events.

Inventory of Socially Supportive Behaviors (Barrera, Sandler, & Ramsay, 1981). The Inventory of Socially Supportive Behaviors is a 40-item scale that measures the amount of support that an individual receives from others. This scale requires participants to assess how frequently in the last month, someone performed various supportive behaviors for them. The scale is a 5-point Likert scale ranging from "Did not happen at all" to "Happened about every day." Items represent various types of social support such as "Provided you with a place that you could stay for awhile" and "Let you know that you did something well." The scale has been shown to be reliable with an alpha coefficient of .93. Validity has been demonstrated by positive correlations between the Inventory of Socially Supportive Behaviors and network size and perceived support of family.

Cohen-Hoberman Inventory of Physical Symptoms (Cohen & Hoberman,

1983). The Cohen-Hoberman Inventory of Physical Symptoms is a 33-item scale assessing the frequency of various physical ailments. Respondents are required to rate how frequently various common physical symptoms have been a part of their life over the past month (i.e. back pain, headache, stuffy head or nose, nausea, constant fatigue). The scale is a 4-point Likert scale ranging from “Not at all a part of my life” to “Very much a part of my life.” The scale has been shown to be a reliable with a reported alpha coefficient of .88.

Self-Efficacy Scale (Sherer et al, 1982). The Self-Efficacy Scale is a 30-item

measure of one’s self-confidence and capability to achieve. This scale requires respondents to rate themselves on a 5-point Likert scale ranging from “Disagree strongly” to “Agree strongly.” Items such as “If I can’t do a job the first time, I keep trying until I can” and “Failure just makes me try harder” assess an individual’s sense of self-efficacy. The scale has been shown to be a reliable measure of self-efficacy with a reported alpha coefficient of .86. Validity of the scale has been demonstrate through positive correlations with interpersonal competence, self esteem, ego strength, and personal control.

Self-Esteem Scale (Rosenberg, 1965). The Self-Esteem Scale is a 10-item

measure of one’s sense of self-worth. It contains items such as “I feel that I have a number of good qualities” and “On the whole, I am satisfied with myself.” Participants are required to respond to the items on a 4-point Likert scale ranging from “Strongly

disagree” to “Strongly agree.” Validity of the scale has been demonstrated and internal consistency of the scale has been shown to be good with reliability coefficients ranging from .72 to .78 (Rosenberg, 1965; DeLongis, Folkman, & Lazarus, 1988).

Social Provisions Scale (Cutrona, 1984). The Social Provisions Scale is a 24-item scale that assesses one’s social support. Respondents rate their agreement with statements on a 4-point Likert scale ranging from “Strongly disagree” to “Strongly agree.” It contains items such as “There are people I can depend on to help me if I really need it” and “I have close relationships that provide me with a sense of emotional security and well-being.” The scale contains 6 subscales: Attachment, Social Integration, Opportunity for Nurturance, Reassurance of Worth, Reliable Alliance, and Guidance.

Center for Epidemiological Studies Depression Scale (Radloff, 1977). The Center for Epidemiological Studies Depression Scale (CESD) is a 20-item scale that measures one’s level of sadness, hopelessness, and depression. Using a 4-point Likert scale, respondents indicate how often they have felt or behaved this way during the past week. The scale ranges from “less than one day” to “five to seven days.” The scale contains items such as “I felt depressed,” “I had crying spells,” and “I felt fearful.” Validity of the CESD has been demonstrated through positive correlations with clinical ratings of depression.

The Profile of Mood States (McNair, Lorr, & Droppleman, 1971). The Profile of Mood States is a 30-item scale that measures one’s recent mood. Respondents are asked to rate how well a list of adjectives corresponds to their feelings on a scale of 1 (not at

all) to 5 (extremely). Positive mood and negative mood are assessed. Items contain negative adjectives such as tense, angry, grouchy, and furious and positive adjectives such as energetic, vigorous, full of pep, and lively.

Physiological Measurements

Cardiovascular measurements included heart rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure. These measurements were obtained every 30 minutes from 09:00 until 23:00 and every 60 minutes from 23:00 until 09:00. Measurements were recorded and stored by the DynaPulse 5000A Ambulatory Blood Pressure Monitor (*Pulse Metrics, Inc., San Diego, CA*).

Apparatus

The Dynapulse 5000A ambulatory blood pressure monitor is a small, lightweight, battery operated monitor which uses an oscillometric blood pressure monitoring method. The unit consists of a cuff with a microphone which is placed over the brachial artery on the upper arm and a small unit which stores the readings from a 24-hour period. Following each 24-hour measurement period, readings were downloaded into a computer using software which organizes and stores the measurements for each participant (Ambulatory Blood Pressure Analysis Version 2.2). The monitors were programmed to inflate every 30 minutes during daytime hours (09:00 – 23:00) and every 60 minutes during nighttime hours (23:00 – 08:00). The Dynapulse 5000A detects and records errors and the monitor was programmed to attempt a second measurement if error occurred. After completion of the study, all measurements were edited for invalid measurements.

Data were also removed if diary entries indicated that the participant had just engaged in strenuous activity. When one measurement was eliminated, the corresponding BP and HR values at that time also were eliminated. Data were edited without regard to gender and social support classification.

CHAPTER 3: RESULTS

Data Analyses

The statistical package SPSS 10.0 was used to analyze the data. Primary analyses included the analysis of the cardiovascular data based on mean daytime (09:00 – 18:00), mean evening (18:00 – 23:00), and mean sleeping (bedtime – 06:00) levels of SBP, DBP, MAP, and HR (similar to Shapiro, Jamner, & Goldstein, 1997). Participants had an average of 14 valid readings during the daytime, 8 valid readings during the evening, and 5 valid readings during the nighttime. Initial examination of the relationship between giving social support and ambulatory blood pressure included a 2 X 2 (giving social support X gender) multivariate analysis of variance (MANOVA) with daytime SBP, DBP, MAP, and HR as dependent variables. Two additional MANOVAs were computed with mean evening SBP, DBP, MAP, and HR and mean nighttime SBP, DBP, MAP, and HR as dependent variables. A median split of Tendency to Give Social Support scores divided participants into high and low tendency to give groups. The high giving group consisted of those with a TGSS score of 113 to 150 with a mean score of 130.0, $sd = 10.1$. The low giving group consisted of those with a TGSS score of 68 to 112 with a mean score of 95.6, $sd = 10.7$. A significant gender difference existed in TGSS score, with females scoring significantly higher than males on the scale ($p < .001$). Scores from male participants ranged from 68 to 137, with a mean score of 104, $sd = 18.2$. Scores from female participants ranged from 73 to 150, with a mean score of 118.5, $sd = 19.5$. The low giving group consisted of 25 males and 20 females and the high giving group consisted of 11 males and 33 females.

Following analyses of mean daytime, evening, and nighttime levels, differences in diurnal and nocturnal cardiovascular levels (BP dipping) were also examined. Shallow declines in nocturnal blood pressure compared with diurnal blood pressure (BP dipping) have been associated with cardiovascular disease (Berdecchia, Clement, Fagard, Palatini, & Parati, 1999). Therefore, due to its association with long term cardiovascular health, blood pressure dipping was included in the present analyses. A 2 X 2 (gender X giving social support) multivariate analysis of variance was computed with SBP, DBP, MAP, and HR dipping entered as dependent variables. Dipping was calculated by subtracting the mean nighttime blood pressure from mean waking blood pressure (09:00 – 23:00).

The final analysis of the effect of tendency to give support on blood pressure included comparisons of cardiovascular measurements in five commonly encountered situations: alone, studying, attending class, socializing with friends, and watching television. A 2 X 2 (gender X giving social support) multivariate analysis of variance with SBP, DBP, MAP, and HR as dependent variables was computed for each of the five situations in order to determine in which situations one's tendency to give social support has an effect on blood pressure.

In order to determine the psychosocial and health correlates of one's tendency to give social support, correlations were computed between the Tendency to Give Social Support Scale and the Perceived Stress Scale (Levenstein, Prantera, Varvo, Scribano, Luzi, & Andreoli, 1993), the Self-Esteem Scale (Rosenberg, 1965), the Centers for Epidemiological Studies Depression Scale (Radloff, 1978), the Self-Efficacy Scale (Sherer et al., 1982), the Cohen and Hoberman Inventory of Physical Symptoms (Cohen & Hoberman, 1983), the Social Provisions Scale (Cutrona, 1984), and the Inventory of

Socially Supportive Behaviors (Barrera, Sandler, & Ramsay, 1981). Total scores on the Perceived Stress Scale ranged from 49 to 107 (mean = 75.9, sd = 8.5). Scores on the Social Provisions Scale ranged from 65 to 94 (mean = 72.9, sd = 8.5). Total scores of depression ranged from 20 to 60 (mean = 33.9, sd = 8.6). Scores on the Inventory of Socially Supportive Behaviors ranged from 50 to 170 (mean = 100.7, sd = 25.2). Self-esteem scores ranged from 15 to 51 (mean = 28.8, sd = 4.8) and self-efficacy scores ranged from 81 to 141 (mean = 109.2, sd = 13.0). Scores on the Cohen-Hoberman Inventory of Physical Symptoms ranged from 32 to 81 (mean = 49.2, sd = 9.9).

Gender Differences in ABP

In the analysis of mean daytime, evening, and nighttime blood pressure, the 2 X 2 (gender X giving social support) MANOVA revealed main effects for gender such that males had significantly higher SBP than females during the daytime ($F(1,76) = 10.5, p < .01$) and evening ($F(1,73) = 5.5, p < .05$). Males also had higher DBP ($F(1,73) = 3.6, p < .05$) and MAP ($F(1,73) = 4.1, p < .05$) during the evening than females. Females had significantly higher HR during the daytime ($F(1,76) = 7.5, p < .01$) and during the nighttime ($F(1, 62) = 12.2, p < .001$) than males. Table 1 shows the mean values by gender for daytime, evening, and nighttime periods.

Main effects for gender were also evident during the following situations throughout the day: watching television, attending class, socializing with friends, and studying. Males had significantly higher SBP than females while watching television ($F(1, 60) = 10.8, p < .001$). While attending class, males had significantly higher SBP

($F(1, 59) = 17.7, p < .001$) and MAP ($F(1, 59) = 5.1, p < .05$) than females. While socializing with friends, males had significantly higher SBP ($F(1, 58) = 5.1, p < .05$) than females. While studying, males had higher SBP ($F(1, 63) = 6.2, p < .05$) and MAP ($F(1, 63) = 4.4, p < .05$) than females.

No main effects for gender were found for nighttime dipping.

Giving Social Support and ABP

Investigation of the effect of Tendency to Give Social Support on blood pressure included three 2 X 2 (gender X giving social support) MANOVAs for daytime, evening, and nighttime levels of SBP, DBP, MAP, and HR. There were no main effects of giving social support on daytime, evening, or nighttime blood pressure. An interaction between gender and giving social support emerged for nighttime MAP ($F(1, 60) = 6.9, p < .01$), nighttime DBP ($F(1, 60) = 6.5, p < .01$), and nighttime SBP ($F(1, 60) = 5.2, p < .05$). As can be seen by Figure 1, males who reported a high tendency to give social support had significantly lower nighttime SBP ($F(1, 25) = 4.1, p < .05$), lower nighttime DBP ($F(1, 25) = 5.0, p < .05$), and lower nighttime MAP ($F(1, 25) = 5.3, p < .05$) than males who reported a low tendency to give social support to others. No significant differences emerged in nighttime SBP, DBP, and MAP for females with high and low tendency to give social support. Furthermore, males who reported giving social support to others had nighttime SBP, DBP, and MAP similar to females in both categories. No significant interactions emerged for daytime values.

Giving Social Support and Nighttime Dipping

To investigate further the effect of giving social support on blood pressure, the association between giving social support and nighttime dipping was also evaluated. A 2 x 2 (gender X giving social support) MANOVA was computed with SBP dipping, DBP dipping, MAP dipping, and HR dipping entered as dependent variables. There was a significant main effect of giving social support on SBP dipping ($F(1, 60) = 5.5, p < .05$) and MAP dipping ($F(1, 60) = 3.9, p < .05$). The main effect of giving social support on DBP dipping was marginally significant ($F(1, 60) = 2.7, p < .10$). There was no significant interaction with gender. As can be seen by Table 2, those with a high tendency to give to others have greater SBP and MAP dipping than those with a low tendency to give to others.

Giving Social Support and Blood Pressure in Various Situations

Blood pressure was recorded on a typical school day to maintain consistency in activities among participants. While inconsistency in daily activities existed, there were five common activities in which most of the participants engaged: attending class, watching television, studying, socializing with friends, and sitting alone (usually while reading a magazine, thinking or writing letters). Five separate 2 X 2 (gender X giving social support) MANOVAs were computed for each situation with SBP, DBP, MAP, and HR as dependent variables. Blood pressure and heart rate did not differ significantly between high and low givers while in class, while socializing with friends, nor while studying. A significant main effect of giving social support emerged for SBP while alone such that high givers displayed lower SBP than low givers, $F(1, 55) = 4.9, p < .05$.

This was qualified, however, by an interaction between giving social support and gender, $F(1, 55) = 4.0, p < .05$. An additional interaction between giving social support and gender emerged for MAP while alone, $F(1, 55) = 4.4, p < .05$. As can be seen by Figure 2, male participants who reported a high tendency to give social support had significantly lower SBP and MAP while alone than males who reported a low tendency to give social support. No significant difference existed for high and low giving females. Similar to interaction between gender and tendency to give social support on nighttime levels of SBP, DBP, and MAP, the high giving males had blood pressure similar to the females in both categories while alone.

A marginally significant interaction between gender and giving social support also existed for DBP while watching television ($F(1, 60) = 2.9, p = .09$). This relationship is similar to the interaction that emerged for blood pressure while alone such that high giving males displayed lower DBP than low giving males while watching television. No difference in DBP emerged for high and low females. And, males who reported a high tendency to give social support had DBP similar to females in both groups while watching television.

Giving Social Support and Psychosocial Characteristics

To examine the relationship between one's tendency to give social support to others and other psychosocial characteristics, correlation coefficients were computed between the Tendency to Give Social Support Scale and the following inventories: Social Provisions Scale, Inventory of Socially Supportive Behaviors, Rosenberg Self-Esteem Scale, Self-Efficacy Scale, the Profile of Mood States, and the CESD. The

Tendency to Give Social Support was negatively correlated with depression ($r = -.217$, $p < .05$) and positively correlated with received social support as measured by the Inventory of Socially Supportive Behaviors ($r = .479$, $p < .001$), self-efficacy ($r = .553$, $p < .001$), Social Provisions Scale Factor 3 - Opportunity for Nurturance ($r = .234$, $p < .05$), and Social Provisions Scale Factor 5 – Reliable Alliance ($r = .201$, $p < .05$). The correlation between self-esteem and Tendency to Give Social Support was marginally significant ($r = .177$, $p < .10$). The Tendency to Give Social Support also correlated with state characteristics assessed on the day of monitoring. The TGSS was positively correlated with reported support provided on day of monitoring ($r = .345$, $p < .001$) and reported support felt on day of monitoring ($r = .275$, $p < .01$). Tendency to Give Social Support was negatively correlated with reported stress during day of monitoring ($r = -.245$, $p < .05$). Furthermore, assessment of mood on the day of monitoring revealed a positive correlation between giving social support and the Vigor subscale of the Profile of Mood States ($r = .472$, $p < .001$). The relationship between the Tendency to Give Social Support and the previous psychosocial variables did not differ by gender.

Due to the established relationship between stress and blood pressure and between received social support and blood pressure, all multivariate analyses of blood pressure were re-computed with stress and received social support as covariates. The inclusion of these two variables as covariates did not alter the results reported previously. Therefore, even though giving social support is associated with less perceived stress and greater received social support, Tendency to Give Social Support exerts a unique influence on blood pressure.

Giving Social Support and Perceived Physical Health

To examine the relationship between one's tendency to give social support to others and perceived physical health, a 2 X 2 (high/low TGSS X gender) ANOVA was computed with perceived health as the dependent variable. Individuals with a low tendency to give social support reported slightly more physical illness than those with a high tendency to give social support to others, $F(1,89) = 2.6, p < .10$. Mean score on the Cohen-Hoberman Inventory of Physical Symptoms was 50.6, $sd = 1.5$ for low social support providers and 46.9, $sd = 1.7$ for high social support providers. There was no significant interaction with gender.

CHAPTER 4: DISCUSSION

The relationship between the social network and blood pressure has been studied extensively. However, the research is dominated by a focus on the cardiovascular benefits of receiving social support. Individuals who report receiving support from others have displayed lower resting blood pressure, less cardiovascular reactivity to laboratory stressors, and lower ambulatory blood pressure. Research has not examined the effects of giving social support to others on blood pressure. While resting laboratory blood pressure has been shown to be related to tendency to give social support, this study is the first to examine ambulatory blood pressure among high and low social support providers. The purpose of the present study was to examine the relationship between one's level of giving to others and ambulatory blood pressure. It was hypothesized that those who had a high level of giving to others would display lower blood pressure than those who report a low tendency to give to others. The data reported herein suggest that individuals who give social support to others experience cardiovascular health benefits.

The effect of the tendency to give social support on blood pressure was evident in nighttime resting values. Both nighttime dipping and mean levels displayed the expected relationship between the tendency to give social support and blood pressure. First, mean blood pressure levels at night were lower for those who reported a high tendency to give social support than for those who reported a low level of giving support. This was qualified by an interaction with gender. Males who reported a high tendency to give social support to others had lower nighttime blood pressure than males who reported a low tendency to give social support. No significant difference in mean nighttime blood

pressure levels was found for low and high giving female participants. While an interaction between gender and giving social support existed in mean nighttime levels, examination of nighttime dipping, revealed similar effects for males and females. Individuals who reported a high tendency to give social support to others showed greater nighttime dipping of systolic blood pressure and mean arterial pressure than individuals with a low tendency to give support to others. Thus, while females did not display differences in blood pressure levels due to giving social support, they did display a difference in nighttime dipping due to giving social support. For both males and females, individuals who reported a high tendency to give to others had greater nighttime dipping than those individuals who reported not giving to others.

While mean daytime values were not significantly associated with giving social support, two situations during the day revealed a significant association between giving support and blood pressure in men. Systolic blood pressure and mean arterial pressure while alone were lower among high giving males than among low giving males and a trend towards this relationship also existed for diastolic blood pressure while watching television.

These results suggest that a relationship exists between giving to others and blood pressure during a 24-hour period. Differences did not exist while individuals were active, but were revealed while individuals rested. For males, one's tendency to give to others was associated with lower blood pressure levels when alone, watching television, and sleeping. Additionally, cardiovascular recovery from one's day, as reflected in nighttime dipping, was related to tendency to give social support for males and females.

It seems that when resting, one's tendency to give social support to others is associated with lower blood pressure.

The results found in the present study are important due to the established relationship between resting blood pressure and cardiovascular health. High resting blood pressure in youth has been found to be predictive of hypertension and cardiovascular illness (Berenson, Cresanta, & Webber, 1984; Hosack, Bruce, Fisher, & Hofer, 1983; Thomas & Duszynski, 1982). Furthermore, shallow declines in nocturnal blood pressure compared with diurnal blood pressure (BP dipping) have been associated with cardiovascular disease (Berdecchia, Clement, Fagard, Palatini, & Parati, 1999). The present study found significant differences in resting blood pressure (both during the waking hours when alone and at night) and in blood pressure dipping between those who report a high and low tendency to give social support. These data suggest that giving to others benefits one's cardiovascular health through the demonstration of greater blood pressure recovery in high giving individuals.

However, it seems that the relationship between giving social support and blood pressure is stronger for males than for females. While a relationship between nighttime dipping and tendency to give social support existed for females, there was no significant relationship between nighttime levels of blood pressure and tendency to give social support. Furthermore, there was no significant relationship between giving social support and blood pressure while resting quietly alone, as there was for male participants. The lack of a significant blood pressure difference between high and low giving females may be due to the lack of inclusion of truly low giving females. The scores on the Tendency to Give Social Support Scale were significantly higher for females than for males, thus

the females in the low giving category were on the high-end of giving. And, research on helping behavior has shown that women spend more time helping others, give higher quality of help, and feel more sympathy and empathy towards friends (George, Carroll, Kersnick, & Calderon, 1998). In the present sample, it seems likely that females with a truly low tendency to give social support were not studied. Even though their scores fell into a range of “low givers” based on sample means, the low giving females were probably still relatively highly giving. Utilization of a tertiary split of Tendency to Give Social Support scores on a larger sample (with a broader range of scores) may have revealed a significant difference in blood pressure for high and low giving female participants.

Another explanation for the interaction with gender may be that giving social support to others is a construct that is more relevant to the health of men than of women. Studies of gender differences in giving reveal that men are less likely to help others than women (Belansky & Boggiano, 1994; George et al., 1998). Because most men are not highly giving, investigations of the few who do report supporting others reveal the significant differences in blood pressure. It is interesting to note that the blood pressure levels of men who give were equal to the blood pressure of the female in both categories. While men typically display higher blood pressure than women, this study shows that men who possess a traditionally female trait of giving display blood pressure similar to females. Future research should examine this further in order to determine if the typical blood pressure differences between men and women is due to physical differences or due to psychosocial differences between men and women.

In addition to cardiovascular health, examination of the psychosocial characteristics associated with giving to others suggests a relationship between giving to others and mental health. Having a high tendency to give to others was associated with less daily stress, less depression, higher self-esteem, higher self-efficacy, and greater received social support. Each of these psychosocial correlates has been associated with cardiovascular health in previous studies. One could argue that the cardiovascular health benefits of giving to others are confounded by its association with less stress and greater received social support, two variables previously shown to be related to blood pressure. However, controlling for stress and received social support did not alter the relationship between giving social support and blood pressure. This suggests that giving to others is a unique trait that affects blood pressure.

Research on volunteers suggests that giving to others through organized volunteer work benefits the volunteer through enhancement of self-esteem and self-efficacy. Similarly, the present data demonstrate a relationship between giving informal social support to others and the psychological benefits of increased self-efficacy and self-esteem. Furthermore, individuals who reported a high tendency to give social support to others reported less depression and less stress than those who did not report a high tendency to give to others. It seems likely that through increased self-esteem and self-efficacy, individuals who give support to others are able to cope with daily stressors, thus reporting less stress, less depression, and consequently lower resting and nighttime blood pressure. Giving to others may reliably increase positive social responses from others and may increase one's own sense of value and meaningfulness of life. Through the positive affect received from giving to others, individuals experience less negative affect

such as stress and depression. As evidenced by the nighttime dipping, those who report giving to others were able to recover from their day more than those who reported a low level of giving to others. While it cannot be tested with the present cross-sectional data, we proposed that giving to others can increase one's sense of self-esteem and self-efficacy which can, in turn, influence one's perceptions of stress and eventual physical health. Thus, giving to others may delay the progression of disease due to the mental health benefits of providing for others.

Limitations

The first limitation of the present study is its utilization of college students as participants. In order to explore fully the effects of giving social support on cardiovascular health, future studies should examine this relationship in older adults. Additionally, due to the cross-sectional nature of the study, it is impossible to test the theoretical associations proposed herein. We theorize that by giving to others, one gains self-esteem and self-efficacy which helps him/her cope effectively with stressors and maintain health. However, because the data are cross-sectional and correlational, it is not possible to confirm that direction of the relationship. It is quite possible that individuals who do not have high levels of stress and who are efficacious are the individuals who are more likely to assist others. Future research on giving to others would benefit from a longitudinal design which will allow for analyses of within subjects changes due to giving support to others.

Future Research

Ambulatory blood pressure has been shown to be a better predictor of long term cardiovascular health than single office resting blood pressure or cardiovascular reactivity (Berdecchia, Clement, Fagard, Palatini, & Parati, 1999). This is due primarily to the collection of additional data through ambulatory measurement that cannot be obtained in the office (i.e., nighttime levels, dipping). Therefore, future studies should examine ambulatory blood pressure when making inferences about cardiovascular health. Additionally, in order to study the theory of social support provisions provided herein, longitudinal studies must be completed. In order to determine that providing support to others results in increased self-efficacy and self-esteem and consequently less depression and less stress, research must utilize a longitudinal design. While the mental health correlates of giving are likely to be the factors responsible for lower blood pressure, this mediating effect remains to be demonstrated.

Future directions may also include the utilization of this theory of social support provisions in the treatment of hypertension. In treating hypertension, medical professionals often prescribe psychosocial methods to reduce the blood pressure of their patients (i.e. stress reduction, social support groups). While previous social support research demonstrated the beneficial effects of being supported by others, this study shows similar benefits of giving to others. Therefore, when attempting to lower one's blood pressure, a patient can take a more active approach to their recovery by giving to others, as opposed to the traditional passive approach to recovery which includes joining support groups and accepting support from others. It is possible that hypertensive patients could lower blood pressure by joining volunteer organizations and giving support

to others. Due to the increased self-efficacy, self-esteem, and decreased stress and depression associated with giving, a systematic prescription of giving social support may be an effective way to reduce hypertension.

In addition to an active approach to recovery, giving social support to others can result in a shift of attention from one's own illness to another person. By focusing on another, one may not dwell on their own illness. Therefore, the depression and stress experienced due to one's own illness may be minimized through a focus on another. Future research should examine this potential shift of attention that results from giving support to others and whether this shift can benefit one's physical health.

Conclusion

Through this study, the informal provision of social support to others has been shown to have beneficial psychological and physical health correlates. This study is the first to study systematically one's tendency to give social support and its effect on cardiovascular health. Future research should examine the social network in terms of what one gives to others. Receiving social support has been well supported as a benefit to cardiovascular health. Research must now focus on the cardiovascular health benefits of giving to others. In showing such a relationship between giving and cardiovascular health, interventions can be implemented that allow a patient a more active role in their recovery and health. Currently, psychosocial interventions include the passive acceptance of support by others. However, if providing social support can also yield cardiovascular health benefits then patients can take a more active role in their own recovery through giving to others.

REFERENCES

Antonucci, T.C. & Akiyama, H. (1987). An examination of sex differences in social support among older men and women. *Sex Roles, 17*, 737-749.

Antonucci, T.C., Fuhrer, R., & Jackson, J.S. (1990). Social support and reciprocity: A cross-ethnic and cross-national perspective. *Journal of Social and Personal Relationships, 7*, 519-530.

Barrera, M., Sandler, I., & Ramsay, T. (1981). Preliminary development of a scale of social support: studies on college students. *American Journal of Community Psychology, 9*, 435-447.

Belansky, E.S. & Boggiano, A.K. (1994). Predicting helping behavior: The role of gender and instrumental/expressive self-schemata. *Sex Roles, 30*, 647-661.

Benotsch, E.G., Christensen, A.J., & McKelvey, L. (1997). Hostility, social support, and ambulatory cardiovascular activity. *Journal of Behavioral Medicine, 20*, 163-176.

Berenson, G.S., Cresanta, J.L., & Webber, L.S. (1984). High blood pressure in the young. *Annual Review of Medicine, 35*, 535-560.

Berkman, L.F. (1995). The role of social relations in health promotion. *Psychosomatic Medicine, 57*, 245-254.

Berkman, L.F. & Syme, S.L. (1979). Social networks, host resistance, and mortality: A nine year follow-up study of Alameda County. *American Journal of Epidemiology, 109*, 186-204.

Black, M. (1985). Health and social support of older adults in the community. *Canadian Journal on Aging, 4*, 213-226.

Bland, S.H., Krogh, V., Winkelstein, W., & Trevisan, M. (1991). Social networks and blood pressure: A population study. *Psychosomatic Medicine*, 53, 598-607.

Blazer, D. (1982). Social support and mortality in an elderly community population. *American Journal of Epidemiology*, 115, 684-694.

Blumenthal, J.A., Burg, M.M., Barefoot, J., Williams, R.B., Haney, T., & Zimet, G. (1987). Social support, Type A behavior and coronary artery disease. *Psychosomatic Medicine*, 49, 331-339.

Brownley, K.A., Light, K.C., & Anderson, N.B. (1996). Social support and hostility interact to influence clinic, work, and home blood pressure in Black and White men and women. *Psychophysiology*, 33, 434-445.

Carels, R.A., Blumenthal, J.A., & Sherwood, A. (1998). Psychosocial influences on blood pressure during daily life. *International Journal of Psychophysiology*, 28, 117-129.

Case, R.B., Moss, A.J., Case, N., McDermott, M., Eberly, S. (1992). Living alone after myocardial infarction: Impact on prognosis. *Journal of the American Medical Association*, 267, 515-519.

Cassell, J. (1976). The contribution of the social environment to host resistance. *American Journal of Epidemiology*, 104, 107-123.

Chandra, V., Szklo, M., Goldberg, R., et al (1983). The impact of marital status on survival after an acute myocardial infarction: A population based study. *American Journal of Epidemiology*, 117, 320-325.

Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, 38, 300-313.

Cohen, S., & Hoberman, H.M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology, 13*, 99-125.

Cohen, S., Kaplan, J.R., & Manuck, S.B. (1994) Social support and coronary heart disease: Underlying psychologic and biologic mechanisms. In Shumaker SA, Czajkowski, S.M. (eds), *Social Support and Cardiovascular Disease*. New York, Plenum Press.

Cottingham, E.M., Brock, B.M., House, J.S., & Hawthorne, V.M. (1985). Psychosocial factors and blood pressure in the Michigan statewide blood pressure study. *American Journal of Epidemiology, 121*, 515-529.

Cutrona, C.E. (1984). Social support and stress in the transition to parenthood. *Journal of Abnormal Psychology, 93*, 378-390.

Dressler, W.W. (1980). Coping dispositions, social supports, and health status, *Ethos, 8*, 146-171.

Dressler, W.W. (1983). Blood pressure, relative weight, and psychosocial resources. *Psychosomatic Medicine, 45*, 527-536.

Dressler, W.W. (1991). Social support, lifestyle incongruity, and arterial blood pressure in a southern Black community. *Psychosomatic Medicine, 53*, 608-620.

Dressler, W.W., Mata, A., Chavez, A., Viteri, F.E., & Gallagher, P. (1986). Social support and arterial blood pressure in a central Mexican community. *Psychosomatic Medicine, 48*, 338-350.

Dressler, W.W., Dos Santos, J.E., & Viteri, F.E. (1986). Blood pressure, ethnicity, and psychosocial resources. *Psychosomatic Medicine, 48*, 509-59.

Dressler, W.W., Grell, G.A., Gallagher, P.N., & Viteri, F.E. (1992). Social factors mediating social class differences in blood pressure in a Jamaican community. *Social Science and Medicine*, 35, 1233-1244.

Ell, K. & Haywood, L.J. (1984). Social support and recovery from myocardial infarction: A panel study. *Journal of Social Service Research*, 7, 1-19.

Fontana, A.F., Kerns, R.D., Rosenberg, R.L., Colonese, K.L. (1989). Support, stress, and recovery from coronary heart disease: A longitudinal causal model. *Health Psychology*, 8, 175-193.

Fontana, A.M., Diegnan, T., Villeneuve, A., & Lepore, S.J. (1999) Non-evaluative social support reduces cardiovascular reactivity in young women during acutely stressful performance situations. *Journal of Behavioral Medicine*, 22, 75-91.

Friedmann, E. & Thomas, S.A. (1995). Pet ownership, social support, and one year survival after acute myocardial infarction in the Cardiac Arrhythmia Suppression Trial (CAST). *American Journal of Cardiology*, 76, 1213-1217.

George, D.M., Carroll, P., Kersnick, R., & Calderon, K. (1998). Gender-related patterns of helping among friends. *Psychology of Women Quarterly*, 22, 685-704.

Gerin, W., Pieper, C., Levy, R., & Pickering, T.G. (1992). Social support in social interaction: A moderator of cardiovascular reactivity. *Psychosomatic Medicine*, 54, 324-336.

Gilksman, M.D., Lazarua, R., Wilson, A., & Leeder, S.R. (1995). Social support, marital status and living arrangement correlates of cardiovascular disease risk factors in the elderly. *Social Science and Medicine*, 40, 811-814.

Graham, T.W., Kaplan, B.H., Cornoni-Huntley, J.C. et al (1978). Frequency of church attendance and blood pressure elevation. *Journal of Behavioral Medicine*, 1, 37-43.

Hanson, B.S., Isacson, S.O., Janzon, L., Lindell, S.E., & Rastam, L. (1988). Social anchorage and blood pressure in elderly men - A population study. *Journal of Hypertension*, 6, 503- 510.

Hawley, P. & Chamley, J.D. (1986). Older persons' perceptions of the quality of their human support systems. *Aging and Society*, 6, 295-312.

Hedblad, B., Ostergren, P.O., Hanson, B.S., & Janzon, L. (1992). Influence of social support on cardiac event rate in men with ischaemic type ST segment depression during ambulatory 24-h long-term ECG recording. *European Heart Journal*, 13, 433-439.

Helgeson, V.S. (1991). The effects of masculinity and social support on recovery from myocardial infarction. *Psychosomatic Medicine*, 53, 621-633.

Horsten, M., Ericson, M., Perski, A., Wamala, S.P., Schenck-Gustafsson, K., & Orth-Gomer, K. (1999). Psychosocial factors and heart rate variability in healthy women. *Psychosomatic Medicine*, 61,49-57.

Hossack, K.F., Bruce, R.A., Fisher, L., & Hofer, V. (1983). Prognostic value of risk factors and exercise testing in men with atypical chest pain. *International Journal of Cardiology*, 3,37-50.

House, J.S., Landis, K.R., & Umberson, D. (1988). Social relationships and health. *Science*, 241, 540-545.

House, J.S., Robbins, C., & Metzner, H.L. (1982). The association of social relationships and activities with mortality: Prospective evidence from the Tecumseh community health study. *American Journal of Epidemiology*, 116, 123-140.

Irvine, J., Basinski, A., Baker, B., Jandciu, S., Paquette, M., Cairns, J., Connolly, S., Roberts, R., Gent, M., & Dorian, P. (1999). Depression and risk of sudden cardiac death after acute myocardial infarction: Testing for the confounding effects of fatigue. *Psychosomatic Medicine*, 61, 729-737.

Janes, C.R. (1990). Migration and biocultural adaptation: Samoans in California. *Social Science and Medicine*, 22, 821-834.

Janes, C.R. & Pawson, I.G. (1986). Migration and biocultural adaptation: Samoans in California. *Social Science and Medicine*, 22, 821-834.

Jenkinson, C.M., Madeley, R.J., Mitchell, J.R.A., & Turner, I.D. (1993). The influence of psychosocial factors on survival after myocardial infarction. *Public Health*, 107, 305-317.

Kamarck, T.W., Manuck, S.B., & Jennings, J.R. (1990). Social support reduces cardiovascular reactivity to psychological challenge: A laboratory model. *Psychosomatic Medicine*, 52, 42-58.

Kaplan, J.R., Salonen, J.T., Cohen, R.D., et al. (1988). Social connections and mortality from all causes and cardiovascular disease: Prospective evidence from Eastern Finland. *American Journal of Epidemiology*, 128, 370-380.

Kasl, S.V. & Cobb, S. (1980). The experience of losing a job: Some effects on cardiovascular functioning. *Psychotherapy and Psychosomatics*, 34, 88-109.

Kawachi, I., Colditz, G.A., Ascherio, A., Rimm, E.B., Giovannucci, E.,

Stampfer, M.J. & Willett, W.C. (1996). A prospective study of social networks in relation to total mortality and cardiovascular disease in men in the USA. *Journal of Epidemiological Community Health*, 50, 245-251.

Kiecolt-Glaser, J.K. & Greenberg, B. (1984). Social support as a moderator of the aftereffects of stress in female psychiatric inpatients. *Journal of Personality and Social Psychology*, 93, 192-199.

King, K.B., Reis, H.T., Porter, L.A., & Norsen, L.H. (1993). Social support and long term recovery from coronary artery surgery: Effects on patients and spouses. *Health Psychology*, 12, 56-63.

Kleman, M., Bickert, A., Karpinski, A., Wantz, D., Jacobsen, B., Lowery, & Menapace, F. (1993). Physiological responses of coronary care patients to visiting. *Journal of Cardiovascular Nursing*, 7, 52-62.

Knox, S.S. (1993). Perception of social support and blood pressure in young men. *Perceptual and Motor Skills*, 77, 132-134.

Knox, S.S., Theorell, T., Scensson, J.C., & Waller, D. (1985). The relation of social support and working environment to medical variables associated with elevated blood pressure in young males: A structural Model. *Social Science and Medicine*, 21, 525-531.

Kobasa, S.C. (1982). Commitment and coping in stress resistance among lawyers. *Journal of Personality and Social Psychology*, 42, 707-717.

Krantz, D., & Manuck, S. (1984). Acute psychophysiologic reactivity and risk of cardiovascular disease: A review and methodologic critique. *Psychological Bulletin*, 96, 435-464.

Kulik, J.A., & Mahler, H.I.M. (1989). Social support and recovery from surgery. *Health Psychology*, 8, 221-238.

Lepore, S.J., Allen, K.A., & Evans, G.W. (1993). Social support lowers cardiovascular reactivity to an acute stressor. *Psychosomatic Medicine*, 55, 518-524.

Lercher, P., Hortnagl, J., & Kofler, W.W. (1993). Work noise annoyance and blood pressure: Combined effects with stressful working conditions. *International Archives of Occupational and Environmental Health*, 65, 23-28.

Levenstein, S., Prantera, C., Varvo, V., Scribano, M.L., Luzi, C., & Andreoli, A. (1993). Development of the Perceived Stress Questionnaire: A new tool for psychosomatic research. *Journal of Psychosomatic Research*, 37, 19-32.

Linden, W., Chambers, L., Maurice, J., & Lenz, J.W. (1993). Sex differences in social support, self-deception, hostility, and ambulatory cardiovascular reactivity. *Health Psychology*, 12, 376-380.

Litwin, H. (1998). The provision of informal support by elderly people residing in assisted living facilities. *The Gerontologist*, 38, 239-246.

Livingston, I.L., Levine, D.M., & Moore, R.D. (1991). Social integration and Black intraracial variations in blood pressure. *Ethnicity and Disease*, 1, 135-149.

Lynch, J.J., Thomas, S.A., Paskewitz, D.A., Katchar, A.H., & Weir, L.O. (1977). Human contact and cardiac arrhythmia in a coronary care unit. *Psychosomatic Medicine*, 39, 188-192.

Malcolm, A.T. & Janisse, M.P. (1991). Additional evidence for the relationship between Type A behavior and social support in men. *Behavioral Medicine*, 17, 131-134.

McNair, D.M., Lorr, M., Droppleman, L.F. (1971). *Profile of Mood States*. San Diego: Educational Testing Services.

Musick, M.A., Herzog, A.R., & House, J.S. (1999). Volunteering and mortality among older adults: Findings from a national sample. *Journals of Gerontology*, 54B, S173-S180.

Olsen, R.B., Olsen, J., Gunner-Svensson, F., & Waldstom, B. (1991). Social networks and longevity. A 14 year follow-up study among elderly in Denmark. *Social Science and Medicine*, 1189-1195.

O'Reilly, P. & Thomas, H.E. (1989). Role of social networks in maintenance of improved cardiovascular health status. *Social Science and Medicine*, 28, 249-260.

Orth-Gomer, K & Johnson, J.V. (1987). Social network interaction and mortality. A six year follow-up study of a random sample of the Swedish population. *Journal of Chronic Diseases*, 40, 949-957.

Orth-Gomer, K., Rosengren, A., & Wilhelmsen, L. (1993). Lack of social support and incidence of coronary heart disease in middle-aged Swedish men. *Psychosomatic Medicine*, 55, 37-43.

Orth-Gomer, N., Unden, A.L., & Edwards, ME (1988). Social isolation and mortality in ischemic heart disease. A 10 year follow up study of 150 middle aged men. *Acta Med Scand*, 224, 205-215.

Oxman, T.E., Freeman, D.H., & Manheimer, E.D. (1995). Lack of social participation or religious strength and comfort as risk factors for death after cardiac surgery in the elderly. *Psychosomatic Medicine*, 57, 5-15.

Piferi, R.L. & Lawler, K.A. (submitted). The Tendency to Give Social Support Scale: Reliability, validity, and relationship to health. *Health Psychology*.

Radloff, L.S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

Raikkonen, K., Matthews, K.A., Flory, J.D., Owens, J.F., & Gump, B.B. (1999). Effects of optimism, pessimism, and trait anxiety on ambulatory blood pressure and mood during everyday life. *Journal of Personality and Social Psychology*, 76, 104-113.

Reed, D., McGee, D., & Yano, K.. (1984). Psychosocial processes and general susceptibility to chronic disease. *American Journal of Epidemiology*, 119, 356-370.

Rosenberg, M. (1965). *Society and the Adolescent Self Image*. Princeton, NJ: Princeton University Press.

Ruberman, W., Weinblatt, E., Goldberg, J.D., Chaudhary, B.S. (1984). Psychosocial influences on mortality after myocardial infarction. *New England Journal of Medicine*, 311 552-559.

Schmidt, N.A. (1997). Salivary cortisol testing in children. *Issues in Comprehensive Pediatric Nursing*, 20, 183-190.

Schoenbach, V.J., Kaplan, B.G., Freedman, L., & Kleinbau, D.G. (1986). Social ties and mortality in Evans County, Georgia. *American Journal of Epidemiology*, 123, 577-591.

Schwartz, C.E. & Sendor, M. (1999). Helping others helps oneself: Response shift effects in peer support. *Social Science and Medicine*, 48, 1563-1575.

Seeman, T.A., Berkman, Kahout, F., et al. (1993). Intercommunity variations in the association between social ties and mortality in the elderly: A comparative analysis of three communities. *Annals of Epidemiology*, 3, 325-335.

Seeman, T.A. & Syme, S.L. (1987). Social networks and coronary artery disease: A comparison of the structure and function of social relations as predictors of disease. *Psychosomatic Medicine*, 49, 341-354.

Shapiro, D., Jamner, L.D., & Goldstein, I.B. (1997). Daily mood states and ambulatory blood pressure. *Psychophysiology*, 34, 399-405.

Sherer, M. et al (1983). The self-efficacy scale: Construction and validation. *Psychological Reports*, 51, 663-671.

Simmons, R.G. (1991). Altruism and sociology. *Sociological Quarterly*, 32, 1-22.

Spitzer, S.B., Llabre, M.M., Ironson, G.H., Gellman, M.D., & Schneiderman, N. (1992). The influence of social situations on ambulatory blood pressure. *Psychosomatic Medicine*, 54, 79-86.

Stavig, G.R., Igra, A., & Leonard, A.R. (1984). Hypertension among Asians and Pacific Islanders in California. *American Journal of Epidemiology*, 119, 677-691.

Steptoe, A. (2000). Stress, social support and cardiovascular activity over the working day. *International Journal of Psychophysiology*, 37, 299-308.

Stephoe, A., Lundwall, K., & Cropley, M. (2000). Gender, family structure, and cardiovascular activity during the working day and evening. *Social Science and Medicine*, 50, 531-539.

Stevens, E.S. (1992). Reciprocity in social support: An advantage for the aging family. *The Journal of Contemporary Human Services*, 73, 533-541.

Strogatz, D.S. & James, S.A. (1986). Social support and hypertension among Blacks and Whites in a rural, southern community. *American Journal of Epidemiology*, 124, 949-956.

Switzer, G.E., Simmons, R.G., Dew, M.A., & Regalski, J.M. (1995). The effect of a school-based helper program on adolescent self-image, attitudes, and behavior. *Journal of Early Adolescence*, 15, 429-455.

Thomas, C.B. & Duszynski, K.R. (1982). Blood pressure levels in young adulthood as predictors of hypertension and the fate of the cold pressor test. *Johns Hopkins Medical Journal*, 151, 93-100.

Thorsteinsson, E.B., James, J.E., & Gregg, M.E. (1998). Effects of video-relayed social support on hemodynamic reactivity and salivary cortisol during laboratory-based behavioral challenge. *Health Psychology*, 17, 436-444.

Uchino, B.N., Cacioppo, J.T., Malarkey, W.M., Glaser, R., & Kiecolt-Glaser, J.K. (1995). Appraisal support predicts age-related differences in cardiovascular function in women. *Health Psychology*, 14, 556-562.

Uchino, B.N. & Garvey, T.S. (1997). The availability of social support reduces cardiovascular reactivity to acute psychological stress. *Journal of Behavioral Medicine*, 20, 15-27.

Uchino, B.N., Holt, L.J., Uno, D., Betancourt, T.R., Garvey, T.S. (1999).

Social support and age related differences in cardiovascular function: an examination of potential mediators. *Annals of Behavioral Medicine*, 21, 135-142.

Unden, A., Orth-Gomer, K., & Elofsson, S. (1991). Cardiovascular effects of social support in the work place: Twenty-four hour ECG monitoring of men and women. *Psychosomatic Medicine*, 53, 50-60.

Veiel, H.O. & Baumann, U. (1992). *The Meaning and Measurement of Social Support*. New York: Hemisphere Publishing Corp.

Venters, M., Jacobs, D., Pirie, P., Luepker, R., Folsom, A., & Gillum, R. (1986). Marital status and cardiovascular risk: The Minnesota heart survey and the Minnesota Heart Health Program, *Preventive Medicine*, 15, 591-605.

Verdecchia, P., Clement, D., Fagard, R., Palatini, P., & Parati, G. (1999). Blood pressure monitoring. Task force III: Target-organ damage, morbidity, and mortality. *Blood Pressure Monitor*, 4, 303-317.

Vogt, T.M., Mullooly, J.P., Ernst, D., Pope, C.R., & Hollis, J.F. (1992). Social networks as predictors of ischemic heart disease, cancer, stroke, and hypertension: Incidence, survival, and mortality. *Journal of Clinical Epidemiology*, 45, 659-666.

Welin, L., Larsson, B., Svardsudd, K., Tibblin, B. & Tibblin, G. (1992). Social networks and activities in relation to mortality from cardiovascular diseases, cancer, and other causes: A 12 year follow-up of the study of men born in 1913 and 1923. *Journal of Epidemiological Community Health*, 46, 127-132.

Welin, L., Tibblin, G., Svardsudd, K., et al. (1985). Prospective study of social influences on mortality: The study of men born in 1913 and 1923. *Lancet*, 1, 915-918.

Wentkowski, G. (1981). Reciprocity and the coping strategies of older people: Cultural dimensions of network building. *The Gerontologist*, 21, 600-609.

Wiklund I., Oden, A., Sanne, H., et al (1988). Prognostic importance of somatic and psychosocial variables after a first myocardial infarction. *American Journal of Epidemiology*, 128, 786-795.

Williams, A.L., Haber, D., Weaver, G.D., & Freeman, J.L. (1998). Altruistic activity: Does it make a difference in the senior center? *Activities, Adaptation, and Aging*, 22, 31-39.

Williams, R.B., Barefoot, J.C., Califf, R.M., et al (1992). Prognostic importance of social and economic resources among medically treated patients with angiographically documented coronary artery disease. *Journal of the American Medical Association*, 267, 520-524.

Winefield, H.R. (1982). Male social support and recovery after myocardial infarction. *Australian Journal of Psychology*, 1, 45-52.

Yates, B.C. (1995). The relationships among social support and short- and long-term recovery outcomes in men with coronary heart disease. *Research in Nursing and Health*, 18, 193-203.

APPENDICES

Appendix A

The Tendency to Give Social Support Scale (Piferi & Lawler)

Tendency to Give Social Support (Piferi & Lawler, submitted)

Using the following scale, please rate how well the following statements apply to you..

- 1 = Never
- 2 = Rarely
- 3 = Sometimes
- 4 = Often
- 5 = Almost always

1. I am one of the first people to lend an ear when someone I know needs to talk.
2. When someone I know is down, I offer to comfort him/her.
3. When someone I know is going through a situation similar to one I've been through, I offer advice on what he/she should do.
4. If I know how to do something that someone else is struggling with, I suggest how to do it.
5. I invite people I know to fun activities if they need cheering up.
6. I make myself available to those I know when I notice they are going through a rough time.
7. I offer suggestions to those I know on how they can solve a problem that they are facing.
8. I loan people money when they need it.
9. I provide others with a place to stay when they need it.
10. I joke and kid around with others when they need to be cheered up.
11. I hug others when they are noticeably upset.
12. If someone I know needs a ride somewhere, I take him/her.
13. When someone I know needs to know how to do something, I teach him/her how to do it.
14. When someone I know has to perform or present something to a large group of people, I go and support him/her by being there.
15. I organize groups of people to go out and socialize.
16. If someone I know needs directions to a place I've been, I tell him/her how to get there.
17. When someone I know is working on a project/homework that I am working on also, I offer to work with them.
18. I offer to run errands for others when they do not have time to do it for themselves.
19. I offer suggestions to those I know when they are working on a project.
20. I call those I know to see if they are doing well.
21. When someone I know has succeeded at a task, I reward him/her with a gift or by taking them out.
22. When someone I know is running late, I do what I can to assist him/her.
23. When someone I know needs to talk about a problem, I drop what I am doing to listen.
24. When someone I know is under stress, I surprise him/her with a small diversion/break.

25. If someone I know is going through an emotional event, I offer to be there.
26. When someone I know is undergoing an extremely stressful event, I just jump in and do what I can to help.
27. I send uplifting notes and cards to people I know to let them know that I care.
28. I invite people that I know to do fun things.
29. I verbally reassure others that they can do the task at hand.
30. I offer to pick up mail, water plants, and feed pets for others when they go on vacation.

Appendix B
Tables and Figures

Table 1. Mean SBP, DBP, MAP, and HR during daytime, evening, and nighttime for male and female participants.

	Men	Women
Daytime		
SBP*	129 $\pm$ 7.8	122 $\pm$ 7.2
DBP	72.1 $\pm$ 8.8	68.9 $\pm$ 8.7
MAP	90.3 $\pm$ 8.2	87.1 $\pm$ 7.6
HR*	73.6 $\pm$ 6.7	78.4 $\pm$ 9.1
Evening		
SBP*	130.3 $\pm$ 9.3	122.7 $\pm$ 8.9
DBP*	74.5 $\pm$ 11.6	69.1 $\pm$ 8.3
MAP*	92.7 $\pm$ 9.7	87.1 $\pm$ 7.5
HR	78.3 $\pm$ 11.5	79.0 $\pm$ 8.3
Nighttime		
SBP	114.0 $\pm$ 9.9	111.4 $\pm$ 10.8
DBP	62.0 $\pm$ 11.3	58.9 $\pm$ 10.7
MAP	79.5 $\pm$ 10.5	75.6 $\pm$ 10.4
HR**	61.3 $\pm$ 6.1	67.9 $\pm$ 8.6

* $p < .05$

** $p < .001$

Table 2. Mean SBP, DBP, and MAP dipping for participants high and low in tendency to give social support.

	Low Giving	High Giving
SBP Dipping**	7.9 $\pm$ 3.1	19.0 $\pm$ 7.2
DBP Dipping*	9.4 $\pm$ 3.6	14.1 $\pm$ 4.1
MAP Dipping**	10.0 $\pm$ 4.1	16.3 $\pm$ 4.7
HR Dipping	12.8 $\pm$ 4.0	14.9 $\pm$ 4.7

** p < .05

* p < .10

Table 3. Psychosocial correlates of the Tendency to Give Social Support Scale.

Variable	Correlations	p - value
Received Support	.479	.000
Self-Efficacy	.553	.000
Self-Esteem	.177	.09
Depression	-.217	.04
Social Provisions Scale (SPS)	.147	ns
SPS Fact 1-Attachment	.088	ns
SPS Fact 2-Social Integration	.102	ns
SPS Fact 3–Nurturance	.234	.03
SPS Fact 4-Reassurance of Worth	.018	ns
SPS Fact 5–Reliable Alliance	.201	.05
SPS Fact 6-Guidance	.027	ns
Daytime Stress	-.245	.02
Support Given	.345	.001
Support Felt	.275	.009
POMS – Vigor	.472	.000

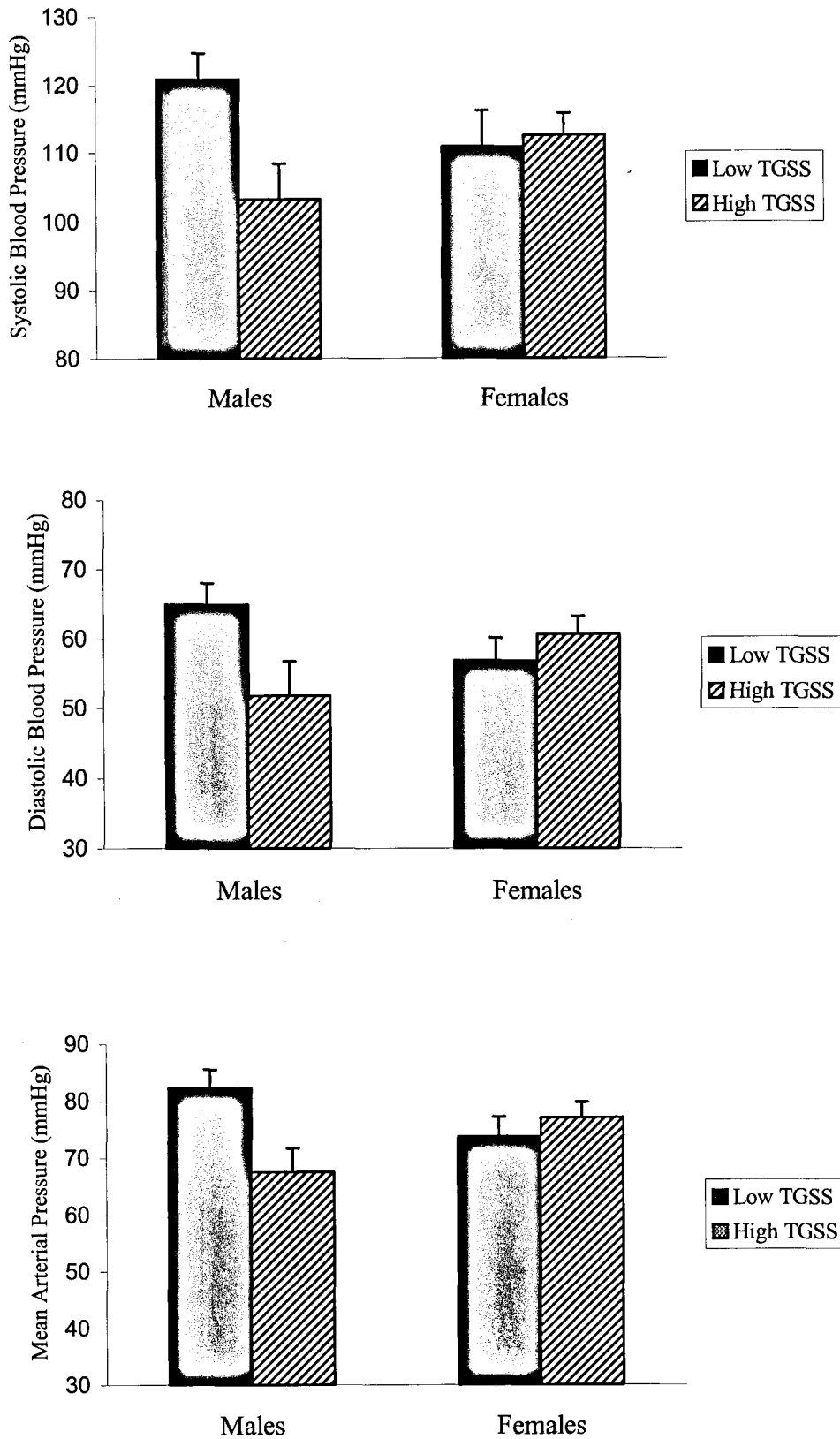


Figure 1. Mean nighttime blood pressure.

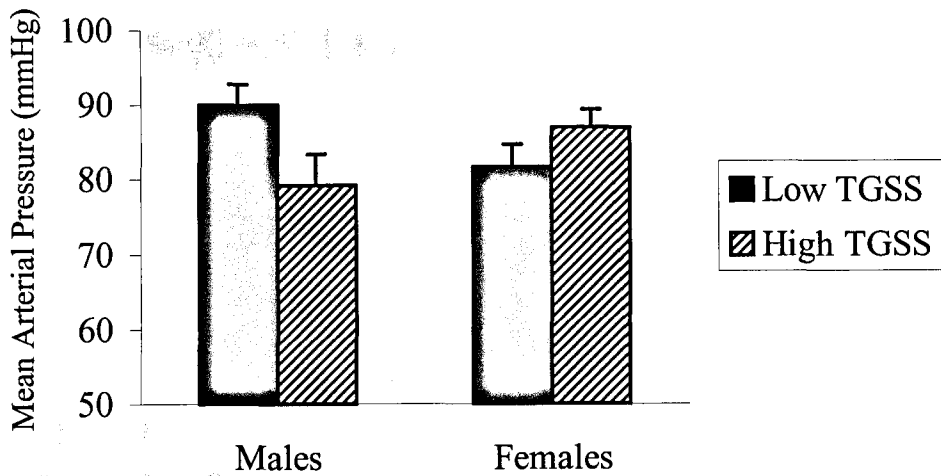
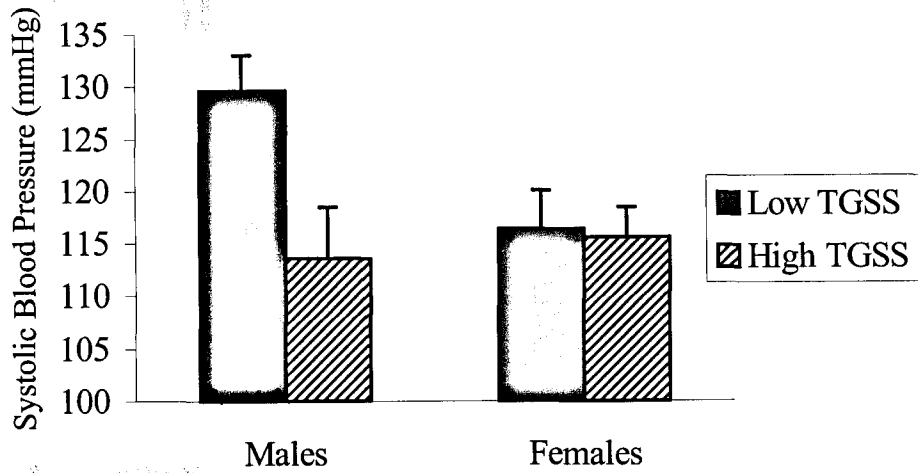


Figure 2. Mean SBP and MAP while alone for high and low giving males and females.

VITA

Rachel L. Piferi was born in Akron, Ohio on November 18, 1974. She was raised in Chesterfield, Virginia where she attended public school, graduating from Thomas Dale High School in June, 1992. The following fall, she entered the College of William and Mary, in nearby Williamsburg, Virginia. During her years at William and Mary she was initiated into the sorority Kappa Delta. She also was awarded enrollment into the honorary societies, Psi Chi and Alpha Kappa Delta. Following graduation from William and Mary, Rachel enrolled in the Master's Program at the University of Tennessee. Soon after matriculation, she decided to remain at the University of Tennessee for her doctoral degree in Experimental Psychology. In May, 1998, Rachel received her Master of Arts degree in Psychology and she was married to Silvano Piferi. Silvano is a computer programmer and member of the Air National Guard. In the final year of her doctoral study, Rachel was awarded a National Research Service Award from the National Institute of Mental Health to study the effects of giving social support to others. Rachel is seeking additional funding from N.I.M.H. to continue studying giving support to others. In October, 2000, Silvano and Rachel received their greatest gift in the birth of their son, Luke Alexander. Rachel and Silvano would like to return to Richmond, Virginia following graduation where Rachel will continue to study the health effects of the social network.