A FRIEND IN NEED:

A CONTINGENCY MODEL OF SOCIAL SUPPORT NETWORKS
AND HEALTH STATUS

Gail K. Auslander

ABSTRACT

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Social support networks have been shown to be related to the
health status of various groups of people, when measured in different
ways and under different circumstances. Yet, there have been few
comparisons of this relationship across population groups. Therefore
the purpose of this study was to compare the ways that social support
networks relate to the health status of different population groups.

The study used data that was collected in Wave I of the National
Survey of Personal Health Practices and Consequences in 1979, in
telephone interviews with 3025 persons aged 20-64 residing in households
with telephones. Ten target groups were selected for study--those with
high stress jobs, the unemployed, the aged, the widowed, the bereaved,
the disabled, those who had recently experienced serious illness or
injury, the poor, those with negative status inconsistency, and single
parents.

It was found that there was no uniform pattern in the way that
social networks relate to health status, but rather different elements
of social networks related to the health status of members of different
target groups. These relationships were fairly consistent regardless of
which of two health status measures were employed--self-rated health
status and composite health status. And social networks were more
strongly related to the health status of target group members than they
were to the health of the general population.

Existing theories regarding the ability of social networks to predict health status are explored, in an attempt to explain the findings of this study. As they prove inadequate, a new model is proposed, in which the needs of various groups are seen as determining which social network elements will be able to modify health status. That is to say, the success of social networks in maintaining health is contingent upon a proper fit between social networks, individual needs and health status.

The implications of the study for social work practice and policy center around the importance of specificity in relating networks to health. In addition, avenues for future research are explored, especially in designing studies to specifically test the proposed model.

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IN MEMORY OF MY MOTHER

GERTRUDE KUZMINSKY KIZNER

CHAPTER ONE

INTRODUCTION

Social workers have long been aware of the importance of the social environment for individual well-being. In recent years, one element of the social environment--the social support network--has received increasing amounts of attention as a contributor to health, both physical and emotional. It has also come to be seen as an appropriate target for intervention on several levels, through such mechanisms as the enhancement of personal networks, volunteer linking, developing mutual aid networks, consulting with neighborhood helpers, and encouraging community empowerment. (Froland, Pancoast, Chapman and Kimboko, 1981)

Social support systems or networks have been defined as attachments consisting of three elements:

> The significant others help the individual mobilize his psychological resources and master his emotional burdens; they share his tasks; and they supply him with extra supplies of money, materials, tools, skills, and cognitive guidance to improve his handling of his situation. (Caplan, 1974, p. 6)

Others have characterized the functions of social networks as the provision of emotional or expressive support, instrumental or tangible support, and informational support or advice. (Schaefer, Coyne, and Lazarus, 1981; Dean and Lin, 1977; Cassel, 1976)

In a wide range of investigations, social support networks have been shown to be related to mortality, morbidity, mental illness, and other health outcomes, for a host of population groups, both general and specific. As yet, however, no definitive explanation has been proven as to the way in which this relationship works--what is it about social support networks that benefit those who have them?

There are two main theoretical formulations which seek to explain this relationship. The first, a main effects theory, is drawn from the

concepts of traditional sociology. It posits that social networks are a necessary component of the healthy person's environment. Without networks to perform such functions as providing feedback reaffirming their self-worth, people's health will suffer. The implication here is that social networks perform the same function for all persons.

The second theoretical formulation, commonly known as the buffering hypothesis, has its roots in modern ego psychology. Networks are said to serve to mediate the effects of stress on health. Thus, people who face numerous stressful situations and who do not have strong social networks will suffer from deteriorating health. The implication here is that social networks work only for people who are under serious enough stress to negatively affect their health.

A new, alternative formulation will be proposed in this study, based on a contingency model of social networks and health. It posits that the relationship between social networks and health status is contingent upon the presence of a health-related need which can be met by social networks. It is grounded in a high degree of specificity of both needs and network functions--not every support network can meet every need. While networks are seen as multi-functional, a successful outcome requires matching of individual needs to networks which can meet those needs.

To date, the bulk of the research in this area has been of two kinds: (1) broad-based studies of large populations with little exploration of the needs of specific groups within those populations; and (2) smaller studies of specific groups, which explore the way that networks function for that group, but fail to compare them to different types of groups.

This investigation begins to fill that gap. It looks comparatively at the way social networks relate to the health of a variety of groups with a variety of needs. In particular, it seeks to determine whether social networks work in the same way for all people, or alternatively, whether different social network elements are more important for some groups than for others. Along the same lines, it also seeks to determine whether the relationship between social networks and health status is specific to certain elements of health or can be generalized to a broad conception of health.

As such, three research questions will be investigated:

1. Are the same social support network elements important determinants of the health status of various groups in the population?

2. Is the relationship between social support networks and health the same, regardless of which of two measures of health status is used?

3. Are social support networks more important for individual groups in the population than for the general population?

These questions will be investigated using data gathered in the National Survey of Personal Health Practices and Consequences. This is a data base collected in telephone interviews with a random sample of over 3,000 adults in the United Status in 1979. As such it allows for complex manipulations of data and broader generalizations than has been the case in many previous studies.

Ten target groups were selected for study. These are groups for whom the literature suggests that social support networks play an important role in maintaining their health, and/or groups with whom social work interventions often take the form of trying to strengthen their social support networks. Each group will be examined individually, to see what role social support networks play in predicting health status within the group. They will also be examined

comparatively, to see how the role of social networks in the group varies from their role in the general population and in a selected sub-population--that made up of people who are not members of any target group.

Much of the research to date in this field has been in the domain of sociology, social psychology and epidemiology. As such, for the most part, it has not been carried out with an eye toward possible interventions. The increased specificity of the model to be developed here is a small step in a necessary reorientation, if this research is to result in practical application.

More specific knowledge of this kind will then be of use to both the practitioner and the policy maker in three areas:

1. <u>Assessment of high risk clients</u>.--If we know for whom social networks are an important determinant of health status, workers could use their knowledge of social networks in assessing individual clients, determining what kind of support, if any, their networks can provide, and fostering the strengthening or development of replacement supports where necessary.

2. <u>Use of social networks to supplement professional interventions</u>.--Such a strategy stresses the use of informal social networks in addition to formal agency ties. Support gained from informal helping networks may be as important, if not more so, than that provided by professionals. (Collins and Pancoast, 1976; Mitchell and Hurley, 1981) This is exemplified by the proliferation of self-help groups around such varied problems as cancer, widowhood and step-parenting. Here too, it is important to know for whom this is the case--what are the needs and what kind of networks can meet those needs.

3. <u>Program planning and development</u>.--In addition to direct
intervention to strengthen social networks for people at risk, we should
consider the effect of larger social policies on the individual's
support system. For those people for whom such networks are important,
policy should be designed in such a way as to strengthen rather than
weaken them. If this research shows that,in fact, social networks are
important in maintaining health in some groups, then their promotion
should also be a critical component of other intervention programs aimed
at those groups.

This study undertakes to address these research questions in a way
which will prove meaningful both to practitioners and to the growing
number of students of the field. The following two chapters are devoted
to exploring both the theoretical and empirical bases for the
relationship between social support networks and health status. This is
followed by Chapter 4, which explores the characteristics of the data
base and explains in detail the research design. Chapter 5 provides the
basis for the analysis of the data, presenting the results of
preliminary investigations of the relationship between variables. The
in-depth data analysis around the three research questions is presented
in Chapter 6, and discussed critically in Chapter 7, including an
exploration of the implications of the findings for social work practice
and policy, and directions for future research. Finally, conclusions to
the study are drawn in Chapter 8.

INTRODUCTION

The idea that social support networks are related to health status derives directly from the role of the environment in health and disease, a role that has been recognized for centuries. Rosen (1979), in recounting the history of medical sociology, traces the development of this recognition from the early Greeks and Romans through the present. It did not, however, gain real importance in the medical world until the Progressive Era of the 1800's and 1900's, when it was embraced by both the fledging public health movement and social work profession.

Complementing the biological and genetic components of disease, the emphasis on the role of the environment follows Dubos in refuting the "Doctrine of Specific Etiology". As he states, "the search for the cause may be a hopeless pursuit because most disease states are the indirect outcome of a constellation of circumstances rather than the direct result of single determinant factors." (Dubos, 1959, p.86) He envisioned people's internal environments in ongoing interaction and dynamic equilibrium with a constantly changing external environment, which contained many determinants of health. In order to survive, one has to constantly adapt to one's external environment. Any factor that upsets the equilibrium of either system can lead to disease. "The environment in which the individual lives and his manner of living are of great importance in determining his susceptibility to the diseases of modern time." (p. 167)

Indeed, to support this theory, we are often reminded that much of today's mortality in developed countries is due to causes which medicine per se cannot treat; causes that are primarily environmental in nature. (Knowles, 1977; Fuchs, 1974). As just one example, most deaths of young

children today (41%) are caused by accidents, not illness or disease. (National Center for Health Statistics, 1982, p. 12)

Among those elements of the environment which are important determinants of health status is the social environment. The social work profession recognized this at the turn of the century, as recalled by Bosanquet (1914) in her history of the 19th century London C.O.S.: "Illness among the working classes is so frequently the result of some social problem . . . that to treat with medicine and advice only is now beginning to be generally recognized as unscientific." (p. 22)

There have been numerous studies of the relationship between the social environment and health status. To cite just several facets of the phenomenon, population density, ethnicity, race, stress, status inconsistency, alienation and socioeconomic status have all been shown to be related to morbidity or mortality, both disease-specific and general, beyond what can be explained by access to and utilization of health services. (See, for example, Cassell, 1974; Cohen, Glass and Phillips, 1979; Graham and Reeder, 1979; Kosa and Zola, 1975; Lerner, 1968; Moos, 1976; Dohrenwend and Dohrenwend, 1974; and Rabkin and Streuning, 1976.) One of the clearest examples comes from an examination of infant mortality rates. These rates have been declining for both blacks and whites since the late 1960's. But the mortality rate for black infants remains almost twice as high as for whites (21.8 vs. 11.4 deaths per 1,000 live births). The differences are even greater during the post neonatal period (2-12 months), "a time when environmental and socioeconomic factors are more likely to affect the infant than during the neonatal period." (National Center for Health Statistics, 1982, p. 8)

The particular element of the social environment which is of
interest here is social support networks. Before exploring the theories
which attempt to explain their relationship to health, it would be
useful to look at the concepts themselves and the various meanings
ascribed to them.

CONCEPTUAL DEFINITIONS

Social Networks

The concepts of social support and social networks seem intuitively intertwined, the implication being that social networks of necessity provide their members with social support. Indeed a number of authors have cited this assumption as a consistent problem in the research literature. (Gottlieb, 1981; Schaeffer, Coyne and Lazarus, 1981; Thoits, 1982) I will, therefore, examine them separately, here, at the conceptual level.

The concept of social networks is a sociological and sociometric one which became popular in the late 1940's and early 1950's. According to Mitchell (1969), it arose from two sources: First, it was a way of rigorously defining interrelationships within a social system. This is represented by Moreno (1953) and other sociometricians whose interest centered on characteristics of the linkages between people; that is, the structure of networks. Second, social networks provided an alternative to structural-functionalism as a means for interpreting social action. Instead Lewin's (1951) field theory is used for a conceptual model, wherein behavior is seen as the function of a person in a situation. This idea was adopted by Bott (1957), who defined networks as the "pattern of social relationships with and among friends, neighbors, and relations." (p. 3) Individual's social actions are then interpreted in light of the actions of members of their social netowork. (This notion has been directly applied in the health field to such areas as tendancy to seek care and compliance with medical regmiens. See Anderson, Kravits and Andersen, 1975; Salloway and Dillon, 1973; and Langlie, 1977.) This implies that in order to understand individual actions one

needs knowldedge of both the overall social system in which actions occur and the social relationships of the individuals within that system.

This requires an elaboration of the characteristics of social networks. Mitchell (1969) categorizes these characteristics as either morphological or interactional. The former refer to the patterning or shape of networks; the latter to their nature. The morphological characteristics cited by Mitchell are (1) Anchorage--the point or orientation of the network, or the person in whose network we are interested; (2) Reachability--the degree to which one can contact the other members of the network and through how many other people one must go to reach the furthest point; (3) Density--the degree to which members of the network know each other; and (4) Range--the number of direct contacts an individual has. Much of the research on social networks and health status centers on anchorage and range as morphological criteria of interest.

The interactional characteristics described by Mitchell are (1) Content--the meanings attached to relationships; (2) Directedness--the extent to which relationship are reciprocal; (3) Durability--whether the network is constant, or mobilized only in limited situaitons; (4) Intensity--the value or importance of the relationship; and (5) Frequency of contact. Some researchers have also looked at the interrelationships between these characteristics. Thus, for example, Hammer (1983) explores the importance of the extended network, in which the immediate personal network is embedded (range and reachability); and Granovetter (1973) looks at weak vs. strong ties (intensity and range). These views are indicative of a recognition of the need to look beyond

range and frequency to explore the multiple dimensions of social networks.

We should also note here the overlap with primary group theory, starting with Cooley's definition of "primary groups. . . [as] those characterized by intimate face-to-face association and cooperation." (1955, p. 15) They tend to be characterized by high intensity--all of the members of the primary group know each other; in a more general social network all members know the central person or anchor but not necessarily each other.

Finally, we can describe social networks as informal or formal. In informal networks, relationship are much like those in primary groups: warm, diffuse, with broad and reciprocal responsibilities. (Litwak, 1978) Formal networks on the other hand are those in which the relationship is contractual. This would approximate the relationship between a client and social worker, for example. The current investigation, however, deals only with informal networks.

Social Support

Social support can be seen as one possible content of a social network. Thoits (1982) among others has been highly critcal of much research in this area for its failure to adequately formulate a precise conceptual definition of social support. (See also Schaeffer et al., 1981; Hammer, 1983; Rabkin and Streuning, 1976). It has been described in the literature both in its presence and in its absence. We see reference to an absence of social support in Durkheim's (1951) anomie theory and Faris and Dunham's (1939) social isolation. These negative definitions predominate ecological studies of social support and health status.

From a positive point of view, it would be most useful to look first at the concept of social support and then relate back to the network that provides it. Social support is generally seen as a measure of fit between individual's social needs and resources to meet those needs. Thus French, Rodgers and Cobb (1974) define social support as a specific kind of person-environment fit, between the person's demand for social resources and his/her environment's ability to supply them. In their review artical, Kaplan, Cassel and Gore (1977) define it as "the 'metness' or gratification of a person's basic social needs (approval, esteem, succorance, etc.) through environmental supplies of social support," (p. 50) or the "degree to which a person's basic social needs are gratified through interaction with others." (Thoits, 1982, p. 147)

Most authors deal chiefly with social support as emotional support, stressing the need for attachment and affiliation. Thus Cobb conceives of it as information which leads one to believe that he or she is cared for and loved, esteemed and valued, and a member of a network. He explicitly excludes support of a material nature, as do Turner (1981) and Pearlin, Menaghan, Lieberman and Mullan (1981). For the purposes of this investigation, a broader definition of social support is warranted, however. Schaefer et al. (1981) distinguish between the structural characteristics described above and perceived social support. This "involves an evaluation or appraisal of whether and to what extent an interaction, pattern of interactions, or relationship is helpful." (p. 384) They delineate three functions of social support: (1) Emotional support, which is equivalent to Cobb's (1976) notion of feeling cared for and loved; (2) Tangible support--direct aid and services; and (3) Informational support--giving advice and feedback. The first two have

been termed by Dean and Lin (1977) expressive and instrumental support, respectively. Cassel (1976) in the social interactionist tradition sees information as the central function of support, helping a person to achieve a social identity.

We should note that these categories may not be mutually exclusive in practice. For example, it is likely that the receipt of information and tangible support also contributes to one's emotional support. However, the distinction become useful in looking, as is done in this investigation, at the various needs of different groups of people and how their metness or lack thereof may contribute to their health.

Social Support Networks

These two concepts can then be combined into that of a social support network, also known as a social support system and a helping network. It has been defined as a "set of relations involving the giving and receiving of objects, services, social and emotional supports defined by the giver and the receiver as necessary or at least helpful." (Lopata, 1975, p. 35) Caplan and Killelea (1976) use Cassel's formulation to define social support systems as "continuing social aggregates. . . that provide individuals with opportunities for feedback about themselves and for validation of the expectations about others." (p. 19)

There has been a confusion in the literature about the dual components of social support networks. Failure to recognize that the individual has sources of support other than what can be obtained from his social network, e.g., coping skills, has been cited by Pearlin et al. (1981) And Thoits (1982) and others point out the erroneous assumption that social networks are necessarily supportive. (See also

Germaine and Gitterman, 1980; and Collins and Pancoast, 1976) Pearlin et al. (1981), Porritt (1979), and Schaefer et al. (1981) make the point that being part of a social network is only a first step to receiving positive support. The quality of the support is likely to be as important, if not more so, than they quantity received. And, in fact, there are some social networks which may prove to be anything but positive and supportive. (Germaine and Gitterman, 1980, and Collins and Pancoast, 1976). These would include those that reinforce deviant behavior or prevent adoption of healthy behaviors.

For the purpose of this investigation, social support networks are conceived as having two properties—structure and content. Drawing upon Lin, Ensel, Simeone and Kuo (1979), Schaefer et al. (1981) and Thoits' (1982) ideas, social support networks are seen as interpersonal relationships through which individual social needs are met and/or are defined by the individual as helpful.

Health Status

The definition of health status, or the state of one's health, has also been the subject of much debate. I will review here a few of the main features of that debate along with alternative definitions of health.

Probably the most widely cited and debated definition of health is that contained in the preamble to the charter of the World Health Organization: "Health is a state of complete physical, mental, and social well being and not merely the absence of disease or infirmity."

While praised for its idealism, this definition has come under attack from two sides, one being the difficulty in operationalizing it (Elinson, 1977), and the other its seeming enfranchising of the medical

establishment in its search for expanded power. (Antonovsky, 1979)
With regard to the former, while many pay lip service to the definition,
few actually employ it. A notable exception is the measure developed by
Belloc, Breslow and Hochstim (1971) which "arrays the population along a
spectrum from invalidism at one end through various levels of health to
physical vigor at the other end." (p. 329) (See also Breslow, 1972,
for a discussion of development of measures based on the WHO
definition.)

Much more common is the use of the second part of the above
definition. We note, for example, that in its report Healthy People,
the Surgeon General's Committee on Health Promotion and Disease
Prevention never explicitly defines health. (Office of the Assistant
Secretary, 1979) They seem, however, to concentrate on preventing
specific causes of morbidity and mortality. This tendancy to
concentrate on negative aspects of health has been criticized as
inefficient and inappropriate for general population studies. (Ware,
Brook, Cavies and Lohr, 1981; Siegman and Elinson, 1977)

With regard to the medical imperialism argument, the WHO
definition could be seem as symptomatic of what Fox (1977) and others
call the medicalization of America. (See also Ehrenreich and
Ehrenreich, 1978; Zola, 1978; and Illich, 1975) This phenomenon has
contributed to what Antonovsky (1979) quoting Dubos, calls the "mirage
of health": An equation of normalcy with perfect health. In actuality
at any given point in time many people show signs of illness. For
instance, in a random sample of a rural New Jersey county, "only 1
person in 7 was free of currently or potentially disabling disease."
(Trussell and Elinson, 1959) "Instead of it being a relatively

infrequent or abnormal phenomenon, the empirical reality may be that illness, defined as the presence of serious symptoms, is the statistical norm." (In Fox, 1977, p. 11)

Dubos carries this even further, defining health as a "modus vivendi enabling imperfect men to achieve a rewarding and not too painful existence while they cope with an imperfect world." (In Antonovsky, 1979, p. 53) Health is thus seen as the failure to succumb to the noxious influences of the environment.

Along this line, in an attempt to pose an alternative to the above dichotomy between disease and an indefinable state of perfect well-being, Antonovsky puts forth the notion of a multifaceted continuum of the human condition, running from low breakdown (health) to high breakdown. Using a 384-cell matrix, the key variables in placement on such a continuum are degree of pain, functional limitation, prognostic implication and action implication. While such a detailed matrix is not employable in the current effort, it points up two key notions: (1) Health is indeed a multi-faceted variable; and (2) it is dynamic, changing and different for different people in differing environments. For the purposes of this dissertation, health will be defined as a state of comparative well being and full functioning.

SOCIAL SUPPORT NETWORKS AND HEALTH STATUS

With these concepts in mind, we can now turn to an exploration of the theory behind the relationship between social support networks and health. According to King (1972), there are two possible perspectives to take in looking at such relationships: one in which etiological causes are of interest and "one in which the patient's reaction to illness becomes central." Here we are interested in the former which "concentrates on the effects of psychological and social variables on physiological processes leading to a state of illness." (p. 130) Cassel (1976) expands this into two alternatives--social environment can increase susceptability to illness or buffer against illness. Hammer (1983) offers four possible models: (1) Illness leads to reduced social contact (like King's second perspective); (2) Social networks affect health by mediating health-related activities; (3) Social networks buffer the negative effects of stress on health; and (4) Social networks provide feedback which directly affects health. The current investigation is primarily concerned with variations of the latter three of Hammer's models. They will be discussed below in two categories-- social support networks as indirectly affecting health, via interaction with some variable that could lead to or prevent illness, herein the "buffering effects model;" and social support networks as relating directly to health status, herein the "main effects model."

Main Effects Model.

There has been an ongoing debate in the literature for the past decade as to whether the observed relationships between social support networks and health is due to a main effect or a buffering one. Much of the debate has been atheoretical, taking the form of constantly

developing new research designs. According to one group, "Surprisingly.

. . the literature provides almost no theoretical explanation as to why

social support should play a [negative] role in the etiology of

illness." (Lin et al., 1979, p. 109) Much of the work centers around a

search for buffering effects; much less has been done to "examine the

theoretically pertinent and practically significant main effect."

(Thoits, 1982, p. 146)

A main effect would, by definition, show that social supports

either have a direct beneficial effect on health; or precede other

variables which directly effect health status in a causal model. Two

sociological traditions would support this kind of effect--symbolic

interactionism and anomie theory. (Thoits, 1982; and Graham and Reeder,

1979)

Symbolic interactionism, as developed by Cooley and Mead, proposes

that social interactions form the basis for self-evaluation and social

identities. People learn what others expect of them through social

interactions. At times, though, incongruencies develop between goals

and norms and the individual's capacity to achieve them, which may lead

to stress and illness (in Graham and Reeder, 1979, p. 92)

Similarly, the absence of such interaction may deprive the

individual of the feedback necessary for normal growth, development and

self-maintenance. This is consistent with the social isolation

hypothesis developed by Faris and Dunham (1939). Cassel (1974) proposes

that when people get insufficient social feedback they become

susceptible to disease, while increased feedback strengthens them.

Using this base, Hammer (1983) then theorizes that people with large and

diverse (kin and non-kin) extended social networks can benefit from

multiple sources of feedback, in addition to being able to replace parts of their core network when a member is lost.

The second major sociological tradition which would provide support for a main effect theory is Durkheim's (1951) anomie theory. Dealing primarily with psychological well-being, he emphasized the impact of external forces in maintaining social integration, a necessary condition of well-being. Accordingly, membership in a cohesive group gives a purpose to life and "protects against uncertainty and despair that may lead to disordered functioning. . . [The] implication is that social support as an aspect of social integration should have a main effect upon psychological state." (Thoits, 1982, p. 154)

We should also note that in much of the research, as will be described below, main effects occur where they are not expected, in the absence of, or complementary to, buffering effects. Likewise, the two are not necessarily mutually exlusive, as will also be shown below.

Buffering Effects

Much as the main effects school has its roots in traditional sociology, the buffering hypothesis relies heavily on concepts of ego-psychology, particularly inasmuch as the buffers most often referred to are working against the deleterious effects of stress and life changes upon health. (See Dohrenwend and Dohrenwend, 1974.) The hypothesis, however, has been highly criticized by some, such as Hammer (1983), who see it as a phenomenon in search of a theory. She argues that "the 'buffer' model of social support arose in part as a metaphorical rationale for the apparent impact of social relationships upon health and in part from findings. . . which showed these effects only under high stress." (p. 406) This ties in to another criticism: "the

failure of researchers to define clearly what is meant by buffering or modifying effects. . . of social support." (Williams, Ware, and Donald, 1981, p. 326) The latter criticism has been met in part (1) by consistent operationalization of buffering as an interaction effect, and (2) by attempts to formulate a theory of social network utilization as a coping strategy.

The buffering hypothesis per se was first proposed by John Cassel (1974), who derived it from the works of Dubos and Wolff. Dubos (1965) describes disease potential in humans as ubiquitous and omnipresent, but "exert[ing] pathological effects only when the infected person is under conditions of psychological stress." (p. 165) Wolff differentiates between physiochemical disease agents and psychosocial ones, saying that the former act directly upon the body "while the latter acted indirectly by virtue of their capacity to act as signals or symbols." (In Cassel, 1974, p. 473) Thus social support systems are conceived of as intervening in the ability of a disease-causing agent to adversely affect the individual. As Cassel states, "These might be envisioned as the protective factors buffering or cushioning the individual from the physiologic or psychologic consequences of exposure to the stressor situtaion." (Cassell, 1974, p. 478)

In order for this theory to be borne out, there is a need to demonstrate an interaction between social supports and a disease-producing agent in its effect on health. Research around this phenomenon has centered on ongoing life strain and stressful life events as those agents. (See, for example, Lin et al., 1979, Miller and Ingham, 1976, and Turner, 1981). Thus "the occurance of events in the presence of social support should produce less distress than should the

occurance of events in the absence of social support." (Thoits, 1982,
p. 145) I will deal with evidence regarding this effect in the
following chapter. What is of concern to us here are the possible
mechanisms by which buffering might work.

According to Cobb (1976), "The most attractive theory about the
nature of this phenomenon involves pathways through coping and
adaptation." (p. 311) Such an approach requires a broad
conceptualization of coping which includes both "cognitive and
behavioral responses attempting to deal with the external stressor as
well as behavioral responses that seek to avoid the problem." (Billings
and Moos, 1981, pp. 140-141) It also requires (1) seeing coping as both
problem-focused and emotion-focused, the former aimed at modifying or
eliminating stress or change; the latter at managing its consequences;
and (2) recognizing the importance of the source of stress.

Within such a framework, then, there are several ways in which
coping can be protective: (1) by eliminating or modifying conditions
causing problems; (2) by changing one's perception of problematic
situations; and (3) by containing the consequences of problems (Pearlin
and Schooler, 1978, p. 2). Viewed in this way, the buffering hypothesis
would be a restatement of numbers one and two above. What Cobb calls
"esteem support" could enhance one's mastery--using one's own resources
to cope. Tangible and information support could give the individual the
resources which would enhance his/her ability to cope. And a sense of
belonging could provide the climate for self-identity change,
particularly as it involves abandoning (or failure to adopt) the sick
role. (Cobb, 1976, p. 311; Wilcox, 1981, p. 372. See also Hirsch,
1981.)

A Contingency Model

Both of the above models are limited. The main effects model would imply that social support networks are a panacea for unidentified causes of disease and work in the same way for all people. It therefore is lacking as a basis for developing interventions. On the other hand, the buffering hypothesis, as presented above, is also limited: It is restricted to the relationship of stress and life events to illness. It fails to examine the possible roles of social support networks in the face of other social needs; it deals primarily with emotional support; and inasmuch as loss of a network member figures prominantly in the measuring of stressful life events, confounding is a problem. It leaves unanswered Mitchell and Trickett's (1980): "What types of social netowrks are most useful for which individuals in terms of what particular issues under what environmental contitions?" (p. 28) In other words, what contingencies are involved in the relationship between social support networks and health?

The answer to this question would seem to derive both from the multiple functions of social support networks and the multiple needs of people. In reviewing the functions of social support, Mitchell and Trickett found four recurring themes—emotional support, task-oriented assistance, socialization, and access to new and diverse information and contacts.

Unfortunately,

> Virtually all studies of social support emphasize the attachment and affiliative functions of support over the instrumental, material or social integration functions. . . As a result, we have no information about the importance of different types of functions of support for the health outcomes states." (Schaefer et al., 1981, p. 385)

For example, it would seem likely that informational support plays a role in the decision to seek care (Berkanovic, Telesky and Reeder, 1981; Gottlieb, 1983; Wan, 1982; Langlie, 1977). Yet this function rarely appears in the social support and health literature.

Just as support functions vary, so do needs. Not all needs can be met by the same form of social support. "This should be evident to anyone who has received emotional support in the form of a sympathetic word when what was really needed was some tangible aid such as a ride to an appointment or help with child care." (Schaefer et al., 1981, p. 386)

Even within the limited realm of stress as a pathogenic agent, there is some evidence that certain stresses are best handled by matched supports, i.e., work-related stress could be buffered by work-related supports. (LaRocco, House and French, 1980)

This could be supported by a related theory developed by Litwak and others around primary groups. He points out that various primary groups are equipped to perform different tasks, depending on both task and group structure, i.e., the kind of support that a spouse can give is not the same as that of neighbors. (Litwak, in press; Litwak and Szelenyi, 1963; Litwak and Kulik, 1983) Salloway and Dillon (1973) in an examination of social networks and health care utilization also show a difference in care-seeking depending on whether one's network is dominated by friends or family.

From all of the above, then, we could extrapolate that the role of social support networks in relation to health status revolves around the social needs of the focal individual and the tasks the network is equipped to perform. When there is a good fit, we could hypothesize

that people will be healthier, with various supports buffering the
effect of a variety of needs (emotional, instrumental and information)
which might adversely affect health, if not met.

CHAPTER 3

REVIEW OF THE EMPIRICAL LITERATURE

-Introduction

-Ecological Studies

-Marital Status

-General Population Studies

-Studies of Subpopulations

-Conclusions

INTRODUCTION

There exists a large and growing volume of empirical studies which deal with the relationship between social networks and health status, with comprehensive reviews appearing in both the social work and public health professional literature in recent years. (Broadhead, et al., 1983; Ell, 1984; Kaplan et al., 1977) These studies have for the most part shown social support networks to have a positive outcome on health status. They employ a variety of conceptions of social support networks, and measure health in various ways across very different population groups, both general and specific.

The studies selected for review here were obtained through several resources--a Medline search carried out by the Columbia University Health Services Library; manual searches of the Cumulative Index Medicus going back to 1970 and sources listed in the bibliographies of major review articles (i.e., Broadhead et al. 1983; Ell, 1884; Kaplan et al., 1977, DiMatteo and Hays, 1981); and through personal correspondence with all those who presented papers relating to social networks at the 1983 and 1984 annual meetings of the American Public Health Association. Studies selected for review were those which included specific health status measures as outcome variables. They are grouped here, for review, into four categories: ecological studies, studies of marital status and bereavement, studies of general populations, and studies of sub-populations.

ECOLOGICAL STUDIES

Ecological studies are those which compare the characteristics of aggregate population groups with each other, but not characteristics of individuals within those groups. Hence they are not suitable for inferring causality. They are, however, included here as they provide a jumping off point for theory development around this subject. Those presented here are summarized in Table 1.

Stout, Morrow, Brandt, and Wolf (1964) observed the unusually low death rate from myocardial infarction (MI) of the residents of the Italian immigrant town of Roseto, Pa. They compared death rates of Rosetans to those of residents of four neighboring towns, over a seven-year period, and found that the death rate from MI in Roseto was significantly lower than the rates in the other four towns. They also found that Roseto was the only town of the five in which males outnumbered females in the 55-64 and 65+ age groups. Following these findings, residents of Roseto were examined and observed in order to determine what lifestyle or other factors might be related to their low death rate from MI, in spite of a high fat, high calorie diet. The major observation was the prevalence of a high degree of mutual trust and support in Roseto, which the authors speculate might mitigate the consequences of diet and other poor health practices.

Data from this study are obviously exploratory and non-generalizable. One possible explanation for the findings are genetic factors, particularly since most of the residents of Roseto came from the same part of Italy. There are also many difficulties with the study design: In particular, the follow-up survey was a convenience sample of Rosetans, and comparable data on residents of surrounding towns were not

Table 1. Summary of Ecological Studies of Social Networks and Health Status

Author/ Date	Study Per.	Design	Population	Social Network Characteristics	Health Status Measure	Findings
Jenkins 1983	--	Ecological	Massachusetts, men	Residence in high risk neighborhood	Cancer mort.	Neighborhoods classified as high risk had high cancer mortality rates.
Neser et al. 1971	1956- 1961	Ecological	N. Carolina, blacks	Social disorganization	Stroke mort.	Counties with high social disorganization had higher rates of stroke mortality for blacks, especially men.
Stout et al. 1964	1955- 1961	Ecological	Roseto, Pa.	Mutual trust, support	M. I. mort.	Town had lower death rate from M. I., than surrounding towns.
Bruhn & Wolf 1978	1965- 1975	Ecological	Roseto, Pa.	Mutual trust, support	M. I. mort.	Death rate from M. I. same as nat'l average.

gathered. Similarly, no data on mortality from other causes is given--
perhaps they all died of cancer rather than heart disease. Finally, the
fact that more men are alive than women at later ages could just be a
reflection of patterns of immigration--it is very likely that more men
came to the town from Italy than did women and hence they are
overrepresented among the survivors. Nevertheless, the study represents
an interesting exploration from a different viewpoint--looking at
positive ecological traits relating to low mortality, rather than the
opposite.

Bruhn and Wolf (1978) followed up the Roseto study 15 years later.
At the time of the earlier study, it was hypothesized that if social
supports were indeed important in reducing MI mortality, then as the
community became more "Americanized," i.e., through the erosion of old
world values and supports, the death rate from MI would more closely
approximate that of neighboring towns. According to the authors,
evidence of this process was "observable by 1965 and by 1970
materialistic and individualistic values had displaced much of the
cohesive group concern of Roseto." (p. 86) By 1975, the death rate was
approximately the same as that of the U.S. at large.

A second ecological study is somewhat more typical of that genre.
Neser, Tyroler and Cassel (1971) looked at the phenomenon of social
disorganization in counties in North Carolina in relation to stroke
mortality for blacks in those counties. Social disorganization was
measured by an index comprised of (1) family instability (% single-parent
families); (2) % illegitimate births; (3) rate of males sentenced to
prison road camps; (4) % population separated or divorced; and (5) %

children under 13 not living with both parents. Counties were then ranked and grouped into 5 levels of social disorganization.

Mortality data was gathered from the State Health Department for the period 1956-64, and tabulated by age, sex, race and place of residence for people aged 35-74. These were they converted to age-specific mortality ratios for blacks for each county, using the rate for the least disorganized group of counties as the denominator. In comparing the two sets of data, the researchers found "a regular, stepwise rise in mortality rates for stroke among counties as these counties have increasing levels of social disorganization." (p. 168) The relationship was particularly strong in the younger age groups, where the rate for the most disorganized county was 2.90 times that in the least disorganized counties for males and 2.12 times for females, after controlling for poverty level and geographic factors. Here too, the ecological nature of the relationships and the limitation to the black population limit the generalizability of the results. This is recognized by the authors as well, who nevertheless suggest that the results "could form a starting point in the search for explanations for the sustained black excess in cerebrovascular diseases and allied disorders." (p. 184)

A final example of this kind of study is one which looks at the relationship of social environment and cancer mortality in men. (Jenkins, 1983) In this exploration, a high correlation was found between residence in high-risk neighborhoods and sex-specific age standardized mortality ratios for those areas. That is, neighborhoods which were categorized as high-risk (high percent living in poverty, high unemployment, poor housing conditions, few married couples, many female-

headed households, and many disabled people) also had high rates of cancer mortality for men. Earlier studies also showed these areas to have high death rates from all causes. While again subject to the ecological fallacy, it is interesting to note that the results do not hold up for women. Similarly, in both of the other studies cited, the relationship was stronger for males. (This is also true in a number of the prospective studies reviewed below.) This might lead one to suspect that the relationship between social supports and health is not a uniform one across all population groups but rather has different importance for subgroups of the population.

MARITAL STATUS

General Studies

Of all kinds of social networks and supports, marriage is probably the most intensive. Hence, I will explore this relationship first, before moving on to broader areas.

There have been several attempts made at documenting the link between marital status and health status, as measured by mortality rates. (See Table 2) Lynch (1977) in a detailed study of premature death due to heart disease has summarized data from the U.S. Office for Vital Statistics. [Gove (1973) analyzed the same data for several causes of death.] Premature deaths are defined as those occurring between the ages of 15 and 64. Looking at all deaths that occurred in the U.S. between 1959-61, premature death dates in men and women who were single, divorced or widowed were significantly higher than those for married individuals. This finding was consistent for every major cause of death. Gove found the relationship to be stronger for men than for women, and particularly strong for "those types of mortality where social factors would appear to be especially important." (p. 60) We should note that such findings hold for other countries too. For example, Koskenvuo (1979) in an examination of death certificates in Finland found that for the population aged 25-65, divorced men and women have the highest death rates in all age groups and for all causes of death.

In another major study, data from the U.S. Third National Cancer Survey was used to explore whether "marital status contributes to or protect[s] against cancer of various sites." (Ernster, Sacks, Selvin and Petrakis, 1979, p. 567) For all sites, for both blacks and whites, males and females, married people had significantly lower incidence rates of

Table 2. Summary of Studies of Marital Status and Health Status

Author/ Date	Study Per.	Design	Population	Social Network Characteristics	Health Status Measure	Findings
Ernster et al. 1979	1969- 1971	Cross- sectional	U.S., aged 35-64	Marital status	Cancer incidence	Married people have significantly lower cancer rates than unmarried people.
Gove 1973	1959- 1961	Cross- sectional	U.S., aged 15-64	Marital status	Cardiac Mortality	Death rates are lower for married people, especially among men.
Lynch 1977	1959- 1961	Cross- sectional	U.S., aged 15-64	Marital status	Premature deaths	Premature death rates lower for married people than all others.
Koskenvuo 1979	1969- 1971	Cross- sectional	Finland	Marital status	Mortality	Divorces have highest death rates at all ages and sexes.

cancer than did unmarried people. We also note that in some of the longitudinal studies of general populations presented below, marital status was a significant predictor of mortality for men (House, Robbins and Metzner, 1982; Berkman and Syme, 1979) and for whites (Schoenbach, Kaplan, Kleinbaum and Fredman, 1983).

There are, however, two difficulties with these kind of data: (1) Marital status seems to covary with other factors related to mortality (i.e., cigarette smoking and general life style), and (2) there may be selection factors operating about which we have no knowledge. For example, it may be that healthier people marry more than ill people.

Recent Bereavement

One way of dealing with these selection factors would be to limit study to people within marital status categories. This is essentially what has been done in numerous studies of bereaved persons. People who had a close relationship (generally marriage) are studied following the termination of that relationship due to the death of the partner, to assess their mortality and morbidity. I will review several of these studies briefly. They are summarized in Table 3.

Rees and Lutkins (1967) surveyed the residents of an area of Wales served by a single group practice. Death records for all persons who died during the years 1960-1965 were obtained, and their close relatives located. The deceased persons were then matched by age, sex and marital status with persons still living in the area (choosing alternate names from the practice lists.) The subsequent mortality of the relatives of both the deceased persons and the control group were determined. (Deceased persons with no close relatives, and neonates were excluded from the study, leaving n=371.) "It was found that 4.76% of the bereaved

Table 3. Summary of Studies of Bereavement and Health Status

Author/ Date	Study Per.	Design	Popula- tion	N	Resp. rate	Social Network Measure	Health Status Measure	Findings
Bunch 1972	1969	Cross- sectional, case-cont.	Suicides England	225	---	Bereave- ment, Mar. Stat.	Suicide	Suicides were more likely to have been bereaved.
Maddison & Viola 1968	1964- 1966	Longitu- dinal, case-cont.	Widows, Boston/ Sidney	752	50%	Bereave- ment	Reported health status	Widows had lower reported health status than matched controls.
Parkes et al. 1969	1957- 1966	Longitu- dinal	British widowers age 55+	4486	---	Bereave- ment	Mortality	Excess mortality in first six months of bereavement.
Rees & Lutkins 1967	1960- 1965	Longitu- dinal, case-cont.	Close rel's of deceased persons, Wales	371	82%	Bereave- ment	Mortality	Bereaved persons had higher death rates in year following loss than matched controls, especially men.

close relatives died within one year of bereavement compared with .68% in the control group." (p. 16) In particular widows and widowers were more likely to die during the first year of bereavement than non-bereaved spouses (12.2% vs. 1.2%), and the mortality rate was over twice as high for widowers (19.6%) as for widows (8.5%). Unfortunately, the narrowness of the population studied limits the generalizability of the results. It also led to some bias--in a population so small, some cases could not be matched exactly, so approximate matches were used. And no study was made of the 108 cases who had no close local relatives; these are essentially cases lost to follow-up, about 18%.

In a prospective study, Parkes, Benjamin and Fitzgerald (1969), identified 4,486 British widowers aged 55+ whose wives died in 1957 (the entire cohort) and followed them for 9 years. Of these, 40% more died than expected during the first six months of bereavement. After that period, their mortality was similar to that of married men. Most of the increased mortality (53%) was due to coronary heart disease. A possible explanation could be a shared unhealthy environment, or, as the authors point out, poorly managed stress.

A third study on the subject was carried out in Boston during 1964-65 and replicated in Sydney, Australia during 1966 by Maddison and Viola (1968). A mail survey was done of 276 Boston and 476 Sydney women, 13 months after their husbands' deaths (a cohort of all registered deaths over a six-month period, in Boston all men 45-60, in Sydney all men under 60.) The questionnaire measured reported health status and service utilization for the cases and matched controls. The reported health status of widows was significantly lower than that of controls in both

studies, although the low response rate (50%) limits the generalizability of the findings.

In a final example, Bunch (1972) examined the relationship between bereavement and suicide in England. Seventy-five consecutive suicides (from inquests) formed the study group. Controls were 150 living subjects randomly selected from two group practice registers, matched for sex, age, marital status and area of residence. For the suicides, data was gathered from friends, relatives and physicians, regarding their clinical state, personality, personal and family history and social circumstances. For controls, data were gathered from the subject. Findings include that suicides were more likely to have been bereaved (36% vs. 13%). It was also found that, among the bereaved, unmarried males were much more likely to suicide than married males. Along the same lines, among the bereaved, suicides had less frequent contact with other relatives than did survivors. Unfortunately, no data were provided to support the latter finding. Obvious problems with this study include the reliance on secondary data sources, and the fact that there is a switch in the groupings of study groups midstream, from suicide/non-suicide, to bereaved/non-bereaved, even though matching was done only for the first schema.

In summary, these studies show that married people have lower mortality than non-married people. Keeping in mind the limitations of the various study designs, it would seem that among the once-married, death of a spouse seems to be related to increased risk of mortality and perhaps reported morbidity, especially in the short run. This might indicate that existence of close relationships shielded those people from illness, and that once the relationship ended, their resistance dropped

and they were at increased risk. This could also hold with regard to
other close relatives. And conversely, those who had a strong social
support network might be better equipped to cope with the stress of
bereavement. The latter possibility in particular bears further
exploration.

GENERAL POPULATION STUDIES

The ecological studies and those on marital status form part of the base for the studies that follow. The first group is characterized by fairly large, random samples, with a prospective design, which look at the relationship between health and social networks. Three of them use mortality as the outcome variable, and four use measures based on self-reports and symptoms. The second group is made up of somewhat smaller cross-sectional studies, all of which use self-reports as outcome measures. They are summarized in Table 4.

Longitudinal Studies

The first major study of this kind was done by Berkman and Syme (1979). As will be discussed below, this study was the stimulus for many of those which follow, and was also the stimulus for the collection of the data to be analyzed in this investigation. As part of the 1965 Alameda County study conducted by the Human Population Laboratory of the California State Department of Health, a stratified random sample of 4452 households was surveyed, in which 6928 people responded (86%). For this study, only the responses of the 2229 men and 2496 women aged 30-69 were analyzed. Nine years following the interviews, mortality data was obtained on the sample population (with 4% loss to follow up). Included in the survey instrument were sources of social contact--marital status, contacts with friends and relatives, church membership, and group affiliations. In every age and sex group, married people had lower mortality rates than non-married people. And for most ties, people with the tie had lower mortality than those without it. While each of the four sources predicted mortality independently, marriage and contacts with friends and relatives were the best predictors. Berkman and Syme

Table 4. Summary of Studies of Social Networks and Health Status: General Population Studies

Author/ Date	Study Per.	Design	Popula- tion	N	Resp. rate	Social Network Measure	Health Status Measure	Findings
Andrews et al. 1977, 1978	No Date	Cross- sectional	Suburban Sidney, aged 20-69	863	90%	Social resources isolation partici- pation.	Rept'd health status, mental status	Low social support rela- ted to morbidity and mental status, especially for elderly. No buffering effect for stress.
Berkman and Syme 1979	1965- 1974	Longitu- dinal	Alameda Co., CA aged 30-69	4725	86%	Marital stat., close ties, church, index.	Mortality	All network measures negatively related to mortality.
Brown et al. 1984	1981	Cross- sectional	Richmond, VA, blacks	451	72%	No. and proximity of ties, church, perceived support	Depres- sive symptoms, self- rated health	Social networks more important in physical health of men. Religious activities more important for men. Church attendance and perceived support buffer stress for females, church attendance for men.
Eaton 1970	1967- 1969	Longitu- dinal	New Haven, CT adults	750	--	Living alone	Mental illness	People living alone more likely to have symptoms of mental illness.
Graham 1978	No Date	Cross- sectional	White, males, Georgia	355	--	Church atten- dance	Blood pressure	Frequent church atten- ders had lower blood pressures.
Hibbard & Pope 1984	1970- 1971	Cross- sectional	Kaiser- Perm. members	2357	--	No. of ties	Health Behaviors	The link between social ties and health behaviors is greatest for those 65 and over.
House et al. 1982	1967- 1979	Longitu- dinal	Tecumsah, MI, aged 35-69	2754	71%	Marital statis. contact, satis., groups, leisure activities	Mortality	Social relationships and activities negatively related to mortality, especially for men. No re- lation with satisfaction.
Lin & Dean 1984	1979- 1980	Longitu- dinal (1-yr.)	Albany. adults	871	80%	Ties support	Depres- sion	Support mediates stress- depression relationship.

Author/ Date	Study Per.	Design	Popula-tion	N	Resp. rate	Social Network Measure	Health Status Measure	Findings
Lin et al. 1979	1972	Cross-sectional	Chinese-Amer's Wash., DC	170	--	Non-kin support, Marital status	Pschiatric symptoms	Marital status and support relate negatively to symptoms, very weak buffering of stress.
Milburn et al. 1984	1981	Cross-sectional	Richmond, VA, blacks	451	72%	No. and proximity of ties	Depres-sive symptoms	No. of close friends nearby and no. of rela-tives are significant pre-dictors of depression. Stronger for young, low income and unemployed.
Miller & Ingham 1976	No Date	Cross-sectional	Edinburgh Group practice patients	337	80%	No. of friends	Physical & psychiatric symptoms	People with few friends report more symptoms.
Schaefer et al. 1981	1977	Longitu-dinal (1-yr.)	Subsample of Alameda Co.	100	50%	Network func-tions	Reported health status	No relationship either directly or as buffer of stress.
Schoenbach et al. 1983	1967-1980	Longitu-dinal	Evans Co. GA	2059	80%	Berkman index	Mortality	Social network index predicted mortality for elderly.
Turner 1981	No Date	Longitu-dinal Secondary analysis	New moth-ers, Mala-daptive parents, deaf, mentally ill	878	--	Per-ceived support	Well-being	Social support positively related to well-being and buffered effect of stress.
Wilcox 1981	No Date	Cross-sectional	Adults, aged 16+	320	64%	Index of network size & function	Psychiatric symptoms	Networks mediate rela-tionship between stress and psychiatric symptoms.
Williams et al. 1981	No Date	Longitu-dinal	Seattle, aged 14-69	2234	90%	Avail-able supports	Mental status	Available supports posi-tively related to mental health but do not buffer stress.

also developed a Social Network Index that considers the number of ties, and weights their importance, giving intimate ties stronger weights. The study "reveals a consistent pattern of increased mortality rates associated with each decrease in social connection." (p. 192) The only exception is for women aged 50-59. Relative risks for the least connected run from 1.8 for men aged 60-69 to 4.6 for women aged 30-49.

In explaining their results, Berkman and Syme try to control for four possible confounding variables: health status in 1965, socioeconomic status, health practices, and utilization of health services. While each of these weakened the social network-mortality relationship, it persisted at statistically significant levels through all of the controls.

In a later follow-up, Schaefer et al. (1981) selected a subsample from the subjects of the Alameda study who were 45-64 years old, white, Protestant or Catholic, educated (8+ years), non-poor and non-disabled. In a one-year panel study, data was collected on functions of social support networks, stressful life events and health status. They found that social support did not relate to health status either directly or as a buffer of stress, for this middle-aged, middle-class, relatively healthy subpopulation.

The third study of this type was carried out as part of the Tecumseh Community Health Study in 1967-69. (House et al., 1982) Respondents included persons who had been through two previous rounds of health examinations (eight and five years previously) plus a 10% random sample of those not previously sampled. The eligible population was thus 3873, of which 71% responded. In 1978-79 mortality data was obtained for all 3873. Data on social integration and activities were collected

during personal interviews in 1967-69, using three types of measures:
(1) intimate social relations; (2) formal organizational involvement; and
(3) type of leisure activities. Adjusting for age, they found that for
men, passive/solitary leisure was positively associated with mortality.
When other risk factors were controlled for, four relationships remained
significant--marital status (married), and frequency of attending
voluntary association meetings, spectator events and classes or lectures
were all related to decreased mortality. For women, adjusting for age,
passive leisure and church attendance were related to mortality.
Controlling for frequency of activities, satisfaction with relationships
and activities had no significant association with mortality.

In a recent attempt to replicate Berkman and Syme's findings,
Schoenbach et al. (1983) applied their Social Network Index in an ongoing
panel study in Evans County, Georgia. In formally testing the
hypothesized relationship (social networks and mortality), they found
only a weak relationship. However, in a further exploration they found
that marriage was a significant predictor of survivorship in white males
and females; and church participation was a significant predictor for
white males and black females. They cite, though, as most meaningful the
finding of increased risk among the elderly with few social ties. This,
too, would indicate that social networks are not of equal importance for
all sub-populations.

Finally, in addition to health status as an outcome measure,
several studies use mental health status, whether individually or in
conjunction with physical health status, as outcomes, particularly in
cross-sectional studies. They are included here due to the generally
high correlation between mental and physical health status. (See

Andrews, Schonell, and Tennant, 1977.) Four longitudinal studies of this relationship are presented here. Williams et al. (1981) looked for evidence to support the theory that social support buffers stressful life events in their impact on mental health, using a sample from the Rand Corporation Health Insurance Experiment. They found no significant interaction between available social supports and life events or social supports and disability in predicting mental health status, although each alone significantly predicted mental health status.

Eaton (1978), on the other hand, in a secondary analysis of data from Myers' New Haven Study, found that persons living alone were more likely to exhibit symptoms of mental illness following stressful life events than were persons who were either married or living with others.

Turner (1981) looked only at one aspect of social support, using Cobbs' conceptualization of support as information that one is loved, valued, and part of a network, using the samples of four ongoing studies, both in combination and individually. (All four of the samples involve what could be characterized as high-risk groups.) He found that social support had a direct effect on well-being for all groups and also mediated the effect of stress. It did so differentially for various social classes, with support being especially important in mediating the effect of stress on depression among lower socioeconomic class people.

And finally, in preliminary results from the Albany Health Study (of social support and health) Lin and Dean (1984) examine some 13 elements and measures of social support and their relationship to symptoms of depression. Using two waves of data collection (1979 and 1980) they report on one element--strong ties support--which demonstrates capability to mediate the effects of stress on depression.

Cross-Sectional Studies

While cross-sectional studies may not be as useful in establishing causality as are longitudinal studies, they can add to our understanding of the relationship between variables and provide the basis for further longitudinal studies. Andrews, et al. (1977) studied the population of a suburb of Sydney, Australia, selected for its demographic similarity to the Sydney area. A random sample of all adults completed a self-administered questionnaire, containing questions aimed at assessing physical health, psychological morbidity, and social morbidity (measured by an index of items on social resources, personal isolation and social participation and employability). As becomes clear, this was a community with few socially isolated people. Social isolation showed no relationship with physical health (r=.04), although of the 6% of the population who were socially isolated, half reported themselves to be chronically ill.

In a later analysis, the employability item was removed from the social isolation index; it was then found that social isolation was a significant predictor of both physical and psychiatric impairment. With regard to psychiatric impairment, the relationship was most important for the elderly. (Andrews, Tennant, Hewson and Schonell, 1978)

In other cross-sectional studies, Miller and Ingham (1976) report that persons who had few friends tended to have higher levels of physical and psychiatric symptoms and, in a subsample, that social support buffered the relationship between life events and symptoms. Looking at a very different measure of social-connectedness, Kaplan et al. (1978) found that frequent church attenders had lower blood pressure than do non-attenders.

Hibbard and Pope (1984) used data from the large scale Kaiser Permanente Health Plan study. Using a variety of measures of health behaviors, they found that the link between social ties and health behaviors was greatest for persons over age 65.

Finally, three cross-sectional studies look at the potential buffering effect of social support on psychiatric symptoms. Lin et al. (1979) studied the Chinese community of Washington, D. C. Focusing on non-kin relationships (friends and community groups) they found that both stressful life events and social support predict psychiatric symptoms, although virtually no support was shown for an interaction between them in their relation to symptoms.

In a further study along similar lines, Wilcox (1981) also looked for support of the buffering effect of social support on life events in their relation to depression. In a community study of 320 residents, indices of network size and function were obtained as well as life events and psychiatric symptoms. Items on function were collapsed into a "presence of support" scale. He found that both presence of support and network size mediated the relationship between life events and psychiatric symptoms, with the former measure accounting for more variance than the latter.

Finally Milburn et al. (1984) and Brown et al. (1984) both report on a study of black residents of Richmond, Va. They found that the number of close friends and relatives is an important predictor of depression and of self rated health. These relationships were stronger for the young, the low income and the unemployed. Looking at the buffering effects of social support, they found that for both men and women, church attendance buffers the effects of stressful life events

upon health status. Additionally, for women, perceived support buffered the negative effect of stressful life events.

In summary, the support for the buffering effect of social support versus the main effects model in studies of general populations is mixed. If we take a broad view of the buffering hypothesis, defining buffering as an interaction effect between social support and another independent variable, either demographic or experiential, there are only two studies (Williams et al., 1981 and Lin et al., 1979) which looked for and found no buffering effect. For example, both the Berkman and Syme (1979) and House et al. (1982) studies showed a differential effect of marital status by sex (stronger for men). Andrews et al. (1978), Schoenbach et al. (1984), and Hibbard and Pope (1984) found stronger relationships between social support and health status for the elderly. And Turner (1981), Lin and Dean (1984), Miller and Ingham (1976); Wilcox (1981); Eaton (1978); Milburn et al. (1984) and Brown et al. (1984) all found some degree of buffering of stressful life events by social supports. The results, while inconsistent in the variables studied and measures employed would all point in the direction of different outcomes for different sub-populations. This point of view is further supported by Schaefer's finding of no relationship between social support and health in what could be termed a low-risk population--white, middle-aged, middle class. This possibility will be the focus of the next section.

Author/ Date	Study Per.	Design	Popula- tion	N	Resp. rate	Social Network Measure	Health Status Measure	Findings
C. Pregnant Women and Mothers								
Barrera & Balls 1983	No date	Longitu- dinal	Pregnant adoles- cents	74	86%	No. of ties, satis.	Apgar; compli- cations	Both measures of networks buffered effects of neg. life events on pregnancy.
Hall 1983	No date	Cross- sectional	Low- income mothers	111	89%	Berkman index, marital status	Depressive symptoms	Networks inversely associ- ated with depression only among unemployed. Life events more important for unmarried women.
Norbeck & Tilden 1983	No date	Longitu- dinal	Pregnant women	117	84%	Index of available supports/ quality	Compli- cations, Emotional disequil.	Support buffered effect of stress on both out- comes.
Nuckolls et al. 1972	No date	Longitu- dinal	White, primi's, wives of soldiers	170	50%	Psycho- social assets	Compli- cations	For women who had high stress, social support buffered its effects on complications.
Sosa et al. 1980	No date	Experi- mental Case- control	Guatamala primigra- vidas	103	—	Presence of sup- portive companion	Compli- cations	Women with support less likely to experience complications.
D. Serious Illness or Injury								
Boyer & Friend 1984	No date	Cross- sectional	Hemodi- alysis patients	60	—	Perceived support, religion	Quality of life, lab. tests	Most support measures significantly related to all outcomes.
Friis et al. 1983	No date	Cross- sectional, case-cont.	Chronic diabetics	112	—	Berkman index	Depression	Main effect of social support on depression for overall group. For con- trols, high network asso- ciated with low depres- sion.
Funch & Marshall 1982	1958- 1980	Longitu- dinal	White breast cancer patients	208	—	Marital status No. ties, groups	Survival time for decedents	Only social involvement predicted survival time. No interaction for stress.

Author/ Date	Study Per.	Design	Popula- tion	N	Resp. rate	Social Network Measure	Health Status Measure	Findings
Garrity 1973	No date	Cross- sectional	White, male MI survi- vors	58	67%	Perceived family concern	Return to work	The more concerned the family, the fewer hours worked.
Litman 1963	No date	Cross- sectional	Orthope- dically disabled aged 15+	100	--	Fam. sol- idarity, groups	Response to rehabi- litation	Patients with strong family support responded better to rehabilita- tion.
McLeroy et al. 1984	No date	Longitu- dinal (6 mos.)	Stroke survivors	393	--	Type of support, Network charac- teristics	Activities of daily living	Only instrumental sup- port related to ADL (neg.) Net. variables not related after control for support.
Porrit 1979	1972- 1974	Experi- mental	Male accident victims	70	--	No. ties, perceived support	Emotional distress, health change	Quality of support more important than size in predicting health.
Reveson et al. 1983	No date	Longitu- dinal (6 mos.)	Nonhospi- talized cancer pts. aged 40+	32	55%	Suppor- tive behaviors	Adjustment to cancer	Support negatively related to long-term adjustment.
Weisman & Worden 1975	No date	Cross- sectional	Deceased cancer patients	35	--	Poor social rela- tionships	Survival time	People with poor social relationships died sooner than those with good relations.

that support does not buffer the effects of stress, but rather that low support exacerbated the effect of stress.

LaRocco et al. (1980) examined the role of perceived social support in buffering the effect of perceived job stress and strain on mental and physical health. An occupationally stratified random sample of 636 men in 23 occupational groups was drawn from several organizations. In a secondary analysis, using some 225 regression analyses, LaRoccoo et al. found that social support buffered the effect of stress and strain on health, but did not directly reduce either stress or strain, or buffer the effect of stress on strain. They also note that work-related support buffered work related stress and strain better than did other supports. We should note that this study has come under criticism for using inappropriately lax tests of significance, especially given the large number of tests performed. (Schaefer, 1982) Yet the direction and consistency of the results would still seem to warrant the wide attention they have received in the literature as supporting the buffering hypothesis.

Finally, Pearlin et al. (1981) looked at job disruption as a stressful life event, composed of being fired, laid off, downgraded or having left work due to illness. Social support was examined as a mediator of the effect of job disruption on depression, in a longitudinal sample of 2300 adult heads of households in Chicago. A causal model was developed with stress (job disruption) and strain (economic strain), moderated by mastery and self-esteem, leading to mental status (depression). Emotional support from friends, relatives and spouses were then examined to test the effect of the availability of effective supports on depression. In their findings, social supports helped job

losers by preventing lowering of self esteem. The effect was stronger
for job losers than for the stably employed, thus supporting the
buffering hypothesis. What is particularly notable about this study is
its marking of the path by which the interaction works, i.e., preventing
the loss of self-image through emotional support.

All three of these studies offer support for the hypothesis that
social support buffers the stress of job-related problems on health, as
does that of Hall (1984, below). They would indicate that among members
of the work force, the relationship of social support and health is more
important for persons with job-related problems than for those without
such problems.

Outcomes of Pregnancy and Motherhood

Social support networks have been found, in several studies, to
relate to the health of mothers and/or their children. Nukolls, Cassell
and Kaplan (1972) looked at the extent to which psychosocial assets act
as buffers of stressful life changes in their effect on pregnancy
outcomes. Psychosocial assets were measured by a questionnaire designed
to assess factors which contribute to adapting to a first pregnancy (ego
strength, social support, attitude toward pregnancy). (We note that this
index includes factors other than social support networks, and can, for
our purposes, provide only possible directions for further research.)
Life crisis was measured by the Holmes and Rahe life change score.
Pregnancy was classified as either "normal" or complicated.

The study population was white primigravidas, married to enlisted
men and registered for obstetrical care at a military hospital. Of 340
in the cohort, half stayed in the study until the end. The study found
no significant relationship between either independent variable and

pregnancy outcome. But taking them into consideration together, "in the presence of mounting life change. . ., women with high psychosocial assets had only one-third the complication rate of women whose psychosocial assets were low." (p. 438). It is not clear that this is due to the social support components of the index; nor do we know whether social supports alone have a main effect on pregnancy outcome from this study.

A similar prospective study by Barrera and Balls (1983) was carried out with a population of pregnant adolescent primigravidas who were clients in educational and health programs, and were paid to volunteer. Data was collected on social support (three indices of supportive behaviors, network size, and satisfaction); negative life events; psychological symptoms; and birth outcome (one-minute Apgar, and presence of complications). None of the measures of support were found to be independently related to either measure of birth outcome. But an interaction was found between stressful life events and social supports. Thus, "negative life events were significantly correlated with Apgar scores for women with small networks but not for those with large networks." (p. 690) For women who reported low satisfaction with the support they received during their pregnancies, negative life events were moderately correlated with birth complications.

This study was particularly useful in that it separated out three aspects of support systems (size, function and satisfaction). However, limitations of the study design and population also limit its generalizablity.

In an attempt to overcome some of the shortcomings of previous studies, Norbeck and Tilden (1983) designed a study of healthy women aged

20-39 enrolled in the regular clinic of a large university hospital.

Measures were obtained on life events and their desirabiilty;

informational, emotional and tangible social support; psychological

state. Follow-up data were obtained from medical charts on complications

of gestation; labor, delivery, and postpartum; and infant condition.

Respondents who had many stressful events and low emotional support

during pregnancy had high emotional disequillibrium. With regard to

pregnancy outcomes, the results were mixed, with only the interaction of

life stress and tangible support significant for all kinds of

complications. Thus women who had low tangible support and high stress

were most likely to experience complications.

In an experimental setting, Sosa, Kennel, Klaus, Robertson and

Urritia (1980) examined the effect of having a supportive companion

present during labor and delivery. The purpose of the study was to

observe differences in length of labor and mother-child interaction

between those with and without a companion. However, in the course of

trying to obtain equal numbers of cases and controls, women with

perinatal problems (or who needed obstetric interventions) were removed

from the study. The researchers found that such problems were present in

75% of the controls and 37% of the cases. In other words, a significant

association was observed "between the presence of a supportive companion

during labor and a lower incidence of the problems of labor, delivery, or

the neonate that were used as criteria for exclusion." (p. 598)

Likewise, those with supportive companions had shorter labors and higher

scores on interaction with their babies.

In an even longer range study, children discharged from a neonatal

intensive care unit were followed up at age three by Pascoe and Earp

(1984). Using a scale of maternal social support (perceptions about tangible support, satisfaction with support and community involvement), they found that mothers who perceived they had more social support also provided more stimulation for their children. These last two studies would indicate that social support to pregnant women and mothers of young children is important not only for maternal health but may also be important for mother-child bonding and child development as well.

Finally, Hall (1984) looked specifically at low income mothers. She found that social networks were negatively related to depression only among unemployed women. In a test of the buffering hypothesis, she found that stressful life events were more strongly related to depression among unmarried women.

Serious Illness or Injury

The final category of sub-populations to be examined here is that of people suffering from illness or injury. They differ from all those populations described above in that here it is not expected that social support networks will prevent illness or maintain health, but rather will either promote coping with illness and/or reduce its effects. The results here, too, are mixed, with some studies finding negative relationships between support and health and others positive ones. They also represent a range of conditions of varying severity, with varied outcomes. (For a thorough review of social supports and illness, see Di Matteo and Hayes, 1981, who look not only at informal patient supports but also at formal supports and supports for families of patients.)

Garrity (1973) was one of the first to suggest a negative relationship between social supports and adjustment to illness. Looking at 58 men who survived first heart attacks, he found that for those who

were working before the attack, the more they felt their families were concerned about them the fewer hours they worked after the attack.

In another study of adjustment, Reveson, Wollman and Felton (1983) examined the relationship of various kinds of social support to coping in 32 patients with cancers of the blood. They found that a summary index of social support was positively correlated with feelings of personal growth but negatively related to mastery. For the very ill, support was negatively related to all measures of adjustment at follow-up. They conclude that support may threaten autonomy and self-worth especially in chronic conditions.

This conclusion would seem to be borne out in two other studies, which found no relationship between support and health outcomes. Friis, Nanjundappa and Frye (1983) used a case control design (56 in each group) to look at the potential of social support to moderate depression in diabetics. They found that for controls, an interaction effect existed: support was negatively correlated with depression. But for diabetics (who tended to be more depressed), support made little difference in level of depression.

Similarly McLeroy, DeVellis, DeVellis, Kaplan and Toole (1984) looked at the relationship between kinds of social support and social networks and functional health status (activities of daily living) in a longitudinal study of 393 stroke survivors. They found that instrumental support from professionals was negatively related to functioning, and posit that having someone to provide them with instrumental support may prevent patients from developing independent living skills. It is also important to note that they looked only at survivors. Those who died following a stroke might have had differing levels of support.

On the other hand, other studies show a positive relationship between social support and disease outcomes. For example, Weisman and Worden (1975) examined the relationship between social relationships and survival time among cancer patients. Among 35 known deaths, those with poor social relationships had shorter survival periods. (Here nothing is reported about those who survived.)

In yet another cancer study, Funch and Marshall (1982) followed up 283 women, who were diagnosed as having breast cancer, until their deaths. Looking at three measures of social networks (marital status, network size, and organizational involvement), they found only organizational involvement to be important in predicting length of survival. Its effect, even when controlling for prior health status, was most important for the oldest and youngest groups in the study, but did not mediate the effect of stress on length of survival. Again, we note that this study too looks only at those who die of cancer, not survivors.

In a small study of in-house hemodialysis patients, Boyer and Friend (1984) found measures of perceived support and the role of religion to be positively related to perceived quality of life and to a number of physiological indicators.

Finally, two studies of conditions with rapid onset showed positive relationships between social support and health outcomes. Litman (1963) studied 100 orthopedically disabled patients to see if social support was important in rehabilitation. He found that both family reinforcement during rehabilitation and social involvement prior to the disability were significant predictors of positive response to treatment. And Porritt (1979) in an Australian study of road accident victims found that availability of supports was not a factor, but rather that quality of

support was a significant determinant of physical and emotional health status.

As noted above, these findings on the relationship of social support networks and health among the ill, are not consistent with each other. Nor are the measures employed of either social support networks or health status similar enough to allow specific comparisons. Also, in several cases, studies seem incomplete, looking only at survivors or at decedents, but not both. In general, it would seem that social support may be important in a return to function from incidents of rapid onset. In some cases high levels of support seem to impede a return to functioning, although they do seem significant in prolonging survival. This would then lead one to question whether the appropriate definition of a positive outcome is a return to normal functioning or prolonged survival at any cost.

CONCLUSIONS

The above discussion has presented numerous studies which represent various designs, a wide range of study populations, and a variety of measures of both health outcomes and social networks. The combined strength of these studies represents over 30,000 individuals, excluding studies of national death rates. In trying to draw conclusions from the literature, it would be useful to have some systematic way of combining the results of widely varying study designs. One way to do this would be to use meta-analysis. This cannot be done here due to the variety of statistics used to report outcomes (chi-square, relative risks, standardized and unstandardized regression coefficients), not all of which can be transformed to any one measure of association (Glass, McGaw and Smith, 1981)

Likewise, it is necessary to base conclusions on what is reported in these studies, not on raw data. Thus, for example, for those studies which did not specifically look for interaction effects (i.e., Berkman and Syme, 1979) we have no way of knowing whether any exist beyond those for age or sex observed.

Overall, the evidence that there is a relationship between people's social networks and their health status is overwhelming. In only one study (Schaefer) was there no evidence of a relationship of any kind. This knowledge alone, however, is not very useful for planning interventions. Much more specificity is required.

It would be useful to look at these studies in light of the research questions posed for study in the current investigation. First, is there any indication that there are differences between population groups as to what social network elements are important for the health

status of that group's members. It is difficult to respond unequivocally
to this question based on the available evidence. This is primarily so
because many of the studies reviewed based their findings on social
network indices which aggregate scores on a number of network elements--
size, frequency of contact, groups, satisfaction, etc. Along the same
lines there is a lack of consistency as to the measures used, even when
the data is disaggregated. While there are some clues that there may be
some differences among groups, e.g., with network size important for the
elderly, while job-related supports are important for those with job-
related problems, it is really not possible to draw a conclusion here.
What is clear is that that there has been no report as to a systematic
comparison of social network needs between various groups.

Another of the research questions of this dissertation deals with
whether the relationship between social networks and health status is
stronger in certain groups than in other groups. Here, it is possible to
at least discern a pattern. There is a good deal of evidence of the
existence of interaction effects between social networks and other
variables in their effect on health status. This has been shown for such
variables as stressful life events, sex, age, employment status. There
does not seem to have been much of an attempt to conceptualize membership
in any of the sub-populations studied as constituting on-going strain or
increased susceptibility to health risk. Certain groups have been
examined individually to determine whether networks are important
predictors of health status. Sometimes, additional analyses have been
carried out to determine if the presence of this relationship buffers the
effect of stress on health status. In some of these cases, a search for
such interaction effects proved fruitless, especially with regard to

specific stressful life events. Thus while it is possible to say with a good deal of certainty that the relationship does seem to be stronger for some groups than for others, it is not possible to categorize those groups for whom this relationship is particularly strong.

The third research question deals with whether there is a difference in the relationship between social networks and health status, depending on what measure of health status is used. Three measures of health status predominate the studies reviewed here--mortality, self-rated health status and depression. Social networks seem to be related to all three of them. In an occasional study more than one such outcome is measured. In some cases (i.e, Lubben), it seems that social networks were more important in predicting mental health status than functional health status. Here too, though, it is difficult to compare among diverse units of measure.

In conclusion, we find that although the relationship between social support networks and health status has been widely studied and documented, there are still gaps in the field. The goal of this investigation is to try to close some of those gaps in a way that will make this knowledge meaningful for social work practitioners and planners. In particular, knowledge is needed as to what aspects of social networks are important for which people, and whether the observed relationship is epiphenominal--consistent in its importance for all persons in all situations. The way in which these relationships appear in selected subgroups of the general population and how they compare with each other will, then, be the central focus of the current study.

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

-Logic of the Approach

-The NSPHPC Data Base

-The Study Sample

-Selection, Definition and Measurement
 of Study Variables

-Data Analysis

LOGIC OF THE APPROACH

As shown in the review of the literature, social networks have demonstrated a contribution to health status when measured in different ways across various populations. The relationship is particularly strong among certain subgroups of the population. Likewise, in some studies of general populations, interaction effects have been found that indicate social networks may be more important in affecting health for certain subpopulations. However, for the most part what has been done is either to draw broad conclusions about the role of social networks in the health status of general populations, or to limit their conclusions to specific subpopulations. There have not been comparisons made among different population groups aimed at determining for whom social networks are more important. Nor have comparisons been made among different segments of the same population to determine whether different network elements are more important for some groups than for others.

The main thesis of this investigation is that social networks, while beneficial in terms of health for most people, are of particular importance to certain high risk groups. These groups are composed of persons who are more likely to be of ill health than the general population, and whose risk status could be mitigated by connections to a social network. As such, one main research question and two subsidiary questions will be addressed:

Main research question: Are social network characteristics more strongly related to health status in certain target populations than they are in the general population?

Subsidiary questions: (1) Are the same social network characteristics associated with higher health status among all populations, or do the network characteristics which are important in determining health status vary according to group? (2) Are social networks equally important in determining both self-rated health status and functional health status?

The answers to these questions have both theoretical and practical implications. They represent new directions of thought in the relationship of networks to health, based on the multiple and different health-related needs of populations and the ways in which social networks can meet those needs.

The practical implications are even more important. Currently many practitioners base interventions on the premise that strong networks are important for everyone. (See, for example, Appendix 1.) However, professional responsibility and accountability requires the matching of appropriate interventions to needs. To do this workers must be equipped with refined knowledge as to which social networks are important to which people--and to which people they are not important at all.

The analysis had two stages. In the first stage hypotheses were tested regarding the importance of various network characteristics and target group membership in determining the health status of the general population. In the second stage, a comparison was made of the importance of different social network elements for members of different target groups, and their relative importance compared to the general population.

THE NSPHPC DATA BASE

All of the research questions will be examined using data gathered in the National Survey of Personal Health Practices and Consequences (NSPHPC). The NSPHPC was carried out as part of the Preventive Initiative established by the Secretary of the Department of Health, Education and Welfare in 1977, based on the thesis that improving the health of the nation depended not only on increasing health care and resources, but also on disease prevention and health promotion. The purpose of the survey "was to collect data on the extent and distribution in the population of positive personal health practices, their stability over time, and their relationship to morbidity and mortality." (Wilson and Elinson, 1981, p. 219) Related activities carried out under this initiative were the convening of a Conference on Prevention by the National Institutes of Medicine, and subsequent publication of Perspectives on Health Promotion and Disease Prevention in the United States; and the organization of a Departmental Task Force on Prevention, which commissioned the work Healthy People and some 28 background papers, as well as formulating health promotion/disease prevention objectives in 15 areas. (Public Health Service, 1980)

The NSPHPC was stimulated by a panel study carried out in 1965-74 in Alameda Co., Calif., by the California State Health Department Human Population Laboratory. (Schoenborn, 1981, p. 1) That study showed that seven good health practices (sleep, weight control, exercise, limiting alcohol consumption, not smoking, breakfast, and curbed snacking) were associated with both present health status and subsequent mortality risk. (See Belloc, 1973; Belloc and Breslow, 1972; Wiley and Camacho, 1980.) Other factors shown to be related to mortality were social networks

(Berkman and Syme, 1979) and indulgence in the sick role (Berkman, 1975). The NSPHPC refines and replicates the work done by the Human Population Labs and provides a national data base for looking at a variety of health practices, behaviors, health status measures and intervening variables.

The data were collected in two waves, first in spring 1979, and again one year later, by Chilton Research Services of Radnor, Pa., under contract to the National Center for Health STatistics. The target population was adults (aged 20-64) residing in households with telephones in the coterminous United States. The sampling plan used a random-digit dialing technique in a 3-stage stratified cluster design:

Stage 1--Each county and its telephone exchanges were assigned to one of 18 strata by region and metro/non-metropolitan status. Exchanges were randomly selected from each stratum.

Stage 2--From each exchange, households were randomly sampled in proportion to the number of households served by that exchange. (The initial sample was inflated to allow for screening out of households with no member aged 20-64.)

Stage 3--At initial contact, interviewers listed the age and sex of all eligible respondents. One respondent was randomly selected from each listing.

Thus in stages 1 and 2 each exchange and household had an equal probability of being selected. In stage 3 a person's probability of being selected was inversely proportional to the number of eligible persons in the household. (See Implications and Limitations, Chapter 7.)

THE STUDY SAMPLE

As noted above, the data were collected in two waves. In Wave I, 3025 respondents were interviewed for a response rate of 81%. Of these, 2453 (81%) were reinterviewed for Wave II. Sixty percent of the respondents were women, 40% male. These proportions are considerably different than the 53%-47% distribution found in other surveys aimed at households with telephones. To assess whether this led to bias in other variables, NSPHPC were compared by NCHS staff to those collected in the National Health Interview Survey, which interviews about 110,000 persons a year with a response rate of 96%. While no bias was found to result with respect to race, marital status, and employment status, there was a modest bias on education (NSPHPC respondents better educated) and income (NSPHPC respondents slightly lower income.) (Schoenborn, 1981)

In addition to the sex distribution of the sample, several other demographic variables are worth noting. For men, 71% were married, 10% were widowed, divorced or separated, and 19% never married. For women 71% were married, 15% were widowed, divorced or separated, and 14% never married. The sample was predominantly white (90% of men, 86% of women) and employed (88% of men and 53% of women). Forty-three percent of both sexes were aged 20-34 years; 33% men and 30% women were aged 35-49; and 23% and 26% respectively were aged 50-64. As noted above, the sample population was relatively well-educated, with 47.8% of men and 37.9% of women having completed 13+ years of school. On family income, 26% of men had family incomes of $25,000 or more, compared to 21% of women. (More detailed descriptions are found in the following section.)

There are several advantages to using this sample for studying the research questions cited above. First, it is a random sample drawn from

virtually the entire adult population of the United States. Hence, the
generalizability of results found here will be far greater than in
studies cited previously, which are limited either geographically or as
to subpopulations studied.

Second, the sample size is very large. It allows for more complex
manipulations of data and use of more powerful statistical techniques
without loss of power, and with reduced risk of over-using the data.

Third, the size and range of the sample and characteristics allow
for the simultaneous study of a number of subgroups, drawing comparisons
among them and contrasting them with one another. As such the sample
affords an opportunity to take a new look at a subject which has not been
approached in this fashion before.

SELECTION, DEFINITION AND MEASUREMENT OF STUDY VARIABLES

The main concepts which will be examined in the study are target group membership and social networks, as related to health status. Specific variables, their operational definitions and the appropriate questionnaire items used to measure them are shown in Table 6. The full survey instrument is found in Appendix 2. Note that variables are measured both by single items and by multiple item indices. Most of these indices are already part of the data set, appearing as constructed variables on the data tape.

Health Status

Many indicators of health status are insensitive to those factors which are responsible for much of the morbidity in developed countries or affect such a small proportion of the population as to lack utility here (i.e., mortality). Siegman and Elinson (1977) have called for the development of new health indicators: "Sociomedical indicators that are designed to distinguish those dimensions of health which are primarily social from those which are primarily physiological are now recognized as Sociomedical Health Indicators." (p. 85) Two such indicators will be utilized in the proposed investigation:

Self-rated health status (SRHS).--In past studies this has been measured in two ways: as a single-item self report, and as an index. The single item, "Would you say your health is excellent, good, fair or poor?" has been widely used in health research, appearing in 38 empirical studies between 1958 and 1976 (Goldstein, Siegel and Boyer, 1984). It has been shown to be highly predictive of mortality. Mossey and Shapiro (1982) found that the risk of mortality was about three times greater for people who rate their health as poor than for those who rate their health

Table 6: Study Variables, Operational Definitions, and Source within
          Survey Instrument

Variable	Operational Definition	Survey Items
Dependent Variable		
Health status	Self-rated health status (index)	1, 49-51, 53
	Composite (Functional) health status (constructed variable)*	54, 62-64, 69-85
Independent Variables		
Social support networks	Marital status	126
	No. of close relatives	121
	No. of close friends	122
	No. of relatives and friends visited frequently	123
	Frequency of contact	124
	Church attendance	114
	Group membership (CV)*	113
	Network size	121, 122
	Sociability score--index of close personal ties	121-123
	Berkman-Syme Social Network Index	121-123, 126, 113, 114
	Satisfaction with no. of ties	125
	Marital happiness	127

Variable	Operational Definition	Items
Target Group Membership		
Elderly persons	Persons aged 60-64	142
Widows/widowers	Widowed	126
Bereaved	Loss or spouse of child in last five years	131
Disabled	Limited ability to perform usual activities	65-85
Recent serious accident or illness	Illness, accident or operation within past 5 years	131
Unemployed persons	Persons laid off, on strike or unemployed	102
Job-stress	People whose jobs involve a great deal of stress	109
Low income	Annual family income under $10,000	153
Single parents	Unmarried people with people under age 20 living in household	126, 143
Status inconsistency	More than 12 years education and income less than $15,000, for persons aged 30-55	141, 142, 153
Interaction		
Social support networks X Target group membership	Combinations of target group membership and social support networks, above	
Controls		
Age	Age at last birthday	142
Sex	Sex	(Screening sheet)
Race	Reported race	150-152
Income	Reported annual family income	153
Education	Years of school completed	141

*Constructed variables are already on the data tape. Shown here are the items from which they were constructed.

as excellent, controlling for objective health status (physician rated),
age, sex, life satisfaction, income and residence. Similarly, in the
Midtown Manhattan Study of mortality and mental health, "Aside from age
and sex, self-rated health proved to be the most powerful predictor of
mortality." (Singer , Garfinkel and Cohen, 1976, p. 523) Kaplan and
Camacho (1982) in the Alameda study found a two-fold increase in risk in
mortality between people who perceived their health as "poor" vs.
"excellent," controlling for reported (composite) health status and
health practices. However, they also found composite physical health
status to be a better predictor of mortality (below). SRHS has also been
found to be associated with indices of general well-being and physician
ratings of health status (See Singer et al., 1976 and Andrews, et al.,
1977.) However, Goldstein et al. (1984) found change in self-rated
health status over a one-year period not to be associated with any
indicator of objective health status, concluding that it actually
measures the individual's sense of chronic illness.

Self-rated health status has also been measured as a multiple item
index. This study will use a five-item index developed by Foley (1984)
as "a measure of general health as assessed via self ratings about one's
health." (Elinson, Foley and Ungemach, 1982, p. 4) It is constructed by
adding the scores on single items of overall health status (above),
satisfaction with physical condition, comparison with health of two years
ago; amount of worrying caused by one's health, and comparison with other
people of the same age. Scores range from 5-20, with a mean of 14.6 in
this sample. Employing an index such as this is preferable to the single
item, because it has a demonstrated reliability (Chronbach's alpha=0.72).
In this sample, the index has a .52 correlation with the composite health

status measure (below). On the other hand Mossey and Shapiro (1982) report a correlation of .34 and Kaplan and Camacho (1982) .39 between the single-item measure and measures of composite health status, like that which follows.

Composite Health Status.--There are several ways of examining health status using this data set. One is a close replication of the index developed by Belloc et al. (1971) for the Alameda Co. study. It is based on limitation of activity level, activities of daily living, number of bed-days, and energy level, combined into a five-point scale. As noted above, this was found to be an excellent predictor of mortality (Kaplan and Camacho, 1982).

The index exists on the data tape as a constructed variable, as follows:

    1=Severely limited

    2=Moderately limited

    3=Symptomatic, 8 or more bed days

    4=Healthy, low energy

    5=Healthy, high energy

In this data set, the mean score is 3.9 with a standard deviation of 1.4. Most people were rated a score of 5. Use of global composite scale such as this is desirable because it allows us to achieve the goal, stated in the conceptual definitions, of seeing health not only as the absence of disease or symptoms, but in a positive sense.

There are several reasons for examining two different sets of outcome measures--self-rated health status and composite health status. While they are highly correlated, they seem to be measuring different constructs. The first one is an assessment of one's own evaluation of one's health. The second is more an index of functional health status.

Likewise, they have different implications for intervention. The goal of improving the functional health of individuals is vastly different from that of improving how people rate their own health. (See Implications and Limitations, Chapter 7.)

Social Networks

As noted in the literature review, this too is a multi-dimensional concept, for which measures are still being developed. Particularly problematic is the assumption that all networks are supportive. While the questions on the NSPHPC do not directly probe the content of linkages, the questions are phrased in such a way that we can assume at least positive rather than negative content: "How many close relatives/friends do you have? These are people that you feel at ease with, can talk to about private matters, and can call on for help?" It is also addressed indirectly through the development of hypotheses regarding the target groups who might benefit from networks. In order to more fully understand the relationship between social networks and health status, it would be necessary to have data on the content and function of individual's networks and the tasks network members perform. For example, do certain populations have need of more instrumental and routine tasks; are they connected with the kind of ties best suited to perform those tasks; and does this connection lead to improved health? Unfortunately, such data were not collected here. (See Implications and Limitations, ch. 7.) What can be measured here are some of the morphologic and interactive characteristics of social networks, and two measures of the individual's evaluation of his/her network. Summary statistics on these variables are shown in Table 7.

Table 7: Summary Statistics on Measures of Social Networks

Network measure	Range	Mean	Mode	Standard Deviation
# of close friends	0-10	4.9	10	3.3
# of close relatives	0-10	5.2	10	3.3
# of friends and relatives visited once/month	0-10	6.2	10	3.3
Frequency of visiting	1-5	3.9	5	1.2
Marital Happiness	1-3		1	
Church Attendance	1-4	2.2	1	1.2
Group participation (variety)	0-5	1.4	0	1.3
Network size	0-20	10.1	20	5.4
Index of close personal ties	0-30	16.2	30	8.1
Sociability score	1-5	3.4	3	1.3
Berkman's Social Network index	0-12	5.5	1	3.3

1. **Number of Close Friends, Number of Close Relatives, Number of Friends and Relatives Seen at Least Once a Month.**--These three variables are all measured on parallel 11-point scales, ranging from none to ten or more. Persons who reported having no friends or relatives (n=41) were not asked about the number seen once a month; for the purposes of this study, those persons were counted as zero on that scale also.

Most people report having 10 or more close friends, with a mean of 4.9 and a standard deviation of 3.3. One hundred sixty-eight people report having no close friends.

Similarly, most people report having 10 or more close relatives, with a mean of 5.2 and a standard deviation of 3.3.

Finally, with regard to the number of friends and relatives seen at least once a month, a similar pattern exists. Here, too, most people report that they see at least 10 of their close friends and relatives one a month, with a mean of 6.2 and a standard deviation of 3.3. Seventy people reported that they see none of their close friends or relatives at

least once a month, in addition to the 41 people who were not asked this question because they reported neither friends nor relatives in the two previous questions.

In all three of these variables a bimodal pattern emerges, with the number of people reporting friends and relatives and the number seen at least monthly increasing steadily from zero to two, reaching a slightly downward sloping plateau from two through six, dropping off sharply between seven and nine, and then shooting up to a peak at 10 or more. This could indicate a ceiling effect or that people, in fact, can be categorized as having no ties, a few close ties, or a very large number of ties, with very few people in between.

2. <u>Frequency of Visiting with Friends and Relatives</u>.--This item is based on a 5-point ordinal scale:

5=more than once a week

4=about once a week

3=two or three times a month

2=about once a month

1=less than once a month

People who reported no friends or relatives were not asked this question, and for the purpose of this investigation are coded as seeing friends and relatives less than once a month. Most people report visiting with friends and relatives more than once a week, with a mean of 3.9 (about once a week) and a standard deviation of 1.2.

4. <u>Satisfaction with Number of Ties</u>.--People who reported having any close friends or relatives were asked whether they felt they had enough of them. Because no assumption could be made with regard to those people having no ties, they are treated as missing for this item. The

vast majority of persons (2462) felt they had enough ties, while 499 felt they did not.

5. <u>Marital Status</u>.--Most of the respondents report that they are currently married (1980), with 473 never married, 155 widowed, 308 divorced and 108 separated. People who were not married were not asked if they were sharing living quarters with persons of the opposite sex (as is now collected for census data), so that some people who actually do have a marriage-like tie may be reported as lacking that tie here.

6. <u>Marital Happiness</u>.--In another attempt to measure the quality of the network tie, people who responded that they were married were asked how happy the marriage had been for them. Most (1235) reported that it was very happy; 661 reported that it was "pretty happy" and 75 reported that it was "not too happy."

7. <u>Church Attendance</u>.--Respondents were asked how often, if ever, they attend religious services. The responses form an ordinal scale:

1=once a week or more

2=1 to 3 times a month

3=less than once a month

4=never

Most respondents (1248) attended religious services once a week or more. The mean was 2.2 (or slightly less than 1-3 times a month), with a standard deviation of 1.2.

8. <u>Group Participation</u>.--This variable was measured by a series of five questions on membership in different types of groups, including unions/commercial and professional organizations; church groups; groups relating to children (i.e., PTA); service organizations; and social or fraternal organizations. Respondents scored 1 point for each group type

they belonged to, yielding a scale of group participation ranging from zero to five. Most people report belonging to no groups, with a mean of 1.4 and standard deviation of 1.3. This scale has a reliability (Cronbach's alpha) of 0.56. Note, however, that this scale yields a measure of variety of groups participated in. A more accurate measure of participation can be achieved by dichotomizing the scores between those who participate in no groups, vs. those who participate in a least one kind of group. Using this measure we see that 1021 persons participated in no groups, while 2004 participated in one or more groups.

In addition to single-item measures of social networks, several indices are developed or replicated here.

1. <u>Network Size</u>.--This index is formed by adding together scores on number of close relatives and number of close friends. Scores range from zero to 20, with a mean of 10.1 and standard deviation of 5.4. This index has a reliability (Cronbach's alpha) of .52.

2. <u>Index of Close Personal Ties</u>.--This is an index devised by Foley (1984) arrived at by adding the scores on number of close friends, number of close relatives, and number of friends and relatives seen once a month. Scores range from zero to thirty, with a mean of 16.2, and standard deviation of 8.1. This index has a reliability of (Cronbach's alpha) of .74.

3. <u>Sociability Score</u>.--This measure uses the same items as does the index of close personal ties, but collapses them before combining them. First the number of friends and relatives is collapsed, yielding a four-point scale of low, medium, high and very high. This is then combined with the number of ties seen at least once a month, to arrive at the following scale:

1=very low

2=low

3=medium

4=high

5=very high

The way it is arrived at is illustrated in Table 8. Most people had a score of medium, with a mean of 3.4 (between medium and high) and a standard deviation of 1.3. It differs somewhat from the index of close personal ties in that it gives somewhat more weight to the frequency of visits with network ties.

Table 8: Computation of Sociability Score

# Friends and Relatives Visited Once/Month	# Friends and Relatives			
	Low (1)	Medium (2)	High (3)	Very High (4)
0-2	Very Low	Low	Medium	High
3-5	Very Low	Medium	High	High
6-10	Very Low	Medium	High	Very high

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4. <u>Berkman's Social Network Index</u>.--This measure replicates that developed by Berkman (Berkman and Syme, 1979), and combines data on number of ties, frequency of visits, marital status, church attendance and group affiliation, weighing intimate ties more heavily than church and group affiliation. As a general measure of connectedness, it has been found in other studies to be predictive of mortality and morbidity and is included here as a basis of comparison with those studies. (See, for example, Schoenbach et al., 1984) On a 12-point scale, from zero to 12, the mean score was 5.5, with a standard deviation of 3.3. These were

which can be examined using the data from the NSPHPC. Ten groups were potentially identified as people whose health might be at risk were they lacking a strong social network and with whom social workers often intervene in order to strengthen their networks. Their numbers and proportion in the sample are summarized in Table 10.

Table 10: Frequency Distribution of Target Group Membership

Target Group	N	% of Total Population
Elderly	250	8.3
Widowed	155	5.1
Bereaved	156	5.2
Disabled	564	18.6
Recently ill/injured	685	22.6
Unemployed	100	3.3
Job Stress	499	16.5
Low Income	727	24.0
Single parent	394	13.0
Status inconsistency	388	12.8
TOTAL TARGET POP.	2085*	68.9

*Total does not equal sum of all groups due to overlapping membership.

We should note that some of the variables used to identify target groups are also used for other purposes in the study--either as network variables or control variables. For example, for some of these groups their inclusion as target groups is really spurred by the loss or absence of some social network element, usually a spouse. This is true for the widowed, the bereaved and the single parents. The question here will become whether the presence of other network elements can offset this lack. Likewise, age and income, both control variables for the total population are also elements of the determination of target group status.

then collapsed further into a four-point scale, in order to compare this sample to that of the Alameda County study. (See Table 9.) It appears from this that the NSPHPC sample, while older, is somewhat less connected than were the Alameda County respondents.

Table 9: Comparison of Distribution of Scores of Berkman's Social Network Index for NSPHPC Sample and Alameda Co. Sample*

Social Network Score	NSPHPC (aged 20-64)		Alameda (aged 30-69)	
	n	%	n	%
Low (few contacts)	487	16	434	9
Medium	1042	34	1465	31
Medium-high	612	20	1304	28
High (Many contacts)	884	29	1522	32
TOTAL	3025	100	4725	100

*Source: Berkman and Syme, 1979.

Target Group Membership

This set of variables, while central to the thesis of this investigation, has received virtually no attention per se in the literature. Most studies of the relationship between social support and health status, which examine a "buffering effect" assume the entity to be buffered is exposure to stressful life events, and that the buffering mechanism is one of emotional support. A broader view is taken here, assuming there are a range of social needs which might lead to deleterious health outcomes which could be mitigated by social support networks. These needs include emotional support for ongoing life strains, as well as needs for tangible and informational support. These needs occur in differing degrees in various sub-populations, many of

1. <u>Elderly Persons</u>.--A relationship between social networks and health status has been shown to exist for this population in studies by Andrews et al. (1978), Blazer (1982), Gallo (1982), Schoenbach et al., (1983), Wan (1982), and Lubben (1984). Some researchers have hypothesized that the role of networks for the elderly in maintaining health depends on the nature of the tasks which the network must perform. (Litwak and Kulis, 1983; Lurie, Barbaccia and Robinson 1983; and Litwak, 1981) In many cases these tasks are primarily instrumental, i.e., help with activities of daily living, financial support. Unfortunately, the NSPHPC data are limited in that potential respondents over age 65 were screened out. Therefore people aged 60-64 were used to represent the elderly. The sample contains 250 people in this age group.

2. <u>Widowers and Widows</u>.--There is a large body of research on the relationship of marital status to health status, particularly mortality. Widows and widowers consistently have higher death rates than people of other statuses (Lynch, 1977; Gove, 1973; Rees and Lutkins, 1967; Parkes et al., 1969; and Bunch, 1972) and report more illness than married people (Ernster et al., 1971 and Maddison and Viola, 1968). In this sample 155 (5%) of the respondents were widowed. Note that social networks indices that include marital status are confounded here. Thus we cannot use the Berkman Social Network Index as a social network measure for this group. Also to differentiate between this and the next group, note that this will include only those persons who were still widowed at the time of the survey.

3. <u>The Bereaved</u>.--Loss of a spouse or a child has received much attention both singly and as one of many stressful life events which may

be buffered by social support networks. (See, for example, Holmes and Masuda, 1974.) This differs from the category of widowhood because it is limited to events of the recent past (5 years) and includes death of a child. As such it is more a measure of a stressful event than of on-going life strain. One hundred fifty-six respondents or 5% of the sample were bereaved in the last five years. Given the coincident numbers of widows (above) and bereaved persons, each representing 5% of the population, it is worth noting here that they are not the same population. While widowhood is highly correlated with bereavement (phi=.59), there are 60 persons who were widowed, yet not in the past five years; and 61 persons who were bereaved in the past five years yet not currently widowed, i.e., remarried. (See Table 11.)

Table 11: Numbers of Widows by Number of Recently Bereaved*

	Bereaved	Not Bereaved	Total
Widowed	95	60	155
Not Widowed	61	2808	2869
Total	156	2868	3024

Chi square = 1040, 1 d.f., p<.001; Phi = .5898
*Loss of spouse or child within the past 5 years.

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4. <u>Long-term Disabled</u>.--While some work has been done on the role of social networks in mitigating the consequences of severe illness, little has been done on disabilities (Litman, 1963; DiMatteo and Hayes, 1981). What does exist indicates that the disabled benefit from support from kin and from organizational involvement. This item derives from a series of questions relating to respondents' ability to perform their usual activities, such as going to work, going to school, performing

housework, or any other of their usual activities. It is based on the categories developed for the Health Interview Study. Most (2467 or 82%) of the respondents were not limited in any way; 217 (7%) were able to perform their usual activities, but limited in outside activities; 268 (9%) were able to perform their usual activities but were limited in amount or kind; and 79 (3%) could not perform their usual activities. The group selected for study here are the 12% who were limited in their ability to perform their usual activities. This category is differentiated from that which follows inasmuch as it is not limited to events of the past five years.

    5. <u>Serious Illness and Injury</u>.--People who have been faced with life-threatening illness may need ongoing close support in order to regain normal levels of functioning. Litwak and Kulis (1983) propose that these kinds of support are non-routine tasks, best performed by kin. Note that this category differs from that above in that it deals only with events of the past five years. Six hundred eighty-five respondents (23%) reported serious illness, injury or operation within the past five years.

    6. <u>Unemployed Persons</u>.--Gore (1978), and Pearlin (1981), and Hall et al. (1984) have shown social networks to buffer the stress of unemployment in its effect on health. Granovetter (1974) has stressed the importance of a wide range of friendship ties as being of prime importance in finding new employment. Employment status was measured on a nominal scale:

        1=full time, working

        2=part time, working

        3=laid off, or on strike

4=retired

5=looking for work, unemployed

6=not looking for work, unemployed

7=unable to work (disabled)

8=keeping house

9=full time student

Unemployment will be defined as persons laid off/on strike and persons unemployed, whether looking for work or not. One hundred persons, or 3% of the sample were thus unemployed.

7. <u>Job stress</u>.--Having a psychologically demanding job has been shown to be associated with the risk of developing such ailments as coronary heart disease. (Karasek, Baker, Marxer, Ahlbom and Theorell, 1981) LaRocco et al. (1980) and Pearlin et al. (1981) have shown social supports to be associated with depression, apparently by buffering the strain of job-related stress. Employment-related contacts (i.e., non-kin networks) are most effective here. Job stress was measured by a single-item self-report measure:

1=Hardly any job stress

2=Some job stress

3=A great deal of job stress.

Of 2080 employed persons, 499 (24%) reported a great deal of job stress.

8. <u>Poverty</u>.--There is much evidence pointing to the relationship between income and health status. (See for example Milburn et al., 1984.) It is not clear, however, whether social networks can mitigate some of the health-related stresses caused by lack of money. One would think, for example, that a strong kin network could provide some of the resources needed by low-income families. Those who are isolated,

however, may not have access to such resources and therefore suffer.
Income was measured on an ordinal scale, as follows:

    1=less than $5,000

    2=$5,000 to $9,999

    3=$10,000 to $14,999

    4=$15,000 to $24,999

    5=$25,000 or more

There were 727 people whose family income before taxes in 1978 was below
$10,000. Note that income is also a control variable which will be used
with all risk groups.

    9. Single Parents.-- Single parent families have a range of needs
that have been documented elsewhere. (See, for example, Ross and Sawhill,
1975. Note that this documentation is generally not related to health
status,except in ecological studies, where a predominance of single
parent families is an indicator of social disorganization. See Neser et
al., 1971 and Jenkins, 1983). Most of these families, we should note,
are female-headed and low-income. Hall et al. (1984) have shown social
networks to be important in predicting depression among low-income women.
Single parenthood is not measured directly in the survey instrument.
Therefore, a proxy measure has been developed by combining two items:
marital status and number of people under 20 in the household. While
this introduces some measurement error, it would be in the direction of
including in this category some people who are not single parents (i.e.,
a 20-year old cohabitating with a 19-year old) thus leading to
attenuation. There were 394 people in the sample who fit this category,
or 13%.

10. <u>Status Inconsistency</u>.--Hinkle et al. (1976) suggest that people with this trait are likely to suffer from poor health. One measure of status inconsistency would be people with high education and low income. In order to avoid confounding this variable due to the fact that the very young, i.e., those just out of school, and the very old, those who are retired, have low incomes, this group was limited to people between the ages of 30 to 55. It was defined as people with family income under $15,000 per year and who had 12 or more years of education. There were 388 persons (13%) who met these criteria.

Control Variables

Previous studies have indicated the correlation of a number of demographic factors with health status. Those to be examined here are age, sex, race, income and education.

1. <u>Age</u>.--Age is measured at last birthday. It ranges from 20-64. The mean age is 39.3, with a standard deviation of 12.9 years.

2. <u>Sex</u>.--As noted above, this sample is disproportionately female, with 1854 women and 1171 men.

3. <u>Race</u>.--Categorization as to race was reached through a series of questions asking about racial background, racial group, national origin or ancestry. The sample is overwhelmingly white (2637 persons or 87%) with 289 blacks (9.5%), 79 classified as other (3.0%), and 20 unknown (.7%). For purposes of the regression analysis, these data were collapsed into two categories--white and non-white.

4. <u>Income</u>.--Income is defined as family income in 1978 before taxes. It was measured on an ordinal scale, described above in the section on people living in poverty as a target group. Mean income rank was 3.4 or about $12,000, with a standard deviation of .81. Two hundred

thirteen people (7%) either refused to answer this question or responded
that they did not know their family income.

5. <u>Education</u>.--Education was measured as years of school competed
on an ordinal scale as follows:

1=none

2=1-4 years

3=5-6 years

4=7-8 years

5=9-11 years

6=12 years (high school or equivalent)

7=13-15 years (some college or trade school)

9=8-16 or more years (completed college or more)

Most people (1131) had completed 12 years of school. The mean score was
6.3 (slightly more than 12 years), with a standard deviation of 1.2.

DATA ANALYSIS

The analysis of the data in this study had two stages, both carried out using cross-sectional data from Wave I of the survey.

In the first stage, preliminary analyses were carried out in the form of zero-order correlations or breakdowns of the dependent variables--self-rated health status and composite health status--in order to determine whether they are, in fact, associated with the independent variables and with what degree of strength and significance. Following this, the control variables were entered into hierarchical multiple regression, to determine what proportion of the variance in each of the dependent variables could be explained by the combined effect of the control variables. Then each of the independent variables--network variables and risk group variables--were tested individually in a regression with the control variables, to see whether they explain significant amounts of the variance in health status beyond that of the control variables. The results of this stage will form a basis for deciding which variables to retain in the second stage and to provide a base line against which to measure the results of the second stage.

In the second stage, separate analyses were carried out for each target group found to be at risk in the first stage. In order to address the first subsidiary research question, each network variable was entered individually into a multiple regression equation, following the control variables. They could, in this way, be compared as to the relative strength of association of network variables within that particular target group.

In order to the respond to the main research question, the network elements were also compared as to their strength of association for that

target group as opposed to two other groups--the general population and a non-target population, that is, the general population with all target group members removed. The comparison was achieved by use of interaction terms (target group membership times network variable). Where the interaction is significant we could then say that the relationship of social networks with health status is significantly different in that target group than in the general population. Finally, in this stage, an assessment was made of the relative importance of social networks for self-rated versus composite health status, in response to the second subsidiary research question.

Three levels of data were collected in this study--interval, ordinal, and nominal. Both interval and ordinal level data were treated as interval level for purposes of the multiple regression. This practice has been debated in the literature with arguments for both sides. (See for example, Lewis-Beck, 1980). For the purpose of this study, in order to avoid overloading equations with numerous variables and to simplify interpretation, ordinal level data will be treated as continuous. Wherever possible for ease of interpretation (following initial explorations), variables have been recoded so that they relate positively with the dependent variables. With regard to nominal level variables, a dummy coding scheme was adopted as follows: Following the initial exploration, target group membership was coded "0" and non-members as "1" so that they too would correlate positively with the dependent variables. (Likewise, sex and race were dummy-coded: 0=male, 1=female; and 0=white, 1=non-white.) In this way, significant interaction terms with negative signs would be evidence in support of a stronger relationship between

network variables and health status target as opposed to non-target populations.

All analyses were conducted within SPSS-X. Missing data were handled by listwise deletion. A separate analysis was carried out to determine the effects of this. In order to avoid distorting the results, listwise deletion was the only possibility for handling key network, target group and outcome variables. As for the control variables, the only ones with missing data were income (213 cases) and education (14 cases). As such it was necessary to look further at those people missing responses for income. As noted earlier, most of those who did not report their income claimed not to know what it was (n=163). As a first step, the population was divided into two groups--those who reported income and those who did not. The two groups were then compared on a number of variables. Key among the findings here is that there was no significant difference on either outcome measure between those who reported income and those who did not. There were, however, some differences on other control and network variables, notably that more women than men did not report their family income.

To further refine the effect of deleting those cases without a score on income, a series of multiple regressions was done, which sought to see if any differences between the reporting and non-reporting groups resulted in differences in health status when other variables were held constant. To do this, the population mean value for income was substituted in the cases with missing values. Reporting of income was coded as a dummy variable and entered into a regression controlling for age, sex, income and education. Also entered was a network variable and an interaction term (income reporting X network). In no case was the

interaction significant. That is, in no case was the relationship of interest (between social networks and health status) significantly different for those who report income and those who did not report. For this reason, it was decided to use the conservative method of deleting cases with missing values on any variables.

CHAPTER 5

PRELIMINARY ANALYSIS OF DATA FROM THE NSPHPC

-Introduction

-Relationship of Control Variables to
 Health Status

-Relationship of Network Variables to
 the Dependent Variables

-Relationship of Target Group Membership
 to Health Status

-Summary

INTRODUCTION

This chapter presents the results of the introductory stages of the
analysis of the data from the NSPHPC. It has two main purposes. The
first is to explore the relationship of all variables in the study with
the two dependent variables--self-rated health status and composite
health status--in order to be certain that they do, in fact, relate as
presumed from the literature. The second reason is to establish a base
line for comparing their individual relationship to the dependent
variables with their relationship when other variables are controlled
for.

This stage of the analysis has several steps, each of which is
carried out separately for each set of independent variables--control
variables, network variables and target group membership variables. In
the first step, each variable's relationship to the dependent variables
is examined bivariately. This relationship will be expressed in terms of
the correlation coefficient, Pearson's r, (for interval level independent
variables) or the correlation ratio, eta-squared (for nominal level
independent variables). Pearson's r represents the degree of linear
relationship between two interval level variables, whereas eta represents
the extent to which there are differences in the mean of a dependent
variable among various nominal groups. Both eta-squared and r-squared
can be interpreted as the extent to which variance in the dependent
variable is explained by variance in the independent variable. (See
Mueller and Schuessler, 1961). In those cases where a set of variables
includes both interval and nominal level data, both statistics will be
presented: the r-squared to show the extent to which the relationship is
linear, and the eta-squared to serve as a basis for comparing the degree

of association with the dependent variable among all the independent variables.

In the second step, the relationship of each variable with the dependent variable will be examined, holding constant all of the control variables. In other words we will be looking at the degree to which variation in the dependent variable is explained by an independent variable above and beyond that explained by the control variables. This was done by first entering the control variables into a multiple regression equation, and then adding the variable of interest. We can then compare the r-squared at each stage to see whether it increases appreciably and significantly with the inclusion of the variable of interest; or we can look at the slope (B) associated with the variable of interest to determine whether the relationship is in the hypothesized direction, and if it is statistically significant.

RELATIONSHIP OF CONTROL VARIABLES TO HEALTH STATUS

Five control variables were proposed for use in this study. In this section we will explore their relationship to the dependent variables individually and together. Summary statistics on the zero-order relationship between variables is found in Table 12. More detailed breakdowns of health status by each control variable are found in Appendix 3, Table 1.

Table 12: Summary Correlations, Health Status and Control Variables

Control Variable	Self-rated Health Status		Composite Health Status	
	Eta Sq.	R Sq.	Eta Sq.	R Sq.
Sex	.003*	--	.017**	--
Age	.018**	.02**	.043**	.04**
Income	.069**	.06**	.045**	.04**
Race	.009**	--	.002*	--
Education	.069**	.06**	.040**	.04**

*p<.01
**p<.001

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1. <u>Sex</u>.--Males in this sample rate their health status significantly higher than do females. This holds true for both self-rated health status and composite health status, although the relationship is stronger for composite health status.

2. <u>Age</u>.--Age in this sample is negatively related to health status; as people's age increases their health score decreases. This is true for both self-rated health status (r=-.14) and composite health status (r=-.20). Here too the relationship is stronger for composite

health status than for self-rated health status. In other words, age
seems to be slightly more important in determining how well people
function than in how highly they rate their own health.

3. _Income_.--Income is positively related to health status in this
sample. As income increases so does people's health status. This
relationship is somewhat stronger for self-rated health status (r=.25)
than for composite health status (r=.19).

4. _Race_.--Whites in this study rate their health higher than do
non-whites. While the relationship is significant for both measures of
health status, it is not a very strong one, with race explaining .9% of
the variance in self-rated health status, and .2% of the variance in
composite health status.

5. _Education_.--Education here is positively related to health
status. As education increases, so does level of health status, for both
measures. The relationship is stronger for self-rated health status
(r=.25) than it is for composite health status (r=.19). Education alone
explained 6.9% of the variance in self-rated health status, as opposed to
4.0% of the variance in composite health status.

Looking at each of these variables individually we see
that while all of them are significantly related to both measures of
health status, they are not equally important, nor do they show the same
strength of relationship for both dependent variables. Thus for self-
rated health status, the most important control variable is educational
level, followed by income, with age, race and sex still significant but
relatively speaking, much less important. On the other

hand, for composite health status, while education and income are still among the most important variables in explaining the variance of health status, age is equally important, while race and sex are much less so.

In order to consider the effect of the control variables upon each other in their relation to the dependent variables, a series of multiple regressions was done, entering the control variables into the equation in a stepwise fashion. (Tables 13 and 14)

For self-rated health status, income is the first variable to enter the equation, explaining 6.4% of the variance in self-rated health status. This is followed by education and age. These three variables together explain 10.1% of the variance in self-rated health status. Neither sex nor race was significantly related to self-rated health status when the first three variables in the equation are controlled. This is likely due to the fact that women have lower education and income and are more likely to be older than men. Likewise, non-whites are likely to have lower income and educations than do whites. (See Appendix 3, Table 2 for correlations of race and sex with education, income and age.)

With regard to composite health status, a somewhat different picture prevails. Here age was the first variable to enter into the equation due to its high correlation with composite health status. It was followed by income, sex, and education, which explain a total of 8.9% of the variance in composite health status. Race did not contribute significantly, probably for the same reasons that it did not contribute to the previous equation. It is interesting to note that here sex is a significant predictor, with women rating their composite health lower than do men, with age, income and education held constant. Sex explains

an additional 1% of the variance in composite health status beyond that explained by the other controls.

Table 13: Regression of Control Variables on Self-rated
Health Status, in order of entry

Variable	B	T-Test	Mult. R Square
Income	0.40*	9.61	0.0644
Education	0.34*	7.64	0.0924
Age	-0.02*	-5.35	0.1014
Sex*	-0.13	-1.32	0.1029
Race*	-0.21	-1.64	
Constant	11.95*	33.76	

*Sex and Race Dummy Codes:
 0=white; 1=non-white
 0=male; 1=female

*p<.001

Table 14: Regression of control variables on composite
Health Status, in order order of entry

Variable	B	T-Test	Mult. R Square
Age	-0.02*	-9.43	0.04
Income	0.16*	7.00	0.07
Sex*	-0.30*	-5.43	0.08
Education	0.10*	4.14	0.09
Race*	-0.05	-0.67	0.09
Constant	3.72*	19.01	

*Sex and race dummy codes:
 0=white; 1=non-white
 0=male; 1=female

*p<.001

RELATIONSHIP OF NETWORK VARIABLES TO THE DEPENDENT VARIABLES

Nine individual network measures and five indices of network strength were evaluated in terms of their relationship to the two dependent variables--self-rated health status and composite health status. A summary of these zero-order relationships is found in Table 15. Here the eta square term represents the percent of variance in the dependent variable explained by differences between categories of the network variables. More detailed breakdowns are found in Appendix Table 3.

Of the nine single-item measures, eight were significantly related to self-rated health status, and seven to composite health status. Church attendance was not found to be significantly related to either measure of health status. Marital happiness was found to be related to self-rated health status, but not to composite health status.

Of the five indices of network strength evaluated all were found to be significantly related to both measures of health status.

The measures were also examined to see whether their relationship with health status was in fact linear, using Pearson's r. For several of the variables--number of close friends, number of ties visited frequently, frequency of contact, and sociability score--there was some indication from scatterplots that the relationship with the dependent variables was not strictly linear, either due to a large jump between the extreme lower end of the scale and the middle portions, or because the curve dropped off a bit at the upper extremity. For this reason, two transformations were tried--a logarithmic one and one of grouping the data. Neither was found to make a large difference in the strength of the linear relationship between the variables, although some improvement

Table 15: Zero-order Correlations of Network Variables with Health
Status

Network Variable	Self-Rated Hlth. Stat.		Composite Hlth. Stat.	
	Eta sq.	R	Eta sq.	R
No. of close relatives	.010**	.10***	.005***	.06***
No. of close friends	.017***	.09***	.013***	.01 NS
No. of ties visited frequently	.016***	.13***	.007***	.08***
Satisfaction with network size	.015**	.12***	.006***	.07***
Frequency of contact	.012***	.08***	.015***	.08***
Marital Status	.016***	--	.016***	--
Happiness of marriage	.011***	.11***	.001 NS	.03 NS
Group membership	.015***	--	.007***	--
Church attendance	.001 NS	.02 NS	.002 NS	.005 NS
Network size	.018***	.11***	.006***	.04*
Index of Close personal ties	.018***	.12***	.011***	.07***
Sociability score	.016***	.12***	.006***	.06**
Group variety	.017***	.12***	.008***	.08***
Berkman's social network index	.021***	.13***	.008***	.06**

*p<.05
**p<.01
***p<.001

was found. However, for ease of interpretation and conceptual clarity, it was decided not to transform the variables.

Two other important inferences can be drawn from these zero-order correlations. First, for all of the network variables evaluated, the relationship is stronger for the self-rated health status measure than for the composite health status measure. Thus it would seem that at least at this level, social networks are more important in relation to how people feel about their health than in how well they function. Likewise, there is no uniformity in the ranking of importance of networks in relation to the two measures of health status. For self-rated health status Berkman's index, network size and the index of close personal ties are the most important. For composite health status marital status, frequency of contact with ties and number of close friends are important.

Secondly, we must take note of the fact that while most of these relationships are statistically significant, they are not terribly strong. Looking at the squared eta's, we see that the "best" predictor—Berkman's social network index—explains 2% of the variance in self-rated health status. Other than this the amount of variance explained ranges from 1.0% to 1.8% of self-rated health status, and from .52% to 1.6% of composite health status.

In the next step in this stage of the analysis each of the network variables was entered into the regression after the control variables. In this way we can look at the change in the amount of variance in health status explained by the additional variable. In other words, the incremental r-squared tells us how much more variance the new variable explains beyond that of those variables already in the equation. The results of this examination are summarized in Table 16.

Table 16:   Variance in Health Status Explained by Network
            Variables, Controlling for Background Variables

Network Variable	Incremental R-Sq. Self-rated H.S.	Incremental R-sq. Composite H.S.
(Controls only)	(.103)	(.090)
No. of Close Friends	.005***	.000 NS
No. of Close Relatives	.007***	.002**
No. of Close Ties Visited Frequently	.007***	.002*
Satisfaction with Number of ties	.013***	.006***
Frequency of contact	.002*	.006***
Marital Status (dichot.)	.00 NS	.0001 NS
Happiness with marriage	.010***	.001 NS
Church attendance	.001 NS	.002*
Group Membership (dichot	.003**	.002*
Network Size	.009***	.001 NS
Index of close personal ties	.010***	.001*
Group Variety	.001 NS	.0001 NS
Sociability Score	.008***	.001 NS
Berkman's Social network index	.006***	.001 NS

*p<.05
**p<.01
***p<.001

Looking first at self-rated health status, we see that the one network measure which was not significantly related to self-rated health status at the zero-order level--church attendance--remains insignificant when age, sex, race, income and education are held constant. In addition, marriage (dichotomized) and variety of group participation are no longer significant, all other things equal. Likewise, we see that the relative importance of these variables in relation to self-rated health status changes when the control variables are held constant. In this case, satisfaction with number of ties is much more important, followed by happiness with marriage, the index measure of close personal ties and network size.

There are also changes in the relationship of the network variables to composite health status when the control variables are held constant. Whereas at the zero-order level seven of the nine single-item measures and all of the index measures were significantly related to composite health status, in the multiple regression only six are significant. Moreover, whereas at the zero-order level the number of close friends was the single most important network variable in relation to composite health status, in the multiple regression it is not related at all. The extreme lack of relationship between this variable and composite health status, probably accounts for the weakness or absence of relationship of three of the network indices (network size, sociability score, and Berkman's index), due to the importance of number of close friends as a factor in those indices. On the other hand, church attendance, which was not significantly related at the zero-order level, is related, albeit weakly, in the multiple regression.

Here, too, we note a change in the ranking of importance of variables for predicting composite health status. As in the regression of self-rated health status, here satisfaction with number of ties is the most important of the network variables, explaining 1.3% of the variance of self-rated health status, and 0.6% of the variance in composite health status. Again, we should note that while a number of these relationships are statistically significant, they are not strong relationships. On the other hand, the pattern persists that network variables seem to be more important in predicting self-rated health status than they are for composite health status.

RELATIONSHIP OF TARGET GROUP MEMBERSHIP TO HEALTH STATUS

This section of the analysis differs somewhat from those preceding, in that the goal is not to determine if a significant proportion of the variance in the dependent variable is explained by target group membership. Here populations were proposed for study based on both evidence in the literature that their health benefits from strong social networks and the fact that they are often targeted for intervention by social workers. The goal then is to ascertain whether or not target group members were in fact at risk of lower health status. This can be determined by entering a dummy variable—target group membership—into a regression equation following the control variables. The dummy codes were set in such a way that target group membership was equal to zero and non-membership to one. Thus, if the slope associated with that variable is significant and positive, we know that that group is at greater risk of lower health status than non-members, other things being equal.

Therefore, the following hypothesis is being tested:

H_o. Other things being equal, target group members will have health statuses similar to those of people who are not target group members.

H_a: Other things being equal, target group members are likely to have lower health status than people who are not target group members.

Ten potential target groups were tentatively identified: the unemployed, persons with stressful jobs, widows, the bereaved, the poor, single parents, persons with negative status inconsistency, recently ill or injured persons, the disabled and the elderly. The zero-order relationship of target group membership with health status is summarized in Table 17; a full breakdown is found in Appendix 3, Table 4. We see that all of the proposed target groups were in fact at risk for reduced

self-rated health status. For composite health status, the only proposed
group not found to be at risk was unmarried parenthood.

Table 17: Summary of Zero Order Relationship between
Target Group Membership and Health Status

Target Group	Self-Rated Health Status (eta)	Composite health status (eta)
Unemployed	.068**	.049*
Job stress	.057*	.071**
Bereaved	.102***	.081***
Recently ill/injured	.341***	.328***
Disabled	.458***	n.a.
Widows	.113***	.093***
Elderly	.098***	.153***
Unmarried parent	.045*	.026 NS
Status inconsistency	.093**	.084**
Low Income	.219***	.176***

*p<.05
**p<.01
***p<.001

The above general hypothesis will be tested individually for each
target group. While they will be discussed and presented separately, the
results of the analysis are summarized in Table 18. As this illustrates,
for three of the nine groups membership is not significantly related to
health status as measured by the index of self-rated health status; and
for four of eight target groups membership is not significantly related
to the measure of composite health status. Note that three of these
target groups received somewhat different treatment than the others.
First, for the disabled, we are unable to determine a relationship with
the outcome variable of composite health status, due to the fact that
this relationship is confounded--disability status is one of the elements
used in determining composite health status. Second, for elderly, it was
assumed a priori that this variable would be so highly correlated with
the control variable of age that it (age) should not be used as a control

Table 18:   Summary of Relationship between Target Group Membership and
             Health Status, Controlling for Age, Sex, Income, Education

Target Group	Self-Rated Health Status (slope-B)	Composite health status (slope-B)
Unemployed	.479 NS	.292*
Job stress	.321***	.205***
Bereaved	.496**	.056 NS
Recently ill/injured	1.777***	.994***
Disabled	3.502***	n.a.
Widows	.365 NS	.111 NS
Elderly (no control for age)	.395*	.557***
Low income (no control for income)	.993***	.402***
Unmarried parent	.090 NS	.033 NS
Status inconsistency	.527*	.203 NS

*p<.05
**p<.01
***p<.001

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variable with this target group. A similar assumption was made regarding

the relationship between the low income target group and the control

variable of income.

1. The Unemployed.

H₀: Unemployed persons will have the same health status as employed
      persons, all other things being equal, among persons in the work
      force.

Hₐ: Unemployed persons will have lower health status as employed
      persons, all other things being equal, among persons in the work
      force.

With regard to self-rated health status, the null hypothesis cannot

be refuted. That is to say, when unemployment was entered into the

regression after the control variables, it was not found to be

significantly related to self-rated health status. On the other hand, it

was significantly and positively related to composite health status. One

could suspect a problem of bi-directionality here: that people are

unemployed because their functional health status is low. That is,

however, unlikely, because people classified as "unable to work (disabled)" were excluded from this stage of the analysis. It would, therefore, seem that while the unemployed do not perceive their health status differently than does the larger population of people in the work force, their functional health status is lower.

2. People Employed in Stressful Jobs.

H_o: Among the employed, the health status of people with stressful jobs is no different than that of people with non-stressful jobs.

H_a: Among the employed, the health status of people with stressful jobs is lower than that of people with non-stressful jobs.

With regard to both self-rated health status and composite health status, the null hypothesis in this case can be rejected. All other things equal, people with stressful jobs were significantly more likely to have lower health status than people with low stress jobs. While the relationship is more strongly significant with regard to self-rated health status, the key point here is that job stress seems to be related to both how people rate their own health overall, and how they report their level of functioning.

3. Bereaved Persons.

H_o: The health status of persons who have lost either a spouse or child during the past five years will be no different than that of people who have not suffered such a loss.

H_a: The health status of persons who have lost either a spouse of child during the past five years will be lower than that of people who have not suffered such a loss.

For this target group, there proved to be a difference in the degree to which it was related to self-rated and composite health status. It was found that bereavement was significantly related to self-rated health status ($p < .05$), but not to composite health status. Because bereavement was not strongly related to any of the control variables,

multicolinearity is not suspected. Rather it seems that bereavement is related to the way people perceive their health, but not to their level of functioning. It is important to note that this may not be true in the short term. In this case, the variable measures bereavement during the past five years. One would suspect that somatic complaints (which would be pinpointed by the composite measure) disappear during this period.

4. Recently Ill or Injured Persons.

H_o: The current health status of people who were seriously ill or injured during the past five years will be no different than that of the general population, all other things being equal.

H_a: The current health status of people who were seriously ill or injured during the past five years will be lower than that of the general population, all other things being equal.

Membership in this target group was found to be highly predictive of lower health status, both self-rated and composite. We can, therefore, reject the null hypothesis and conclude that people who were recently ill of injured are at risk for reduced health status.

5. Disabled Persons.

H_o: People who have some degree of limitation of their activities will not rate their health status different than people whose activities are not limited.

H_a: People who have some degree of limitation of their activities will rate their health status lower than do people whose activities are not limited.

Like the above, membership in this target group was found to be highly predictive of lower health status. We can therefore reject the null hypothesis and conclude that all other things being equal, disabled persons will perceive their health as lower than do people with no disability. It is important to note, again, that composite health status was not used as a dependent variable for this target group, as it is

confounded by the fact that degree of activity limitation is used as one

component of that measure.

6. **Widows**.

H₀: All other things being equal, the widowed will have the same level
of health status as do non-widowed persons.

Hₐ: All other things being equal, widows will have lower health status
than do non-widowed persons.

For this target group, the null hypothesis cannot be rejected. Neither

for self-rated nor for composite health status was there a significant

slope associated with widowhood when it was entered into a regression

following the control variables of age, sex, education and income. One

obvious possibility for the failure to find an association, particularly

given the strong support for such an association in the literature is a

problem of multicolinearity with age. That is to say, it is likely that

widowed persons are also elderly, and that by first controlling for age

one eliminates the possibility of observing the expected relationship

between widowhood and health status. To deal with this possibility, two

steps were taken: The first step was to re-examine the correlations

between the target group variable--widowhood--and all of the control

variables. (Table 19) It was found that widowhood was significantly

correlated with all of them; widows were likely to be older, female,

lower income and lower educated than the general population. The

strongest correlation was with age (r=-.27, p<.001). For this reason, it

was decided to repeat the multiple regression, omitting age as a control

variable. This done, it was found that widowhood was in fact

significantly correlated with self-rated health status (p<.01) but not

with composite health status. This would indicate that widows perceive

Table 19: Zero-order Corelations (r) between Selected
           Target Groups and Control Variables

Target Group .	Age	Sex[a]	Income	Education
Widow[a]	-.27**	-.11**	.23*	.14**
Single parent	.17**	-.11**	.20**	.05*
Status Inconsistency	.03 NS	-.11**	.59**	.08**
Elderly	-.71**	-.06**	.17**	.21**

*p<.01
**p<.001

[a] Dummy codes: Target group member=0; other=1.
                 Male=0; female=1.

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themselves as less healthy than the general population, but are not, in
fact, functioning at a lower level.

This leaves, of course, the question of the validity of controlling
for age. What we could be observing is a relationship due entirely to
age. That is widows have lower self-rated health status because they are
older. One way of determining this would be to observe the relationship
of one of the other target groups--the elderly-- to health status. One
could then compare the two patterns for similarities or differences. As
a further step, one could compare the relationship of network variables
to health status in the two target groups--elderly and widows--to test
for similarities. If there is no difference between the two we could
assume that the only reason widows have lower health status than people
of other marital statuses is because they tend to be older. If, however,
there are significant differences in the pattern of relationships of the
two groups, we could assume that there are unique qualities inherent in
widowhood that place those people at risk.

7. The Elderly.

H_o: The health status of people aged 60 or over is not significantly different than that of those aged under 60, other things being equal.

H_a: The health status of people aged 60 or over is significantly lower than that of those aged under 60, other things being equal.

For this variable, it was assumed a priori that being elderly and increasing age (measured continuously) are essentially the same variable; hence, it would not be logical to include age as a control when the target group of interest is the elderly. (Note here that the sample is limited to persons aged 64 and under. This assumption might not hold true were there a broader range of elderly persons, i.e, no upper limit.) For both self-rated and composite health status a significant relationship was found between old age and reduced health. We can, therefore, reject the null hypothesis.

In addition, we should compare the results of this regression with that achieved by regressing widowhood on the same variables with the same controls. Here we can see a somewhat different pattern. First, we see that for composite health status, widowhood was not a significant predictor, while old age was. In fact, old age was a more highly significant predictor of composite health status than of self-rated health status. This would lead us to conclude that widowhood and old age, while correlated, are measuring different phenomenon, and that it is of some value to further investigate the relationship of widowhood to health status without controlling for age, which seems to suppress this relationship.

8. Low Income.

H_o. The health status of people with annual family incomes of less than $10,000 is not significantly different than that of those with incomes of $10,000 of more.

H_a: The health status of people with annual family income of under $10,000 is significantly lower than that of those with incomes of $10,000 or more.

As with the previous variable, it was concluded a priori that the measures of income (as a control) and poverty were the same. Therefore income could not be used as a control when the target group of interest was the poor. For both self-rated and composite health status, having a low income was significantly related to poor health. We can, therefore, reject the null hypothesis.

9. Unmarried Parents.

H_o: Unmarried parents will have levels of health status no different from the rest of the population.

H_a: Unmarried parents will have levels of health status lower than those of the rest of the population.

This target group did not prove to be significantly predictive of reduced health status--we cannot refute the null hypothesis here for either self-rated or composite health status. A possible explanation for this failure is that there is multicolinearity between unwed parenthood and income, with low-income persons more likely to be single parents and vice versa. To examine this possibility, the correlations between unmarried parenthood and the control variables was checked, with the relationship between target group membership and income proving to be the strongest (r=.20, p<.001). (Table 19) Therefore, a new regression was computed, without income as a control. (Table 20) Here it was found that single parenthood was significantly predictive of lower self-rated health status, but not of composite health status. In other words, single parents seem to see themselves as less healthy, although their functional health status is not significantly different from that of the general population. This is not surprising, given the fact that composite health

status and unmarried parenthood were not related even when no other
variables were controlled for (Table 17).

Table 20: Summary of Relationship between Target Group Membership
and Health Status, for Selected Target Groups,
Selective Deletion of Controls

Target Group	Control Omitted	Self-Rated Health Status (slope-B)	Composite Health Status (slope-B)
Widows	Age	.656**	.212 NS
Elderly (no control for age)	Age	.395*	.557***
Unmarried parent	Income	.374**	.151 NS
Status inconsistency	Income	.638***	.267**

*p<.05
**p<.01
***p<.001

Here, too, the validity of eliminating the control for income could
be questioned. The argument here lies more within the conceptual
framework than in the manipulation and comparison of data. The question
here is whether the variable of interest is income or single parenthood,
as a group at risk of reduced health status, whose risk might be mediated
by a strong social network. It is the latter stipulation which is of
greater import here. We are interested in knowing whether the presence
of a strong network can mitigate the effects of being a single parent
upon health status. Thus it could, be possible that the additional
burden of single parenthood among the low-income might be mediated by a
strong social network. Here too, one way of ascertaining whether the
observed relationship is due entirely to the effect of poverty on health
would be to compare the results for this group with those for the low
income. If the relationships between social network variables and health
status are different for the two groups, it would add weight to the
supposition that single parenthood is a threat to health, beyond that

threat caused by poverty, a threat which can be mitigated by social
networks. It would, therefore, be justified to remove income as a
control in the examination of this target group, in order not to obscure
the relationship completely.

10. Status Inconsistency.

H_o: Among people aged 30-55, those with negative status inconsistency
(highly educated and low income) will have health status levels
similar to the levels of those whose income and education status is
either consistent or positively inconsistent (low education and
high income).

H_a: Among people aged 30-55, those with negative status inconsistency
will have health status levels lower than those of persons whose
income and education status is either consistent or positively
inconsistent.

Status inconsistency here refers to a gap between an individual's
expected income based on his/her education and actual income. As such it
is a measure of under achievement. This variable was found to be
significantly related to self-rated health status, but not to composite
health status. It was suspected that a problem could arise due to the
fact that both education and income are used in arriving at this variable
and hence would be measured twice in the regression. In fact, status
inconsistency was strongly correlated with income ($r=.59$, $p<.001$),
although not nearly as strongly with education ($r=.08$, $p<.001$). (Table
19) For this reason, the regression was repeated, eliminating the
control for income. (Table 20) In the revised equation, status
inconsistency was found to be related to reduction in both self-rated and
composite health status, although it was more strongly significant for
self-rated health status.

Another problem with this measure also arises. It could be that
people with negative status inconsistency are actually people who cannot
earn an income because they are ill. This would mean that we are

actually measuring physical health or disability rather than under achievement. There are several ways of approaching this problem. One is to look at the correlation between status inconsistency and disability. At r=.08, this is not a very strong correlation, although in is statistically significant (P<.001).

Another way of looking at it is to look at the relationship between status inconsistency and the two dependent variables. If the reason for low income was an inability to work, we would expect to find a low composite (functional) health status score. Instead, what we find is a stronger relationship with self-rated health status.

The final way of looking at the possibility of what is essentially a construct validity problem (Cook and Campbell, 1979) is in the next set of analyses. We can look at whether the relationships between social networks and health status for this group closely resemble those for people who are either disabled or had serious illness or injury in the recent past. If the patterns are similar, we would conclude that the construct being measured here is not under achievement, but rather disability.

With this in mind we can, for the present, conditionally refute the null hypothesis, concluding that status inconsistency is related to reduced health levels when income alone is not controlled for. In other words, we cannot say that this phenomenon holds at all levels of income.

SUMMARY

In this chapter, the results of three aspects of introductory analyses were presented. In the first, the unconditional relationship between each of five control variables--age, sex, income, education and race--and health status was examined. All five were found to be significantly related to health status. Their combined relationship was also examined via a stepwise multiple regression. This showed that each of the control variables except race was significantly related to health status, independent of the other controls. (Hence, race will not be used as a control in the next stage of the analysis.). However, the importance of the controls was different for the two measures of health status.

In the second aspect, the importance of all of the network variables for explaining health status was examined. At the unconditional level, all of the variables except church attendance were found to be positively related to self-rated health status, while all but church attendance and happiness of marriage were positively related to composite health status. However, the relationship between network variables and health status was consistently stronger for self-rated health status than for composite health status. When, however, the background variables were controlled in a multiple regression, fewer of the network variables remained significant. For self-rated health status, seven of the nine single item measures and three of the four indices remained significant; while for composite health status, six of the nine single item measures and only one of the indices remained significant. Church attendance, which was not significant for either dependent variable at the zero-order level, became significant for

composite health status when background variables were controlled for. And number of close friends, which was strongly related to composite health status at the zero-order level was not related at all to composite health status when background variables were controlled for. Here, again, in most cases the network variables were more important in explaining variance in self-rated health status than in composite health status. Also, it was noted that while most of the relationships are significant, they are not particularly strong for the general population, although the relative risk of poor health is greater for those with low network score than for those with higher scores.

In the final step, hypotheses were tested concerning the potential identification of target groups--persons who belong to groups whose health status is lower than that of non-members, and whose risk might be mediated by a strong network. Of ten target groups, seven were found to be predictive of reduced self-rated health status; and five of nine potential target groups were found to be predictive of composite health status. However, when problems of multicolinearity were dealt with, all of the target groups were found to be predictive of reduced self-rated health status, while seven of nine were predictive of composite health status. In the latter instance, widowhood and single parenthood were not found to be predictive of composite health status.

The next stage of the analysis will entail the separate analysis of each of the identified target groups to ascertain whether or not social networks are more important in determining the health status of target group members than of non-members, and to assess the relative importance of different network aspects for each target group.

CHAPTER 6

DATA ANALYSIS--SOCIAL NETWORKS AND HEALTH STATUS

-Introduction

-Relationship of Health Status and Networks
 Among Selected Target Groups

  -Job Stress
  -Unemployed
  -Elderly
  -Widowed
  -Bereaved
  -Recently ill or injured
  -Disabled
  -Low income
  -Status inconsistency
  -Single parents

-Summary

INTRODUCTION

This chapter presents the results of the analyses around the central research questions of the dissertation. The goal of the analysis was to explore the differential impact of social networks on the health of various groups of people. The groups selected for study are those for whom, according to prior research, health status is affected by the presence or absence of strong social networks and/or groups with whom social workers often intervene by trying to strengthen or expand their social networks. As such they are referred to here as "target groups."

Because of the complexity of the analysis, the results are presented in two ways: first through a detailed look at the relationship between social networks and health status within each of the target groups, both alone and in comparison to the rest of the population, and second by a summary of the relationship between social networks and health status in all the target groups.

The analysis addresses three research questions. The main research question was: Are social network characteristics more strongly related to health status in members of the target groups than in the general population?

Two subsidiary questions are also explored:

1. Are the same social network characteristics associated with higher health status among all populations or do important network characteristics vary according to target group?

2. Are social networks equally important in determining both the self-rated and functional health status of target group members?

All three questions will be addressed in both portions of the analysis.

These questions are addressed in the form of the following

hypotheses:

1. H_o: The same social network characteristics relate to the health
   status of all target groups.

   H_a: There are different social network characteristics which relate
   to the health status of different target groups.

2. H_o: Social networks relate in the same way to both the self-rated
   and composite health status of target group members.

   H_a: Social networks relate differently to the self-rated and
   composite health status of target groups members.

3. H_o: Social networks are no more important in relation to the health
   status of target group members than they are in relation to
   the health of the rest of the population.

   H_a: Social networks are more important in relation to the health of
   target group members than they are in relation to the health
   of the rest of the population.

This stage of the analysis had three main steps. In the first,

each of the proposed target groups was examined to see whether social

network measures were significant in determining the health status of

members of that group. This was done using multiple regression, with

health status as the dependent variable. Each target group formed a

separate population, for which the control variables—age, sex, income

and education, were entered into a multiple regression equation, followed

by a network variable, as illustrated in table 21, step 1. In this case

the statistics of interest are the slope (or unstandardized regression

coefficient) of the network variable and the incremental r-squared (or

amount of variance in health status explained) gained by the addition of

the network variable to the regression equation.

Table 21:   Analysis Steps and Equations

Step 1:   Select Target Group, repeat for each group for each network
variable.
Equation 1: $Y = a + b_2(\text{Control a}) . . . + B_n(\text{Network})$

Step 2:   Do for each target group for each network variable.
Equation 2: $Y = a + b_c(\text{Controls}) . . . + b_t(\text{Target Group}$
$\text{Membership}) + b_n(\text{Network}) + b_i(\text{Target Group Membership X}$
$\text{Network})$

Step 3:   Select population of people who are not members of any target
groups, plus members of one target group. Repeat for each
target group for each network variable.
Equation 3:   Same as equation 2.

A caution needs to be stressed here, due to the large number of

regressions carried out. The goal of this step was not to determine the

best-fitting model for predicting health status in each group, but

rather to see if there were differences between groups as to which

network elements were significant predictors of health status. Hence,

while findings will be presented regarding the importance of networks

within groups, it is the larger picture which is stressed here. The

stress the micro level would require specific hypotheses regarding each

network element and more stringent tests of significance. For further

discussion of this point see Chapter 7, Implications and Limitations.

In the second stage, these relationships were compared to the

importance of social networks to the health status of the general

population, by entering target group membership, network strength and

their interaction as variables in a multiple regression, controlling for

age, sex, income and education. (See table 1, Step 2.) We are looking

for two things here: First, is there some consistency of direction? In

general are the slopes associated with social networks larger in the

target groups than they are in the general population? And to carry this even further, we are looking for a statistically significant interaction term--was the way that social networks relate to the health of target group members significantly different than the way they relate to the health of the larger population. The hypothesized outcome is that there is a difference. There is, however, a possibility that such a relationship might be obscured: As the general population contained members of all the target groups other than that being tested, it is unrealistic to assume that each group will be more at risk than all other groups. Therefore, an absolute difference of magnitude should suffice at this exploratory level.

In the third stage, the population was split into two groups-- people who were not members of any target group and people who were members of one or more target groups. The final analytic step, then, involves comparing the importance of social networks for the health status of each target group's members, with their importance for the non-target group population, the hypothesis being that social networks would prove to be significantly more important in determining the health status of target group members than they are in determining the health status of people who are not a member of any target group. This was done by selecting a population of (1) members of no target groups plus (2) members of a selected target group. A multiple regression was then done (controlling for demographic variables), with health status as the dependent variable, entering target group membership, network variable and an interaction term (target group membership X network variable). See Table 1, Step 3. This step was performed in order to overcome the obscuring of a real difference between the target populations and the

rest of the population described in the previous step. If the interaction term was significant, there was a difference between the way social networks relate to the health status of the target group and the way they relate to the health status of people who are not members of any target group.

While examining the results of these analyses, we should bear in mind the alternative theoretical frameworks presented in Chapter 2, which could be used to explain them. Briefly, the main effects model would predict that there will be no difference in the role social networks play in relation to health status between groups. The buffering effect model would predict that there would be differences between groups, with networks more important for those groups which experience most stressful life events, as compared to the general population and the non-target population. It would not, however, necessarily allow for different network elements being more important for different groups. The findings will then be discussed in terms of these theoretical frameworks in Chapter 7.

RELATIONSHIP OF HEALTH STATUS AND NETWORKS AMONG SELECTED

TARGET GROUPS

As was noted in the previous chapter, membership in each of the target groups was negatively correlated with at least one measure of health status. That is to say, for each group, members of that group had lower health status than did people who were not members of that group. In this stage, then, the analysis aimed at determining whether the presence of a strong social network mitigates that risk, and which elements of social networks are important for that group.

Of the 10 target groups originally proposed, all but one (the disabled) seemed to be at risk of reduced health status if they were lacking some aspect of strong social networks. Several facets of the relationship were explored: (1) the direction and significance of the slope (b--unstandardized regression coefficient) associated with the network variable; (2) the percent of variance in health status explained by the network variable, beyond that explained by the control variables (incremental r-square); and (3) the magnitude of difference between the associations of network strength and health status in the target group and in the general and non-target populations.

The network characteristics explored here fell roughly into four groups. While not mutually exclusive (e.g., number ties seen at least once a month measures both availability and contact) they do serve as a framework for a range of network variables.

1. Availability of intimate ties: number of close relatives, number of close friends, number of close ties seen frequently, marital status.

2. Contact with close ties: Frequency of contact, marital status, number of close ties seen frequently, church attendance.

3. Perception of ties: Satisfaction with network size, marital happiness

4. Affiliations: Group membership, variety of groups participated in, church attendance.

We should remember that for the general population, while most of the network variables were significantly and positively related to health status, the amount of variance they explained was quite small. However, one needs to be cautious in comparing this statistic between populations--it is in part dependent on the amount of variance in the population to begin with. Thus, while there might be a great deal of variance in health status in the general population, there could be much less variance in health status among members of a particular target group. For this reason, the variance in the outcome measures in all subpopulations was also examined. The variances of health status for each group is presented in Appendix Table 7.

Briefly, the differences in variance among the target groups and the general populations are slight. The only instance in which there is a major departure is with regard to the non-target group population. Here the variance in both health status measures was much less than for either the general population or any of the target groups. Intuitively this makes sense. All the target groups are people who are significantly less healthy than the general population. Hence, removing them all from that population essentially removes a large number of the people with poor health. Indeed the sample mean for the non-target group is in fact higher on both measures (SRHS=15.40; CHS=4.42 for the non-target group

population vs. SRHS=14.6; CHS=3.9 for the general population. Thus the use of the non-target population as a comparison group violates the assumption of homoskedasticity. This assumption is, however, fairly robust to violation (Kleinbaum and Kupper, 1978, p. 137). That is, observed p-values and confidence intervals are not radically different from the actual p-values. It was, therefore, decided to include this step, with the caveat in mind that the assumption was violated.

A final difficulty also bears mention. As will be discussed later in this chapter, the disabled did not seem to be aided by social networks. A question therefore arose as to whether they should be dropped as a target group, particularly in the selection of the non-target population. An examination was therefore done of the non-target population, once including the disabled and once excluding them. The difference in the population size was 33 people, with only slightly greater variance when they were not counted as a target group. In order to strictly adhere to the original hypotheses of the investigation, it was decided to maintain their status as a target group.

1. Job stress.--There were 510 people in the sample population who reported that their jobs involved a great deal of stress. Among these people there is very strong evidence of the importance of social networks in relationship to their self-rated health status, but not to their composite health status. (Table 22) In looking at the slopes of network variables entered into a regression equation, controlling for age, sex, income and education, we see that all of the measures of intimate ties, with the exception of marital status, were significantly positively related to self-rated health status for people with high-

Table 22:   Regression of Social Networks on Health Status: People with
             High Stress Jobs (n=510)

Variable	Self-Rated Health Status		Composite Health Status	
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls[b]		0.048		0.042
Network Variables/ Single Items:				
# Close Rel's	.09**	0.011	-.001	0
# Close Frd's	.09**	0.012	-.01	0
Satis. with netsize	.76***	0.016	.16	0.002
# Freq. Contacts	.18***	0.026	.12	0.002
Freq. of Contact	.21**	0.011	.11*	0.009
Marital Stat.	-.25	0.002	-.07	0
Marital Hap.	.45*	0.012	.10	0.001
Church Atten.	-.07	0.001	-.05	0.001
Group memb.	-.06	0	-.07	0
Indices:				
Net. Size	.06***	0.017	-.01	0
Group Variety	.02	0	.01	0
Close Pers. Ties	.43***	0.023	0	0
Soc. Score	.24***	0.015	-.03	0.001
Berkman SNI	.10***	0.017	0	0

*In a regression equation of the form:

Y=a + b1(Age) +b2(Sex) + b3(Education) + b4(Income) + b5(Soc. Network)

In each case, Y equals self-rated health status or composite health status.   Control variables were entered into the equation first, as a block, after which the network variable was entered.   For each equation, the previously added network variable was removed and a new one entered.

[b]Control variables were age, sex, education and income.   The incremental r-square for the control is that when no other variables are in the equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

stress jobs. On the other hand none of the measures of affiliation (group membership, group variety and church attendance) were related to self-rated health status. In addition, only one measure of network strength--frequency of contact with close friends and relatives--was significantly related to composite health status; several other measures were, in fact, negatively related to composite health status, although not significantly so.

In comparing those with stressful jobs to the general population, we see that the amount of variance explained by network variables is greater for those with stressful jobs than it is in the general population, with the greatest amount--2.6%--explained by the number of friends and relatives seen at least once a month. This compares with a maximum explained variance of 1.3% (for satisfaction with number of ties) in the general population. (See Table 16, chapter 5).

In another way of comparing the importance of social networks in this group with that in the general population, the interaction effects of network strength and target group membership were assessed (Table 23, columns 1 and 3). For self-rated health status, most of the measures of intimate ties which were significantly related to the health status of those with stressful jobs were indeed more important for them than for the rest of the population, although the difference was not significant. The only significant interactions were for the measures of affiliation, and they were in the opposite direction from that expected. For the dichotomized measure of group membership, we see that it was significantly less important in relation to both the self-rated and composite health status of those with stressful jobs than it was for the general population (b=.60, p<.05; and b=.31, p<.05, respectively).

Table 23: Interaction effects (target group membership X social
          networks): People with High Stress Jobs

	Self-Rated Health Status		Composite Health Status	
Variable	Interaction Gen. Pop.[a]	Interaction in Limited Pop.[b]	Interaction Gen. Pop.[a]	Interaction In Limited Pop.[b]
Network Variables/ Single Items:				
# Close Rel's	-.02	-.06*	.03	.01
# Close Frd's	-.02	-.02	.01	.01
Satis. with netsize	.05	-.36	.17	-.07
# Freq. Contacts	-.05	-.09***	.00	-.01
Freq. of Contact	-.13	-.26***	-.05	-.11*
Marital Stat.	-.27	-.55*	-.06	-.02
Marital Hap.	-.05	-.005	-.06	.11
Church Atten.	.16	.13	.11*	.11*
Group memb.	.60*	.20	.31*	.14
Indices:				
Net. Size	-.01	-.03	.01	.01
Group Variety	.14	-.02	.05	.01
Close Pers. Ties	-.01	-.03*	.01	.001
Soc. Score	-.03	-.11	.08	.03
Berkman SNI	-.03	-.07*	.02	.01

[a]Unstandardized regression coefficients derived from an equation of the
form:

$$Y=a + b1(Age) + b2(Sex) + b3(Education) + b4(Income) + b5(Job\ Stress) + b6(Social\ Network) + b7(Job\ Stress\ X\ Social\ Network).$$

Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

[b]Population is all members of study population who are not members of any
hypothesized target groups (n=940) plus those who report high job stress
(n=510).

*p<.05, one-tailed t-test
**p<.01
***p<.001

Likewise, church attendance was less important for those with job stress than for the general population ((b=.11, p<.05), significantly so for composite health status.

Also explored was the relationship of social networks for those with stressful jobs in comparison to a second population--those who do not belong to any target group (Table 23, columns 2 and 4). What was most important for this group in comparison to others was actual contact with close ties. That is to say, people who had stressful jobs were more likely than people who were not target group members to rate themselves as healthier if the number of close friends and relatives whom they see frequently was large and if they actually saw them frequently. They were also likely to benefit more from the availability of close relatives and from being married. Other measures, while important for this population alone, were not significantly more important for them than for the general population. On the other hand, less intimate affiliations did not seem to benefit them, and were in fact significantly less important for them than they were for the rest of the population.

In summary, then, three conclusions can be drawn with regard to the relationship of social networks and the health status of people with high-stress jobs: (1) Social networks were more important to this group's self-rated health status than composite health status. (2) What was important for this group was both the availability of and contact with intimate ties, while group affiliations were not beneficial to them. And (3) it was more important for the health of people with stressful jobs to be in contact with their networks than it was for other people in the population.

2. The unemployed.--There were 100 persons in the sample

population who were unemployed. As was shown in Chapter 5, the

unemployed had lower composite health status than the rest of the

population, although their self-rated health status was not significantly

different. Here too there is strong evidence that the unemployed who had

stronger social networks were healthier. (See Table 24.) For both self-

rated and composite health status, the factor that seems to be important

is the availability of and contact with intimate ties--friends and

relatives. For self-rated health status, it is the number of both kind

of ties which is significant (relatives, b=.16, p<.05; friends, b=.23,

p<.01). For composite health status, the number of ties frequently

visited is the most important (b=.12, p<.001), explaining 7.6% of the

variance of composite health status. Also significantly positively

related to composite health status among the unemployed were the number

of close relatives and satisfaction with network size. The number of

friends alone was not important for the composite health status of the

unemployed. None of the measures of affiliation was significant for the

unemployed, nor were those related to marriage, although, only 37 of the

100 in this group were married.

In looking at the amount of variance explained, we see that the

proportion of variance explained by network ties in the unemployed

population was much greater than in the general population (Chapter 5,

Table 16)--with sociability score explaining the most variance, 6.3% of

self-rated health status and 7.7% of composite health status.

In further comparing the unemployed to the general population, in

all but one set of variables (groups), the relationship between social

networks and health status was stronger for the unemployed than it was

Table 24: Regression of Social Networks on Health Status: Unemployed
(n=100)

Variable	Self-Rated Health Status		Composite Health Status	
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls[b]		0.141		0.227
Network Variables/ Single Items:				
# Close Rel's	.16*	0.031	.08*	0.037
# Close Frd's	.23**	0.057	.07	0.020
Satis. with netsize	.85	0.010	.72*	0.032
# Freq. Contacts	.14	0.024	.12***	0.076
Freq. of Contact	.24	0.010	.19*	0.028
Marital Stat.	.83	0.016	.29	0.008
Marital Hap.	.94	0.024	.41	0.014
Church Atten.	.16	0.003	.17	0.014
Group memb.	.12	0	.34	0.012
Indices:				
Net. Size	.14***	0.064	.06*	0.042
Group Variety	-.15	0.003	.07	0.003
Close Pers. Ties	.08**	0.052	.05***	0.062
Soc. Score	.57***	0.063	.31***	0.077
Berkman SNI	.15	0.016	.06	0.014

*In a regression equation of the form:

Y=a + b1(Age) +b2(Sex) + b3(Education) + b4(Income) + b5(Soc. Network)

In each case, Y equals self-rated health status or composite health status. Control variables were entered into the equation first, as a block, after which the network variable was entered. For each equation, the previously added network variable was removed and a new one entered.

[b]Control variables were age, sex, education and income. The incremental r-square for the controls is that when no other variables are in the equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

in the general population (Table 25, columns 1 and 3). For five of these variables, the difference was statistically significant. That is, for self-rated health status, the interaction of each of several variables--the number of close friends, network size, the index of close personal ties and the sociability score-- with unemployment was significant and negative. Thus these network variables were more important in determining the health of the unemployed than of the general population. Similarly, for composite health status, the number of close friends, and the two indices (close personal ties and sociability score), were more important for the unemployed as was the number of friends and relatives seen once a month.

Finally, the importance of networks to the health status of unemployed was compared to their importance for people who are not members of any target groups. Here, too, it was found that measures of intimate ties were significantly more important for the unemployed. That is to say the interactions of unemployment and four measures of network strength (number of close relatives, number of close friends, number of ties seen at least once a month, and frequency of contact) as well as the indices based on those measures, were significantly negative, for both measures of health status. In addition, satisfaction with network size was also significantly more important for the composite health status of the unemployed (b=-.58, p<.05). On the other hand, being married was significantly less important for the composite health status of the unemployed.

It would seem therefore that it is intimate ties which are important in the health of the unemployed, and that these ties are more important for the unemployed than for other people. Of particular

Table 25: Interaction effects (target group membership X social
networks): Unemployed Persons

	Self-rated Health Status		Composite Health Status	
Variable	Interaction Gen. Pop.[a]	Interaction in Limited Pop.[b]	Interaction Gen. Pop.[a]	Interaction In Limited Pop.[b]
Network Variables/ Single Items:				
# Close Rel's	-.10	-.16**	-.06	-.08*
# Close Frd's	-.17*	-.19***	-.08*	-.09**
Satis. with netsize	.02	-.41	-.37	-.58*
# Freq. Contacts	-.08	-.13*	-.11***	-.12***
Freq. of Contact	-.19	-.34*	-.15	-.22*
Marital Stat.	.86	.63	.53*	.58*
Marital Hap.	-.64	-.77	-.34	-.30
Church Atten.	-.06	-.07	-.02	-.10
Group memb.	.09	-.26	-.06	-.23
Indices:				
Net. Size	-.10*	-.13***	-.05*	-.06***
Group variety	.13	.01	-.01	-.05
Close Pers. Ties	-.06*	-.08***	-.04*	-.05***
Soc. Score	-.41*	-.51***	-.29***	-.34***
Berkman SNI	-.06	-.13*	-.02	-.04

[a]Unstandardized regression coefficients derived from an equation of the form:

$$Y=a + b1(Age) + b2(Sex) + b3(Education) + b4(Income) + b5(Unemployed) + b6(Social Network) + b7(Unemployed X Social Network).$$

Where the coefficient of the interaction term is significant and negative, that social network variable is more strongly related to the health status of target group members than of non-members.

[b]Population is all members of study population who are not members of any hypothesized target groups (n=940) plus those who are unemployed (n=100).

*p<.05, one-tailed t-test
**p<.01
***p<.001

importance is the number of friends for determining self-rated health status and number of ties visited more than once a month for composite health status. Affiliations do not appear to be of particular import here.

3. Elderly.--As was discussed in earlier chapters there were no members of the population who were older than age 64. For that reason a proxy measure was used--people aged 60-64--in order to get some idea of the importance of social networks to the health of the elderly. There were 250 people aged 60-64 in the sample. As is shown in Table 26, only two network variables were significantly related to the health status of this group. For their self-rated health status, satisfaction with network size is significant ($b=.86$, $p<.05$); for their composite health status, the variety of groups they participate in is significant ($b=.20$, $p<.05$). These two variables explain 1.2% and 1.5% of the variance in the respective dependent variables, beyond that explained by sex, income and education. Overall, however, it does not seem that social networks are particularly important for the health of this group. In particular we note that the availability of close ties--friends and relatives does not seem to be a significant predictor.

Looking at the relation between social networks and the health of the elderly as compared to their relationship to the health of the larger population, we see that there was no difference for self-rated health status (Table 27). Although for most measures except the availability of intimate ties, the relationship was stronger, the difference was not significant.

For composite health status, however, there were several significant interactions. Both church attendance and the variety of

Table 26:   Regression of Social Networks on Health Status: Elderly
            (n=250)

| Variable | Self-Rated Health Status | | Composite Health Status | |
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls[b]		0.167		0.230
Network Variables/ Single Items:				
# Close Rel's	.07	0.006	-.01	0
# Close Frd's	.01	0	-.01	0
Satis. with netsize	.86*	0.012	.47	0.011
# Freq. Contacts	.02	0.001	.01	0.001
Freq. of Contact	.08	0.001	.13	0.011
Marital Stat.	.01	0	.00	0
Marital Hap.	.49	0.008	-.30	0.009
Church Atten.	.09	0.001	.16	0.011
Group memb.	-.16	0.001	.31	0.007
Indices:				
Net. Size	.03	0.002	-.01	0
Group Variety	.06	0	.20*	0.015
Close Pers. Ties	.02	0.002	0	0
Soc. Score	.03	0	-.03	0
Berkman SNI	-.01	0	-.02	0.001

*In a regression equation of the form:

Y=a + b2(Sex) + b3(Education) + b4(Income) + b5(Social Network)

In each case, Y equals self-rated health status or composite health
status. Control variables were entered into the equation first, as a
a block, after which the network variable was entered. For each
equation, the previously added network variable was removed and a
new one entered.

[b]Control variables were sex, education and income. The incremental r-
square for the controls is that when no other variables are in the
equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

Table 27: Interaction effects (target group membership X social
           networks): Elderly Persons

| | Self-Rated Health Status | | Composite Health Status | |
Variable	Interaction Gen. Pop.[a]	Interaction in Limited Pop.[b]	Interaction Gen. Pop.[a]	Interaction In Limited Pop.[b]
Network Variables/ Single Items:				
# Close Rel's	.002	-.04	.04	.02
# Close Frd's	.04	.02	.01	-.001
Satis. with netsize	-.06	-.47	-.23	-.42*
# Freq. Contacts	.03	-.01	.01	-.002
Freq. of Contact	-.01	-.16	-.07	-.15*
Marital Stat.	-.42	-.69*	-.20	-.22
Marital Hap.	-.09	-.09	.42*	.53*
Church Atten.	-.03	-.03	-.15*	-.13
Group memb.	.32	.01	-.21	-.32
Net. Size	.02	0	.02	.01
Group variety	-.11	-.22	-.20*	-.23***
Close Pers. Ties	.02	-.001	.01	.004
Soc. Score	.16	.07	.08	.03
Berkman SNI	.03	-.01	.02	.003

[a]Unstandardized regression coefficients derived from an equation of the
form:

$$Y = a + b2(Sex) + b3(Education) + b4(Income) + b5(Elderly) + b6(Social$$
$$Network) + b7(Elderly \ X \ Social \ Network).$$

Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

[b]Population is all members of study population who are not members of any
hypothesized target groups (n=940) plus those who are elderly (n=250).

*p<.05, one-tailed t-test
**p<.01
***p<.001

groups participated in were more important for the health status of the elderly than they were for the general population. On the other hand, marital happiness is significantly less important for them.

In comparing the elderly to the non-target group population, again the differences are clearer for composite health status, which had three significant interactions: satisfaction with network size, frequency of contact with close ties and variety of groups participated in were all more important for improved health status among the elderly than they were for people who were not members of any target groups. For self-rated health status, it appears that being married is significantly more important for the elderly than for the non-target group.

The overall picture presented here is not very clear. In fact the only variable which behaved consistently is variety of groups participated in. Those elderly who participate in a wider variety of groups are healthier than those who participate in a narrower range of groups. In addition, this participation is more important for them than for either the general population or for people who are not members of any target group. On the other hand, no measures of the availability of close ties were significantly related to the health status of the elderly, nor were they more important for the elderly than for others in the population.

4. Widowed Persons.--There were 155 persons who were widowed in the sample population. As was noted in Chapter 5, widowhood is only related to health status when age is not controlled for, due to a high degree of multicollinearity with age. Even when age is not controlled for, widowhood is negatively related to self-rated health status, but not to composite health status.

Among the widowed we find no evidence that the availability of intimate ties were important in relationship to their health status, either self-rated or composite. (Table 28.) On the other hand, using composite health status as the dependent variable, a different picture emerges: Here, both church attendance and frequency of visiting with friends and relatives were significant (b=.19, p<.05; and b=.29, p<.05, respectively). This would seem to indicate that what is important in regard to the functional health status of the widowed is being with other people. This could, of course easily be turned around--only those who have high functional health status can get out to go to church or to visit others.

On the other hand, the fact that these relationships persist in comparison to other populations gives them added weight. Table 29 presents the results of the analysis of interaction effects. Here we see several patterns. First, looking at the availability of intimate ties, there was no difference between their importance for the health of widows and their importance for the health of others, whether members of other target groups or not, with one exception. The number of ties seen frequently is less important for widows self-rated health status than for non-widows. The other kinds of measures, however--contact with ties, evaluation of networks and measures of affiliation do seem to be more important for widows than for the general population, although only the greater importance of church attendance for widows is statistically significant (b=-.29, p<.001).

Table 28:   Regression of Social Networks on Health Status: Widowed
(n=155)

Variable	Self Rated Health Status		Composite Health Status	
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls*		0.082		0.162
Network Variables/ Single Items:				
# Close Rel's	.07	0.005	.01	0.001
# Close Frd's	-.01	0	-.05	0.010
Satis. with netsize	1.15	0.018	.52	0.013
# Freq. Contacts	-.08	0.007	-.04	0.006
Freq. of Contact	.12	0.002	.19*	0.021
Marital Stat.	na	--	na	--
Marital Hap.	na	--	na	--
Church Atten.	.24	0.007	.29*	0.037
Group memb.	.39	0.003	.33	0.009
Indices				
Net. Size	.02	0.001	-.02	0.002
Group Variety	.16	0.003	.16	0.011
Close Pers. Ties	-.01	0	-.01	0.004
Soc. Score	0	0	-.08	0.004
Berkman SNI	na	0	na	0.004

*In a regression equation of the form:

$$Y = a + b2(Sex) + b3(Education) + b4(Income) + b5(Soc. Network)$$

In each case, Y equals self-rated health status or composite health status. Control variables were entered into the equation first, as a a block, after which the network variable was entered. For each equation, the previously added network variable was removed and a new one entered.

bControl variables were sex, education and income. The incremental r-square for the controls is that when no other variables are in the equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

Table 29:   Interaction effects (target group membership X social
            networks):Widows (n=155)

| | Self-rated Health Status | | Composite Health Status | |
Variable	Interaction Gen. Pop.ᵃ	Interaction in Limited Pop.ᵇ	Interaction Gen. Pop.ᵃ	Interaction In Limited Pop.ᵇ
Network Variables/ Single Items:				
# Close Rel's	-.01	-.05	.01	-.003
# Close Frd's	.06	.05	.05	.04
Satis. with netsize	-.37	-.70	-.24	-.41
# Freq. Contacts	.15*	.09	.06	.04
Freq. of Contact	-.08	-.25*	-.13	-.22***
Church Atten.	-.21	-.20	-.29***	-.26***
Group memb.	-.23	-.48	-.28	-.37*
Indices				
Net. Size	.02	.003	.02	.02
Group Part.	-.20	-.33*	-.17	-.20*
Close Pers. Ties	.04	.02	.02	.02
Soc. Score	.19	.11	.12	.08

ᵃUnstandardized regression coefficients derived from an equation of the
form:

Y=a + b2(Sex) + b3(Education) + b4(Income) + b5(Widowed) + b6(Social
      Network) + b7(Widowed X Social Network).

   Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

ᵇPopulation is all members of study population who are not members of any
hypothesized target groups (n=940) plus those who are widowed (n=155).

*p<.05, one-tailed t-test
**p<.01
***p<.001

When we compare the widowed to the population who do not belong to any target groups, these relationships are strengthened. Three variables are striking in their importance. First we note that frequent contact with close friends and relatives was more important for the self-rated health status (b=-.25, p<.05) and composite health status (b=-.22, p<.001) of the widowed than for those who are not members of target groups. The same is also true for participation in a variety of groups. Finally church attendance, while more important for the self-rated health status of the widowed than for the non-target group population, was significantly more important for their composite health status (b=-.26, p<.001).

The conclusion to be drawn from all these findings is fairly clear. For the widowed, those who have frequent contact with their networks and attend church also tend to have better functional health. On the other hand, the number of available ties is not important for them. This relationship is more important for them than for others in the population. While similar to the pattern presented for the aged, the variables involved are different, leading to the conclusion that there is a unique need for widows to be in touch with other people, a need that derives from factors other than their age.

We should note that this pattern varies from that reported in the literature review. It will be further explored in the following chapter.

5. The Bereaved.--As noted earlier, this group does not represent exactly the same population as does the category of widows, both because the person lost here could also have been a child, and because, for this

group the respondent could have since remarried. Also, we should recall bereavement was negatively associated with self-rated health status, but not composite health status (Chapter 5, Table 18).

There were 156 persons in this group. Here, too, we do not find strong evidence that social networks are important in predicting health status. None of the measures of availability of intimate ties was a significant predictor of either health status measure; neither were any of the measures of affiliation (Table 30). The only variables which were significant were satisfaction with number of ties (b=1.33, p<.05 for self-rated health status, and b=.65, p<.05 for composite health status) and frequency of visiting (b=.22, p<.05,for composite health status). Each of these variables explains between 2% and 3% of the variance in health status.

These relationships persist when comparing the bereaved to other populations (Table 31). That is to say, satisfaction with network size is more important in predicting the health status of the bereaved than of people who are not target group members, as evidenced by significant negative interaction terms (b=-1.02, p<.05 for self-rated health status and b=-.65, p<.05 for composite health status).

Similarly, frequency of contact with close friends and relatives is also more important for the bereaved than for others. Compared to the general population, it is more important in predicting good composite health (b=-.17, p<.05). And compared to those who are not members of any target group, it was more important for both self-rated health status (b=-.35, p<.05) and composite health status (b=-.25, p<.001).

Table 30: Regression of Social Networks on Health Status: Bereaved
(n=156)

Variable	Self-Rated Health Status		Composite Health Status	
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls[b]		0.186		0.120
Network Variables/ Single Items:				
# Close Rel's	-.004	0	-.03	0.002
# Close Frd's	.01	0	.01	0
Satis. with netsize	1.33*	0.025	.65*	0.022
# Freq. Contacts	-.004	0	.02	0.002
Freq. of Contact	.23	0.009	.22*	0.028
Marital Stat.	.29	0.001	.21	0.003
Marital Hap.	-.33	0.004	-.08	0
Church Atten.	.22	0.006	.12	0.006
Group memb.	.67	0.010	.32	0.008
Indices:				
Net. Size	.004	0	-.006	0
Group variety	.26	0.010	.05	0.001
Close Pers. Ties	0	0	.001	0
Soc. Score	-.07	0	-.03	0
Berkman SNI	.02	0	-.002	0

*In a regression equation of the form:

$$Y = a + b1(Age) + b2(Sex) + b3(Education) + b4(Income) + b5(Soc. Network)$$

In each case, Y equals self-rated health status or composite health status. Control variables were entered into the equation first, as a a block, after which the network variable was entered. For each equation, the previously added network variable was removed and a new one entered.

[b]Control variables were age, sex, education and income. The incremental r-square for the controls is that when no other variables are in the equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

Table 31:   Interaction effects (target group membership X social
            networks): Bereaved Persons

| | Self-Rated Health Status | | Composite Health Status | |
Variable	Interaction Gen. Pop.ᵃ	Interaction in Limited Pop.ᵇ	Interaction Gen. Pop.ᵃ	Interaction In Limited Pop.ᵇ
Network Variables/ Single Items:				
# Close Rel's	.03	-.02	.03	.02
# Close Frd's	.06	.04	.02	.01
Satis. with netsize	-.67	-1.02*	-.48	-.65*
# Freq. Contacts	.08	.03	.01	0
Freq. of Contact	-.17	-.35*	-.17*	-.25***
Marital Stat.	.22	-.11	.24	.18
Marital Hap.	.48	.41	.35	.45*
Church Atten.	-.20	-.20	-.09	-.08
Group memb.	-.31	-.61	-.04	-.17
Net. Size	.03	.01	.02	.01
Group Variety	-.22	-.35**	.02	-.02
Close Pers. Ties	.03	.01	.01	0
Soc. Score	.24	.15	.09	.05
Berkman SNI	.04	-.01	.03	.01

ᵃUnstandardized regression coefficients derived from an equation of the
form:

Y=a + b1(Age) + b2(Sex) + b3(Education) + b4(Income) + b5(Bereaved) +
    b6(Social Network) + b7(Bereaved X Social Network).

   Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

ᵇPopulation is all members of study population who are not members of any
hypothesized target groups (n=940) plus those who are bereaved (n=156).

*p<.05, one-tailed t-test
**p<.01
***p<.001

Two other significant interaction terms also bear mention. It seems that marital happiness is less important for the composite health status of the bereaved than for those who are not members of any target groups. It is, however, likely that this is a statistical artifact due to the small number (n=45) of bereaved persons who were asked this question, i.e., those whose loss was not a spouse, or if a spouse, had since remarried.

The other interaction term which achieved significance was variety of groups participated in, which was more important for the good self-rated health status of the bereaved than for people who are not members of target groups (b=-.35, p<.01). While this is the only measure of affiliation that achieves significance, most of the others are consistent in their direction. That is, church attendance and group membership are all positively associated with good health among the bereaved, although none of these relationships are significant. Likewise, these affiliations are for the most part more important for the good health of the bereaved than for others, as evidenced by the negative direction of all the interaction terms. This would lead to the conclusion that the one significant interaction term does in fact represent a real finding of difference in relationship strength.

Overall, the findings with regard to the bereaved lead to several conclusions--(1) The availability of intimate ties is not an important factor in predicting the health status of the bereaved. (2) The key network characteristics for predicting the health status of the bereaved are their satisfaction with the number of close ties they have and how often they see them. This is not only important for the bereaved, but is more important for them than for other people, particularly those who are

not members of any target group. And (3) group affiliation and participation are somewhat important for the bereaved, slightly more important for them than for others, although for the most part, not significantly so.

6. Recently ill or injured persons.--There were 685 people in the study sample who reported being seriously ill or injured during the past five years. What seems to characterize the health-related social network needs of this target group is the need to be with people. Thus, here too we see that the network factors which were significantly positively correlated with self-rated health status were frequency of contact (b=.20, p<.05), group membership (b=.75, p<.001),and variety of group participation (b=.22, p<.01). (Table 32) For composite health status, the only network variable which was significant was group membership (b=.25, p<.05). On the other hand, the availability of ties was either not related or slightly negatively associated with health status for this group, although not significantly so.

In comparison to the general population we see that these contact and affiliation factors were significantly more important for those who had been ill or injured than for the general population, as evidenced by significant negative interaction terms. (Table 33) Thus, having frequent contact with close ties was significantly more important for the self-rated health status of the recently ill than for either the general population (b=-.19, p<.05) or the non-target population (b=-.29, p<.001). Being a member of at least one group was also more important for the self-rated health status of the recently ill as compared to the general population (b=-.88, p<.001) and the non-target population (b=-.85, p<.001) and also more important for their functional health status

Table 32: Regression of Social Networks on Health Status: Recently Ill or Injured Persons (n=685)

Variable	Self-Rated Health Status		Composite Health Status	
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls[b]		0.160		0.131
Network Variables/ Single Items:				
# Close Rel's	.03	0.001	-.008	0
# Close Frd's	-.04	0.001	-.02	0.002
Satis. with netsize	.37	0.002	.13	0.001
# Freq. Contacts	.01	0	-.02	0.002
Freq. of Contact	.20*	0.006	.02	0
Marital Stat.	.06	0	-.09	0.001
Marital Hap.	.24	0.002	-.03	0
Church Atten.	.07	0.001	.05	0.001
Group memb.	.75***	0.011	.25*	0.005
Indices:				
Net. Size	-.003	0	-.01	0.001
Group variety	.22**	0.008	.04	0.001
Close Pers. Ties	.001	0	-.01	0.002
Soc. Score	.04	0	-.04	0.001
Berkman SNI	.03	0.001	.001	0

*In a regression equation of the form:

$$Y = a + b1(Age) + b2(Sex) + b3(Education) + b4(Income) + b5(Soc. Network)$$

In each case, Y equals self-rated health status or composite health status. Control variables were entered into the equation first, as a a block, after which the network variable was entered. For each equation, the previously added network variable was removed and a new one entered.

[b]Control variables were age, sex, education and income. The incremental r-square for the controls is that when no other variables are in the equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

Table 33: Interaction effects (target group membership X social
networks): Recently Ill or Injured Persons

	Self-Rated Health Status		Composite Health Status	
Variable	Interaction Gen. Pop.[a]	Interaction in Limited Pop.[b]	Interaction Gen. Pop.[a]	Interaction In Limited Pop.[b]
Network Variables/ **Single Items:**				
# Close Rel's	.001	-.01	.01	.01
# Close Frd's	.09***	.09**	.02	.03
Satis. with netsize	.34	.001	.17	0
# Freq. Contacts	.04	.01	.04*	.03
Freq. of Contact	-.19*	-.26***	-.03	-.08
Marital Stat.	-.27	-.18	-.16	-.01
Marital Hap.	.24	.22	.18	.29*
Church Atten.	-.04	-.02	-.01	-.003
Group memb.	-.88***	-.85***	-.24*	-.24*
Net. Size	.04*	.03	.01	.01
Group Variety	-.33***	-.35***	-.05	-.05
Close Pers. Ties	.02	.01	.01*	.01
Soc. Score	.17*	.14	.05	.04
Berkman SNI	-.02	-.01	-.01	.004

[a]Unstandardized regression coefficients derived from an equation of the
form:

$$Y = a + b1(Age) + b2(Sex) + b3(Education) + b4(Income) + b5(Rec. Ill) + b6(Social Network) + b7(Rec. Ill \times Social Network).$$

Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

[b]Population is all members of study population who are not members of any
hypothesized target groups (n=940) plus those who were seriously ill or
injured during the past 5 years (n=685).

*p<.05, one-tailed t-test
**p<.01
***p<.001

(b=-.24, p<.05) as compared to both the general population and the non-target population. Finally, being a member of a variety of groups, which was a significant predictor of good self-rated health status for those who had recently been ill, was also more important for them than for both the general population (b=-.33, p<.001) and the nontarget population (b=-.35, p<.001).

On the other hand, some measures of intimate ties were significantly less important for target group members than they were for others, although in no case were networks significantly negatively associated with health in this target group. (Table 32) Thus, the number of close friends one has was less important for the recently ill than for others, as were some of the indices which are built with this measure. That is to say, while intimate ties may be important for the general population's health they are not important for people who have been ill or injured during the past five years. We should note that this puzzling finding is in fact consistent with other findings in the literature, which shows some negative associations in the importance of social networks for the health status of the ill. This will be discussed further in Chapter 7. What is important for this group and their perception of their health is actual contact with others, either through frequent one-to-one meetings, or through participation in group activities.

7. Disabled.--The survey questionnaire did not include a straightforward item on degree of disability. Rather, a proxy measure was used based on the Health Interview Survey's limitation of activity measure. As was discussed in Chapters 4 and 5, this is a four-item index which informs as to whether the subject is limited in his or her regular

activities or any other activities due to a chronic condition. For purposes of this investigation disability was defined as having total or partial limitation of regular activities. As this item is one of the components of the composite health status measure, only self-rated health status was looked at as an outcome variable for this target group.

There were 341 people who were disabled by this definition in the study sample. As is shown in Table 34, none of the network characteristics measured were significantly related to the self-rated health status of the disabled. One possible explanation for this outcome is measurement error--that is to say, perhaps limitation of one's activities is not really a measure of disability but rather an outcome of disability. If in fact social networks are beneficial for the health of the disabled, it could be that the group here labeled as disabled are those for whom the appropriate network was missing. Unfortunately, testing this assumption would also require an alternate measure of disability, which is not available from the data set.

Comparing this population to the general population we find one significant interaction--for the variety of groups participated in. (See Table 35.) Group variety was more important as a predictor of self-rated health status for the disabled than it was for those with no limitations (b=-.23, p<.05). It was also more important for them than for those who were not members of any target group. Unfortunately, this finding does not tell us much--group variety was not shown to be a significant determinant of the health status of the general population and it is not a significant determinant of the health status of the disabled, although it is more important for the disabled than for

Table 34: Regression of Social Networks on Health Status: Disabled
(n=341)

Self-Rated Health Status

Variable	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls[b]		0.093
Network Variables/ Single Items:		
# Close Rel's	.08	0.006
# Close Frd's	-.01	0
Satis. with netsize	.37	0.002
# Freq. Contacts	-.01	0
Freq. of Contact	.12	0.003
Marital Stat.	.18	0.001
Marital Hap.	.24	0.001
Church Atten.	.02	0
Group memb.	.19	0.001
Indices:		
Net. Size	.02	0.001
Group Variety	.15	0.003
Close Pers. Ties	.01	0
Soc. Score	.05	0.001
Berkman SNI	.08	0.006

*In a regression equation of the form:

Y=a + b1(Age) +b2(Sex) + b3(Education) + b4(Income) + b5(Soc. Network)

In each case, Y equals self-rated health status.   Control variables were entered into the equation first, as a a block, after which the network variable was entered. For each equation, the previously added network variable was removed and a new one entered.

[b]Control variables were age, sex, education and income. The incremental r-square for the controls is that when no other variables are in the equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

Table 35: Interaction effects (target group membership X social
           networks): Disabled Persons

Self-Rated Health Status

Variable	Interaction Gen. Pop.[a]	Interaction in Limited Pop.[b]
Network Variables/ Single Items:		
# Close Rel's	-.04	-.06
# Close Frd's	.06	.05
Satis. with netsize	.16	-.11
# Freq. Contacts	.05	.02
Freq. of Contact	-.10	-.17
Marital Stat.	-.46	-.55
Marital Hap.	.29	.18
Church Atten.	.03	.05
Group memb.	-.21	-.15
Indices:		
Net. Size	.01	.001
Group Variety	-.23*	-.23*
Close Pers. Ties	.01	.003
Soc. Score	.07	.03
Berkman SNI	-.05	-.06

[a]Unstandardized regression coefficients derived from an equation of the
form:

$$Y = a + b_1(Age) + b_2(Sex) + b_3(Education) + b_4(Income) + b_5(Disabled) + b_6(Social\ Network) + b_7(Disabled\ X\ Social\ Network).$$

Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

[b]Population is all members of study population who are not members of any
hypothesized target groups (n=940) plus those who are disabled (n=341).

*p<.05, one-tailed t-test
**p<.01
***p<.001

others. It does, however, fit a pattern in which frequency of contact, group membership, marital status and number of close relatives are important for the disabled, more so than for others, but not significantly so. The pattern would suggest that what is important for the disabled is both the availability of the most intimate ties (spouse and family) and contact with people through multiple group affiliations. However, the poor quality of the measure of disability and the lack of statistical significance preclude anything beyond speculation.

8. Low-income.--There were 727 people in the sample whose family income in the year 1978 was below $10,000, which is slightly higher than the Federal poverty line for a family of four. As can be seen in Table 36, many social network characteristics were important predictors of the health status of this population. The most important network factor for both self-rated health status and composite health status was satisfaction with network size, which explained an additional 3.8% of the variance in self-rated health status, and 2.1% of composite health status beyond that explained by the control variables. Along the same lines, marital happiness proved to be a very important factor in explaining self-rated health status of those who were married, with an incremental r-square of .029. The only factors which were not significantly positively associated with health status among the poor were group participation and marital status. However, we note that for composite health status, the number of friends was not significant, and that most of the measures of intimate ties were less strongly related here than for self-rated health status.

In comparison with the general population, we see that again the key variable was satisfaction with ties (Table 37). It was more

Table 36:   Regression of Social Networks on Health Status: Low Income
         (n=727)

| Variable | Self-Rated Health Status | | Composite Health Status | |
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controlsᵇ		0.100		0.100
Network Variables/ Single Items:				
# Close Rel's	.12***	0.018	.04**	0.008
# Close Frd's	.10***	0.010	.02	0.002
Satis. with netsize	1.51***	0.038	.60***	0.021
# Freq. Contacts	.11***	0.016	.05***	0.011
Freq. of Contact	.13	0.003	.09*	0.005
Marital Stat.	.14	0	.11	0.001
Marital Hap.	.86***	0.029	-.05	0
Church Atten.	.17*	0.005	.09*	0.004
Group memb.	.36	0.003	.22*	0.004
Indices:				
Net. Size	.08***	0.020	.02*	0.006
Group Variety	.11	0.001	.06	0.002
Close Pers. Ties	.05***	0.021	.02***	0.009
Soc. Score	.29***	0.017	.09*	0.006
Berkman SNI	.13***	0.015	.04*	0.006

*In a regression equation of the form:

   Y=a + b1(Age) +b2(Sex) + b3(Education) + b5(Social Network)

    In each case, Y equals self-rated health status or composite health
status. Control variables were entered into the equation first, as a a
block, after which the network variable was entered. For each equation,
the previously added network variable was removed and a new one entered.

ᵇControl variables were age, sex, and education. The incremental r-
square for the controls is that when no other variables are in the
equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

Table 37:   Interaction effects (target group·membership X social
            networks): Low Income Persons

| | Self-Rated Health Status | | Composite Health Status | |
Variable	Interaction Gen. Pop.[a]	Interaction in Limited Pop.[b]	Interaction Gen. Pop.[a]	Interaction In Limited Pop.[b]
Network Variables/ Single Items:				
# Close Rel's	-.07**	-.09***	-.02	-.03
# Close Frd's	-.02	-.02	-.01	-.01
Satis. with netsize	-.88***	-1.06***	-.39**	-.48***
# Freq. Contacts	-.04	-.08*	-.03*	-.03*
Freq. of Contact	-.06	-.21*	-.07	-.12**
Marital Stat.	.30	-.02	.13	.11
Marital Hap.	-.30	-.30	.23	.32*
Church Atten.	-.08	-.08	-.04	-.02
Group memb.	-.06	-.26	-.14	-.19
Net. Size	-.03	-.04*	-.01	-.01
Group Variety	-.09	-.16	-.07	-.07
Close Pers. Ties	-.02	-.03*	-.01	-.01
Soc. Score	-.11	-.15	-.06	-.08
Berkman SNI	-.04	-.06	-.02	-.02

[a]Unstandardized regression coefficients derived from an equation of the
form:

$$Y=a + b1(Age) + b2(Sex) + b3(Education) + b5(Poverty) + b6(Social Network) + b7(Poverty \times Social Network).$$

Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

[b]Population is all members of study population who are not members of any
hypothesized target groups (n=940) plus those who are low income (n=727).

*p<.05, one-tailed t-test
**p<.01
***p<.001

important to those with low incomes than it was for the general population in relation to both their self-rated (b=-.88, p<.001) and composite (b=-.39,p<.01) health status. It was also more important for the poor in comparison to the non-target group population (b=-1.06, p<.001 for self-rated health status and b=-.48, p<.001 for composite health status.)

Another important network characteristic for the poor was the number of close relatives. It was also more important to the self-rated health status of the poor than it was to that of the general population (b=-.07, p<.01) and to the non-target group population (b=-.09, p<.001.) The number of close relatives was also more important for their composite health status, although the difference was not significant.

Yet another measure of intimate ties--the number of close ties seen more than once a month--was also more important for the self-rated health status of the poor than for the non-target group members (b=-.08, p<.01) and more important for their composite health than for either the general population or the non-target group population (b=-.03, p<.05.)

Along the same lines, frequency of contact with close ties was more important for the poor than it was for the self-rated health status (b=-.21, p<.05) or composite health status (b=-.12, p<.01) of the non- target group population. It was also more important for them than for the general population although not significantly so.

Finally we should note there is one variable which was significantly less important for the composite health status of the poor--marital happiness. Among the married poor, marital happiness was not a significant predictor of composite health status; as such it was less important than for the non-target group population.

What comes out in this analysis is that factors associated with intimate ties (particularly family)--availability, contact and satisfaction with number of ties--are important predictors of the health status of the poor, and are more important for them than for other people in the population. Other factors, such as group affiliations, are not nearly as important. In the following sections, these relationships will be further explored in two specific low-income groups.

9. Status Inconsistency.--This group represents a rather specialized segment of the low income population in that they have relatively low incomes in spite of average or above average educational attainment. In order to avoid inclusion of retirees or new workers, this group was limited to people aged 30 to 55. There were 390 people who fell into this category, that is who had more than 12 years of education yet family incomes under $15,000. As is shown in table 38, measures of intimate contacts, i.e, friends, relatives, satisfaction with network size were all important in relationship to the health of target group members, using both measures of health status. The only measure of close ties which was not significantly positively related to either measure of health status was that of marital status. The results are only slightly different for self-rated and composite health status, with frequency of contact significant for self-rated health status, while church attendance was significant for composite health status. Of the single item indicators, satisfaction with network size was most important for both self-rated and composite health status, explaining an additional 4.2% and 3.0% of variance respectively, beyond that explained by the controls.

Table 38:   Regression of Social Networks on Health Status:
            Status Inconsistency (n=390)

Variable	Self-Rated Health Status		Composite Health Status	
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls^b		0.032		0.059
Network Variables/ Single Items:				
# Close Rel's	.09*	0.011	.07***	0.024
# Close Frd's	.15***	0.033	.07***	0.021
Satis. with netsize	1.40***	0.042	.65***	0.03
# Freq. Contacts	.15***	0.036	.06***	0.017
Freq. of Contact	.38***	0.034	.08	0.005
Marital Stat.	-.02	0	-.21	0.004
Marital Hap.	.62*	0.017	-.11	0.002
Church Atten.	.12	0.003	.11*	0.008
Group memb.	.22	0.010	.14	0.002
Indices:				
Net. Size	.09***	0.031	.05***	0.033
Group Variety	.05	0	-.001	0
Close Pers. Ties	.07***	0.038	.03***	0.031
Soc. Score	.38***	0.036	.17***	0.025
Berkman SNI	.10**	0.014	.06**	0.016

*In a regression equation of the form:

Y=a + b1(Age) +b2(Sex) + b3(Education) + b5(Social Network)

    In each case, Y equals self-rated health status or composite health status. Control variables were entered into the equation first, as a a block, after which the network variable was entered. For each equation, the previously added network variable was removed and a new one entered.

^bControl variables were age, sex, and education. The incremental r-square for the controls is that when no other variables are in the equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

Table 39:   Interaction effects (target group membership X social
            networks): Status Inconsistency

Variable	Self-Rated Health Status		Composite Health Status	
	Interaction Gen. Pop.[a]	Interaction in Limited Pop.[b]	Interaction Gen. Pop.[a]	Interaction In Limited Pop.[a]
Network Variables/ Single Items:				
# Close Rel's	-.02	-.07*	-.06**	-.06***
# Close Frd's	-.08*	-.09*	-.07***	-.07***
Satis. with netsize	-.66*	-.98***	-.49*	-.56***
# Freq. Contacts	-.08*	-.12***	-.03	-.04*
Freq. of Contact	-.32***	-.45***	-.03	-.11*
Marital Stat.	.49*	-.06	.08	.02
Marital Hap.	-.15	-.13	.24	.35*
Church Atten.	-.06	-.06	-.07	-.06
Group memb.	.24	-.07	-.01	-.13
Indices:				
Net. Size	-.04	-.06*	-.05***	-.05***
Group Variety	.05	-.06	.01	-.01
Close Pers. Ties	-.03*	-.05***	-.03***	-.03***
Soc. Score	-.18*	-.25**	-.14***	-.17***
Berkman SNI	.003	-.05	-.03	-.04

[a]Unstandardized regression coefficients derived from an equation of the
form:

Y=a + b1(Age) + b2(Sex) + b3(Education) + b5(Status Inconsistency) +
    b6(Social Network) + b7(Status Inconsistency X Social Network).

    Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

[b]Population is all members of study population who are not members of any
hypothesized target groups (n=940) plus those whose income is not
consistent with their education (n=390).

*p<.05, one-tailed t-test
**p<.01
***p<.001

Likewise, all of those factors which were important for the target
group were more strongly related to health in that group than in the
general population, as evidenced by negative interaction terms (Table
39). For many of these relationships the difference was statistically
significant. For self-rated health status, all of the single item
measures of availability of ties, contact with them and the indices based
on them are more important for the target group, with the exception of
number of close relatives and marriage. But for composite health status,
only the measures of availability--number of close relatives and number
of close friends-- and three indices based on them--network size, close
personal ties and sociability score were significantly more important for
the target group than for the general population, although the other
interaction terms were in the expected direction. Also of interest is
that here, too, affiliations do not seem to play as important a role in
the health status of this target group as do intimate ties.

Much the same pattern prevailed when those with status
inconsistency were compared to the non-target group population: For both
self-rated and composite health status, all of the measures of
availability and contact with close ties were more important for the
target group members than for people who were not members of any target
group.

From this we can conclude that for people who have relatively low
incomes in spite of strong educations, the most important network factors
in relation to their health is the availability of and contact with close
ties. This is more important for them than for others in the population.
On the other hand, group membership and affiliation does not seem to be

of much importance for them either as a group or in comparison to other groups.

10. Single parents.--There was no direct measure of single parents in the survey instrument. In its place the proxy measure of people who were not married and who were living with people under 20 years old was used. There were 394 people in the sample in this category. For this group, social networks seem more important as a whole for composite health status than for self-rated health status, based both on the number of significant relationships and their strengths (Table 40). It is also interesting to note that for self-rated health status, the number of close friends was the most important social network variable, explaining 1.1% of its variance beyond that explained by the control variables, while the number of close relatives was not significant. For composite health status the opposite holds true, with the number of close relatives explaining 2.5% of its variance. In addition for composite health status, satisfaction with number of ties, number of contacts visited frequently, and frequency of contact with ties were all significantly positively related as well as the indices built on these items.

In comparison to the general population, these same factors were more important for the single parents (Table 41). But only for composite health status did these differences reach statistical significance, and here for number of close relatives (b=-.06, p<.01), and the indices that include it.

The same pattern holds when single parents were compared to the non-target groups population. Here we see (columns 2 and 4) that most

Table 40:   Regression of Social Networks on Health Status: Single
            Parents (n=394)

Variable	Self-rated Health Status		Composite Health Status	
	Unstandardized Regression Coefficient*	Inc. R-sq.	Unstandardized Regression Coefficient*	Inc. R-sq.
Controls^b		0.081		0.113
Network Variables/ Single Items:				
# Close Rel's	.06	0.004	.07***	0.025
# Close Frd's	.10*	0.011	.02	0.002
Satis. with netsize	.51	0.005	.37*	0.011
# Freq. Contacts	.05	0.003	.05*	0.010
Freq. of Contact	.09	0.001	.12*	0.009
Church Atten.	-.03	0	-.001	0
Group memb.	.23	0.001	-.005	0
Indices:				
Net. Size	.06*	0.010	.04***	0.016
Group Variety	.11	0.002	-.03	0.001
Close Pers. Ties	.03*	0.008	.02***	0.016
Soc. Score	.16	0.005	.15***	0.016

*In a regression equation of the form:

Y=a + b1(Age) +b2(Sex) + b3(Education) + b5(Soc. Network)

In each case, Y equals self-rated health status or composite health status.   Control variables were entered into the equation first, as a a block, after which the network variable was entered.   For each equation, the previously added network variable was removed and a new one entered.

^bControl variables were age, sex, and education.   The incremental r-square for the controls is that when no other variables are in the equation.

*p<.05, one-tailed t-test
**p<.01
***p<.001

Table 41: Interaction effects (target group membership X social
           networks): Single Parents

	Self-Rated Health Status		Composite Health Status	
Variable	Interaction Gen. Pop.[a]	Interaction in Limited Pop.[b]	Interaction Gen. Pop.[a]	Interaction In Limited Pop.b
Network Variables/ Single Items:				
# Close Rel's	.02	-.04	-.06**	-.07***
# Close Frd's	-.05	-.06	-.03	-.03
Satis. with netsize	.41	-.11	-.08	-.28
# Freq. Contacts	.03	-.04	-.03	-.04*
Freq. of Contact	.05	-.14	-.07	-.14*
Church Atten.	.14	.11	.07	.07
Group memb.	.15	-.18	.14	.01
Indices:				
Net. Size	-.01	-.03	-.03*	-.04***
Group Variety	-.04	-.16*	.04	.004
Close Pers. Ties	0	-.02	-.02*	-.02**
Soc. Score	.04	-.09	-.13*	-.16***
Berkman SNI	.05	-.01	.01	-.01

[a]Unstandardized regression coefficients derived from an equation of the
form:

Y=a + b1(age) + b2(Sex) + b3(Education) + b5(Single Parent) + b6(Social
    Network) + b7(Single Parent X Social Network).

   Where the coefficient of the interaction term is significant and
negative, that social network variable is more strongly related to the
health status of target group members than of non-members.

[b]Population is all members of study population who are not members of any
hypothesized target groups (n=940) plus those who are single parents
(n=394).

*p<.05, one-tailed t-test
**p<.01
***p<.001

of the network variables are more important for single parents. But only

for composite health status are the interaction terms significant. Here,

too, the key factor seems to be the availability of relatives, as well as

contact with ties and the indices derived from these measures. Measures

of group and church affiliation do not seem to be of importance here.

What would seem to be the case here, then, is that for single

parents, having other family members to fall back on is important for

one's health, particularly one's functional health status.

SUMMARY

The analysis of these data was aimed at exploring three hypotheses. The first two of these hypotheses were exploratory in nature in that no specific relationships were predicted.

Hypothesis: There are different social network characteristics which relate to the health status of different target groups.

The results of the regression equations of network variables on health status for each target group are summarized in Tables 42 and 43. Looking at the relationship between network measures and health status among target groups, it becomes clear that different groups of variables are important for different target groups. That is to say, there was no uniformity of importance of social networks across all populations. It is worth looking at the relationship in two ways--by network measure and by group. First it seems that the availability of intimate ties is most important for people whose membership in a target group is based on employment-related or income-related problems--the unemployed, those with stressful jobs, the low income, those with status inconsistency, and the single parents. For all those groups, the availability of intimate ties was a significant predictor of health status. There did not seem to be any consistent difference between friends and relatives in their importance for health status, although marital status, was not a significant predictor for any group. There was some evidence that the number of close friends was important for determining self-rated health status, while less important for composite health status.

The measures of network perception are less consistent. Satisfaction with network size was significantly related to the health status of most groups, on one measure or the other. But only for the bereaved, those with status inconsistency and the low income was it a

Table 42. Summary of Relation of Social Networks to Self-Rated Health Status for Selected Target Groups

TARGET GROUP

Network Variable	Job Stress	Unemployed	Elderly	Widowed	Bereaved	Recently Ill	Disabled	Low Income	Status Incon.	Single Parents
Single Item										
No. of close relatives	+	+	0	0	0	0	0	+	+	0
No. of close friends	+	+	0	0	0	0	0	+	+	+
Satisfaction with number of ties	+	0	+	0	+	0	0	+	+	0
No. of close ties visited frequently	+	0	0	0	0	0	0	+	+	0
Frequency of contact	+	0	0	0	0	+	0	0	+	0
Marital status (dichot.)	0	0	0	n.a.	0	0	0	0	0	n.a.
Happiness with marriage	+	0	0	n.a.	0	0	0	+	+	n.a.
Church attendance	0	0	0	0	0	0	0	+	0	0
Group membership (dichot.)	0	0	0	0	0	+	0	0	0	0
Indices										
Network size	+	+	0	0	0	0	0	+	+	+
Index of close personal ties	+	+	0	0	0	0	0	+	+	+
Sociability score	+	+	0	0	0	0	0	+	+	0
Group variety	0	0	0	0	0	+	0	0	0	0
Berkman's social network index	+	0	0	n.a.	0	0	0	+	+	n.a.

Key:+ slope of variable significantly greater than zero (p<.05, one-tailed test).
  0 slope of variable not significantly greater than zero (p>.05, one-tail test)

Table 43. Summary of Relation of Social Networks to Composite Health Status for Selected Target Groups

TARGET GROUP

Network Variable	Job Stress	Unemp- loyed	Elderly	Widowed	Bereaved	Recently Ill	Low Income	Status Incon.	Single Parents
Single Item									
No. of close relatives	0	+	0	0	0	0	+	+	+
No. of close friends	0	0	0	0	0	0	0	+	0
Satisfaction with number of ties	0	+	0	0	+	0	+	+	+
No. of close ties visited frequently	0	+	0	0	0	0	+	+	+
Frequency of contact	+	+	0	+	+	0	+	0	+
Marital status (dichot.)	0	0	0	n.a.	0	0	0	0	n.a.
Happiness with marriage	0	0	0	n.a.	0	0	0	0	n.a.
Church attendance	0	0	0	+	0	0	+	+	0
Group membership (dichot.)	0	0	0	0	0	+	+	0	0
Indices									
Network size	0	+	0	0	0	0	+	+	+
Index of close personal ties	0	+	0	0	0	0	+	+	+
Sociability score	0	+	0	0	0	0	+	+	+
Group variety	0	0	+	0	0	0	0	0	0
Berkman's social network index	0	0	0	n.a.	0	0	+	+	n.a.

Key:+ slope of variable significantly greater than zero (p<.05, one-tailed test).
   0 slope of variable not significantly greater than zero (p>.05, one-tail test)

significant predictor of both composite and self-rated health status.
Marital happiness, on the other hand, only related to self-rated health
status, and then only for those with stressful jobs and the low income.

The notion of contact with ties, while only measured directly by
one variable, is also indirectly addressed by at least two others--
marital status, and church attendance. However, as they are discussed
elsewhere, discussion will be limited to the measure of frequency of
contact with ties. This was one of the most consistently related
measures. It was significantly related to the health status of almost
every group on at least one measure of health status.

Finally, measures of affiliation were important for the health
status of selected groups. For the poor and the widowed, church
attendance was a significant predictor of health status. And for those
people who had been seriously ill in the past five years, groups seemed
to be an important factor in predicting their health status.

Looking at these relationships by group rather than by variable,
two distinct patterns appear. (See Table 44.) In the first one, the
availability of ties and contact with those ties are key predictors of
health status. This pattern seems to apply to those with job stress, the
unemployed and the three income-related target groups--the poor, those
with status inconsistency, and single parents.

In the second pattern the key factors are contact with ties and/or
group or church affiliations. This pattern seems to apply to those
target groups who tend to be older--the elderly, widows, the bereaved and
those who were seriously ill or injured during the past five years.
While there is not a perfect fit between the patterns and the health

Table 44: Social Network Grouping Relevant to health Status of Selected
Target Groups

Network Grouping

Target group	Availability	Contact	Evaluation	Affiliation
Job Stress	X	X	X	
Unemployed	X	X		
Elderly				X
Widows		X	X	X
Bereaved		X	X	
Rec. Illness		X		X
Disabled	-	-	-	-
Low income	X	X	X	
Status Inc.	X	X	X	
Single Par.	X	X		

status of target groups, it does seem to differentiate between them,

particularly in the importance of group affiliations as opposed to the

availability of ties.

The second hypothesis dealt with the differential importance of

ties to the two measures of health status.

Hypothesis: Social networks relate differently to the self-rated and
composite health status of target group members.

Here three patterns emerge: In the first pattern all the

network variables relate to both measures of health status in similar

fashions, although overall, the associations with composite health

status are stronger than for self-rated health status. This is the case

for the unemployed and for the single parents.

In the second group, there were overall strong relationships

between network variables and self-rated health status, but almost no

relationship with composite health status. This was the case for people

with stressful jobs.

Finally, for most target group members, the relationships between networks and health status were very similar for both measures of health status. In most cases the relationships were slightly stronger for self-rated health status. But more importantly, when a significant relationship was observed for one outcome measure, for the other the relationship was either also significant, or at least in the same direction.

As this hypothesis was only exploratory, no attempt was made to measure the strength or weakness of the uniformity of outcomes. However, it seems clear that we cannot reject the null hypothesis for every group. In most cases there is not a strong difference in the way social networks relate to the two measures of health status.

The last hypothesis to be addressed is really the central one to this investigation.

Hypothesis: Social networks are more important in relation to the health of target group members, than they are in relation to the health of the rest of the population.

There were several findings related to this hypothesis. They are summarized in Tables 45-48. First, for every target group, there was at least one relationship between social networks and health status that was more important for that group than for the rest of the population. (Tables 45 and 46.)

Secondly, we can look at only those network elements which were significant predictors of health status for target group members. For self-rated health status, there were 25 significant positive relationships, where network variables were significant predictors of good health among target group members. Comparing these relationships to those in the general population, we find that 23 of them were

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As this hypothesis was only exploratory, no attempt was made to measure the strength or weakness of the uniformity of outcomes. However, it seems clear that we cannot reject the null hypothesis for every group. In most cases there is not a strong difference in the way social networks relate to the two measures of health status.

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There were several findings related to this hypothesis. They are summarized in Tables 45-48. First, for every target group, there was at least one relationship between social networks and health status that was more important for that group than for the rest of the population. (Tables 45 and 46.)

Secondly, we can look at only those network elements which were significant predictors of health status for target group members. For self-rated health status, there were 25 single-item significant positive relationships, where network variables were significant predictors of good health among target group members. Comparing these relationships to those in the general population, we find that 23 of them were

Table 45. Summary of Importance of Social Networks in Relation to Self-rated Health Status in Target Groups as Compared to the General Population

TARGET GROUP

Network Variable	Job Stress	Unemp- loyed	Elderly	Widows	Recently Bereaved	Ill	Disabled	Low Income	Status Incon.	Single Parents
Single Item										
No. of close relatives	+	-	-	+	-	-	+	++	+	-
No. of close friends	+	++	-	-	-	--	-	+	++	+
Satisfaction with number of ties	-	-	+	+	+	-	-	++	++	-
No. of close ties visited frequently	+	+	-	--	-	-	-	+	++	-
Frequency of contact	+	+	+	+	+	++	+	+	++	-
Marital status (dichot.)	+	-	+	na	-	+	+	-	--	na
Happiness with marriage	+	+	+	na	-	-	-	+	+	na
Church attendance	-	+	+	+	+	+	-	+	+	-
Group membership (dichot.)	--	-	-	+	+	++	+	+	-	-
Indices										
Network size	+	++	-	-	-	--	-	+	+	+
Index of close personal ties	+	++	-	-	-	-	-	+	++	-
Sociability score	+	++	-	-	-	--	-	+	++	-
Group variety	-	-	+	+	+	++	++	+	-	+
Berkman's social network index	+	+	-	na	-	+	+	+	-	na

Key: ++ network variable significantly more important for target group than for general population (p<.05)
+ Network variable more important for target group than for general population, although not significantly so.
-- network variable significantly less important for target group than for general population.
- network variable less important for target group than for general population, although not significantly

Table 46. Summary of Importance of Social Networks in Relation to Composite Health Status in Target Groups as Compared to the General Population.

TARGET GROUP

Network Variable	Job Stress	Unemp-loyed	Elderly	Widows	Bereaved	Recently Ill	Low Income	Status Incon.	Single Parents
Single Item									
No. of close relatives	-	+	-	-	-	-	+	++	++
No. of close friends	-	++	-	-	-	-	+	++	+
Satisfaction with number of ties	-	+	+	+	+	-	++	++	+
No. of close ties visited frequently	-	++	-	-	-	--	++	+	+
Frequency of contact	+	+	+	+	++	+	+	+	+
Marital status (dichot.)	+	--	+	na	-	+	-	-	na
Happiness with marriage	+	+	--	na	-	-	-	-	na
Church attendance	--	+	++	++	+	+	+	+	-
Group membership (dichot.)	--	+	+	+	+	++	+	+	-
Indices									
Network size	-	++	-	-	-	-	+	++	++
Index of close personal ties	-	++	-	-	-	--	+	++	++
Sociability score	-	++	-	-	-	-	+	++	++
Group variety	-	+	++	+	-	+	+	-	-
Berkman's social network index	-	+	-	na	-	+	+	+	na

Key:++ network variable significantly more important for target group than for general population (p<.05)
+ Network variable more important for target group than for general population, although not significantly so.
-- network variable significantly less important for target group than for general population.
- network variable less important for target group than for general population, although not significantly

Table 47. Summary of Interactions between Social Networks and Target Group Membership in Relation to Self-Rated Health Status In Non-Target Group Population

TARGET GROUP

Network Variable	Job Stress	Unemp- loyed	Elderly	Widowed	Bereaved	Recently Ill	Disabled	Low Income	Status Incon.	Single Parents
Single Item										
No. of close relatives	++	++	+	+	+	+	+	++	++	+
No. of close friends	+	++	-	-	-	--	-	+	++	+
Satisfaction with number of ties	+	+	+	+	++	-	+	++	++	+
No. of close ties visited frequently	++	++	+	-	-	-	-	++	++	+
Frequency of contact	++	++	+	++	++	++	+	++	++	+
Marital status (dichot.)	++	-	++	na	+	+	+	+	+	na
Happiness with marriage	+	+	+	na	-	-	-	+	+	na
Church attendance	-	+	+	+	+	+	-	+	+	-
Group membership (dichot.)	-	+	-	+	+	++	+	+	+	+
Indices										
Network size	+	++	+	-	-	-	-	++	++	+
Index of close personal ties	++	++	+	-	-	-	-	++	++	+
Sociability score	+	++	-	-	-	-	-	+	++	+
Group variety	+	-	+	++	++	++	++	+	+	++
Berkman's social network index	++	++	+	na	+	+	+	+	+	na

Key: ++ network variable significantly more important for target group than for non-target population (p<.05)

+ Network variable more important for target group than for non-target group population, although not significantly so.

-- network variable significantly less important for target group than for non-target group population.

- network variable less important for target group than for non-target group population, although not significantly

Table 48. Summary of Interactions between Social Networks and Target Group Membership in Relation
        to Composite Health Status In Non-Target Group Population

TARGET GROUP

Network Variable	Job Stress	Unemp- loyed	Elderly	Widowed	Bereaved	Recently Ill	Low Income	Status Incon.	Single Parents
Single Item									
No. of close friends	-	++	-	+	-	-	+	++	++
No. of close relatives	-	++	+	-	-	-	+	++	+
Satisfaction with number of ties	+	++	++	+	++	-	++	++	+
No. of close ties visited frequently	+	++	+	-	+	-	++	++	++
Frequency of contact	++	++	++	++	++	+	++	++	++
Marital status (dichot.)	+	--	+	na	-	+	-	-	na
Happiness with marriage	-	+	--	na	--	--	--	--	na
Church attendance	--	+	+	++	+	+	+	+	-
Group membership (dichot.)	-	+	+	++	+	++	+	+	-
Indices									
Network size	-	++	-	-	-	-	+	++	++
Index of close personal ties	-	++	-	-	-	-	+	++	++
Sociability score	-	++	-	-	-	-	+	++	++
Group variety	-	+	++	++	+	+	+	+	-
Berkman's social network index	-	+	-	na	-	-	+	+	na

Key:++ network variable significantly more important for target group than for non-target group population (p<.05)
    + network variable more important for target group than for non-target group population, although not significantly so.
    -- network variable significantly less important for target group than for non-target group population.
    - network variable less important for target group than for non-target group population, although not significantly so.

stronger for the target group members than for non- target group

members, although not necessarily significantly so. Comparing, these

relationship to those in the non-target group population, however, we

find that 15 of these relationships (64%) were significantly more

important for target group members. Many others were stronger, although

not significantly so. (Table 47).

For composite health status, there were 25 significant positive

relationships between single-item network measures and the health of

target group members. Comparing these relationships to those in the

general population, we find that in 100% of the cases, the relationship

is stronger in the target group than for people who were not members of

that particular group, although the difference is not necessarily

statistically significant. And comparing the relationships to those of

the population who were not members of any target groups, we find that

in 21 cases (81%) the relationship is significantly stronger among

target group members. (Table 48) Combining the results for the two

measures of health status, we find that in 36 of the 50 (72%) positive

relationships between network variables and health status, the

relationship was significantly stronger for the target group members.

Taken together, this enables us to refute the null hypothesis that

social networks are of the same importance to members of target groups

as they are to the general population. In those cases where social

networks are significantly related to the health of target group

members, that relationship is significantly stronger than in the

population of non-target group members. It is also likely, thus, that

the observed and documented relationship between social networks and

health status in general populations is in large part due to the

importance of social networks for the health of targeted populations. The implications of this and the other findings will be explored in the following chapter.

CHAPTER 7

DISCUSSION

-Introduction

-Differences in Network Characteristics
 between Target Groups

-Relation of Social Networks to Two
 Health Status Measures

-Relative Importance of Networks for
 Target Group Members

-Implications and Limitations of the
 Analysis

INTRODUCTION

In the previous chapter the results of analyses of the research questions were presented. The purpose of this chapter is to explore possible explanations for these findings and to compare them to those of other researchers who have looked at the same topic from different perspectives. Included will be a discussion of the ability of alternative theories to explain these findings. In addition, the implications of these findings and the needs for future research will be discussed in relation to social work practice and social welfare policy.

The study was conducted around three questions:

1. Are the same social network elements important determinants of the health status of various groups in the population. Overall, it was found that there are differences in the way that social network elements related to the health status of various subgroups of the population.

2. Is the relationship between social networks and health the same regardless of which of two measures of health status is used? It was found that for the most part these relationships were similar, if not the same, regardless of whether self-rated health status or composite health status was used as the outcome variable.

3. Are social networks more important for individual target groups in the population than for the general population. The study showed that social network elements which were significantly related to the health status of a particular subgroup were frequently more important for that subgroup than for non-members.

The limitations of the analysis will be discussed along with avenues for future research at the end of the chapter. However, it should be noted at the outset that the analysis was based on cross-

sectional data. While this makes it impossible to infer causality conclusively, the consistency of the relationships found provide an important basis for developing a causal model.

DIFFERENCES IN NETWORK CHARACTERISTICS BETWEEN TARGET GROUPS

One of the hypotheses explored in the dissertation was that there would be differences among various target groups as to which, if any, social network elements would be predictive of the health status of that group. The alternative to this hypothesis would be that social networks are important predictors of health status for all groups and that the same elements of networks should be important for all groups. This is essentially what is posited by proponents of a main effects model of the relationship between social networks and health status. (See for example Hammer, 1983; Thoits, 1982)

The findings of the current research would indicate that this is not the case. As such, it supports the thinking of what will be called here contingency theorists. These theorists propose that the effect of networks upon health status is contingent upon congruence between networks and some other determinant of health status. Thus Litwak and Kulis (1983) suggest that there should be a match between the network structure and the nature of the tasks which need to be performed. Salloway and Dillon (1973) suggest that there should be a match between the structure of the network and the kind of support given. In a conclusion close to the point of view taken here, House (1981) states that

> which significant other provides that support that reduces stress, improves health, or buffers the impact of stress on health will vary across individuals and situations. . . . Thus, researchers and practitioners must specify the relevant stresses and health outcomes to know which sources of support are likely to be most effective. (p. 85)

While some previous studies have looked for what is known as a buffering effect, showing that networks can buffer the effect of stressful life events on health, a different conceptualization is

supported here. That is that different groups of people have different needs, some of which can be met by a social network of one type or another. An example of this might be the need of those with low incomes for material assistance which could be provided by family and friends .

The fact that this study used data gathered for other purposes precludes obtaining answers to many of the questions one would like to answer here. For instance, we have no way of knowing exactly what the special needs are of each of the groups looked at here. Thus we cannot carry through on an exploration of whether group structure matches task structure, as Litwak (1981) suggests. The goal of the current research was not to pinpoint the ways in which social networks function to improve health in each of several groups, but rather to show that it is not the same for all groups. Yet, it is difficult to move on without at least a brief look at this basic relationship. What I will do, then, is to summarize briefly how the findings of this study compared to those of others who have studied similar groups, and in particular note those cases where these findings strongly support or differ from the findings of others. It is important to emphasize the exploratory nature of this section, especially in light of the large number of statistical tests performed with no prior directional hypothesis (see Limitations, below).

As noted in the previous chapter, the social network elements examined here fell into four rough categories--availability of close ties, contact with those ties, satisfaction with ties and group/church affiliation. Using these categories, the ten groups examined then can be differentiated by which types of ties were important predictors of their health status. Three classifications were determined--those for whom no type of social networks was important; those for whom availability of

ties, contact with ties and satisfaction with ties was important; and those for whom group affiliation, contact and satisfaction was important.

Using this classification, there was only one target group whose health status did not prove to be related at all to its members' social networks. This group was the disabled, defined as people who were unable to carry out most of their normal activities. As was discussed in a previous chapter, possible explanations for this unexpected finding are measurement error or faulty construct validity. (Cook and Campbell, 1979) What seems likely is that the people who fell into this category are those who both suffer from a chronic condition and as a result are not able to carry out their activities. Probably excluded from this are those who have succeeded in overcoming the effects of their conditions and are functioning at a high level. Unfortunately, data about the presence alone (rather than outcome) of a chronic condition are not available, hence we can only speculate here.

The second category is composed of those people for whom the availability of intimate ties, contact with them and satisfaction with their number are important predictors of health status, while group affiliations, for the most part, are not. Into this category fell those people who have stressful jobs, and those who are unemployed, low income in general, low income in spite of strong education, and single parents. With the exception of those with stressful jobs, all of these groups tend to be poor.

Looking first at those who have stressful jobs, one could assume that their social network needs are for kinds of support which can offset the effect of that stress on their health. The task of such a network would probably be emotional support, and that is likely provided by close

ties--relatives and friends. For example, LaRocco et al. (1980) found
that spouse support was important in mediating the relationship between
such stressors as role conflict and boredom and somatic complaints.
Likewise in the present study, satisfaction with one's marriage was found
to be predictive of good health among those with stressful jobs.

If this is the case we might assume that the reason that group and
church affiliations are not important for this group is that they do not
provide the kind of support needed. An alternative possibility is that
people who have stressful jobs belong to many groups. Yet further
inspection shows that the correlation between group variety and job
stress (r=.15, p<.001) while statistically significant, is not very
strong. It is not, therefore, likely that multicollinearity is the
reason that affiliations are not significant. More likely is the
possibility that the types of groups to which these people belong do not
provide them with the kind of social support necessary to overcome the
effects of job stress on their health.

Also included in this second category are several groups who have
low incomes--those with incomes under $10,000 per year, those whose
incomes are low relative to their education, single parents and the
unemployed. All exhibit a similar although not identical pattern of
relationship between social networks and health status. Two
generalizations can be drawn here. One is that it is intimate ties that
are influential here--their availability, contact with them, and
satisfaction with their number. The other is that many different aspects
of close ties are important here (i.e., number of close friends, number
of close relatives, etc.) This can be contrasted with the final category
for discussion where only a few measures proved significant. Based on

this we could say that strong intimate tie support seems to be particularly important in predicting the health status of those with low incomes, regardless of what the causes of that poverty are (i.e., unemployment, underachievement, absence of the wage-earner).

These findings reinforce some of those of previous researchers. Gore (1978), for example, found that among laid-off workers, those with low perceived levels of support from friends, wives and relative had more illness symptoms. Likewise, Milburn et al. (1984), Brown et al. (1984), and Hall et al. (1985) all studied populations who are either predominantly or entirely composed of low income people; and all found that intimate ties were indeed important predictors of their health status. In a finding similar to those here, Hall et al. found that among the low income, ties were even more important for the unemployed. This would indicate that ties are particularly important for people who fall into more than one target group.

Several other categorizations used here can be seen as posing multiple risks. For example, single parents are at risk of poor health both because they are missing one element of their social network (spouse) and because of the high likelihood that they will be poor. Similarly, those who rank high on status inconsistency are at risk both because of their relatively low income and because of what House (1981) calls "underutilization." That is to say they are also subject to job stress, in that they are performing tasks which are probably below their level of ability. The concept of multiple risk is one which is left open to further exploration, probably via three-way interactions (target group 1 X target group 2 X network). As such it is beyond the scope of this study.

The final category looked at here includes those for whom degree of group affiliation is a significant predictor of health status (in addition, in some cases, to contact with ties and satisfaction with their number), but availability of ties is not. This group includes the widowed, the bereaved, the elderly, and those who have had a serious illness or injury during the past five years.

For the elderly, (defined as persons aged 60-64) this finding differs from that found by other researchers. For instance, Blazer (1982) found that network size, frequency of contact and satisfaction with network were all important predictors of mortality. Gallo (1982) and Lubben (1984) also studied elderly populations but their studies are difficult to use as bases for comparison, the former because of the failure to control for other demographic variables, and the latter because of the considerably older age of the respondents.

On the other hand, Wan's (1982) finding that baseline social support was related to poor health for the elderly is similar to the current findings. Why this is so is rather puzzling. One similarity is that in both Wan's and the current study, those defined as elderly were not really very old. Related to this could be that close ties are important for elderly only in maintaining them when they reach poor levels of health. This would conform to Blazer's finding that ties lower mortality risk. Thus having close ties available and being in frequent contact with them might be important for those who need the kind of ongoing close attention described by Litwak and Kulis (1983) as being provided only by family and spouses, i.e., the severely impaired. Such contact may indeed prolong the life span of people with such a need. But for the "young" elderly, who are still relatively healthy, such ties are

not essential. Rather what is essential is contact with a range of people (i.e., through group affiliation) and the feeling that there are sufficient ties available should one need them. Other studies would suggest that these "weak tie" groups, such as voluntary organizations, facillitate entry to a variety of services, both social and medical (in Litwak, 1983). We might, then, speculate that the elderly who have group affiliations are in better health because they use networks to gain access to needed services.

For the widows and the bereaved, what seems to be most important is actual contact with their ties and satisfaction that they have enough ties. Again, we are struck by the failure of the availability of ties to prove significant. Like single parents, we can look at these people as having lost a piece of their network. Yet here it does not seem as though the availability of alternate ties really helps much. One possible explanation here is that the immediate family performs tasks for the individual which are not easily substituted for by close friends or even other close relatives. What is important is not availability but whether someone is actually fulfilling those tasks, hence the importance of the frequency of contact measure. Again, given the significance of satisfaction with number of ties, it would seem that a small network is sufficient if that network can fulfill the necessary tasks.

Finally, with regard to those who have been seriously ill or disabled, the key finding is that availability of ties does not contribute to their health, but group membership and contact with others does. Here, too, there are a number of reasons why the availability of ties may not be important. First, a large network may make the ill person feel that he/she has to depend on others and in fact may encourage

the person to recognize or accept the sick role. This could reinforce feelings that he/she is a burden and prove to be demoralizing. (DiMatteo and Hayes, 1981) Alternatively, there may be incongruence between medical practice and belief systems among those with large extended networks. In such cases, patients may be torn between following medical or family advice. (See for example Salloway and Dillon, 1973). There may also be a tendency for those who are close to the patient to take over tasks which he/she could be doing for himself, thereby impeding a return to function. (See, for example, Garrity, 1973.) Groups on the other hand, do seem to be an important predictor of health status. One reason may be that already cited above--they provide a path to obtaining services which may promote recovery. In addition, they can be seen as reinforcing other roles, beside the sick role, thus promoting recovery.

Having looked briefly at the different network elements which are significant predictors of health status in different target groups, we should now return to the main finding regarding this hypothesis. That finding is that such differences do, in fact exist. To reiterate, the purpose of this section of the analysis was not to develop the best-fitting model to explain the health status of each individual population. Rather this stage of the analysis looked at several variables which might predict health status (and which have proven to be significant predictors of health status in other studies) and examined whether their role was the same in all population groups. The answer here is clearly negative. While there are broad, rough patterns which would suggest commonalities between groups, it is also clear that most groups are different, both as to membership and as to the role network elements play in relation to their health status.

Again, too, it is important to note how this finding differs from
that of previous studies. In the literature reviewed, there were no
systematic attempts to compare the role of social networks in determining
health status among population groups. The closest we come to this is in
attempts to explain the relationship between social networks and health
as due to the ability of a network to buffer the effects of stressful
life events upon the health of the individual. The notion of stressful
life events has been attacked, however, as not meaningful for many
populations. (See for example Eckenrode and Gore, 1981.) It will be
discussed in greater detail below in relation to the third hypothesis.

RELATION OF SOCIAL NETWORKS TO TWO HEALTH STATUS MEASURES

The second research question explored was whether there was a difference in the importance of social networks for different measures of health status. For this study, two indices of health status were used-- self-rated health status and composite health status. For most groups, social networks predicted both measures of health status, but they were slightly more important in predicting self-rated health status than they were in predicting composite health status. There were three exceptions to this relationship: In the first, social networks were more strongly related to the composite health status of target group members. This was the case for the unemployed and for the single parents. In the second pattern, social networks were only predictive of self-rated health status. This was the case for those with stressful jobs.

Before trying to interpret these results, it would be worthwhile reviewing the various possible health status measures used in such studies, and the reasons for selecting those used here.

Health status measures can be grouped into four types: mortality indicators, morbidity indicators, positive health indicators, and composite health status measures. (Patrick and Erickson, 1984) It is important when looking at health status as an outcome to be certain that there is a sound basis for assuming that a given intervention or trait could plausibly be related to a particular health status outcome. In other words, the measure must be appropriate to the population and problem. For instance, were we studying the frail elderly, we might be interested in whether the actual presence of a network member in the household (proximity) could reduce mortality risk, i.e., by being available to pick up someone who has fallen, or to summon an ambulance

promptly. On the other hand, mortality is not likely to be the outcome of interest in looking at the role of supportive ties among those with stressful jobs. Here we would likely select such health status outcomes as morbidity (i.e., blood pressure) or positive health indicators (i.e., happiness.)

In this particular study, two measures of health status were used, one a positive health indicator, and one a composite health status measure. This was done for two seemingly disparate reasons. One was in order to strengthen the construct of "health status." For instance, self-rated health status could be a proxy for actual health status, but it could also measure the degree to which one has a pessimistic or optimistic outlook on life. Elsewhere it has been shown to be strongly related to a sense of well-being (Foley, 1984). Likewise, composite health status could be confounded by self-rated health status. For example, people who perceive themselves as healthy may resist adopting the sick role, therefore having fewer bed days and/or activity limitations. One way to deal with this problem is through multiple-operationalizing (Cook and Campbell, 1979). Here, a single construct--health--is measured in more than one way. If the outcomes are similar then it is likely that the same underlying construct is being tapped. Thus the decision to use two health status measures.

On the other hand, as was noted earlier, the two measures do relate to slightly different aspects of the same construct. It was also thus important to see whether there were any systematic differences in their relation to social networks among risk group members.

Returning now to the findings of this study, we see that for the most part the relation between social networks and health status is the

same regardless of which measure of health status is used, with the relationship being slightly stronger for self-rated health status. There are only three exceptions, all of which are worthy of note.

For the unemployed and for single parents, overall social networks were more important in predicting composite health status than self-rated health status. A possible explanation here would be tied to the functions of social networks for these two groups. One would expect that these groups are both in need of material support. For example, both would need financial assistance and possibly housing, which kin might provide. Without these their health could suffer. This might be reflected more in composite health status as a loss of function before it resulted in reduced self-rated health status. One could, however, question why these groups are different from the rest of the low income population (for whom networks were equally important for both measures). A possible answer here might lie in the relationship between members of these groups and their ties. One could assume, for example, that if a person is unemployed or a single parent, that not all the members of their network were in the same situation. If, however, we look at the low income in general, we might very well expect to see entire networks who were poor. Thus the latter group may not be able to depend upon their networks for material aid to the same degree as could people whose networks were not in the same situation as themselves.

The other exception to the pattern wherein the relationship between networks and health status is the same for both measures of health status is for people with stressful jobs. Here, networks are only related to self-rated health status. There are several possible reasons for this. One is that having a stressful job does not threaten one's composite

health status. While this does seem to be the case at the zero order level (Chapter 5, Table 17) it is not consistent with reports elsewhere in the literature. (Karasek, 1981 and House, 1981). Another possibility is that by looking only at cross-sectional data, we are only seeing those with stressful jobs who are continuing to function. Hypothetically, in the long run deteriorating function might cause them to either leave those jobs for less stressful ones, or leave the work force altogether due to disability or death. That is, people who have stressful jobs may know they are not well, yet struggle to maintain a level of function that enables them to keep working.

On the other hand the fact that networks are important for self-rated health would indicate that networks play a specific mediating role for these people. One possibility is that they give the individual emotional support, as a kind of balance with the emotional stress placed upon them by their jobs. This would be consistent with the findings of others, such as Gore (1978), Pearlin (1981), and Karasek (1981). Additionally, we could speculate that they work by enhancing the individual's sense of well-being. Foley (1984) has shown this to be highly correlated with self-rated health status. If this is the case, then a path could be drawn from the emotional stress of the job to ill health, mediated by the emotional support of close ties.

In combining these findings with those from the previous question, another possibility arises. That is that different social networks are important for different groups at different points along a continuum from mortality to health. For instance, in looking at the elderly, we might see that spouses and children are important in reducing the mortality risk of the home-bound elderly. Whereas, groups are important in

reducing morbidity. In another group, i.e., the poor, family ties may reduce morbidity by providing material assistance. Group ties, on the other hand, may be important for facilitating their access to services (i.e., hospitalization, Medicaid) which might reduce mortality risk. The current effort could then be seen then as examining the way social networks relate to a portion of a continuum. Disparate results may stem from examining other pieces of the same continuum.

Again, the key finding here is not the differences for some measures of the effect of networks on health status. Rather, it is the uniformity of the relationships overall, regardless of which measure of health status is being used. This then serves to validate the construct of health and the importance of social networks in its determination for members of target groups.

RELATIVE IMPORTANCE OF NETWORKS FOR TARGET GROUP MEMBERS

The third research question to be addressed is really the central issue of this dissertation. The question here is whether social networks are in fact more important for members of target groups than they are for the rest of the population. As such it underlies the development of a theoretical framework for understanding the relationship or importance of social networks for health.

To review briefly the findings related to this question: For every target group, there was at least one relationship between social networks and health status that was more important for that group than for the rest of the population. Looking at those network elements which were significant predictors of health status in target groups, 23 out of 25 significant predictors of self-rated health status and all 25 significant predictors of composite health status were stronger predictors in the target groups than in the general population (as evidenced by interaction effects in the expected direction). When comparing these relationship to those in the non-target population (composed of people who are not members of any target group), 64% of the observed positive relationships with self-rated health status and 75% of the relationships with composite health status are significantly more important for the target population than the non-target population. Thus it was concluded that social networks are of more importance to members of target groups than they are to the general population.

Earlier two of the major theories regarding this relationship were presented, a main effects theory and a buffering effects theory. I will briefly review each of them here and then examine whether they can

adequately explain the results found in this investigation. A third

model--one based on contingency theory--will also be presented.

The main effects school of thought states that social networks are

important for all people, having a direct effect on their health. It is

based largely on the theories of traditional sociology, i.e., Durkheim's

anomie theory. In a clear restatement of this theory, Hammer (1983) uses

Cassel's focus on the network's role as provider of social feedback:

> Normal social networks are seen as providing adequate social
> feedback, which confirms behavior and maintains performance,
> thereby contributing to normal physiological functioning and the
> maintenance of health; whereas inadequate social networks provide
> distorted or insufficient feedback, which leads to disturbed
> behavior and accompanying physiological disturbances, which
> increase a person's susceptibility to illness and death. (p. 407)

Stated in this way, the main effects theory would predict that we

would see consistent relationships among any subsample that we might draw

from a population, and more importantly, that in no case would we find

systematic differences in the relationship between social networks and

health status among subpopulations. Thus, a finding that there are

numerous statistically significant interactions between the presence of a

social network and membership in a subgroup would be inconsistent with

this theory. Given the preponderance of such interactions in the

findings of this study, we can, therefore, reject the main effects theory

as an adequate explanation of these findings.

The second theory frequently used to explain the relationship

between social networks and health status is commonly known as the

buffering hypothesis. Hammer (1983) describes it as follows:

> Normal social networks are seen as providing social support for
> coping with stress, thereby helping to maintain good health;
> whereas inadequate social networks fail to provide support in
> coping with stress, thus leaving the person more vulnerable to
> stress-induced illness and possibly death. (p. 407)

In practice, stress is usually defined as a preponderance of stressful life events and support as emotional support. (See for example, Williams et al., 1981; Eaton, 1978; Turner, 1981; Lin and Dean, 1984; Miller and Ingham, 1976; and Lin et al., 1979)

This theory could possibly allow for the fact that social networks are stronger in some groups than in other. In fact, the search for significant interaction terms has been the basis for exploring hypotheses based on this theory, much as was done in the current research. Individuals are questioned as to the occurrence of any of a number of "known" stressful events. Then a determination is made whether social networks are more important in predicting the health status of those individuals than of others. As noted earlier, the results have been mixed. Several authors have looked for and found a significant interaction between stressful life events and social networks (Eaton, 1978; Miller and Ingham, 1976; and Turner, 1981); others have looked and not found any (Williams et al., 1981; Lin et al., 1979).

The question here is whether this theory could explain the results of the current research. This would require that we determine whether individuals who fall into each of the investigated target groups also experience many stressful life events and whether or not they receive emotional support from their social networks. Unfortunately, data are not available to carry out such an analysis here.

However, even if these data were available, several questions could be raised. First, in attempting to establish causality, one must try to establish a temporal relationship. Which would come first, being a member of a target group or experiencing many stressful events? Looking briefly at several groups, we see for instance that many of the

stressful events we would expect the elderly to experience (i.e.,
illness, personal losses, financial difficulties) are at least in part
due to the fact that they are aging, and certainly not the reverse.
Similarly, for a group such as the unemployed, the stresses we would
expect them to experience (i.e., loss of a home, financial difficulties,
loss of self-esteem) are precipitated by the loss of a job, not the
reverse. Given this, we would expect that it is the target group
membership which is important in determining their need for a network
which may or may not mediate the stresses which might ensue.

Likewise, there are needs of such groups which are not measurable
as stressful events. For instance, the need of a single parent for a
baby sitter so that she can keep a doctor's appointment would not fall
into such a category. Yet without a network to meet that need, her
health could be adversely affected. In sum, we get a picture of ongoing
life strain which probably includes many stressful events, yet also
includes material, informational and emotional needs not describable as
"events."

Finally, and perhaps most importantly, the buffering hypothesis
does nothing to further our understanding of why differences arise
between groups as to which network elements are more important for those
groups than for the general population. All of the groups described are
subject to stress. Given the buffering hypothesis, we would then expect
them all to benefit from networks. Yet there is no indication, given the
buffering hypothesis, why different network elements should benefit
different groups. We would expect that, for instance, the availability
of kin ties would be more important for the disabled than for the general
population, as it is for the poor. Yet this is not the case. For the

above reasons, then, we must reject the buffering hypothesis as an
adequate explanation for the findings of this study.

Instead, a more suitable explanation would seem to lie in a
contingency theory of network needs. (For use of this term in regard to
a range of organizational and individual contexts, see for example,
Litwak, 1978 and Kast and Rosenzweig, 1979). Such a theory would be
based on the hypothesis that the same networks are not necessarily good
for everyone. Rather their benefit depends upon the needs of the
individual and the specific tasks networks can perform. Others have
attempted to define the kind of tasks different network structures can
perform. (Granovetter, 1973; Salloway and Dillon, 1973; Litwak and
Kulis, 1983) While no attempt will be made to expand upon those
structural relationships here, it seems clear that different people have
different needs for social networks. If those needs are not met their
health will suffer. If, however, the need is not present, the presence
or absence of that network element will have no relationship to a group's
health status.

This then could explain the results found in the current study.
The groups identified here can be seen as having specific needs which
networks could meet. When those needs are met, there is no reduction in
health status. But when the necessary network element is missing, health
status is reduced. On the other hand, the rest of the population may not
have that same need. Hence, whether that network element is present or
not makes little or no difference in predicting health status in the
rest of the population.

Finally, we must recall the relationship that has been shown
to exist between social networks and health status in large-scale studies

of general populations. (Berkman and Syme, 1979 and House et al., 1982) The findings of the current study would seem to indicate that most if not all of that relationship is due to membership in one of the identified target groups. Thus when target group members are weeded out of the total population, social networks are of greatly reduced importance in predicting health status. This is essentially what we see in Schaefer's et al. (1981) study, which selected out a population very similar to this study's non-target population from the originally Alameda County panel. Here, too, social networks were of little value in predicting health status.

As noted elsewhere, in order to fully test this hypothesis data would need to be analyzed which was not collected for the current study. Hence, no definitive conclusion can be reached in this regard. However, the findings here are consistent with such a hypothesis, and are inconsistent with the other major schools of thought as to the relationship of social networks and health status.

IMPLICATIONS AND LIMITATIONS OF THE ANALYSIS

The findings of this study have important implications for social work policy and practice. In addition, the need for further research in this area is apparent, stemming from both questions raised by this study and limitations relating to the study design.

Practice Implications

The study has shown that while social networks are significant predictors of people's health status, the relationship is not the same for all people in all groups. This finding could be of use to practitioners whose work with clients is directed toward a primary or secondary goal of health maintenance or improvement. The key practice implication would be that social networks cannot be seen as an assessment criterion or intervention goal in the same way for all people. Rather the strengthening of networks should be targeted at those people for whom they are most important and at those network types which are most likely to meet their health-related needs.

It is important to note that this relationship as studied here relates only to the role of networks regarding health. The relationship of networks to other variables was not explored here. In addition, we should remember that the alternative to this implication (i.e., the need for specificity) is not that strengthening social networks is worthless as an intermediate treatment goal. Rather the alternative explored here is that social networks are uniformly important for everyone.

As these findings indicate, specificity is required on three levels: long-range goals (i.e., health maintenance); intermediate goals (strengthening social networks); and need (here represented by target group membership).

This study looked at two measures of health status and found that for the most part social networks related in the same way to both of them. However, in comparing these results to those of other studies some differences arose, some of which likely stem from the use of different outcome measures. The example was given above of the difference likely when one uses mortality risk as an outcome with the frail elderly as opposed to the use of functional health status as an outcome with the "young" old. Hence, in using health maintenance as a goal, specificity is required as to exactly what health outcome is anticipated.

Specificity is also necessary in identifying client needs. In this study, an assumption was made that different target groups have different needs. Hence target group really acts as a proxy for need. In any case it becomes clear that differences exist in how group membership relates to health. Hence knowledge of target group membership (or ideally, knowledge of potential health-related needs) is an important step in targeting network interventions.

Finally, as this study points out, the way networks relate to health is specific to different groups. For some groups no networks elements related to health. Hence one would not likely aim at strengthening their networks, to achieve a health maintenance goal. For other groups some networks were important while others were not. In trying to use networks to meet clients' health related needs, one must be aware that all networks do not work in the same way for all people. Hence network interventions must be matched to network needs.

To further explore this point, we can draw an example from one of the target groups studied here, for instance, single mothers. (Again we should bear in mind the caveat that these specific findings are drawn

from a great number of regression equations and hence should not be considered conclusive.)

The findings with regard to this population would indicate that social networks are important for composite or functional health of single parents. The best network predictors of composite health status for them have to do with the availability of intimate ties, particularly family, and actual contact with them. Hence, an assessment done with an eye toward utilizing social supports as resources would include information as to the availability of family members and the frequency with which the client visits them. If it becomes clear that the client is isolated from ties which could meet some of her needs this would then be a possible place for intervention. Alternative interventions could include advocacy for a transfer to a project where other family members live, helping an out-of-towner to relocate, or long-term individual or family treatment aimed at strengthening family bonds. (Another type of intervention might be to develop a close substitute for the missing family ties, although the current study does not deal with the substitutability of ties. See Implications for Further Research, below.)

On the other hand, there are certain forms of intervention which would not be indicated here. For instance, group affiliations and church do not seem to be related to the health status of single parents. Given that the goal is to maintain or improve functional health status, encouraging participation in groups such as Parents without Partners or a Welfare Rights advocacy group would not be indicated. (This is not to discount the possibility that such a connection might be useful for other long-term goals.)

The alternative to this tailoring of interventions to target groups would be to assess network strengths and intervene in a similar fashion with all clients wherever a network element is weak. Such strategies have been tried, including broad based community outreach programs through mental health associations and community centers. (See Appendix 1.) The findings of this study would indicate that, while such strategies are not directly harmful to the targets, they are probably of little benefit, and hence are indirectly harmful in terms of opportunity costs.

Policy Implications

The findings of this study also have implications for the development and implementation of social policy. In addition to direct intervention to strengthen the needed network elements for individual clients, we should consider the effect of social programs on individual's social networks. In other words, the effect of policy on social networks should be a consideration or decision rule in many health-related social policies. Where possible policies should be designed so as to strengthen those networks which are important for target groups, rather than to weaken them. A good example of this is in nutrition programs for the elderly. For years such programs gave preference to congregant meal sites rather than home-delivered meals, and offered as an integral part of the meals program social and group activities. Such a policy would be consistent with the findings of this study that group affiliations are important predictors of the health status of the elderly. On the other hand, one would not necessarily recommend such a program for meeting the nutritional needs of single parents, for example.

In addition to the promoting networks and affiliations for the people who need them, a second policy implication would be the need to avoid interfering with those that already exist. Thus, for example, if close contact with relatives is important in maintaining the health of single parents, policies should be avoided which separate such families.

A further implication of the findings of this study stems from the nature of the groups studied, for whom social networks are particularly important. Two phenomena of American life would seem to bear consideration on the horizon. For one, the membership in some of these groups is increasing--with more old people, more single parents, and sporadic unemployment rates, for example. At the same time, we place a high value on individualism and independence. Thus, on the one hand, we might speculate that there will be, in coming years, an increased need for networks to fill the needs of target group members. On the other, there is no indication that human resources will be available to meet those needs. This is a question which bears further analysis.

Finally, there is a danger inherent in stressing the importance of social networks. While social networks are important for the health of some people, they are by no means the only factor contributing to their health. As one group reminds us:

> Family and community effectiveness in the provision of social
> support is heavily dependent upon the broader economic and social
> environment. Where this larger environment creates and tolerates
> war, poverty and injustice, social ties on the individual and
> community levels cannot be expected to dramatically alter high
> morbidity and mortality rates. Indeed, to over-emphasize the
> singular influence of social ties on health and to ignore the
> broader context within which those social ties must operate, is to
> politically misuse the findings on the social support and health
> relationship. (Pilisuk and Winkler, in press)

The findings of this study would confirm that while networks do meet the needs of certain people, the factors which place them at risk of poor

health are a pressing priority. In public health terminology, intervention in terms of these risk factors is a form of primary prevention; strengthening of social networks--secondary prevention or tertiary prevention--to be employed when primary prevention is not sufficient.

Implications for Future Research

The current research stresses the fact that the role that social networks play in determining health status is not a uniform one across all populations in all situations. It also suggests that social networks can answer needs which are present in some groups but not in others. However, much further clarification is still needed.

For one thing, I have speculated as to what the social network needs are of different groups. No data was available to test whether those are in fact the needs of those groups. Nor were the specific functions of networks in relation to those needs examined, again for lack of data. Both of those voids need to be filled in order to allow for adequate testing of the suggested model.

In addition to more specific testing of such a model, the subject requires further examination under different study conditions. For instance, several groups studied were not at very high risk--in particular the disabled. In some cases problems arose because the use of proxy measures may have introduced measurement error. This is likely the case for the disabled and the single parents. While they were kept in the study to conform to the original hypotheses, in further tests these categories should be refined. Likewise, the data did not allow for the study of several groups which one would have liked to examine--i.e., mothers of young children and the very old.

Additionally, this study was based on cross-sectional data. In order to establish causality, we would need to replicate the design using longitudinal data. While this had been the original plan, it was changed for two reasons: (1) The elapsed time between the two waves of data collection was only one year. It was felt that this was not a long enough period to allow for differences in health status due to the presence or absence of a social network to manifest themselves. (2) Many of the people who were at the lower end of the social network measures in the first wave of data collection were lost to follow up in the second wave. (Foley, 1984) While it is possible that these people had died during the year, it could also be that they are more transient and hence difficult to recontact. At any rate, there was not enough variability in the second wave measures to make the study worthwhile. A remedy to that problem will probably lie in both the design of more panel studies (see, for example, Dean and Lin, 1984), and in the completion of the proposed mortality follow up of the data set used here.

The use of a mortality follow-up also ties in to another important research implication. That is the need to compare the impact of social networks upon different health statuses. This study showed that while the relationship between social networks and health status was important for two measures of health status, it was slightly more important for self-rated health status than for composite health status. It was also suggested that some of the relationships observed here, as compared to those found in other studies, might be due to the way health is measured. Future research should then be concerned with comparing the relationship among different health status measures--i.e., self-rated, functional, well-being, and mortality, among others. Such a design would allow for

much greater understanding of where it is that social networks intervene in the health-illness continuum. As such this also has implications for the preventive/curative medicine argument, cited above.

Finally, the current research did not evaluate the affect of strengthening social networks as an intervention or intermediate treatment goal. Ideally, to establish causality one would use an experimental design, introducing social networks where none existed or strengthening existing ones and then measuring the impact on health.

This also raises the question of natural vs. artificial networks. It is sometimes assumed that because a person is unconnected to a network, the appropriate strategy is to connect them with a network created by others. Examples of this abound, witness the recent explosion in the prevalence of self-help groups. (See Katz and Bender, 1976; and Gartner and Reisman, 1984, for example.) These have proven to be very successful in ameliorating some of the problems of specific target groups either as an adjunct or alternative to contact with professionals. (Gottlieb, 1982; Froland et al., 1981; Collins and Pancoast, 1976.) While there have been some evaluations of their effectiveness, this is still a new arena. (See Gottlieb, 1981a) What is needed here then is a systematic examination which would look at and compare various target groups, identify those problems which a social network could address, insure that such a network be made available and then measure health status, all the while controlling for numerous possible confounders. Obviously such a study is far down the road.

OTHER LIMITATIONS

While most of the limitations of the proposed investigation have been raised in previous sections, others will be made explicit here.

Most of the limitations lie, as noted above, in that this was a secondary analysis of data which was collected for other purposes. Hence all of the variables which one would want to measure in such a study were not included.

But in addition to those problems inherent in a secondary analysis, others arise from the data themselves, the sampling design and measurement problems. I will address these two classes of problems-- secondary analysis and inherent design problem--together, using Cook and Campbell's (1979) paradigm of threats to validity as a basis. Cook and Campbell outline four types of validity which should be maximized in an attempt to determine the nature of the relationship between variables:

1. <u>Statistical conclusion validity</u>--Is there a relationship between two variables at the operational level?

2. <u>Interval validity</u>--If there is a relationship, is it plausibly causal; or could the relationship occur due to other reasons?

3. <u>Construct validity</u>--If there is a causal relationship between operational variables, can we infer causality to the constructs we are trying to tap?

4. <u>External validity</u>--How generalizable is the observed relationship across persons, settings and times?

1. <u>Statistical Conclusion Validity.</u>--The key threat here is of a Type I error--concluding a relationship exists when it does not. There is a danger whenever one tests a large number of hypotheses that by chance some of them will be statistically significant. A possible way of dealing with this is to employ a method for making the requirements for assumptions of significance more stringent (i.e., Bonferroni, Tukey or Scheffe techniques). (Gliddon and Fisher, 1982; Schaefer, 1982) This,

however, greatly increases the risk of a Type II error because of low power, particularly as some of the target groups examined here are small.

Two other precautions were included here. First was to bear in mind the fact that if only a few of the many relationships to be tested show statistical significance, they are likely due to chance. More than 5% of them would need to show significance to avoid a Type I error at the p=.05 level. This was clearly met in the investigation of interactions where 75% of the relationships of interest were statistically significant.

The other protection against "fishing" is to avoid looking at specific relationships in specific groups, but rather to look for broad trends across groups. This was in fact the thrust of this dissertation. Hence attempts to pinpoint the exact nature of the relationship between social network elements and health status in each group were only exploratory. The emphasis has been on the broad differences between groups.

2. Internal Validity.--The fact that this is a cross-sectional study has been noted above as an important threat to internal validity. The chief difficulty with doing a longitudinal study here is one of differential survey mortality. Those persons who were least "connected" dropped out of the study disproportionately to their prevalence in the population--40% of them were lost to follow up, in a total loss to follow-up of 19%. (Foley, 1984)

Other threats to internal validity are (a) ambiguity of direction and (b) measurement errors. As measurement errors have been discussed at length in the course of the text, they will not be dealt with here.

With regard to ambiguity of direction, the inference made here is that networks affect health status, but of course, the opposite is also probably true--health status affects networks. People who are ill likely do become isolated, and certainly cannot participate in the range of social activities that healthy people can. One way of dealing with this problem is to demonstrate what Cook and Campbell call "plausibility." (p. 56). This I feel is demonstrated by the literature review, particularly those studies which were able to control for prior health status. (See, for example, Berkman and Syme, 1979; and House et al., 1982).

3. _Construct Validity_.--Here the central issue is whether the operational definitions actually measure the intended constructs. As with measurement error, there were clearly some instances indicated in the body of this work where this was a problem, i.e., with the disabled, and will not be discussed here. Similarly, the construct of health was dealt with earlier, through the process of multiple-operationalizing.

The construct of social support remains problematic. The inference is that networks are necessarily supportive. As has been discussed above, this may not be the case, and the question has not been resolved here. This is a multi-faceted construct, possibly confounded by such factors as personality traits (i.e., the capability to connect with others), varying content of the linkages, and possible negative effects of networks. Again, by doing a secondary analysis of available data, one cannot control for or delve into all these facets. What can be achieved though is an indication of the direction and nature of the relationship which should point the way for further research.

4. _External validity_.--A usual goal of sample surveys is to be able to generalize from the results found in the sample to the general population. This goal is impeded here in two ways. (a) The sampling design is such that each respondent represents a household regardless of household size, so that people who live in small households are over-represented in the sample. (b) The fact that this was a telephone survey limits its generalizability to persons living in households with telephones. While a limitation, others have found this to not be too serious a threat, with little difference in outcome between telephone and personal interviews. (See for example, Cannell and Groves in Wilson and Elinson, 1981.)

On the other hand, there were tremendous advantages to using this data set in this way, as noted earlier. Chief among them are the large sample size and the fact that this was a national sample. The problems raised by doing a secondary analysis were far outweighed by both the availability of the data and the obvious impossibility of otherwise carrying out such a study by a doctoral student. The savings in time and money, and above all, the availability of data on such a large and representative sample which would not be available in any other way are major considerations. And while not without problems, the data do allow for the study of an important topic in a new and meaningful way.

CHAPTER 8

CONCLUSIONS

"A friend in need is a friend indeed." The results of this study would confirm the wisdom behind the aphorism, at least with regard to one's health--social ties are most important for the people who most need them.

The purpose of this study was to explore the different ways that social support networks relate to the health status of different population groups. In particular, ten target groups were selected for whom it was felt social networks would be especially important and/or who are often targeted for intervention by social workers. They were--those with high stress jobs, the unemployed, the aged, the widowed, the bereaved, the disabled, those who had recently experienced serious illness or injury, the poor, those with negative status inconsistency, and single parents.

It was found that there is no single uniform pattern of relationship between social networks and health status. Different social network components were related to the health status of different groups of people. Three broad patterns of relationship were found: In one pattern, no network elements were important predictors of health status. The other two patterns were differentiated by the importance of the availability of close ties vs. the importance of group affiliations and actual contact with ties. Thus those groups which tend to be poor benefit from large numbers of available ties. Those groups which tend to be older do not benefit from the availability of ties, but rather from participating in groups and church and frequent contact with others.

In general the relationships were the same for both of the health status measures employed in the study--self-rated health status and

composite health status. In addition, some elements of social networks were found to be more important in predicting health status among members of each of the ten target groups as compared to people who were not members of that group and also as compared to people who were not members of any of the target groups.

The findings with regard to individual target groups in part conform to the findings of previous researchers, particularly with regard to the poor, the unemployed and people with stressful jobs. However, for several other groups, i.e., the aged and the bereaved, measures of group affiliation and actual contact with close ties proved to be important determinants of health status, in contrast to the findings of other studies. One explanation is the differential impact of networks along various places on the health-illness-death continuum.

The main theories extant today regarding the social networks-health status relationship were probed to see whether they could explain the findings of this study. Neither the main effects theory nor the buffering hypothesis proved adequate. Therefore, a different model was proposed, a contingency model of social needs and health, which fits these findings better. This model posits that not just any network will meet any health-related need. Rather, it is important that there be a matching of people's needs and their network capabilities to meet those needs if networks are to have a preventive role in relation to health.

The findings have important implications, both practical and theoretical. From the theory-building point of view, the study points out directions for future research. While it is clear that there are differences in the way social networks relate to health status among different groups, this study could not fully explore the paths by which

they work. It would be important to try to compare the different needs of groups, the tasks networks perform in meeting these needs, and their relationship to health.

With regard to social work practice, it is important to note the need for specificity in mobilizing social networks as a treatment strategy aimed at improved health status. This is also relevant for policy development: It is important to take note of the relationship between social networks and health in order to facillitate their maintenance where they already exist and their development where they do not, especially among those people who would most benefit. Such implementation also needs to be specific to individual needs. On the other hand, it would be a mistake to see social networks as a panacea for all health-related needs. While their impact is significant, those factors which place people at risk warrant primary attention.

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APPENDIX 1

"FRIENDS CAN BE GOOD MEDICINE"

Pamphlet distributed by Rockland County
Mental Health Association

Friends Can Be Good Medicine
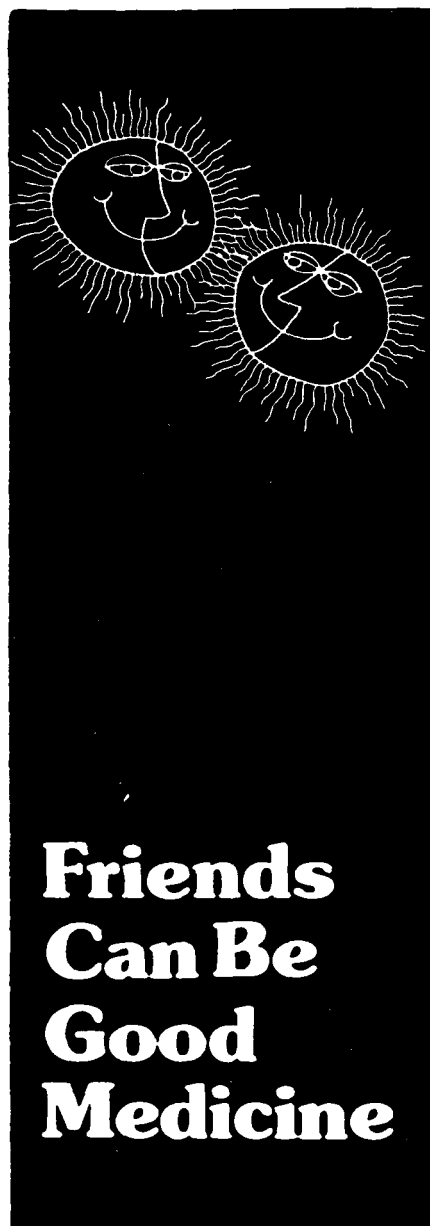
Can friends help you stay well?

This chart shows that about 20 percent of our chances for a long and healthy life comes from heredity and 25 percent is related to the environment. Although the health care system makes important contributions to the treatment of illness. it accounts for only 5 percent of the maintenance of our health. That leaves 50 percent of our chances for a healthy life in our own hands, determined by the way we live and the personal choices we make.

We know how smoking. drinking. exercise and nutrition affect our health but, often overlooked until recently, is the importance of supportive relationships with others. It's certainly not easy to make friends. Keeping them may be even harder.

Although we don't presume to tell you how to create your own circle of friends, it's time to stop doing business as usual when it comes to relationships. Your good health may depend on it!

Health Factors

PERSONAL RELATIONSHIPS

LIFESTYLE
50%

ENVIRONMENT
25%

HEREDITY
20%

HEALTH SERVICES
5%

Research says friends are good medicine

- People who isolate themselves have two to three times the risk of premature death.
- Terminal cancer strikes the isolated more often than those who are connected.
- Mental hospitalization is five to ten times greater for the separated. divorced and widowed than for married persons.
- Pregnant women under stress and without supportive relationships have three times the number of complications as equally stressed women who do have close ties.
- Women who can confide in a close friend are much less likely to become depressed.

1

Test your support network strength

No one knows exactly how relationships work to protect us from illness. We only know they are an important health factor throughout our lives. We also know that relationships are most important during stressful times such as a change in a love relationship or the death of a close friend or relative or even burnout on the job.

Friends may not cost any money but they don't come free. Developing close relationships take time and effort and needs a lot of give and take. There are no hard and fast rules about making and keeping friends. Every person needs to find his or her own way of doing it.

To see how you've been doing, circle one response for each item. Then add the scores and put the total in the box.

1. At work, how many persons do you talk to about a job hassle?
   none (or not employed) (0)
   one or two (3)   two or three (4)
   four or more (5)
2. How many neighbors do you trade favors with (loan tools or household items, share rides, babysitting etc.)?
   none (0)   one (1)   two or three (2)   four or more (3)
3. Do you have a spouse or partner?
   no (0)   several different partners (2)   one steady partner (6)
   married or living with someone (10)
4. How often do friends and close family members visit you at home?
   rarely (0)   about once a month (1)   several times a month (4)
   once a week or more (8)

5. How many friends or family members do you talk to about personal matters?
   none (0)   one or two (6)   three to five (8)   six or more (10)
6. How often do you participate in a social, community or sports group?
   rarely (0)   about once a month (1)   several times a month (2)   once a week or more (4)

SUPPORT TOTAL ☐

If your SUPPORT NETWORK score is:
Less than 15:
Your support network has *low strength* and probably does not provide much support. You need to consider making more social contacts.
15–29:
Your support network has *moderate strength* and likely provides enough support except during periods of high stress.
30 or more:
Your support network has *high strength* and it will likely maintain your well being even during periods of high stress.

2

Chart your own stress level

Stress is at the root of 50 to 80 percent of all illness, according to new medical research. This same research shows that close and supportive ties with others keep us healthier, both physically and mentally. Friends, neighbors and relatives are good medicine when it comes to coping with excessive stress that causes illness.

You can begin to find out how friends can help you stay well by checking out the information below. The following quiz will give you a clear picture of how much stress you are withstanding right now.

Circle each stress event which you experienced within the last 12 months, add the score and put the total in the box.

PERSONAL
(6) Serious injury or illness
(6) Alcohol, drug or emotional problem
(4) Marriage
(4) Death of close friend
(2) Trouble with friends or neighbors
(2) Begin or end school or training program

WORK & FINANCES
(6) Lost job, retired
(4) Sold or bought home
(2) Changed jobs, promotion
(2) Trouble with boss

FAMILY
(10) Death of spouse or immediate family member
(8) Divorce
(6) Reconciliation or separation
(4) Serious illness or injury of family member
(4) Pregnancy or birth
(4) Family arguments or trouble with in-laws
(4) Child enters or leaves home
(2) Relative moves into household
(2) Moved to new residence

STRESS TOTAL ☐

If your STRESS LEVEL score is:
Less than 10:
You have a *low stress level* and your life has been stable in most areas.
10–15:
You have a *moderate stress level* and there has been a lot of change in your life.
16 or more:
You have a *high stress level* and there have been major adjustments in your life.
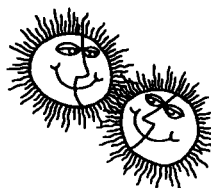
3

Chart your Health

The results of tests 1 and 2 give you some indication of how much your network of friends helps you deal with the stress in your life. Subtract your **Stress Level** from your **Support Network Score.**

If your TOTAL SCORE is between:
40 and 24:
   Chances are excellent you will stay healthy.
23 and 7:
   Chances of staying healthy are very good.
7 and −7:
   Chances are average you will stay healthy.
−7 and −23:
   Chances of staying healthy are below average.
−24 and −40:
   Chances of staying healthy are poor.

If you are concerned about your score, perhaps you would like to give us (RCMHA) a call at 914-354-0200 ext. 2308, 2305

Remember, friends, neighbors and families can assist you in coping with excessive stress that causes illness.

APPENDIX 2

NATIONAL SURVEY OF PERSONAL HEALTH PRACTICES
AND CONSEQUENCES

Wave 1, Survey Instrument

| Chilton Research Services
Radnor, Pennsylvania | OMB #68R-1663
Exp. Sept., 1980 | Study # 8047
April, 1979 |

HEALTH PRACTICES AND HEALTH CONSEQUENCES

FINAL VERSION - WAVE 1

Main Questionnaire

INTRODUCTION A

(IF SCREENING WAS NOT DONE WITH RESPONDENT OR IF SCREENING WAS DONE DURING A PREVIOUS CALL.)

Hello. I'm _____ of Chilton Research Services, calling for the United States Department of Health, Education and Welfare.

As part of a study being conducted under the authority of the Public Health Service Act, we are talking to people across the country about some of their ideas and attitudes on health.

Your participation in this survey is voluntary. Any information which you give us in response to our questions will be kept strictly confidential and will be used only for routine statistical research purposes.

   The first few questions deal with health practices and your day-to-day living habits. (GO TO Q. 1)

INTRODUCTION B

(IF SCREENING WAS DONE WITH RESPONDENT DURING THIS CALL)

As part of a study being conducted under the authority of the Public Health Service Act, we are talking to people across the country about some of their ideas and attitudes on health.

Your participation in this survey is voluntary. Any information which you give us in response to our questions will be kept strictly confidential and will be used only for routine statistical research purposes.

   The first few questions deal with health practices and your day-to-day living habits. (GO TO Q. 1)

I hereby certify that I have read the above Privacy Act Statement to the designated survey respondent.

Signature of
Interviewer _____ Date _____

1. First, would you say your health is excellent, good, fair, or poor?

43-

Excellent	4
Good	3
Fair	2
Poor	1
Don't Know	8

2. How often do you eat breakfast? Would you say . . . (READ LIST)

44-

Almost every day	1
Sometimes	2
Rarely or never	3

3. On an average day how many _____ do you drink? (ASK FOR ENTIRE LIST. RECORD ACTUAL NUMBER. IF "DON'T KNOW", ENTER "98". IF LESS THAN 1, ENTER "97")

(#)

Cups of coffee (45-46)	
Cups of tea (47-48)	
Glasses of milk (49-50)	
Glasses of water (51-52)	
Cans or bottles of soft drink (53-54)	
Glasses of fruit or vegetable juice (55-56)	

4. Do you make any conscious effort to limit the amount of red meat in your diet for health reasons?

57-

| Yes | 1 |
| No | 2 |

5. How often, if ever, do you take vitamin pills or other vitamin supplements? Would you say . . . (READ LIST)

58-

Regularly	1
Occasionally	2
Rarely or never	3

6. On the average how many hours of sleep do you get each day, that is, during a 24 hour period?

# of Hours _____
(59-61)

7. On the average, do you now get more sleep, less sleep or about the same amount of sleep as you did 2 years ago?

62-

	More	1
	Less	2
SKIP TO Q. 9	Same	3

8. Is this because of a health-related problem or condition that you had?

63-

| Yes | 1 |
| No | 2 |

9. About how tall are you without shoes?

| _____ Feet | _____ Inches |
| (64) | (65-66) |

10. How much do you weigh without clothes on?

Actual Weight _____
(67-69)

11. Do you now weigh more, less, or about the same as you did two years ago?

70-

	More	1
	Less	2
SKIP TO Q. 14	Same	3

12. Was this change the result of a health-related problem or condition that you had?

71-

Yes	1
No	2

(INTERVIEWER: IF FEMALE RESPONDENT SAYS WEIGHT IS DIFFERENT BECAUSE OF PREGNANCY, EITHER NOW OR TWO YEARS AGO, ASK ABOUT WEIGHT GAIN OR LOSS OTHER THAN A TEMPORARY PREGNANCY-RELATED CHANGE.)

13. About how much (MORE/LESS) do you now weigh than you did two years ago?

75-

_____
(Number of Pounds)
(72-74)

More	1
Less	2

14. Do you now consider yourself to be overweight, underweight, or about average?

76-

Overweight	1
Underweight	2
Average	3
Don't Know	8

15. About how long has it been since you last went to a dentist? (USE LIST TO PROBE, IF NECESSARY)

77-

Less than 1 year (Less than 12 months)	1
1 - 2 years (12 months up to 24 months)	2
2 - 4 years (More than 24 months up to 5 years)	3
5 or more years	4
Never	5
Don't Know	8

SP. 78-79
END CARD 1   80 - ①

(REFER TO AGE ON SCREENER.

IF 55 OR OVER, CONTINUE.

IF YOUNGER THAN 55, SKIP TO Q. 17)

(IF 55 OR OVER.)

16. Have you lost all of your teeth?

5-

SKIP TO Q. 19	Yes	1
CONTINUE.	No.	2

17. How often do you brush your teeth?

6-

More than twice a day	1
Twice a day	2
Once a day	3
Less than once a day	4

18. And how often, if ever, do you use dental floss or a waterpick? (USE LIST TO PROBE, IF NECESSARY)

7-

Every day	1
3 - 6 times a week	2
1 - 2 times a week	3
Less than once a week	4
Never	5

19. About how long has it been since you last had an eye examination? (USE LIST TO PROBE, IF NECESSARY)

Less than 1 year (Less than 12 months)	1
1 - 2 years (12 months up to 24 months)	2
2 - 4 years (More than 24 months up to 5 years)	3
5 or more years	4
Never	5
Don't Know	8

20. Some people get a general physical examination once in a while even though they are feeling well and have not been sick. When was the last time you had a general physical examination when you were not sick? (USE LIST TO PROBE, IF NECESSARY.)

9-

Less than 1 year (Less than 12 months)	1
1 - 2 years (12 months up to 24 months)	2
2 - 4 years (More than 24 months up to 5 years)	3
5 or more years	4
Never	5
Don't Know	8

(IF RESPONDENT REQUESTS CLARIFICATION SAY: A general physical examination refers to the contact between a doctor and a patient in which the following are usually done - blood pressure taken, weight recorded, stethoscope used, throat examined, and blood test made.)

21. During the past 12 months, that is, since (DATE ONE YEAR AGO), about how many times did you see or speak to a medical doctor about your own health? Please exclude any doctors you may have seen while you were a patient in a hospital.

# of visits _____ (10,11)

None	00
Don't Know	98

22. About how long has it been since you last saw or talked to a medical doctor about your own health?

12-

Less than 1 year (Less than 12 months)	1
1 - 2 years (12 months up to 24 months)	2
2 - 4 years (More than 24 months up to 5 years)	3
5 or more years	4
Never	5
Don't Know	8

23. How long has it been since you last had your blood pressure checked?

13-

Less than 1 year (Less than 12 months)	1
1 - 2 years (12 months up to 24 months)	2
2 - 4 years (More than 24 months up to 5 years)	3
5 or more years	4
Never	5
Don't Know	8

24. (ASK FEMALES ONLY) When was the last time you had a Pap smear test for cancer?

14-

Less than 1 year (Less than 12 months)	1
1 - 2 years (12 months up to 24 months)	2
2 - 4 years (More than 24 months up to 5 years)	3
5 or more years	4
Never	5
Don't Know	8

(ASK FEMALES ONLY)·
25. When was the last time you had a breast examination by a doctor?.

15-

Less than 1 year (Less than 12 months)	1
1 - 2 years (12 months up to 24 months)	2
2 - 4 years (More than 24 months up to 5 years)	3
5 or more years	4
Never	5
Don't Know	8

26. Have you smoked at least 100 cigarettes (five packs of cigarettes) in your entire life?

16-

| | Yes | 1 |
| SKIP TO Q. 36 | No | 2 |

27. Do you smoke cigarettes now?

17-

| SKIP TO Q. 31 | Yes | 1 |
| CONTINUE | No | 2 |

28. Did you ever smoke cigarettes regularly? (REGULARLY MEANS AT LEAST ONE CIGARETTE A WEEK ON A REGULAR BASIS.)

18-

| | Yes | 1 |
| SKIP TO Q. 36 | No | 2 |

29. During the period when you were smoking most, about how many cigarettes a day did you usually smoke?

1 Pack = 20 Cigarettes

_____ (19,20)
(# of cigarettes)

30. About how long it has been since you smoked cigarettes fairly regularly?

| SKIP TO | Years | (21,22) |
| Q. 36 | Months | (23,24) |

31. On the average, how many cigarettes a day do you smoke?

1 Pack = 20 Cigarettes

_____ (25,26)
(# of cigarettes)

32. Think about the tar or nicotine level of the cigarettes you usually smoke. Would you say they are high, medium, or low tar and nicotine?

27-

High tar and nicotine	1
Medium tar and nicotine	2
Low tar and nicotine	3
Don't Know	8

·33. Have you changed the number of cigarettes you smoke or the brand of cigarettes you smoke in the past two years?

28-

| | Yes | 1 |
| SKIP TO Q. 35 | No | 2 |

34. Was this because of a <u>specific</u> health related problem or condition that you <u>had</u>?

29-

| Yes | 1 |
| No | 2 |

35. During the past two years did you make a serious attempt to stop smoking cigarettes?

30-

| Yes | 1 |
| No | 2 |

36. Do you ever drink any alcoholic beverages, that is, beer, wine, or liquor?

31-

| SKIP TO Q. 39 | Yes | 1 |
| | No | 2 |

37. Did you drink any alcoholic beverages two years ago?

32-

| | Yes | 1 |
| SKIP TO Q. 43 | No | 2 |

38. Have you changed your drinking pattern during the past two years because of a specific health-related problem or condition that you had?

33-

| SKIP TO | Yes | 1 |
| Q. 43 | No | 2 |

39. On the average, how often do you drink any alcoholic beverages such as beer, wine, or liquor? (USE LIST TO PROBE, IF NECESSARY)

(34,35)

Every day	01
6 days a week	02
5 - 6 days a week	03
5 days a week	04
4 - 5 days a week	05
4 days a week	06
3 - 4 days a week	07
3 days a week	08
2 - 3 days a week	09
2 days a week	10
1 - 2 days a week	11
1 day a week (4 days a month)	12
3 - 4 days a month	13
3 days a month	14
2 - 3 days a month	15
2 days a month	16
1 - 2 days a month	17
Once a month	18
Less than once a month	19
Don't Know	98

The next group of questions asks your personal opinions about health-related matters.

44. How good a job do you feel you are doing in taking care of your health? Would you say . . . (READ LIST)

41-

	Excellent	4
	Good	3
	Fair	2
	Poor	1
DO NOT READ	Don't Know	8

45. How would you compare your level of physical activity with other people your age? Would you say you are . . . (READ LIST)

42-

	Much more physically active	4
	Somewhat more active	3
	Somewhat less active	2
	Much less active	1
DO NOT READ	Don't Know	8

46. Compared to your level of physical activity two years ago, would you say you are now more physically active, less physically active, or about the same?

43-

	More physically active	1
	Less physically active	2
SKIP TO Q. 48	About the same	3

47. Is this because of a specific health-related problem or condition that you had?

44-

| | Yes | 1 |
| | No | 2 |

48. Do you feel that you get as much exercise as you need, or less than you need?

45-

As much as you need	1
Less than you need	2
Don't Know	8

49. In general, how satisfied are you with your overall physical condition? Would you say . . . (READ LIST)

46-

	Very satisfied	4
	Somewhat satisfied	3
	Not too satisfied	2
	Not at all satisfied	1
DO NOT READ	Don't Know	8

50. Compared with two years ago, that is, since 1977, would you say that your health is now better, worse, or about the same?

47-

Better	3
Worse	2
Same	1
Don't Know	8

51. Over the past year has your health caused you a great deal of worry, some worry, hardly any worry, or no worry at all?

48-

A great deal of worry	4
Some worry	3
Hardly any worry	2
No worry at all	1
Don't Know	8

40. On the days that you drink how many drinks do you have per day, on the average? (USE LIST TO PROBE, IF NECESSARY)

	(36,37)
One	01
One or two	02
Two	03
Two or three	04
Three	05
Three or four	06
Four	07
Four or five	08
Five	09
Five or six	10
Six	11
Seven to eleven	12
Twelve or more	13
Don't Know	98

41. Have you changed your drinking pattern during the past two years because of a specific health-related problem or condition?

		38-
	Yes	1
SKIP TO Q. 43	No	2

42. Do you now drink more or less than you did two years ago?

	39-
More	1
Less	2

43. How often do you use seat belts when you ride in a car? Would you say . . . (READ LIST)

	40-
Always or nearly always	4
Sometimes	3
Seldom	2
Never	1

52. How much control do you think you
    have over your future health? Would
    you say . . . (READ LIST)

    49-

	A great deal	4
	Some	3
	Very little	2
	None at all	1
DO NOT READ	Don't Know	8

53. Compared to other people your age,
    would you say your health is . . .
    (READ LIST)

    50-

	Excellent	4
	Good	3
	Fair, or	2
	Poor	1
DO NOT READ	Don't Know	8

54. Compared to other people your age,
    would you say you have . . . (READ
    LIST)

    51-

	Much more energy	4
	Somewhat more energy	3
	Somewhat less energy	2
	Much less energy	1
DO NOT READ	Don't Know	8

Now, I'd like to ask you some
questions about your health status
and medical care.

55. Is there a particular clinic, health
    center, doctor's office or hospital
    emergency room that you usually go to
    if you are sick or need advice about
    your health?

    52-

Yes	1
No	2

56. Have you been a patient overnight in
    a hospital since (DATE ONE YEAR AGO)?

    53-

	Yes	1
SKIP TO Q. 58	No	2

57. All together, how many nights were
    you in the hospital since (DATE ONE
    YEAR AGO)?

    (Number of nights)_____
    (54,55)

58. Do you feel that there are things you
    can do in your everyday life which
    will prevent you from getting high
    blood pressure?

    56-

Yes	1
No	2
Don't Know	8

59. Have you had high blood pressure or
    were you treated for it during the last
    twelve months?

    57-

Yes	1
No	2
Don't Know	8

    (HIGH BLOOD PRESSURE MAY ALSO BE
    REFERRED TO AS HYPERTENSION OR
    HIGH BLOOD.)

250 250

60. Row many colds, if any, did you have in the past 12 months?

58-

None	0
Cne	1
Two	2
Three	3
Four	4
Five or more	5
Don't Know	8

61. Hew often, if ever, do you get headaches? (USE LIST TO PROBE, IF NECESSARY)

59-

Never	1
Less than once a month	2
Once a month	3
2 - 3 times a month	4
Once a week	5
More than once a week	6
Don't Know	8

62. Do you ever have any trouble or difficulty with routine physical activities such as'..(READ SLOWLY) walking, using stairs or inclines, standing or sitting for long periods, using your fingers to grasp or handle, or lifting or carrying something heavy?

60-

| | Yes | 1 |
| SKIP TO Q. 64 | No | 2 |

63. Do you have any trouble or difficulty . . . (READ LIST)

(ASK FOR EACH "YES")
Do you have a great deal of trouble (ACTIVITY) or just some trouble?

	No	Yes	
		Great Deal	Some
Walking	61-1	2	3
Using stairs or inclines	62-1	?	3
Standing or sitting for long periods	63-1	2	3
Using your fingers to grasp or handle	64-1	2	3
Lifting or carrying something as heavy as 10 pounds	65-1	2	3

64. During the past 12 months, that is, since (DATE ONE YEAR AGO), about how many days did illness or injury keep you in bed all or most of the day?

66-

None	1
1-7 days (up to 1 week)	2
8-30 days (more than 1 week, up to 1 month)	3
31-180 days (more than 1 month, up to 6 months)	4
181 days or more (more than 6 months)	5
Don't Know	8

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65. What were you doing for <u>most</u> of the
past 12 months:working, keeping
house, or something else?

67–

SKIP TO Q. 73	Working	1
SKIP TO Q. 78	Keeping house	2
REFER TO AGE ON SCREEN IF 45 OR OVER, CONTINUE. IF UNDER 45, SKIP TO Q. 67	Something else	3

66. Are you retired?

68–

SKIP TO Q. 68	Yes	1
	No	2

67. What were you doing for most of the
past 12 months?

69–

SKIP TO Q. 82	Going to school	1
SKIP TO Q. 69	Other	2

68. Did you retire because of your health?

70–

	Yes	1
	No	2

69. Does your health now keep you from
working?

71–

SKIP TO Q. 86	Yes	1
	No	2

70. Are you limited in the <u>kind</u> of work
you could do because of your health?

72–

SKIP TO Q. 86	Yes	1
	No	2

71. Are you limited in the <u>amount</u> of work
you can do because of your health?

73–

SKIP TO Q. 86	Yes	1
	No	2

72. Are you limited in the <u>kind</u> or <u>amount</u>
of <u>other activities</u> because of your
health?

74–

SKIP TO Q. 86	Yes	1
SKIP TO Q. 85	No	2

73. Do you <u>now</u> have a job?

75–

SKIP TO Q. 75	Yes	1
	No	2

74. In terms of health, are you now able
to work at all?

76–

	Yes	1
SKIP TO Q. 86	No	2

75. Are you limited in the <u>kind</u> of work
you can do because of your health?

77–

SKIP TO Q. 86	Yes	1
	No	2

76. Are you limited in the <u>amount</u> of work
you can do because of your health?

78–

SKIP TO Q. 86	Yes	1
	No	2

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END CARD 2   80 –②

77. Are you limited in the <u>kind</u> or <u>amount</u> of other activities because of your health?

5-

SKIP TO Q. 86	Yes	1
SKIP TO Q. 85	No	2

78. In terms of health, are you now able to keep house at all?

6-

	Yes	1
SKIP TO Q. 86	No	2

79. Are you limited in the <u>kind</u> of housework you can do because of your health?

7-

SKIP TO Q. 86	Yes	1
	No	2

80. Are you limited in the <u>amount</u> of housework you can do because of your health?

8-

SKIP TO Q. 86	Yes	1
	No	2

81. Are you limited in the <u>kind</u> or <u>amount</u> of other activities because of your health?

9-

SKIP TO Q. 86	Yes	1
SKIP TO Q. 85	No	2

82. Do you have to go to a certain type of school because of your health?

10-

SKIP TO Q. 86	Yes	1
	No	2

83. Are you limited in school attendance because of your health?

11-

SKIP TO Q. 86	Yes	1
	No	2

84. Are you limited in the <u>kind</u> or <u>amount</u> of other activities because of your health?

12-

SKIP TO Q. 86	Yes	1
	No	2

85. Are you limited in <u>any way</u> because of a disability or health?

13-

	Yes	1
SKIP TO Q. 91	No	2

86. What condition causes this limitation?

_____
      (Condition)   (14,15)

87. Did this condition begin more than three months ago?

16-

SKIP TO Q. 91	Yes	1
	No	2

(IF "NO", CHECK TO SEE IF CONDITION IN Q. 86 IS ON LIST)

SKIP TO Q. 91	Condition is on list	1
ASK Q. 88	Condition is not on list	2

88. Is this limitation caused by any other condition?

17-

	Yes	1
SKIP TO Q. 91	No	2

89. What other condition causes this limitation?

_____
      (Condition)   (18,19)

90. Did this condition begin more than three months ago?

20-

Yes	1
No	2

(CONDITION LIST)

Allergy, any	01
Arthritis or rheumatism	02
Asthma	03
Cancer	04
Cleft palate	05
Club foot	06
Condition present since birth	07
Deafness or serious trouble with hearing	08
Diabetes	09
Epilepsy	10
Hardening of the arteries	11
Hay fever	12
Heart trouble	13
Hemorrhoids or piles	14
Hernia or rupture	15
High blood pressure	16
Kidney stones	17
Mental illness	18
Missing fingers, hand, or arm-toes, foot, or leg	19
Palsy	20
Paralysis of any kind	21
Permanent stiffness or deformity of the foot, leg, fingers, arm or back	22
Prostate trouble	23
Repeated trouble with back or spine	24
Rheumatic fever	25
Serious trouble with seeing, even when wearing glasses	26
Sinus trouble, repeated attacks of	27
Speech defect, any	28
Stomach ulcer	29
Stroke	30
Thyroid trouble or goiter	31
Tuberculosis	32
Tumor, cyst, or growth	33
Varicose veins, trouble with	34

FOR OFFICE USE ONLY

Other	97

The next few questions will be used to determine trends in longevity patterns within families. Please answer these questions with reference to your natural parents and grandparents, if you know about them.

91. Is your father now living?

21-

CONTINUE	Yes	1
SKIP TO Q. 93	No	2
SKIP TO Q. 95	Don't know	8

92. About how old is he?

_____ (22,23)
(AGE)

| Don't know | 98 |

(SKIP TO Q. 95)

93. About how old was he when he died?

_____ (24,25)
(RECORD AGE)

| Don't know | 98 |

94. Did he die as a result of an accident?

26-

| Yes | 1 |
| No | 2 |

95. Is your mother now living?

27-

CONTINUE	Yes	1
SKIP TO Q. 97	No	2
SKIP TO Q. 99	Don't know	8

96. About how old is she?

_____ (28,29)
(AGE)

| Don't know | 98 |

(SKIP TO Q. 99)

97. About how old was she when she died?

_____ (30,31)
(AGE)

| Don't know | 98 |

98. Did she die as a result of an accident?

32-

| Yes | 1 |
| No | 2 |

99. How many of your grandparents, if any, are now living?

33-

SKIP TO Q. 101	None	1
	One	2
	Two	3
	Three	4
	Four	5
SKIP TO Q. 101	Don't know	8

100. (Is he or she) (Are any of them) 80 years or older?

34-

SKIP TO Q. 102	Yes	1
	No	2
	Don't know	8

101. Did any of your grandparents live beyond 80 years of age?

35-

Yes	1
No	2
Don't know	8

Now, I'd like to ask you a few questions about your present and past employment experiences.

102. Are you now . . . (READ LIST)

(36,37)

SKIP TO	Working	Full-time	01
Q. 104		Part-time	02
SKIP TO	Laid off or on strike		03
Q. 111	Retired		04
C O N T I N U E	Unemployed	Looking for work	05
		Not looking for work	06
	Unable to work (disabled)		07
	Keeping house		08
	Full-time student		09

103. Have you ever worked?

-38-

SKIP TO Q. 111	Yes	1
SKIP TO Q. 113	No	2

104. Are you self-employed?

39-

SKIP TO Q. 107	Yes	1
	No	2

105. Do you get time off from your job with pay, when you are ill?

40-

Yes	1
No	2

106. Does your employer give you time off from work with pay for visits to the doctor?

41-

Yes	1
No	2

107. Does your job involve a variable work shift? That is, do you work the day shift some times and the night shift at other times?

42-

Yes	1
No	2

108. How much hard physical work is required on your job? I'm referring to things like pushing or carrying heavy objects, handling heavy tools or equipment, or digging. Would you say . . . (READ LIST)

43-

A great deal	4
Some	3
Hardly any	2
None at all	1
DO NOT READ — Don't Know	8

109. How would you describe the degree of emotional stress associated with your job? Would you say you are under a great deal of stress, some stress, or hardly any stress?

44-

A great deal	3
Some	2
Hardly any	1
Don't Know	8

256

110. In your current job are you exposed to any special risk of accidents or injuries or to any substances that could endanger your health?

45-

| Yes | 1 |
| No | 2 |

111. Did you ever change jobs because you were concerned about occupational hazards or dangers to your health?

46-

| Yes | 1 |
| No | 2 |

112. During the past five years, that is since 1974, how many employers or companies, if any, have you worked for on a full time basis, including your present job?

47-

None	0
One	1 .
Two	2
Three	3
Four	4
Five or more	5
Don't know	8

(IF SELF-EMPLOYED IN MORE THAN ONE COMPANY, COUNT AS "ONE")

113. Would you please tell me whether you have participated in any activities or meetings run by any of the following groups in the last 3 months?

	Yes	No	DK
A labor union, commercial group or professional organization 48-	1	2	8
A church group 49-	1	2	8
A group concerned with children such as PTA, Boy Scouts, Girl Scouts, etc 50-	1	2	8
Any other group that is concerned with community betterment, charity or service 51-	1	2	8
Any other group that is mainly social, fraternal or recreational 52-	1	2	8

114. About how often, if ever, do you go to religious services? (USE LIST TO PROBE, IF NECESSARY)

53-

Once a week or more	1
1 to 3 times a month	2 .
Less than once a month	3 .
Never	. 4

115. Now I'm going to read you a list of things that people do in their free time. Please tell me how often you participate in these activities. First how often do you (ACTIVITY)? Would you say often, sometimes, rarely, or never? (ASK FOR EACH ACTIVITY.)

		Often	Sometimes	Rarely	Never
Go swimming in the summer	54-	4	3	2	1
Take long walks	55-	4	3	2	1
Work on a physically active hobby such as dancing or gardening	56-	4	3	2	1
Go jogging or running	57-	4	3	2	1

(IF "OFTEN" OR "SOMETIMES" TO JOGGING OR RUNNING IN Q .-115, ASK Q. 116. OTHERWISE SKIP TO Q. 117)

116. On the average how many miles a _week_ do you usually jog or run?

	58-
Less than 5 miles	1
5 to 15 miles	2
More than 15 miles	3

117. And how often do you (ACTIVITY)?

		Often	Sometimes	Rarely	Never
Ride a bicycle	59-	4	3	2	1
Do calisthenics or physical exercise	60-	4	3	2	1
Participate in any other active sports I haven't already mentioned	61-	4	3	2	1

118. How much enjoyment do you get out of your free time? Would you say . . . (READ LIST)?

62-

	A great deal	3
	Some, or	2
	A little	1
DO NOT READ	Don't Know	8

119. And how often do you find that you have time on your hands that you don't know what to do with? Would you say . . . (READ LIST)?

63-

	Very often	4
	Sometimes	3
	Rarely	2
	Never	1
DO NOT READ	Don't know	8

120. All in all how happy are you these days? Would you say . . . (READ LIST)?

64-

	Very happy	4
	Pretty happy, or	3
	Not too happy	2
DO NOT READ	Don't Know	8

121. How many close relatives do you have? These are people that you feel at ease with, can talk to about private matters, and can call on for help. (RECORD IN Q.121 GRID BELOW.)

122. And how many friends do you have that you feel really close to? These are friends that you feel at ease with, can talk to about private matters, and can call on for help. (RECORD IN Q.122 GRID BELOW.)

	Q. 121	Q. 122
	Relatives	Friends
None	(65,66) 00	(67,68) 00
One	01	01
Two	02	02
Three	03	03
Four	04	04
Five	05	05
Six	06	06
Seven	07	07
Eight	08	08
Nine	09	09
Ten or more	10	10

(IF "NONE" TO FRIENDS AND RELATIVES SKIP TO Q. 126.)

123. How many of these close friends or relatives do you see at least once a month?

(69-70)

None	00
One	01
Two	02
Three	03
Four	04
Five	05
Six	06
Seven	07
Eight	08
Nine	09
Ten or more	10

124. About how often do you visit with any close relatives or friends? (DO NOT READ LIST)

71-

More than once a week (More than 4 times a month)	1
About once a week (About 4 times a month)	2
2-3 times a month	3
About once a month	4
Less than once a month	5
Don't Know	8

125. Do you feel that you have enough close friends or relatives?

72-

	Yes	1
	No	2
	Don't Know	8

126. Are you now . . . (READ LIST)

73-

	Married	1
SKIP TO	Widowed	2
	Divorced	3
Q. 128	Separated	4
	Never Married	5

127. All in all, how happy has your marriage been for you? Would you say . . . (READ LIST)

74-

	Very happy	3
	Pretty happy, or	2
	Not too happy	1
DO NOT READ	Don't Know	8

Now I have a few questions about how you have been feeling lately.

(ASK QUESTION FOR EACH CHARACTERISTIC. BEGIN WITH [√].)

128. How often in the past month have you felt (CHARACTERISTIC)? Would you say very often, sometimes, rarely, or never?

[√]	Very Often	Some-times	Rare-ly	Nev-er	DK
Cheerful and lighthearted	75- 4	3	2	1	8
Loved and wanted.	76- 4	3	2	1	8
Downhearted and blue	77- 4	3	2	1	8
Lonely	78- 4	3	2	1	8

SP. 79
END CARD 3   80 - ③
BEGIN CARD 4
DUP. COLS. 1-4

129. Does it _ever_ happen that you do not have enough money to afford the kind of _medical care_ you or your family should have?

5-

	Yes	1
SKIP TO Q. 131	No	2

130. Would you say this happens . . . (READ LIST)?

6-

Very often	3
Sometimes, or	2
Rarely	1

131. I'm now going to read you a list of things that can happen to people. Please tell me which of these events, if any, happened in your life during the <u>past</u> <u>five years</u>. (READ ENTIRE LIST)

	Yes	No	Don't Know	Not Applicable
Death of your (husband/wife) or one of your children	7- 1	2	8	7
Problems or difficulties with a steady date or fiance	8- 1	2	8	7
Serious financial difficulties or problems	9- 1	2	8	7

. . . And in the past five years did any of these events happen in your life? (READ ENTIRE LIST)

	Yes	No	Don't Know	Not Applicable
Your own serious illness, injury or operation	10- 1	2	8	7
Serious illness, injury or operation of your children	11- 1	2	8	7
Serious illness, injury or operation of your (husband/wife)	12- 1	2	8	7
Being unable to get medical treatment when it was seriously needed for yourself or your (husband/wife) or your children	13- 1	2	8	7
IF "YES", GO TO Q. 132 — Your own marital separation or divorce	14- 1	2	8	7
Other problems or difficulties related to your marriage	15- 1	2	8	7

132. Did you have any <u>severe</u> personal, emotional, behavioral or mental problems that concerned you in the past year?

16-

SKIP TO Q. 134	Yes	1
	No	2
	Don't Know	8

133. Would you say you had no problems of this kind at all, or no <u>severe</u> problems?

17-

SKIP TO	No problems at all	1
Q. 136	No <u>severe</u> problems	2

134. Did you consider any of these to be severe enough that you felt you needed professional help?

18-

	Yes	1
SKIP TO	No	2
Q. 136	Don't Know	8

135. Did you seek professional help?

19-

	Yes	1
	No	2

136. Have you ever had a nervous breakdown?

20-

SKIP TO Q. 138	Yes	1
	No	2
	Don't Know	8

137. Did you ever feel that you were going to have, or were close to having a nervous breakdown?

21-

	Yes	1
SKIP TO	No	2
Q. 140	Don't Know	8

138. Was that during the past year?

22-

	Yes	1
	No	2
	Don't Know	8

139. Are you still bothered by that condition or are you completely over it?

23-

Still bothered by it	1
Completely over it	2
Don't Know	8

140. And finally, these last few questions ask for a little more information about you. This information will be used to compare results from different groups of people who participate in this survey and will not be used to identify you personally in any way.

In the past five years, that is, since (MONTH, 1974), how many addresses have you lived at, including your present address.

# of addresses_____
(24-25)

141. What was the last grade or year of school you completed?
(26-27)

None	01
1 - 4 years	02
5 - 6 years	03
7 - 8 years	04
9 - 11 years	05
12 years (Completed high school or equivalent)	06
13 - 15 years (Some college or trade school)	07
16 + years (Completed college or more)	08
Don't Know	98

142. And what is your date of birth?

Day_____(28-29)

Month_____(30-31)

Year_____(32-33)

(SEE TYPE OF RESIDENCE ON SCREENER. IF "PRIVATE RESIDENCE", ASK Q. 143. IF "GROUP QUARTERS", SKIP TO Q. 146)

143. And now I'd like to know the age and sex of members of your household who are younger than 20 or older than 64.

Age	Sex	
	Male	Female
(34-35)	36- 1	2
(37-38)	39- 1	2
(40-41)	42- 1	2
(43-44)	45- 1	2
(46-47)	48- 1	2
(49-50)	51- 1	2
(52-53)	54- 1	2
(55-56)	57- 1	2
(58-59)	60- 1	2
None	60- 0	

144. Are there any telephone numbers other than the one I've dialed at which household members can be reached at this residence?

61-

	Yes	1
SKIP TO Q. 150	No	2

I would just like to make sure you are referring to a phone number other than the one you are using right now.

62-

	Yes	1
SKIP TO Q. 150	No	2

145. In total, at how many other phone numbers in this residence can household members be reached? (EXCLUDE PHONE NUMBER DIALED)

#_____ (63)

(SKIP TO Q. 150)

146. How many people between the ages of 20 and 64 live here?

Number of People_____ (64 — 66)

Don't Know	998

147. How many of these people have regular access to this phone number?

Number of People_____ (67 — 69)

Don't Know	998

148. Are there any telephone numbers in this residence other than the one I've dialed, at which these (# IN Q. 147) people can be reached?

70-

	Yes	1
SKIP TO Q. 150	No	. 2

149. In total, at how many other phone numbers in this residence can these (# IN Q. 147) people be reached? (EXCLUDE PHONE NUMBER DIALED)

Number _____
(71-72)

Don't Know	98

150. Please tell me which one of the following racial groups best describes your racial background. Are you . . . (READ LIST SLOWLY. PAUSE BRIEFLY AFTER EACH.)

73-

	White	.	1
SKIP	Black	. .	2
TO	American Indian		3
Q. 152	Asian		4
	Pacific Islander		5
.	Some other group		6

151. To which racial group do you belong?

74-

SKIP	Puerto Rican	1
	Cuban	2
TO	Mexican, Mexicano, Mexican American, or Chicano	3
Q.153	Some other Latin American or Spanish group	4
.	Other (SPECIFY) .	5

152. Now I'm going to read you a list of groups which describes some people's national origin or ancestry. Please tell me if any of these groups is your national origin or ancestry. (READ LIST. STOP AFTER FIRST "YES".)

75-

	Puerto Rican	1
	Cuban	2
	Mexican, Mexicano, Mexican American, or Chicano	3
	Some other Latin American or Spanish group	4
DO NOT READ	None of these groups	5
	Don't Know	8

153. And finally, so that we can group our answers, please tell me into which of the following groups your family's combined income fell in 1978, before taxes. Would that be . . . (READ LIST)

		76-
	Less than $5,000	1
	$5,000 to $10,000	2
	$10,000 to $15,000	3
	$15,000 to $25,000	4
	$25,000 or more	5
DO NOT READ	Don't Know	8

SP. 76-79
END CARD 4   80 - ④

Chilton Research Services	OMB #68R-1663	Study # 8047
Radnor, Pennsylvania	Exp. Sept., 1980	April, 1979

HEALTH PRACTICES AND HEALTH CONSEQUENCES

FINAL VERSION - WAVE 1

Main Questionnaire

Int. # _____

Time Began _____ AM _____ PM

Time Ended _____ AM _____ PM

Q. #	Comments

CHILTON RESEARCH SERVICES
Radnor, Pennsylvania

April, 1979
Study #8047

Interview # _____

HEALTH PRACTICES AND CONSEQUENCES

Verification and Locator Data Sheet

Now, for verification purposes, would you please tell me the area code and telephone number at which I reached you?

BEGIN CARD #5
DUP. COLS. 1-4

_____ _____ _____
(AREA CODE) (EXCHANGE) (NUMBER)
(5-7) (8-10) (11-14)

I would like to make sure I have your phone number down correctly. That was . . .

_____ _____ _____
(AREA CODE) (EXCHANGE) (NUMBER)

INTERVIEWER: MATCH THIS NUMBER AGAINST NUMBER ON SAMPLE SLIP. IF THE TELEPHONE NUMBERS ARE NOT EXACTLY ALIKE, MAKE THE APPROPRIATE CORRECTION ON THE SAMPLE SLIP.

Thank you for your interest and cooperation in this study. In return for your help we would like to send you a free government publication about health. We'd also like to note your name and address because we may need to contact you in a year or so to ask about your health practices and any changes at that time.

So that we can send you the booklet and locate you in the future, could you please tell me your full name and address?

Name: _____   Address: _____
          (15-33)   (34-58)

City: _____   State _____   ZIP _____
          (59-71)   (72-73)   (74-78)
                                          END CARD #5   80 - ⑤

What is the name of the person under whose name your phone number is listed?   DUP 1-4

Name: _____ | Unlisted Number | 97 |
          (5-23)

In case we have any difficulty locating you in a year or so, I'd like to have the name and address of one person not living in your household who would be most likely to know how to reach you. What is the name and address of this person? What is this person's relationship to you?

Name: _____   Address: _____
          (24-42)   (43-67)

City: _____   State _____   ZIP _____
          (67-69)   END CARD #6 80 ⑥ DUP 1-4   (5-6)   (7-11)

Telephone #: _____ _____ _____   Relationship: _____
              (AREA CODE) (EXCHANGE) (NUMBER)   (22-31)

(IF THE ABOVE INFORMATION CANNOT BE OBTAINED, ASK THE FOLLOWING:)

Is there a place other than your home where you could be located, like where you work, a church, or a club?

32-

| Yes | 1 |
| No | 2 |

(IF "YES")

Name of Place: _____ (33-47)

Address: _____ (48-62)   END CARD #7 80 - ⑦ DUP 1-4

City: _____   State: _____   ZIP _____
      (5-17)   (18-19)   (20-24)

Telephone #: _____ _____ _____
              (AREA CODE) (EXCHANGE) (NUMBER)
              (25-27) (28-30) (31-34)

Do you expect to be moving to another residence during the next 12 months?   35-

| Yes | 1 |
| No | 2 |

(IF "YES", GET AS MUCH INFORMATION AS POSSIBLE ABOUT NEW RESIDENCE)

Address _____

City _____   State _____   Zip _____

SP 35-79
END CARD #8
80 - ⑧

Thank you. Have a pleasant day/evening.

APPENDIX 3

TABLES

APPENDIX TABLE 1: MEAN HEALTH STATUS LEVEL BY CONTROL VARIABLES

CONTROL VARIABLE	SELF-RATED HEALTH STATUS		COMPOSITE HEALTH STATUS	
	MEAN SCORE	N	MEAN SCORE	N
SEX				
Male	14.74	1152	4.15	1171
Female	14.43	1180	3.76	1854
	Eta Sq.=.0032**		Eta Sq.=.0173***	
AGE				
20-34	14.82	1290	4.16	1302
35-49	14.68	892	3.98	917
50-64	13.94	780	3.42	806
	Eta sq.=.0190***		Eta sq.=.0428***	
	R=-.1377***		R=-.1983	
INCOME				
<$5,000	12.82	242	3.07	258
$5,000-9,999	13.98	455	3.72	469
$10,000-14,999	14.51	569	3.95	572
$15,000-24,999	14.90	880	4.09	890
$25,000+	15,31	617	4.18	623
	Eta Sq.=.0687***		Eta Sq.=.0452***	
	R=.2536***		R=.1938***	
RACE				
White	14.67	2435	3.94	2478
Non-white	14.01	527	3.76	547
	Eta sq.=.0088***		Eta sq.=.0023**	
EDUCATION				
None	7.50	2	1.00	2
1-4 yrs.	12.18	22	2.78	22
5-6 yrs.	12.57	30	3.03	33
7-8 yrs.	13.21	141	3.29	150
9-11 yrs.	13.56	411	3.59	421
12 yrs.	14.54	1109	3.91	1131
13-15 yrs.	15.11	680	4.03	688
16+ yrs.	15.21	556	4.28	563
	Eta sq.=.0691***		Eta sq.=.0396***	
	R=.2486***		R=.1932***	

**p<.01
***p<.001

APPENDIX TABLE 2:   ZERO-ORDER CORRELATIONS AMONG CONTROL VARIABLES
(PEARSON'S R)

	AGE	SEX*	RACE*	EDUCATION	INCOME
AGE	1.00	.05*	-.07**	-.25**	-.02NS
SEX		1.00	.02	-.25**	-.12**
RACE			1.00	-.08**	-.14**
EDUCATION				1.00	.35**

*SEX: 0=MALE; 1=FEMALE
 RACE: 0=WHITE; 1=NON-WHITE

*P<.01
**P<.001

APPENDIX TABLE 3:   MEAN HEALTH STATUS LEVEL BY SOCIAL
                    NETWORK STRENGTH

NETWORK VARIABLE	NETWORK LEVEL	SELF-RATED HLTH. STAT.		COMPOSITE HLTH. STAT.	
		mean	(n)	mean	(n)
NO. OF CLOSE	0-1	14.00	(402)	3.65	(420)
RELATIVES	2-6	14.51	(1616)	3.94	(1644)
	7-10+	14.86	(949)	3.98	(961)
		Eta Sq=.0104 p<.01		Eta Sq=.0052 p<.001	
NO. OF CLOSE FRIENDS	0	13.25		3.39	(168)
	1	14.04		3.69	(217)
	2-5	14.67		4.04	(1543)
	6-10+	14.68		3.86	(1097)
		Eta Sq=.017 p<.001		Eta Sq=.0130 p<.001	
NETWORK SIZE	0	12.80	(41)	3.22	(41)
	1-2	14.18	(1053)	3.81	(1085)
	8+	14.80	(1859)	3.99	(1885)
		Eta Sq=.0183 p<.001		Eta Sq=.0065 p<.001	
SATISFACTION WITH	YES	14.73	(2412)	3.98	(2462)
NETWORK SIZE	NO	13.86	(490)	3.69	(499)
		Eta sq=.0154 p<.001		Eta sq=.0055 p<.001	
NO. OF FREQUENT	NONE	13.56	(107)	3.39	(111)
CONTACTS	1	13.83	(162)	3.69	(170)
	2-6	14.43	(1347)	3.91	(1375)
	7-10+	14.85	(1337)	3.99	(1357)
		Eta sq=.0158 p<.001		Eta sq=.0071 p<.001	
FREQUENCY OF CONTACT	< ONE	13.57	(228)	3.34	(238)
WITH CLOSE TIES	ONE	14.49	(267)	3.91	(275)
(VISITS/MONTH)	2-3	14.67	(344)	3.96	(349)
	4	14.68	(866)	4.05	(883)
	> 4	14.62	(1213)	3.93	(1232)
		Eta sq=.0120 p<.001		Eta sq=.0150 p<.001	

NETWORK VARIABLE	NETWORK LEVEL	SELF-RATED HLTH. STAT. mean	(n)	COMPOSITE HLTH. STAT. mean	(n)
MARITAL STATUS	MARRIED	14.64	(1942)	3.95	(1980)
	WIDOWED	13.23	(147)	3.32	(155)
	DIVORCED	14.24	(302)	3.67	(308)
	SEPARATED	14.39	(104)	3.71	(108)
	NEV. MARR.	14.83	(466)	4.14	(473)
		Eta sq=.0161 p<.001		Eta sq=.0158 p<.001	
HAPPINESS WITH MARRIAGE	NOT TOO HAPPY	13.82	(73)	3.95	(75)
	PRETTY HAPPY	14.37	(647)	3.88	(661)
	VERY HAPPY	14.84	(1215)	3.98	(1235)
		Eta sq=.0114 p<.001		Eta sq=.0013 NS	
FREQUENCY OF CHURCH ATTENDANCE	Once/week	14.52	(567)	3.92	(578)
	1-3/month	14.45	(692)	3.84	(705)
	<1/month	14.48	(475)	4.02	(489)
	Never	14.64	(1223)	3.90	(1248)
		Eta sq=.0009 NS		Eta sq=.0016 NS	
GROUP PARTICIPATION (DICHOTOMIZED)	None	14.08	(990)	3.73	(1021)
	One or more	14.78	(1972)	4.00	(2004)
		Eta sq=.0152 p<.001		Eta sq=.0074 p<.001	
NO. OF CLOSE PERSONAL TIES	NONE	12.80	(41)	3.22	(41)
	1	13.00	(5)	2.86	(7)
	2-10	14.15	(818)	3.74	(846)
	11-20	14.66	(1087)	4.03	(1100)
	21-30	14.84	(997)	3.95	(1012)
		Eta sq=.0175 p<.001		Eta sq=.0106 p<.001	

NETWORK VARIABLE	NETWORK LEVEL	SELF-RATED HEALTH STATUS		COMPOSITE HEALTH STATUS	
		mean	(n)	mean	(n)
GROUP PARTICIPATION	None	14.10	(990)	3.73	(1021)
(NO. OF DIFFERENT	1	14.61	(857)	3.96	(875)
TYPES OF GROUPS)	2	14.81	(519)	3.97	(530)
	3	15.00	(343)	4.04	(343)
	4	14.99	(168)	4.11	(170)
	5	14.92	(67)	4.18	(67)
		Eta sq=.0173 p<.001		Eta sq=.0082 p<.001	
SOCIABILITY	VERY LOW	13.83	(442)	3.66	(461)
SCORE	LOW	14.36	(187)	3.81	(196)
	MEDIUM	14.57	(890)	4.00	(900)
	HIGH	14.66	(727)	3.97	(738)
	VERY HIGH	14.90	(717)	3.93	(730)
		Eta sq=.0157 p<.001		Eta sq=.0062 p<.001	
BERKMAN'S SOCIAL	1	13.98	(471)	3.71	(487)
NETWORK INDEX	2-5	14.27	(1014)	3.83	(1042)
	6-7	14.87	(605)	4.08	(612)
	8+	14.96	(872)	4.00	(884)
		Eta sq=.0211 p<.001		Eta sq=.0080 p<.001	

APPENDIX TABLE 4: MEAN HEALTH STATUS LEVEL BY TARGET
GROUP MEMBERSHIP

RISK GROUP	RISK STATUS	SELF-RATED HLTH. STAT. mean	(n)	COMPOSITE HLTH. STAT. mean	(n)
UNEMPLOYED	EMPLOYED	14.90	(2060)	4.14	(2090)
	UNEMPLOYED	14.12	(90)	3.83	(100)
		Eta sq=.0047 p<.01		Eta sq=.0024 p<.05	
JOB STRESS	HARDLY ANY	15.01	(575)	4.21	(586)
	SOME	14.94	(970)	4.18	(984)
	GREAT DEAL	14.66	(507)	3.97	(510)
		Eta sq=.0033 p<.05		Eta sq=.0050 p<.01	
BEREAVEMENT	NOT BEREAVED	14.61	(2811)	3.94	(2868)
	BEREAVED	13.37	(150)	3.40	(156)
		Eta sq=.0104 p<.001		Eta sq=.0066 p<.001	
RECENT ILLNESS OR INJURY	NO RECENT ILLNESS	15.01	(2292)	4.18	(2330)
	RECENT ILLNESS	13.00	(660)	3.02	(685)
		Eta sq=.0983 p<.001		Eta sq=.1076 p<.001	
DISABILITY	NOT LIMITED	14.97	(2647)	4.22	(2684)
	SOME LIMITATION	11.00	(315)	1.49	(341)
		Eta sq=.2101 p<.001		Eta sq=.3422 p<.001	
WIDOWHOOD	NOT WIDOWED	14.62	(2814)	3.94	(2869)
	WIDOWED	13.23	(147)	3.32	(155)
		Eta sq=.0127 p<.001		Eta sq=.0086 p<.001	

ELDERLY	ELDERLY	13.67	(242)	3.16	(250)
	NOT ELDERLY	14.62	(2720)	3.98	(2775)
		Eta sq=.0096 p<.001		Eta sq=.0234 p<.001	

SINGLE PARENT	NOT SING. PAR.	14.60	(2577)	3.93	(2631)
	SING. PARENT	14.24	(385)	3.81	(394)
		Eta sq=.0021 p<.05		Eta sq=.0007 NS	

STATUS INCONSISTENCY	NEGATIVE	14.23	(380)	3.72	(390)
	CONSISTENT	14.80	(1050)	3.98	(1069)
	POSITIVE	14.48	(114)	4.14	(117)
		Eta sq=.0086 p<.005		Eta sq=.0070 p<.004	

LOW INCOME	POOR	13.58	(697)	3.48	(727)
	NON-POOR	14.91	(2066)	4.08	(2085)
		Eta sq=.0478 p<.001		Eta sq=.0312 p<.001	

APPENDIX TABLE 5:   VARIANCE OF DEPENDENT VARIABLE IN SUBPOPULATIONS

POPULATION	N	VARIANCE IN SRHS	VARIANCE IN CHS
TOTAL POP.	3025	7.13	2.13
Job Stress	510	6.28	2.00
Unemployed	100	8.77	2.06
Elderly	250	9.28	3.02
Rec. Illness	685	10.96	2.63
Widowed	155	10.96	2.88
Bereaved	156	9.70	2.87
Disabled	341	11.15	--
Low income	727	9.70	2.66
Status Inc.	390	7.45	2.25
Single Parent	394	8.28	2.23
TOTAL NON-TARGET	940	3.76	1.23