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AN EXAMINATION OF THE SOCIAL NETWORKS OF NORMALS AND SCHIZOPHRENICS

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AN EXAMINATION OF THE SOCIAL NETWORKS OF NORMALS AND SCHIZOPHRENICS

By

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ABSTRACT

AN EXAMINATION OF THE SOCIAL NETWORKS OF NORMALS AND SCHIZOPHRENICS

By

Kenneth Lee Carrico, Jr.

The major purpose of this study was the comparison of the social networks of normals and schizophrenics, the goal being identification of psychosocial factors associated with the schizophrenic disorder. The comparison was made along four classes of social network variables: (a) structure, the basic morphological characteristics; (b) content, the nature of shared activities; (c) function, the transaction of support; and (d) emotion, the experiencing of affect. A secondary, yet essential, purpose was the evaluation of the research assumption, conceptually basic to much of the previous research, that self-report data are a sufficient and reliable indicator of the actual status of the social network.

The concepts of schizophrenic withdrawal and isolation represent the theoretical basis of this study. The isolation hypothesis posits that the person becomes schizophrenic as a result of being isolated socially. The withdrawal hypothesis posits that as the schizophrenic disorder progresses, the affected person becomes withdrawn. Support was found in the review to substantiate social withdrawal and isolation as interacting and reciprocal.

The normal sample was composed of 18 subjects and the schizophrenic sample, of 17 subjects. All subjects were aged between 18 and 40 years and were living with family. Selection of the subjects was designed to promote comparability along those dimensions that affect outcome (age, sex, race, socioeconomic status, and cultural background), yet insure the identification of appropriate subjects from both populations. Notably, the schizophrenic sample was characterized as willing to participate.

The methodology of the study consisted of two phases, the corroboration of self-report data within both samples and the comparison between the two samples along 16 social network variables. In both phases, the analyses were implemented through the use of multivariate and post hoc univariate statistical procedures.

In the first phase, as the self-report of both samples was not adequately corroborated, the conclusion was drawn that self-report data are an insufficient, possibly inaccurate, and unreliable source of information in social network analysis. This conclusion seriously challenges the assumption made by previous researchers who viewed self-report as sufficient and reliable. Furthermore, the conclusion was drawn that the schizophrenic's perception of social relationships was as reliable as the perception of the normal--a startling conclusion. Having far-reaching implications, evidence was also found to support the contention that the lack of reliability of self-report measures limited the power of the statistical tests to make comparisons between the two groups. In line with these findings, the conclusion was drawn that the self-report data represent solely the perceptions

of the subjects regarding their social networks, not the actual status of the social networks.

In the second phase, the comparison between the social networks of the normals and schizophrenics, significant differences were found in relation to only two network variables, perceived network size and reciprocity. Both results are in line with previous research. The mean perceived network sizes of the social networks of normals and schizophrenics were found to be 36.23 and 12.65, respectively, implying that the schizophrenics perceive themselves surrounded by fewer "important" persons. In terms of reciprocity, the conclusion was drawn that normals perceived their relationships as reciprocal in terms of support, whereas schizophrenics perceived their relationships as lacking in reciprocity, placing the schizophrenic in a dependent position in his/her self-perception. The presence of significant findings along only 2 of 16 variables provided weak support for the hypotheses of withdrawal and isolation. Furthermore, the relative lack of significant differences challenged two consistent findings in previous studies, namely, fewer multiplex relations and negative emotional perception in the social network of the schizophrenic.

DEDICATION

To my social network, in the context of which I came into existence and evolved as a human being. But especially my parents, the true cornerstones of my personality, to whom I owe my creation, preservation, and foundation--debts never paid, yet never outstanding. And my wife, Joanne, the sunshine of my life, for her emotional support, unswerving confidence, and all the love one man could imagine. And my children, Dianna, Katherine, and Kenneth III, the radiant stars of my life, ever propelling from me, yet forever close to my heart. And my granny, whose divine love, grasp of spiritual truths, and faith in God quickened in me a quest for knowledge and truth and instilled in me, like three granite columns, faith in others, my Self, and God. And last, Dr. Peter L. Giovacchini, my analyst, who freed me from inner shackles and burdens, enabling the exquisite realization of two major life goals, my marriage and the completion of my Ph.D.

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The support of several institutions providing research sites for the study was essential for the completion of the research. I am foremost indebted to Dr. Karl Willrich, Director of Adult Programs, and Dr. Truman G. Esau, Medical Director, of Old Orchard Hospital who wholeheartedly endorsed the research and continually supported my efforts throughout the months of data collection. Notably, Dr. Karl Willrich introduced this researcher to the clinical relevance of the

family and social network, providing the initial impetus for the direction of this research project and a strong formative influence on my professional development. I would also like to recognize the following persons in that they were the primary representatives of the other participating institutions: Dr. Charles E. Turk, Medical Director, and Doris L. Lefley, Program Coordinator, of the Day Treatment Center at the Elk Grove/Schaumburg Townships Mental Health Center; Dr. Anthony M. D'Agostino, Chairman of the Department of Psychiatry and Medical Director of the Mental Health Unit and Alcohol Treatment Center, and Sandra L. Spencer, Head Nurse, of the Niehoff Pavillion at the Alexian Brothers Medical Center; and Dr. Edward J. Baranowski, Executive Director, and Mr. Sheldon Gross, Director of the Day Care Program, at the Main Center for Mental Health.

I am, of course, deeply indebted to the direct participants in my research, namely the subjects, who shared their time and lives in the continuing pursuit of scientific knowledge.

My employer, the Elk Grove/Schaumburg Townships Mental Health Center, supported without question or equivocation the completion of this project. The administrative and clinical staff were encouraging and responsive to my needs for flexible scheduling, and unpredictable and extended leave. I am particularly indebted to the members of the Crisis/Emergency Team: Program Coordinator, Richard S. Bloom, A.C.S.W.; and staff members, Florence Anderson, Robert J. Dziewior, Denise Elliot, and Stephen Jzaska. These persons shared extra burdens and responsibilities during my absences and endured by psychological aches and pains.

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I owe special gratitude to a very warm and committed friend, John E. Laycock. As this document was completed out-of-state, necessitating several commuting trips from Chicago, John repeatedly opened his home without hesitation. He endured the unpredictability of last-minute planning and cancellations, late arrivals, scheduling conflicts, and precipitous departures. His hospitality and friendship were, and are, of the highest quality. God's speed is wished to him in his new endeavor, training for the priesthood.

Finally, I salute my wife and children, who dutifully endured the many emotional and financial privations in our family life to support my work and my need for solitude. Their patience and determination were sources of inspiration for me. Indeed, their task was as demanding as mine.

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CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

The phenomenon of schizophrenia has long perplexed researchers. Attempts have been made to relate its occurrence with various factors such as genetics, physiology, body chemistry, individual dynamics, family process, and sociocultural influences. Each viewpoint has had a degree of explanatory power and heuristic value; all, perhaps, have shed light on the genesis/process of the schizophrenic disorder. Accordingly, multitudes of theories have evolved out of the research, making integration of the work a massive and seemingly endless process.

In the present study, which focuses on the psychosocial aspects of schizophrenia, a new concept and methodology developed in the field of social anthropology will be used which shows promise in providing a unifying framework for the psychological and social theories: social network analysis. Social network analysis allows for the quantification and assessment of differing levels of conceptualization, e.g., the personal, the familial, and the sociocultural; thus, the effects of all investigated levels are recognized, permitting further integration.

Statement of the Problem

Previous investigations of the social networks of schizophrenics have demonstrated relationships between social network variables and the schizophrenic, suggesting associations between psychosocial factors and the schizophrenic disorder. Inchoative trends in the research suggest that the social network of the schizophrenic tends to be smaller than that of the normal, nonpsychotic control. Additionally, the relationships of the schizophrenic appear to be characterized more by a lack of reciprocity (in particular, the schizophrenic being in a dependent position) and a limited range of activities compared to the control. Interpretations made from these results point out that the schizophrenic appears to have a less unified and realistically smaller system of social resources than the control. Furthermore, being that this person is predominantly the dependent party in the social network, this small network may be quite taxed to support this person. Last, assuming that quality of relationships is related to the range of activities shared, it would appear that the relationships of the schizophrenic are less satisfying and enriching than those of the control.

Although these investigations appear quite promising, the findings are far from being conclusive because of frequent and notable inconsistencies in the results and the presence of a serious conceptual error in the studies. The inconsistencies in the results prohibit a strict relating of the specific, discrete social factors to the schizophrenic disorder. An examination of the literature suggests that the overall lack of concordance in the studies is related to the

following considerations: (a) inadequate sample descriptions and differing populations, (b) differences in conceptualization and operationalization of variables, (c) differing conceptualizations of the social network under study, and (d) inconsistencies in the reported data. Furthermore, a serious conceptual error calls the findings into question. The assumption was made in three of the four pivotal studies that the subjects' subjective analysis of the status of their social network, i.e., the self-report data, was equivalent to the actual status of the network. The investigators may have only been interested in their subjects' perceptions (and such would be quite important clinically), but inferences were drawn unequivocally to the social network, as if self-report was indeed factual. Attempts were not made to corroborate the reported data with more objective measures or with reports of others in the network. Thus, the validity of the results lacks credibility.

Purpose of the Study

The major purpose of this research study is to compare the social networks of normals and schizophrenics, the goal being identification of psychosocial factors that appear to be associated with the schizophrenic disorder. In this study, the two groups, normal and schizophrenic, will be compared along four major classes of variables pertaining to social networks and relationships: structure, content, function, and emotion. The structure-related variables convey the basic morphological characteristics of the social network. The content-related variables convey aspects of the content of the social

relationship, i.e., the types of shared activities. The function-related variables reflect the transaction of support. And last, the emotion-related variables assess the experiencing of affect in the social network.

Also, a secondary purpose of the study is to evaluate the research assumption, conceptually basic to much of the previous research, that self-report is a sufficient and accurate indicator of the actual status of the social network. To accomplish this task, the self-report of five normal and five schizophrenic subjects will be compared with the report of at least four of their network members on the status of the shared relationship to corroborate the data and obtain some estimation/measures associated with validity. This assessment will be carried out prior to the main analysis as the meaningfulness of the results depends upon it. If it is determined that the self-report data are not truly representative of the actual status of the social network, then the statistical results of the main analysis will not be examined in relation to their more interactional and sociological meaning, but rather to their strictly clinical significance, since the observations do not correspond to a reality based on consensus.

Definitions

General Definitions

Family of origin. A social unit composed of maternal and/or paternal figure, and their offspring and/or stepchildren only, in which the focal person is an offspring or stepchild.

Focal person. The individual who is considered to be the focus or point of origin for the analysis of a social network within this study: The focal person is the subject, unless otherwise noted.

In the fields of sociology and social anthropology, the term "ego" is traditionally used to designate this focal person. General usage of the term "ego" differs significantly from this formal definition and is associated with psychoanalytic theory. Thus, the term "ego" was not chosen for usage in this research, as this study is expected to have wide applicability and value outside the professional boundaries of these two fields. Accordingly, to avoid initial confusion with the more usual psychoanalytic usage of the term "ego" and possibly later specious connotations, the term "focal person" is being used.

Kin or kinship system. Individuals related by blood or marriage.

Nuclear family. A social unit composed of a maternal and/or paternal figure, and their offspring and/or stepchildren only, in which the focal person is a parent or stepparent.

Primary star. Those relationships (linkages in the social network) that exist solely between the focal person and his/her social network; interrelationships among the network members are thus excluded.

Schizophrenic disorders. The group of disorders that share the following essential characteristics as outlined by the American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, III (1980):

1. presence of certain psychotic symptoms during the active phase of the illness, e.g., delusions, hallucinations, poverty of and/or loosening of associations;
2. deterioration from a previous level of functioning in social relations, self-care, and at work;
3. characteristic symptoms involving multiple psychological processes including disruptions in content and form of thought, perception, affect, identity, volition, relationship to the external world, and psychomotor behavior;
4. onset before age 45; and
5. duration of at least 6 months.

(You are referred to the manual for an extensive discussion of the disorders.) No differentiation relative to subtype was made.

Social network. Those individuals with whom the focal person has an important personal relationship as defined by the focal person, whether positive or negative in nature, with nuclear family, family of origin, other blood relatives, relatives by marriage, friends, neighbors, associates at church, work, school, etc. The usual definition of social network in the field of social anthropology applies to a larger matrix of interrelated individuals. The given definition strictly applies to a personal network or what is termed "immediate network."

Definitions Referring to Structure

Adjacent density. This index refers to the proportion of linkages (relationships) in the network to the possible number of linkages in the given network.

Interconnectedness. Interconnectedness refers to the relationships that exist within the social network, including but beyond those of the primary star. The index, adjacent density, assesses this structure-related quality.

Structure-related variables. These variables convey the basic morphological characteristics of the social network. The four structure-related variables are size of the network, frequency of contact, distance between the focal person and network members, and adjacent density.

Definitions Referring to Content

Content-related variables. These variables convey the content of the relationship between the focal person and the social network (actually the primary star). In this study, content is strictly defined as type of activity. Ten content-related categories (types of activities) were selected with the intent of assuring that the areas were inclusive of most activities: family, employment, romantic, conversational, social, recreational, fraternal, religious, political, and volunteer activities. The content of the relationship (the types of activities that characterize a relationship) is presumed to be associated with quality within the relationship.

Multiplex relationship. A content-related variable characterizing a relationship of more than one type of content, i.e., where the focal person and the network member share more than one type of activity.

Relationship density. A content-related variable expressing the intensity and quality of relationships in the primary star of the social network, i.e., solely between the focal person and network members. (Note: The content of the other relationships within the social network is not assessed, since the information would not be considered reliable unless the others were examined.)

Uniplex relationship. A content-related variable characterizing a relationship of only one type of content, i.e., where the focal person and the network member participate in only one type of activity.

Definitions Referring to Function

Functional directionality. A quality of the functioning of a social network that refers to the direction in which support flows between the focal person and another in the social network. If support goes in equal measure between the focal person and the network member, then the relationship is reciprocal and thus is characterized by functional symmetry. If the support goes in unequal measure between the two, then the relationship is functionally asymmetrical.

Functional indegree. A function-related variable indicating the degree to which functions are being served for the focal person by a

network member, i.e., the support the focal person is receiving. The usage of this term is to be distinguished from the term as used by Tolsdorf (1976), which refers to the number of functions served for the focal person.

Functional outdegree. A function-related variable indicating the degree to which the focal person is serving functions for a network member, i.e., the support the focal person is providing for the network member. The usage of this term is also to be distinguished from the term as used by Tolsdorf (1976), which refers to the number of functions that the focal person serves for the network member.

Definitions Referring to Emotion

Affective directionality. A quality of the emotion-related variables that refers to the direction of the emotion experienced between the focal person and the network member. If the type of emotion between the focal person and the network member is identical, then the relationship is reciprocal and thus is characterized by affective symmetry. If the type of emotion between the two varies, then the relationship is characterized by affective asymmetry.

Affective indegree. An emotion-related variable indicating the types of feelings a network member experiences for the focal person as perceived by the focal person. The range extends from all negative to all positive feelings.

Affective outdegree. An emotion-related variable indicating the types of feelings experienced by the focal person for a network member. The range extends from all negative to all positive feelings.

Investment directionality. A quality of the emotion-related variables that refers to the direction of the emotional investment (literally, the strength of the emotion) between the focal person and the network member. If the strength of the emotions experienced by the focal person and the network member is equal, then the relationship is reciprocal for strength of emotion, and thus is characterized by investment symmetry. If the emotional investment varies between the two, then the relationship is characterized by investment asymmetry.

Investment indegree. An emotion-related variable reflecting the strength of feelings (emotional investment) experienced by the network member for the focal person as perceived by the focal person. The range extends from weak to very strong feelings.

Investment outdegree. An emotion-related variable reflecting the strength of feelings (emotional investment) experienced by the focal person for a network member. The range extends from weak to very strong feelings.

Major Hypotheses

The research study is intended to be an exploration of the interpersonal and social processes operating in the schizophrenic disorder. The specific goal is to isolate those properties that distinguish the social networks of the schizophrenic person from the social networks of the normal person. The four major hypotheses (grouped by primary area) that identify the avenues of focus follow:

In terms of the structure-related or morphological variables, the social network of the schizophrenic person, as opposed to the normal person, tends to be characterized by the following properties:

a. Fewer network members; specifically, it is hypothesized that the social network of the schizophrenic person is smaller than the social network of the normal person.

b. A lesser proportion of interrelationships among network members (less interconnectedness); specifically, it is hypothesized that the social network of the schizophrenic person is less interconnected than the social network of the normal person.

c. A lower average distance between the focal person and the network members; specifically, it is hypothesized that within the social network, the members live closer to the schizophrenic person than the members of the social network of the normal person.

d. A relatively higher frequency of contact with the focal person; specifically, the schizophrenic person tends to have more contact per person with the network members than the normal person.

In terms of the content-related variables (those dealing with the nature of shared activities), the social network of the schizophrenic person, as opposed to the normal person, tends to be characterized by the following properties:

e. A greater proportion of relationships in which only one activity is shared (proportionately more uniplex relationships); specifically, it is hypothesized that the schizophrenic person tends to have relatively more relationships than the normal person in which only one type of activity is shared within the dyad.

f. A smaller proportion of relationships in which more than one activity is shared (proportionally fewer multiplex relationships); specifically, it is hypothesized that the schizophrenic person tends to have relatively fewer relationships than the normal person in which two or more activities are shared within the dyad.

g. A relatively smaller proportion of shared activities per person (less relationship density); specifically, it is hypothesized that the schizophrenic person tends to share fewer activities per member of the social network than the normal person.

In terms of the function-related variables (those dealing with the transaction of support within the social network), the social network of the schizophrenic person, as opposed to the normal person, tends to be characterized by the following properties:

h. A greater degree of support provided by network members to the focal person (more functional indegree); specifically, it is hypothesized that the schizophrenic person tends to receive more support per person from network members than the normal person.

i. A smaller degree of support provided by the focal person for network members (less functional outdegree); specifically, it is hypothesized that the schizophrenic person tends to give less support per person to network members than the normal person.

j. A lack of reciprocity (functional asymmetry); it is hypothesized that whereas the normal person and the network members tend to give and receive in equal measure, the schizophrenic person tends to receive more from the network members than he/she gives them; i.e., the schizophrenic person tends to be dependent in relationships.

In terms of the emotion-related variables, broken down into two major categories, affective and investment areas, the social network of the schizophrenic person, as opposed to the normal person, tends to be characterized by the following properties:

k. A lesser degree of positive feelings from network members for the focal person (less affective indegree); specifically, it is hypothesized that the network members of the schizophrenic person feel more negatively toward the schizophrenic person than the network members of the normal person toward the normal person.

l. A lesser degree of positive feelings from the focal person for the network members (less affective outdegree); specifically, it is hypothesized that the schizophrenic person feels more negatively toward the network members than the normal person does.

m. Affective asymmetry; specifically, it is hypothesized that whereas the normal person and the network members tend to feel similarly toward one another, the schizophrenic person tends to feel more negatively toward the network members than they toward him.

n. A greater degree of emotional investment of network members in the focal person (more investment indegree); specifically, it is hypothesized that the network members of the schizophrenic person are more invested in the schizophrenic person than are the network members of the normal person in the normal person.

o. A lesser degree of emotional investment of the focal person in network members (less investment outdegree); specifically, it is hypothesized that the schizophrenic person is less invested emotionally in the network members than is the normal person.

p. Investment asymmetry; specifically, whereas the normal person and the network members tend to be similarly invested in one another, the schizophrenic person tends to be less invested in the network members than they in him.

Before this analysis can be undertaken, the data from the subjects' self-report must be examined to determine if they are in actuality an accurate and sufficiently representative indicator of the functioning of the social network. The following research hypothesis is posited:

> Self-report on the status of the social network is adequately corroborated on all designated measures by reports of the network members in both samples: normal and schizophrenic subjects.

If the above hypothesis is not confirmed, then the following research hypothesis is posited:

> The difference between the self-report of the schizophrenic subject and the network members is larger than the difference between the self-report of the normal subject and the network members.

Overview

In the review of the literature, the following topics are covered in a selective fashion to examine only those aspects relevant to the purpose of this study, the social network analysis of normals and schizophrenics: (a) importance of the study, (b) social network analysis, (c) theoretical perspective--the concepts of schizophrenic withdrawal and isolation, (d) key variables, (e) importance of the social network to the schizophrenic disorder, and (f) relationships between social network variables and psychopathology, in general, and the schizophrenic disorder, in particular. The extremely disrupting

effect of the schizophrenic disorder upon the individual and society is reviewed to demonstrate the general importance of the study. Social network analysis is reviewed in terms of its history and development, a point of controversy, and differing and interrelated conceptualizations. Specifically, the review of history and development indicates how the concept of the social network initially emerged as a metaphor in the research to later develop into an analytical tool of wide applicability and value; the review of one controversial point indicates that social networks have been viewed by some as "informal residuals" unworthy of study, but by others as the key to a new and important type of methodology in social science; and the review of differing conceptualizations provides descriptions of the different perspectives present in social network analysis. The review and discussion of schizophrenic withdrawal and isolation is used to develop a theoretical perspective of how the schizophrenic disorder is associated with the social network. Based on this theoretical framework, the review of the key variables provides an understanding of their psychological and social implications which is crucial to the analysis and interpretation of the results of the study. In the next section, general importance of the social network to the schizophrenic disorder, the components of the social network, i.e., mother, father, family, extended family, and significant others, are reviewed to demonstrate possible relationships to the schizophrenic disorder and to examine the nature of those influences, thereby contributing to the understanding of the role of the social network. The research investigating relationships between social network variables and

psychopathology, in general, and the schizophrenic disorder, in particular, is reviewed to demonstrate the presence of associations between social factors, and psychopathology and the schizophrenic disorder, to identify the sources of inconsistency and potential lack of credibility in the related studies, and last, to suggest alternative, corrective methodologies.

General Importance of the Study

The schizophrenic disorder is a worthy area of study because of its extremely disrupting impact upon the affected individual and society. Generally, the schizophrenic disorder is recognized as the most severe and debilitating psychopathological disorder. Day and Semrad (1978) advanced the following:

> The schizophrenic reactions are a group of diseases that cause massive disruptions of thinking, mood, sensorimotor functioning, and behavior; they lie at the most severe end of the spectrum of psychopathology. Schizophrenics show a greater degree of disturbance in intrapsychic function, character structure, and interpersonal relationships than patients suffering from any other disorder. (p. 199)

Arieti (1974) considered the disorder to be a psychosis which, in his opinion, is generally accepted as a "severe or major psychiatric disorder" (p. 4). Reid (1975) stated regarding the schizophrenic disorder, "It is often catastrophic in effect, taking its toll during the most productive years of an individual's life" (p. 299).

Not only is the schizophrenic disorder a serious psychiatric problem for the affected individual, but it is also a critical concern of major proportions societally. In 1969, Ullman and Krasner found that the schizophrenic reactions compose the largest group of the

psychoses. Furthermore, they stated, "At the present time roughly 20 percent of all first admissions to psychiatric hospitals are categorized as schizophrenic. Even more important, roughly half of all patients remaining in psychiatric hospitals are diagnosed as schizophrenic" (pp. 356-357). Reid (1975) reported that approximately 1% of the general population will be diagnosed as schizophrenic at least once during their lifetime. In terms of incidence, Day and Semrad (1978) in their review found that approximately 92,450 to 148,350 new cases appear each year, and that between 494,500 and 1,010,500 are in treatment for a schizophrenic disorder annually in the United States. Last, they stated, "The total direct and indirect cost of the schizophrenic disorder to the United States is estimated to be $14 billion annually" (p. 207).

Social Network Analysis

History and Development

Social network analysis was developed in the field of social anthropology as a methodology for the study of social relationships (Hammer, Makiesky-Barrow, & Gutwirth, 1978; Whitten & Wolfe, 1973). During the initial stages when the concept of social network was used primarily as a metaphor, Hammer et al. (1978) noted that the social network generally referred to "interpersonal relationships which crosscut the well-defined groups and sectors of pre-industrial societies, giving a measure of integration or cohesion to otherwise discrete segments" (p. 523). At this point, the fields of sociology and anthropology were oriented toward the investigation of more formal

and well-defined groups than those determined by interpersonal processes. Later, as interest grew, social network analysis evolved into a more analytical tool of research which has been applied to a wide range of social phenomena and problems, demonstrating its value and applicability, e.g., conjugal roles (Bott, 1955/1977; 1957), political movements (Gerlach & Hine, 1970), medical practices (Coleman, Katz, & Menzel, 1957), etc. (You are referred to the articles by Hammer et al., 1978, and Whitten & Wolfe, 1973, for a more extensive review.)

A Point of Controversy

Throughout its early development, a controversy raged over the relevance and importance of the social network concept (as the earlier paragraph--above--might suggest). In examining the literature, Whitten and Wolfe (1973) identified a dominant trend toward perceiving social networks as "*residual*--the relationships that remain after the major structural relationships are dealt with" (p. 722). Essentially, social relationships were not seen as important social phenomena worthy of study, but rather as links or connections to fill the voids between the formal units of social structure. The work of Barnes (1954), Redfield (1956), Wolf (1966), and Boissevain (1968) were quoted to identify this viewpoint. Other researchers, particularly Mayer (1962, 1966), Mitchell (1969), and Gutkind (1965), tended to regard the social network as a singularly important concept, allowing for the integration of personal, social, and cultural variables, documenting their independent action and interplay.

Conceptual Bases

Although social networks tend to be recognized now as both focal and important, there is a great deal of variance among researchers as how to proceed in the analysis of networks. Researchers' conceptualizations tend to be based on the focus and needs of their research. Five notable types of conceptualizations, relevant to the present study, are reviewed below based on the following methods of categorization: (a) set theory applied to categories of relationships, (b) levels of linkage to the focal person, (c) zones of intimacy in relationships, (d) the objective and subjective nature/perception of networks, and (e) clinical relevance of relationships. Each contributes to a different perspective on the composition of social networks.

One type of conceptualization is based on the categorization of relationships in the social network by set theory. Wolfe (1970), for example, has developed a "taxonomy of network concepts," based on the structure and process operating within the social network. In his schema, networks are first divided as to whether they are seen as limited or unlimited. Limited networks are considered a subsection to the total (unlimited) network and are based on some criterion applicable throughout the total network. Five types of limited networks were described: (a) the personal set, limited to the links of one person; (b) the categorical set, limited to links involving persons of certain type of category; (c) the action set, limited to links purposefully used for a specific end; (d) the role-system set, limited to links involving a certain role system; and finally (e) the

field set, limited to links with certain content. The unlimited network was conceived of without limiting criteria, and could be expanded to include villages, societies, continents, etc. Thus Wolfe's system is based on categorical arrangements within limited or unlimited sets.

Hammer et al. (1978) distinguished among three linkage levels or orders of an individual's social network:

> The *immediate* or *personal network* consists of the connections linking a given individual with others and the connections linking those individuals with each other;
> The initial individual's *second order network* consists of the connections linking the members of the immediate network with *their* immediate networks; and
> The *extended network* includes the further connections linking these sets of individuals into larger populations. (p. 524)

Thus Hammer and her associates have developed a system which is keyed into the structure of the social network.

Another type of conceptualization is based on zones of intimacy and subjective importance in relationships. Boissevain (1974) has articulated six levels or zones which radiate conceptually around the focal person in concentric circles, constituting the person's first order zone: The lower the number of the zone, the more intimate and subjectively important are the persons to the focal person. The first level, the personal cell, hypothetically contains the closest relatives, such as one's nuclear family or family of origin, and a few of the most intimate friends: Within the personal cell, the contact and interaction is usually regular, frequent, and intense. The second level, intimate zone A, is composed of very close relatives and friends in which active contact and interaction are

maintained. The third level, intimate zone B, consists of friends, relatives, neighbors, and perhaps, co-workers who are emotionally significant to the focal person, but the relations are more passive than in intimate zone A. The fourth level, the effective zone, is composed of those who are important "in a more pragmatic sense for economic and political purposes and the logistics of daily life" (p. 47). These relationships are maintained warm and congenial because the focal person desires access to his/her friends for strategic reasons; thus, their importance is based on instrumental, rather than emotional, importance. The fifth level, the nominal zone, contains persons who mean little to the focal person emotionally and instrumentally, simply acquaintances. The names and faces of these persons may be uncertain to the focal person. The sixth level, the extended zone, is composed of those forgotten where recall would need to be prompted. In conclusion, Boissevain noted, "Placement in these zones is continually shifting: just as the transactional and emotional balance in them is constantly shifting. From this perspective a person's network is a fluid, shifting concept" (p. 48).

The objective and subjective nature of the social network, which relates directly to analysis, is another way of conceptualizing. Pattison (1977) described this method of dichotomizing the content of a network. According to this approach, the objective network is defined by the specific goal/purpose of the researcher, and this network could be observed. For example, a work network is composed only of those observed at work or a political network is composed of only those observed or recorded as participating in a political campaign.

On the other hand, the subjective network can be only defined by the focal person, as guided (not defined) by the criteria of the researcher. As indicated by Pattison, the subjective network may include parts of objective networks, e.g., family network, work network, friend network, etc.

The fifth type of conceptualization relates to the composition of the social network in terms of the clinical relevancy of relationships. To this end, Pattison, de Francisco, Wood, Frazier, and Crowder (1975) have defined a social network called the psychosocial kinship system. Through their review, they supported the conclusion that the American family is surrounded by a significant extended kinship system composed of blood/marriage-related family and/or functional kin (those who respond interpersonally as family) of friends, neighbors, work associates, and others. Furthermore, they suggested that this identified social group, not the family, is the basic and important social system and accordingly, is associated with the individual's functioning. (Unfortunately, Pattison et al. did not distinguish by title between the total group of the extended kinship referred to above and the potential subgroup defined by meaningfulness and psychodynamic importance described below, as both are called the psychosocial kinship system.) In relation to the significant extended kinship system, they concluded that

> (1) the psychosocial system does exist, (2) it exerts both positive and negative sanctions and supports on the nuclear family and the individual, and (3) it is a fundamental social matrix that may prove to be either pathological or helpful and therapeutic. (p. 1248)

Yet Pattison and his associates (1975) were not only interested in investigating this social group, but also those within this group, and perhaps, a group beyond it, who are meaningful to the individuals. They stated,

> Social psychologists have found that affinity by mere blood or marriage does not define meaningful kin relationships and that a causal definition of friend, neighbor, or work associate does not define a significant psychodynamic relationship. (p. 1248)

The clinical relevance of the "psychosocial kinship system," the object of their study, was not only grounded in the social significance of the network of family, relatives, friends, and various associates, but in the psychodynamic significance these persons might have. In the article, Pattison et al. stated the following:

> Our aim is to determine the *psychodynamic* social system that comprises the primary social matrix of the individual. The people in this matrix are related to the individual on the basis of interaction and valued importance. Thus the relationships in the matrix are determined by social and psychological variables. Further, this social matrix represents the functional kin group of the individual. Thus we term it the psychosocial kinship system. (pp. 1248-1249)

In his personal communication, Pattison (1979, 1980) took an additional step of inference. He argued that if the focal person has a cathexis to another person (analytically speaking), then a linkage exists in the psychosocial kinship system; thus, the interactional or social component may be negligible or nonexistent. For this reason, a network member may not necessarily be alive or have ever interacted socially with the focal person, so long as the network member be psychically alive. That is why he prefixed the term with "psycho-," indicating the psychological component and indexing its importance.

The social network conceptualization to be used in the present study, chosen for its clinical importance, is the psychosocial kinship system as articulated by Pattison and his associates (1975). Contrasting this perspective with the other conceptualizations of the social network, the psychosocial kinship system appears to be a subjective network (Pattison, 1977), a product of the first four zones of intimacy (Boissevain, 1974), a subgroup of the immediate or personal network (Hammer et al., 1978) since the network consists of connections linking the focal person with others and connections linking the network members to each other, and in terms of structure, a limited personal set as only one focal person per network exists (Wolfe, 1970).

Schizophrenic Isolation and Withdrawal: A Theoretical Perspective

The two hypotheses of schizophrenic isolation and withdrawal constitute the basic theoretical perspective for the present study. All of the social network variables can be interepreted in light of these two hypotheses. In the following section of this chapter, Principal Network Variables, the social network variables are examined in relation to these hypotheses generally. Other more discrete and measurable influences that appear to be associated with these hypothesized phenomena of isolation and withdrawal, and that have been found to be related to the variables under study, are also examined.

The hypotheses of schizophrenic isolation and withdrawal have two basically differing but interrelated interpretations. The isolation hypothesis posits that as a result of becoming isolated socially,

either the person becomes schizophrenic (a strict etiological interpretation) or the person at high risk of schizophrenia tends to develop this serious disturbance. This latter interpretation tends to be supported by a related and complementary hypothesis termed the social support hypothesis, which suggests that the presence and support of the social network is instrumental in preventing the occurrence of a psychotic break and maintaining the schizophrenic without further and recurring episodes (Beck, 1978; Cobb, 1976). The withdrawal hypothesis posits that as the disorder progresses, the affected person tends to become withdrawn; i.e., an essential characteristic of the schizophrenic disorder is the withdrawal from society. Each of these propositions appears to be the converse of the other: The former states that the schizophrenic condition arises or is precipitated by the social phenomenon of isolation, while the latter states that with the onset of the condition, the schizophrenic withdraws and the social phenomenon of isolation evolves. To more clearly understand the nature of these two influences of isolation and withdrawal, and the impact they may theoretically have on the schizophrenic and the social network of the schizophrenic, they are reviewed below.

The Isolation Hypothesis

The isolation hypothesis initially emerged as an etiological theory, but very little empirical support was found; however, isolation as a general social influence precipitating the schizophrenic disorder has received support. Faris (1934) appears to have originated the concept, stating that

> Data from various sources appear to support the hypothesis that the "shut-in" or "seclusive" personality, which is generally considered to be the basis of schizophrenia, may be the result of an extended period of "cultural isolation," that is, separation from intimate and sympathetic social contacts. (p. 155)

His evidence, in general, was based on two sets of impressionistic findings: (a) the characteristic seclusiveness in the schizophrenic disorder, and (b) anthropological findings relating the isolation phenomenon to schizoid symptomatology. Kohn and Clausen (1955) attempted to test the isolation hypothesis using the strict etiological interpretation. Their data, focusing on the adolescent years, were based on the retrospective impression of former, recovered patients. As only one-third of the patients reported a period of isolation in their adolescence, they wrote, "Our general conclusion must be, then, that for the group here studied the data do not support the hypothesis that social isolation in adolescence is a predisposing factor in either schizophrenia or manic-depressive psychosis" (p. 272). The etiological hypothesis was thus rejected. The investigators interpreted that the social isolation was a result of inadequacies in social relationships eventuating in alienation from peers: They stated, "Thus, in terms of process, social isolation is to be viewed as a sign that the individual's interpersonal difficulties have become so great that he is no longer capable of functioning in interpersonal relationships" (p. 273). This latter conclusion is more in line with the withdrawal hypothesis. However, a year earlier in an epidemiological study, Jaco (1954) interpreted the hypothesis in a less strict fashion as a general influence operating socially. He predicted that

the incidence of the schizophrenic disorder would be higher in areas characterized by more interpersonal isolation. His findings, based on 13 variables which relate to network size and degree of social contact (as well as employment stability and degree of mobility), tended to support his interpretation of the isolation hypothesis. Further, Jaco inferred that isolation acted as a precipitating factor. Thus the research does not support a strict etiological interpretation of the isolation hypothesis; however, an interpretation supporting a relative degree of social isolation as instrumental in the process of the disorder appears tenable.

The related hypothesis focusing on the relationship between social support (loosely related to network size; i.e., with fewer network members available, less support is possible) and the schizophrenic disorder seems to support this conclusion that isolation may act as a precipitant, and for that matter, affect the course and outcome of the disorder. Day and Semrad (1978) have observed the type of onset apparently associated with a chronic developing pattern. They described the type of individual, at high risk for schizophrenia, who nonetheless has been able to cope with his/her needs and with society. Their gradual deterioration has been masked by a significant dependent relationship where the inadequacies and needs were met. With the loss of this person or persons, the deterioration becomes evident. In general, the work of Birley and Brown (1970), Jacobs and Myers (1976), and Jaco (1970) which focuses on stress and social support tends to substantiate these observations. The support role of the social network relative to course and outcome of the

schizophrenic disorder is discussed later in this chapter. (See section, General Importance of the Social Network to Schizophrenia.) Therefore, it appears that we can conclude that the degree of isolation is associated with the onset, course, and outcome of the disorder.

The Withdrawal Hypothesis

Support for the withdrawal hypothesis consists of extensive clinical observations and theoretical formulations. The withdrawal of the schizophrenic person has been observed through the centuries, but Freud (1914/1956) was the first to attempt a coherent explanation dynamically. Basically, he viewed the schizophrenic withdrawal process as mentally endogenous and representative of narcissistic regression. He expressed the view that the essential characteristic of schizophrenia was the change in relationship with people. In Freudian terminology, the schizophrenic person has withdrawn the libidinal cathexes from others and returns to a state of primary narcissism, totally withdrawn from others and cut off from social contact. According to Fenichel (1945/1972), current analytic thought does not accept such a pessimistic position, although the concept of narcissistic regression is still accepted. In his opinion, the schizophrenic can connect due to the presence of "residues of reality relationships" and "the patient's spontaneous attempts at recovery" (p. 447); therefore, the "retreat from society" is never really complete. Other interpretations are reviewed by Arieti (1974): Fairbairn (1952) interpreted the withdrawal as an escape from inner bad objects

as they are projected on society; Szasz (1957), as an expression of an inner deficiency of preexisting objects which prohibits or limits future interpersonal functioning; Becker (1962), as a deficiency of external objects, in that the person has been unable to find responses which reduce problematic situations into habits, and resultingly, develop meanings that will generalize into other interpersonal situations; Sullivan (1953, 1962), as a consequence of unhealthy and anxiety-laden interpersonal relationships since infancy; and Cameron (1947), as a result of a failure to acquire intelligible communication due to socially inadequate development. Arieti (1974) himself viewed the process of desocialization as a reflection of a "concomitant process occurring in the patient's inner reality" (p. 345), in which the schizophrenic person is regressing to earlier forms of symbolization. Summarizing the process, he stated the following:

> By giving up common or socially shared symbols he desocializes himself. Although he may still use common symbols predominantly, the symbols that are involved in his delusions and more intensely experienced by him are his own paleosymbols. . . . As long as the patient uses private symbols, at least for the life situations that are most important to him, he cannot integrate socially. However, even the most regressed schizophrenic will retain expressions, words, and ways that belong to the interpersonal world. A total abandonment of what is obtained from others is not possible. (pp. 345-346)

Thus several theoreticians have observed the withdrawal phenomenon and attempted to explain the process from a number of differing psychological and/or social perspectives, supporting its presence.

Conclusion

The two processes of social isolation and withdrawal of the schizophrenic can be seen as interacting and reciprocal. Arieti (1974) stated:

> Inner life and external life are constantly interrelated: abnormal external relations early in life trigger intrapsychic mechanisms that disturb the inner life. In its turn a disturbed inner life causes alterations in relating to others. A vicious circle thus originates. (p. 345)

Additionally, support for the interaction of social and psychological events is generally provided by the theories of social psychology.

Principal Network Variables

The network variables discussed in this section relate directly to the stated hypotheses of the study. Each is categorized and evaluated as to the psychological and social implications associated with each variable. Understanding of these variables is crucial to the analysis and interpretation of the results: In contasting the two samples, these variables can be perceived as describing the psychological and social impact in type and degree due to the isolation and withdrawal of the schizophrenic.

Network Size

Network size, a structure-related or morphological variable, appears to be associated with the two hypotheses of schizophrenic isolation and withdrawal. This variable, in fact, would be a direct measure of the possible joint effect of the two hypotheses. It is predicted that due to the hypothesized impact of either or both influences (an interaction) acting upon the schizophrenic, the social network of the schizophrenic would be smaller than the social network of the normal.

Interconnectedness

Interconnectedness, a structure-related or morphological variable which refers to the sparsity or density of relationships (links or connections) within a social network, appears to be related with length of and closeness in relationships, and stability and support in social networks likewise affected by withdrawal and isolation. (Although researchers vary widely as to how this variable is operationalized, it is considered to be a significant characteristic of social networks [Whitten & Wolfe, 1973].) The interconnectedness of close ties in a social network has been found to be positively correlated with the mean duration of contact in these relationships, indicating that forming highly interconnected networks takes considerably more time than loosely interconnected networks (Hammer & Schafer, 1975). In a review of this article, Hammer et al. (1978) concluded, "Thus, for any individuals--including, of course, schizophrenic individuals--a relative lack of long-term ties would tend to preclude anything more than peripheral participation in any interconnected network of close relationships" (p. 525), suggesting that a social network of relatively short duration would tend to be loosely interconnected and contain members that are barely involved with each other. Further, a positive relationship has been found between interconnectedness and maintenance of contact with close relationships in social networks during crisis with a psychiatric population (Hammer, 1961, 1963-64); specifically, patients whose closest relationships were with persons who were closely interconnected with each other tended to maintain their relationship during the crisis and ensuing

hospitalization. The implication is that the more highly interconnected the social network, the more stable, durable, and, accordingly, supportive (as the network does not deteriorate) the network tends to be. Therefore, as a variable, interconnectedness appears to vary with the length of the network's life, the degree of involvement and closeness in the network, and the stability and support present in time of stress.

The present study is designed to test if the degree of interconnectedness varies between the social networks of the schizophrenic person and the normal person, possibly due to differences in the life, degree of involvement, closeness, stability, and support characteristic of their respective social networks. The social network of the schizophrenic is predicted to be less interconnected as compared to the normal.

Distance and Frequency of Contact

The distance and frequency of contact between the focal person and the network members are likewise structure-related variables that appear to be related to the influences of schizophrenic withdrawal and isolation. Therefore, one would suspect that for the schizophrenic person, the distance and frequency of contact between the focal person and the network members would be lower than for the normal person; however, as the size of the network of the schizophrenic person is expected to be lower, the frequency of contact per person in the social network of the schizophrenic person is expected and predicted to be higher.

It should be noted that an increased degree of contact within the social network may not always be better for the schizophrenic. For example, Vaughn and Leff (1976) have found that increased contact between the schizophrenic person and a family characterized by highly critical and emotional conflicts results in deterioration. Thus frequency of contact is not an independently related variable to the schizophrenic disorder.

Uniplex and Multiplex Relationships and Relationship Density

Uniplex and multiplex relationships and relationship density are content-related variables which appear to be associated with the quality of the personal relationship between the focal person and the network members; specifically, the more varied the activities within a relationship, the greater the degree of closeness and satisfaction (Bott, 1955/1977, 1957; Brim, 1974; Mayer, 1966). For example, one would expect that a marital relationship in which several activities (family, sexual, social, conversational, recreational, religious) are shared would be closer, more enriching, and satisfying than one in which only a few are shared. Accordingly, the uniplex relationship would lack the quality of the multiplex relationship, and on the network level, the social network with low relationship density would tend to lack quality in its relationships generally, as opposed to the social network of high relationship density. This relationship is also obviously dependent upon other factors such as, and especially, the feelings experienced within the dyads.

The present study is designed to determine whether quality varies between the social networks of the schizophrenic and the normal as measured by the uniplex and multiplex relationship and relationship density.

Functional Indegree and Outdegree

Functional indegree and outdegree are function-related variables which, by definition, identify the degree of affective and instrumental support given and received by the focal person in the social network. Functional indegree and outdegree would appear to be affected by the influences of social isolation and withdrawal, respectively. Therefore, in terms of support, one would suspect that the schizophrenic person would tend to receive and give less within the context of the social network than the normal person. However, the additional factor of size would affect this relationship in that with the reduced size of the schizophrenic's social network, more per person (more functional indegree) would be required to support the schizophrenic person. Due to the withdrawal, though, the schizophrenic person is still expected to give less to each network member, on the average, than the normal person.

The present study is designed to determine if the degree of support given and received in the social network of the schizophrenic differs from that of the normal person, which may be associated with the influences of social isolation and withdrawal as well as network size.

Functional Symmetry

Functional symmetry is a function-related variable in social network analysis which relates to and has its meaning in the basic network concept of reciprocity. According to Hollander (1967), "interaction operates in terms of reciprocity; that is, the expectation that a benefit given will be returned" (p. 207). So in many ways, the exchange or transaction can be seen as defining a relationship. Supporting this conceptualization, Whitten and Wolfe (1973) wrote:

> For network analysis, the important aspect of exchange theory, with its concept of reciprocity, is its demonstration that any exchange can forge an interpersonal link, and interpersonal links can connect individuals in series of communicative, economic, manipulative, and other types of strands. (p. 731)

The degree of reciprocity in a relationship can be used to characterize the nature of transactions and satisfaction in a relationship. The work of Thibaut and Kelley (1959) indicated that the social exchange should be rewarding for both parties for the interaction to be satisfying and continue: this hypothesis can be used to examine the following system of classifying transactions. Sokolovsky, Cohen, Berger, and Geiger (1978) and Cohen and Sokolovsky (1978) focused on the elements of directionality and measure of support within dyadic relationships. In their system, which is defined relative to the focal person, when aid flows from the focal person to a network member, it is termed as "instrumental"; when aid flows in equal measure between the focal person and a network member, it is termed as "reciprocal"; and when aid flows from a network member to the focal person, it is termed as "dependent." Summarizing the above, then, relationships

that are characterized solely by instrumental or dependent transactions, i.e., lacking in reciprocity, would be seen as unsatisfactory and possibly as fragile.

The present study is designed to determine how the social networks of the schizophrenic person and the normal person differ relative to the concept of reciprocity and relate the differences to the degree of satisfaction and fragility in the social network. The links in the social network of the schizophrenic are expected to be characterized by the dependent transaction.

Affective Indegree, Outdegree, and Symmetry

Affective indegree, outdegree, and symmetry are emotion-related variables in social network analysis, associated with the influence of social isolation and withdrawal in schizophrenia in that they are related to the degree of satisfaction and closeness in relationships. Due to these two influences, it is expected that the schizophrenic person cares less for and is cared for less (less positive feelings) by network members than the normal person (low affective indegree and outdegree). Further, it is also predicted that the schizophrenic person feels less positively for the network members than they for him/her (affective asymmetry), whereas the normal person and the network members tend to feel similarly toward one another (affective symmetry).

The present study is designed to determine if affective indegree and outdegree are both less positive in the social networks of the schizophrenic person than of the normal person, and if affective asymmetry exists for the schizophrenic person, while affective symmetry

exists for the normal person. These variables, associated with the influences of social isolation and withdrawal, are related to the degree of satisfaction in the relationship.

Investment Indegree, Outdegree, and Symmetry

Investment indegree, outdegree, and symmetry are emotion-related variables that appear to provide the closest estimate of the degree of isolation and withdrawal of the schizophrenic person. Investment indegree within the social network of the schizophrenic may initially be expected to be lower than that of the normal, due to the phenomenon of isolation; however, considering the smaller network size of the schizophrenic, as well as the tendency to be dependent, it appears that the network members of the schizophrenic are more invested than the network members of the normal person. Investment outdegree may reflect the relative degree of withdrawal of the schizophrenic from the social network. Investment asymmetry is expected for the schizophrenic due to relatively large degree of withdrawal in the schizophrenic, especially since the network members are predicted to be in the position of providing much more support to the schizophrenic than the reverse. Notably, this investment imbalance suggests that at this point in the development and life cycle of the target sample, the role of withdrawal in the schizophrenic, endogenous influences, predominates over the role of isolation, exogenous social influences, within the psychosocial sphere. This statement certainly parallels the thought of Arieti (1974). Last, investment symmetry is predicted

for the social network of the normal; i.e., the emotional investment would be mutual.

The present study is designed to determine how the social networks of normal and schizophrenic persons differ relative to investment indegree, outdegree, and symmetry and further, to relate the differerences to the influences of isolation and withdrawal of the schizophrenic.

Social Networks and Schizophrenia

In this section, the studies exploring the influence of various components of the social network, and the associations between social network variables and psychopathology and schizophrenia, are reviewed to clarify the role of the social network in the schizophrenic disorder. The findings of the most relevant studies are summarized and critically examined to identify weaknesses and sources of inconsistency. Based on the review, the need for replication is supported, and last, an alternative, corrective methodology is outlined.

General Importance of the Social Network to Schizophrenia

Although only a few studies have examined the direct links between social networks and the schizophrenic disorder (to be reviewed), a plethora of studies has explored the relationships between the schizophrenic disorder and the various components of the social network, i.e., the mother, father, family, extended family, and significant others. In this section, the impact of these components upon the schizophrenic disorder is reviewed briefly to demonstrate their

importance. This review is not intended to be exhaustive, but rather to identify major trends in the literature. This is the first step in supporting the contention of this research study that interpersonal and social factors are associated with the schizophrenic disorder.

The relationship between the schizophrenic and his/her parents was an early area of focus that was concentrated on parental characteristics that tended to be associated with schizophrenic offspring. Theorists, concerned primarily with etiology, initially directed their speculations on the maternal relationship (Arieti, 1974), especially Frieda Fromm-Reichmann (1948), who appeared to have had the most influence upon this movement through the development of the heuristic phrase, "schizophrenogenic mother." This type of mother was described in a totally negative way, e.g., over-protective, hostile, rejecting, cold, distant, inconsistent, etc. Others in the interpersonal school of thought such as Rosen (1962) and Sullivan (1953) tended to follow her lead with one result being that the mother was seen as totally responsible for the schizophrenic offspring; therefore, the mother was seen in a very negative light. The work of Lidz and his associates (see Lidz, 1973; Lidz, Cornelison, Fleck, & Terry, 1957; Lidz, Terry, & Fleck, 1958), though strongly affected by Fromm-Reichmann (1948), departed from this single-minded course by focusing on the paternal relationship with the schizophrenic offspring as well. Therefore, the father could now share the responsibility with the mother for the schizophrenic person.

Later developments in the research widened this circle of influence to include the family as a whole. Early pioneers in family research studied the family more as a unit and developed such etiologically based concepts as pseudomutuality (Wynne, Rychoff, Day, & Hirsch, 1958), double bind (Bateson, Jackson, Haley, & Weakland, 1956), undifferentiated family-ego mass and triangulation (Bowen, 1960, 1965), and mystification (Laing, 1964). Based on the early work and theory, present investigators are focusing on specific areas such as communication (Ferreira & Winter, 1968; Mosher, Wild, Valcov, & Feinstein, 1972; Wild, Shapiro, & Goldenberg, 1975), interaction (Mishler & Waxler, 1965, 1975; Riskin & Faunce, 1972; Waxler & Mishler, 1971), role structure (Wild, Shapiro, & Abelin, 1977), cognition and perception (Riess, 1971), and emotional expression (Brown, Birley, & Wing, 1972; Leff, 1976; Vaughn & Leff, 1976). The results of these studies demonstrate associations between schizophrenia and family variables, yet as of the present none have been able to prove an etiological hypothesis due to the difficulties with this type of research (Reiss, 1976). Newer studies are either focusing on non-etiological hypotheses (simply associations) or attempting to integrate genetic hypotheses (Liem, 1980).

Relationships have been found between the extended family and psychopathology, suggestive of possible relationships with the schizophrenic disorder, and in at least one case, a direct connection between characteristics of the extended family and schizophrenia. In 1962, Bell determined that the extended family can affect disturbed families differently than well families by supporting one side within a family

argument, creating further schism, by serving to stimulate conflict, by serving as a projection of family conflicts, and by becoming a competing object for support or indulgence. Cohn and Talmadge (1976) echoed this type of dynamic in a more recent clinical study. In a study of the extended family and the schizophrenic disorder, Walsh (1978) found that families that contained a schizophrenic offspring experienced the death of a grandparent more commonly than families with normal children or children with a nonschizophrenic, psychiatric disorder. Based on clinical findings, Bowen (1961) has developed a theoretical approach which is based on the impact of the extended family from a historical perspective, termed a three-generational theory. According to his approach, the psychopathology is passed through the generations via the projection of emotional immaturity, the end result being the schizophrenic person. It is interesting to note that in a more recent review and update of his theoretical propositions, Bowen (1978) stated that a premature death in the family can hasten the development of schizophrenia, a thought consistent with the findings of Walsh (1978). Therefore, it appears that the characteristics of the extended family may have an impact upon the functioning of the family and quite possibly on the familial setting of the schizophrenic person.

The relationship of the schizophrenic person with significant, but non-blood/marriage related, persons has been shown to have bearing upon the onset of the disorder (psychotic break), prognosis of the disorder, response to psychological and psychotropic treatment, and nature of posthospital functioning. In relation to the psychotic

onset, Birley and Brown (1970) and Jacobs and Myers (1976) found that some disruption in the social network of the schizophrenic person, namely a recent and stressful life event, preceded a symptomatic relapse. (See also related articles by Allisi, 1969, and Feldman & Schertz, 1967, which suggest that treatment may be sought due to ineffective networks.) In terms of prognosis, Strauss and Carpenter (1972, 1977) in two studies utilizing two- and five-year follow-ups found that the amount of social contact just prior to hospitalization was a key predictor of outcome: These studies confirmed the earlier work of Gittelman-Klein and Klein in 1969. Further, Kayton, Beck, and Koh (1976) found that a "favorable convalescent environment," one in which peers as well as parents or spouses "provided nonintrusive emotional support through their attitude toward the patient and through sensitively timed interpersonal contact" (p. 1270), was associated with a positive outcome. Regarding psychotherapy, clinical studies intimate that significant others in the social network may have positive impact by supporting the family (Reuveni, 1979; Speck, 1967) or substituting for the family functions (Minuchin, 1974; Minuchin, Montalvo, Guerney, Rosman, & Schumer, 1967). Dealing with the interface of drug and psychosocial treatment, Gunderson (1977) concluded after an exhaustive review that the interpersonal milieu of the hospital affects the need for psychotropic medication. Last, the reports of healing communities (rehabilitation centers) demonstrated how the functioning of the schizophrenic person is facilitated by a supportive and responsive interpersonal environment (Gunderson, 1980; Mosher & Keith, 1980). For clinical descriptions of

community support programs, see Almond, 1974; Beard, Malamud, & Rossman, 1978; Budson & Jolley, 1978; Dincin, Selleck, & Streicker, 1978; Fairweather, Sanders, Maynard, & Cressler, 1969). This review also identified those who doubt seriously the efficacy of these approaches (Klein, 1980; Torrey, 1980). So, much of the literature suggests that onset, prognosis, response to treatment, and even remission of the schizophrenic disorder are influenced by the nonkin significant others.

In closing and in line with the conclusions of Caplan (1974), it appears that all components of the social network, i.e., family, extended family, significant nonkin, can have impact on the life of the schizophrenic, either in a protective and supportive way or in a provocative and deteriorating manner.

Social Networks and Psychopathology

Direct relationships have been found between the presence of psychopathology and the characteristics of social networks in three clinical studies. As reviewed by Pattison, Llamas, and Hurd (1979), Ratcliffe and Azim (1975) discovered that in comparing normals and psychiatric patients the latter were less satisfied with their personal relationships, depended more on "involuntary" relationships with relatives, and exhibited a lack of voluntary or friendship relationships. A comparison of outpatient psychiatric patients and family practice patients by Silberfeld (1978) indicated that the social networks of psychiatric patients were impoverished in terms of number of relationships and time spent and closeness within these relationships.

Contradicting the study by Ratcliffe and Azim (1975), Silberfeld found that psychiatric patients seemed to have a greater proportion of their relationships with friends. Kleiner and Parker (1974) reported that alienation from the social network correlated positively with three measures of psychopathology. In sum, the results of these studies suggest that the type, quantity, and quality of relationships within the social network appear to be linked to psychopathology.

Review of Major Studies

In the following section four studies are reviewed that have explored the social network of the schizophrenic person as compared to the social network of normal/nonpsychotic controls. Each is examined in light of the major objectives of this study, namely, the identification and relevance of the four major classes of social network variables: structure, content, function, and emotion. Their findings are summarized in terms of consistencies and inconsistencies. Shortcomings and inherent methodological and design differences in the studies which complicate the interpretation and integration of the findings are presented in the section that follows this one.

Cohen and Sokolovsky (1978) have reported on their assessment of the social network of schizophrenic persons who are living in "single room occupancy" (SRO) hotels in Manhattan, New York, away from family and kin. Three groups of tenants were identified for study according to degree of pathology: (a) SR group--schizophrenia with moderate or severe residual symptoms; (b) S group--schizophrenia with minimal or no chronic symptoms; and (c) NP group--those with no

known psychotic history. The population studied included both males and females, and whites and nonwhites. The data were collected through combined participant observation, logs of daily activity, extensive biographical interviewing, and the use of a "Network Profile" questionnaire. The authors distinguished between "interactional characteristics" of networks, the specific variables being uniplex relations, multiplex relations, and directionality (the direction in which support flowed between the focal person and the network members), and "morphological features" (the specific variables being size and interconnectedness).

Significant differences were found in the Cohen and Sokolovsky study (1978). In terms of structure, the results indicated that those with a nonpsychotic history had social networks twice the size of those who had a serious psychotic history (the SR group); no significant differences were found between the two psychotic groups (the S and SR groups): the total number of relations for the SR, S, and NP groups were averages of 10.3, 14.8, and 22.5, respectively. However, it was observed that a progressive increase in network size was associated with decrease in psychopathology. Further, they observed a trend, though statistically nonsignificant, toward a higher degree of interconnectedness in the less disturbed groups (the S and NP groups), indicating that the most disturbed group (the SR group) had networks that were generally less intertwined. In terms of content, significant differences were found in number of multiplex relations between the NP group and the SR group, but not between the two schizophrenic groups. The NP group had an average of 12.1 multiplex

relations, while the figures for the S and SR groups were 6.7 and 4.3, respectively. In terms of function, the authors concluded,

> It was found that schizophrenics with residual deficits were impaired in their ability to form instrumental relationships. Furthermore, both categories of schizophrenics engaged in significantly more dependent interactions than the NP group. (p. 551)

Emotion as a social network variable was not examined. Not directly associated with the objectives of this study, they also found that rehospitalization was dependent upon the degree of psychopathology and hotel network size, the latter being more significant with the schizophrenic group with minimal or nonchronic symptoms (the S group), suggesting that for those without severe symptomatology of overwhelming proportions the size of the social network can play a mediating role.

Tolsdorf (1976) compared 10 male, hospitalized first-admission psychiatric patients and 10 male, hospitalized medical patients at a Veterans Administration Hospital. Those in the psychiatric sample were all diagnosed as schizophrenic. Data were obtained through a 66-item interview conducted by the author. The methodology entailed both quantitative and qualitative analyses. The quantitative data included structural variables, e.g., size and interconnectedness, and content and function variables, both paralleling Cohen and Sokolovsky's (1978) interactional characteristics. The perception of the social network from an emotional perspective was evaluated through the qualitative data.

Significant results were also found in the Tolsdorf (1976) study, but only in relation to the content and function network variables. In terms of structure, no significant differences were found in the

total size of the networks, although a trend was noticed with the medical/nonpsychotic group being larger: the average network sizes of the medical and schizophrenic groups were 37.8 and 29.8, respectively. No differences were found in adjacent density, the measure of interconnectedness. In relation to content variables, the medical group had a significantly higher number and proportion of multiplex relationships: the total average multiplex relationships for the medical and psychiatric groups were 16.6 and 5.4, respectively, and proportioned average multiplex relationships for the medical and psychiatric groups were .44 and .21. Further, significant differences were found on relationship density: average of 1.53 for the medical group and average of 1.24 for the psychiatric group. In terms of function in the networks, the psychiatric group had fewer functional members within the social network, but these members served several functions; thus, the support was concentrated in a limited few. On the other hand, the network of the medical group was characterized by more functional people overall who provided fewer functions apiece, so the supportive functions were spread out more evenly across the network. Additionally, the psychiatric group tended to have asymmetric, dependent relationships with network members, and the medical group, symmetric or reciprocal relationships. Considering a possible interaction, the author hypothesized that the psychiatric group tended to limit their multiplex relationships to functional people in their network, while the medical group had multiplex relationships with nonfunctional people too; therefore, the activities of the psychiatric group were limited primarily to functional people,

i.e., those who support them. From the quantitative data, Tolsdorf (1976) made the following interpretative statement in conclusion (Inferences regarding families examined in the study and contained in the statement below were not explored in this review as they do not pertain to the results of the present study.):

> In summary, the psychiatric subjects reported fewer intimate relationships with their network members in a network that was more heavily dominated by family members, where functional people were in a more controlling and dominant position, and where overall there were relatively fewer but more powerful functional people in the network. The medical subjects, on the other hand, reported more intimate relationships with more people in a network that was less dominated by family members and where functional people were on an equal standing with subject in the exchange of support, advice, and feedback. (pp. 412-413)

The interpretation of the qualitative data generally suggested that members of the psychiatric group had a negative emotional perception of the helpfulness and character of their social networks, and this perception influenced their ability to seek support and utilize the resources of their networks. Members of the medical group uniformly had a positive perception of their networks, which appeared to facilitate the seeking of support and use of resources.

Pattison, deFrancisco, Wood, Frazier, and Crowder (1975) used the Psychosocial Network Inventory (described in Chapter II) to analyze the social networks of normals, neurotics (not pertinent to this study), and psychotics. No statements were made regarding the sexual composition of the samples. The data were analyzed along five variables: (a) degree of interaction, (b) type of emotion, (c) strength of emotion, (d) instrumental base, and (e) symmetry. Except for size and a social connectedness ratio (associated with interconnectedness), the variables were not operationalized.

The results of the study by Pattison et al. (1975) are suggestive of associations between social network characteristics and schizophrenia, but as it is a descriptive study based on impressionistic findings, no statistical validation of any kind, "statistically significant results" cannot be reported. In terms of the structure of the social networks, it was found that the normal sample was composed of 20 to 30 people whereas the psychotic sample was composed of 4 to 5 people, mostly family, so impressionistically the normal sample appears much larger than the psychotic sample. Further, using the social connectedness/unconnectedness ratio, it was determined that approximately one-half to two-thirds of the network members knew one another, while the rest did not. For the psychotic network, approximately nine-tenths of the network knew one another. So one could impressionistically conclude that the social network of the psychotic was more interconnected than those of the normal. Again, hard data were not provided on the other variables; however, it was noted from a review of the data that the relationships appeared to be consistently ambivalent and nonreciprocal. Pattison et al. concluded with the following provocative comment: "In other words, the psychotic is caught in an exclusive small social matrix that binds him and fails to provide a healthy interpersonal matrix" (p. 1249).

In a more recent study directed by Pattison (Pattison, Llamas, & Hurd, 1979), he has modified the results of his earlier research. Again in this study the sample was not described in terms of composition and crucial variables were not operationalized. Furthermore, what hard data were available were not subjected to statistical

validation. In regard to the results, Pattison and his associates indicated that the psychotic network is composed of 10 to 12 network members, whereas the normal network is composed of approximately 25 members. Not of direct relevance to this study, he found that in line with his previous study the network of the psychotic group was populated predominantly by kin/family members. The relationships were characterized from a review of the data as totally interconnected, negativistic, conflictual, ambivalent, and highly asymmetric. Pattison et al. concluded of the psychotic, "The subject is caught in and tyrannized by a collusive closed system, with few links to the larger communities of relationships" (p. 66/481).

This review of the four major studies demonstrates the presence of consistencies and inconsistencies in the reported data. In terms of network size, the results of the four studies differ on the exact figure with the range of reported figures extending from 4 to approximately 30; however, regardless of the average figure for network size, consistently it was found in three studies (Cohen & Sokolovsky, 1978; Pattison, deFrancisco, Wood, Frazier, & Crowder, 1975; Pattison, Llamas, & Hurd, 1979) that the social network of the schizophrenic person tended to be smaller than that of the normal person. In terms of interconnectedness, the results of the studies again vary a great deal. Tolsdorf (1976) found no differences, while Pattison et al. (1975, 1979) reported a high level of interconnectedness and Cohen and Sokolovsky (1978) distinguished a trend indicating that the degree of interconnectedness fell significantly for the schizophrenic groups, the opposite of the previous findings of Pattison et al. (1975, 1979).

In terms of multiplex relationships, the investigators who examined this phenomenon (Cohen & Sokolovsky, 1978; Tolsdorf, 1976) tended to agree on their basic findings and figures: fewer multiplex relations. In terms of relationship density, Tolsdorf (1976), the only investigator to examine this variable, found significant differences. In terms of the transaction of support within the network, the studies reach consensus in that the schizophrenic tended to form more dependent and asymmetric relationships than is true for the normal person. Tolsdorf (1976) further explored this finding, concluding that those who support the schizophrenic are also those with whom the schizophrenic person shares most of his activities; these supportive persons also appeared to be a limited subgroup within the larger network. In terms of the emotion variable, it is unfortunate that the investigators (Pattison, deFrancisco, Wood, Frazier, & Crowder, 1975; Pattison, Llamas, & Hurd, 1979; Tolsdorf, 1976) who examined this phenomenon did not use empirical measures, but their qualitative results tend to agree in essence, namely that schizophrenic persons would have a more negative view of their social network. Using only those results in which some degree of consensus was found, it appears that one can tentatively conclude that as compared to the normal person, the schizophrenic person tends to relate in a more dependent and asymmetrical fasion in a social network that is characteristically smaller, marked by fewer multiplex relations, and perceived in a negative way emotionally.

Need for Replication

In reviewing the research on the social networks of schizophrenics, two major factors led this researcher to consider the need for replication of the previous work: (a) the importance of the research, and (b) confusion around the interpretation and integration of the previous findings. (Statements will be made in the final paragraph of this section as to how this study will be conducted.) First, the social network research is quite promising as it has revealed some findings which are consistent across studies, possibly shedding light upon the social factors operating in schizophrenia (and, for that matter, in other psychopathological populations). Thus, due to the potential importance of these findings, replication is essential.

Second, the findings of the previous work are difficult to interpret and integrate for five basic reasons: (a) inadequate sample descriptions and differing populations, especially those factors relating to residence with family; (b) differences in conceptualization and operationalization of variables; (c) differing conceptualizations of the social network; (d) inconsistencies in the reported data; and (e) importantly, a crucial methodological problem in making inappropriate inference regarding the characteristics of social networks from unvalidated self-report.

Relative to sample characteristics, Pattison et al. (1975, 1979) did not give adequate sample characteristics. The studies of Cohen and Sokolovsky (1978) and Tolsdorf (1976) have more adequate descriptions of their samples, but they differ in sexual composition and especially, residential status. In relation to the latter, residential

status, the three studies except the one supervised by Cohen and Sokolovsky appear to have focused on schizophrenics living with family; Cohen and Sokolovsky only utilized subjects living away from families. Only Cohen and Sokolovsky acknowledge the implications of this sample criterion. Last, it is interesting to speculate that the differences in interconnectedness among the studies of Cohen and Sokolovsky and Pattison et al. may relate to this difference.

Integration of the work is also difficult due to the differences in the operationalization of interconnectedness of the social network, and vague conceptualization of the content variable. To operationalize interconnectedness, Pattison et al. (1975, 1979) used a social connectedness/unconnectedness ratio. Tolsdorf (1976) used adjacent density, and Cohen and Sokolovsky (1978) used density and degree, two related variables (the latter has been used to correct for the tendency for larger networks to produce low density systems). In their conceptualization of content, Tolsdorf and Cohen and Sokolovsky appear to have included distinct and differing concepts under the content category, confusing its meaning and contaminating its significance: Tolsdorf's definition of the content variable included areas that relate to roles and ways of relating within the network, in addition to areas that relate directly to activity, the apparent focus of the content category; and Cohen and Sokolovsky assessed functional properties and supportive roles as well as types of activity within their content variable.

Notable inconsistencies in the data are found in the size and interconnectedness of the social network, as well as other variables. (You are referred to the earlier discussion of this subject.)

The procedures used to collect data suggest differing conceptualizations of the social network which compounds the task of integration of findings. Pattison et al. (1975, 1979) used a specific network termed the psychosocial kinship system, which is composed of all those important to the subject, e.g., family members, relatives, friends, neighbors, co-workers, etc., the basic criterion being personal importance to the subject. According to his personal communication (Pattison, 1979, 1980), it would contain all those of psychodynamic significance, so anyone real or fantasied, or dead or alive, could be included. Referring to the earlier reviewed conceptualizations, the psychosocial kinship system appears to be personal network (see Wolfe, 1970), subjective in nature (see Pattison, 1977), containing only the immediate or personal network level of linkages (see Hammer et al., 1978), and being a product of the first two and possibly third levels of intimacy (see Boissevain, 1974). The social network conceptualization chosen by Tolsdorf (1976, 1980), on the other hand, is much different because he focused on a much larger group of alternative persons and used a more objective model. His primary goal was to identify the largest possible group of persons available in a realistic sense to the schizophrenic person so as to advance some statements regarding the resource capabilities of the social network; therefore, personal importance would appear to play a secondary role. Of course, deceased persons would be excluded as

members of the social network as he conceived it. Again in relation to the reviewed conceptualizations, the social network as chosen by Tolsdorf (1980) was more objective in focus, although the subjective component was high since he relied on self-report (see Pattison, 1977), consisted of the immediate and second-order networks (see Hammer et al., 1978), may have focused on personal as well as categorical sets--an emphasis being on resource capabilities of the network--(see Wolfe, 1970), and may have been directed on including all zones of intimacy, or at least the first four (see Boissevain, 1974). Cohen and Sokolovsky (1978) have most clearly defined their social network, basing their conceptualization on subjective and objective data; the networks were developed from participant observation, logs of daily activity, extensive biographical interviewing, and the use of a "network profile" questionnaire. Networks were broken down into those existing outside of and inside of the SRO hotel. Their conceptualization of the social network was based on subjective and objective perspectives (see Pattison, 1977), conceived as a personal set (see Wolfe, 1970), limited to the level of the immediate or personal network (see Hammer et al., 1978), and may include those from the first four levels of intimacy (see Boissevain, 1974). Thus it is seen that each researcher has from differing perspectives developed differing conceptualizations which inhibit, but when recognized may facilitate integration of their results. For example, the differing conceptualizations used in the studies would certainly affect the figures obtained for network size and, accordingly, account for the large variability in results.

Last and importantly, this study is undertaken to analyze a methodological problem stemming from reliance on unsubstantiated self-report data. Pattison et al. (1975, 1979) through an inventory, and Tolsdorf (1976) through an intensive interview, assessed the subjects' perception of their social network. They assumed that their data accurately reflected the characteristics of the social networks. As has been stated earlier, this is a dubious assumption, for their data reflect only the subjects' opinion of their networks unless otherwise proven. This was not true for the study of Cohen and Sokolovsky (1978), who used subjective and objective measures; their analysis may therefore present data closer to the "actual" status of the social network.

The following steps have been taken in the present study to respond to the difficulties noted above. First, the sample is thoroughly described and delimited demographically, and specifically limited to the 18- to 40-year-old age group. Second, only subjects residing with families are included in the samples. Third, the methodology utilizes the previous sound research techniques for assessment of interconnectedness; and in relation to content, this variable is strictly and categorically defined as the set of shared activity. Fourth, to reduce confusion it is stated that the conceptualization of this study is that of the psychosocial kinship system (Pattison et al., 1975, 1979). And fifth, the present study is designed to corroborate the subjects' perception of their social network with the report of network members as a measure of validity, using the same assessment instrument, the Psychosocial Network

Inventory, Modified. Although it seems inherently inconsistent to choose an instrument focusing on subjective perceptions to investigate objectivity of response, it is consistent with the notion in perceptual theory that all of human existence is subjective, and as consensus is reached, the phenomenon becomes more "objective." The test then is to determine how able the normal and schizophrenic persons are to reach consensus with their relative social networks.

Summary

The major purpose of this research study is to compare the social networks of normals and schizophrenics, the goal being identification of psychosocial factors that appear to be associated with the schizophrenic disorder. The psychosocial kinship system, the particular social network conceptualization used in this study, was chosen for its clinical significance. The two groups are compared along the four major classes of social network variables: (a) structure, the basic morphological characteristics; (b) content, the nature of shared activities; (c) function, the transaction of support; and (d) emotion, the experiencing of affect.

A secondary purpose of this study, yet of paramount importance in the study, is to evaluate the research assumption conceptually basic to much of the previous research, that self-report data are a sufficient and accurate indicator of the actual status of the social network.

Social network analysis was reviewed. Although it was found that the concept of the social network evolved as a metaphor, later

the concept began to be regarded as a singularly important concept with wide applicability and methodological value which has allowed for the integration of personal, social, and cultural dimensions, documenting their importance and interplay.

The theoretical concepts of schizophrenic withdrawal and isolation were reviewed and were found to have joint and interacting impact on the social network of the schizophrenic. They represent the theoretical basis of this study. In light of the influences of schizophrenic withdrawal and isolation, the network variables were reviewed and evaluated as to their psychological and social implications; based on this information, predictions were made. In terms of the structure-related variables, it appears that the schizophrenic, as contrasted with the normal, has a social network that is smaller and less interconnected, and network members that live closer and participate in more frequent contact. In terms of the content-related variables, it appears that the schizophrenic, as contrasted with the normal, has a greater proportion of relationships in which only one activity is shared, a smaller proportion of relationships in which more than one activity is shared, and overall, a relatively smaller proportion of shared activities per network member. In terms of the function-related variables, it appears that the schizophrenic, as contrasted with the normal, within interpersonal relationships with the network members receives more and provides less support. Furthermore, the schizophrenic appears to generally receive more support from network members than is given in return, placing the schizophrenic in a functionally asymmetrical, nonreciprocal, and dependent position.

In terms of the emotion-related variables, it would appear that the schizophrenic, as contrasted with the normal, is the object of less positive (more negative), yet stronger (more emotionally invested) feelings, and has less positive (more negative), and weaker (less emotionally invested) feelings. Overall, the schizophrenic appears to have more negative feelings for and to be less invested in the network members than they in her or him, demonstrating an emotionally asymmetrical and nonreciprocal relationship with the social network, and a withdrawn and/or isolated position.

The four major studies investigating the relationships between the schizophrenic disorder and social networks demonstrated consistencies in their findings tending to support some of the above predictions, as well as inconsistencies. Consistent findings in relation to the normal population compatible with the predictions included the following: (a) smaller network size for the schizophrenic; (b) a smaller proportion of relationships in which more than one activity is shared for the schizophrenic; (c) relatively more support from network members for the schizophrenic; (d) asymmetrical, nonreciprocal, and dependent relationships for the schizophrenic; and (e) negative emotional perception of the social network for the schizophrenic. (One investigator found that the relationships were characterized by fewer activities per person within the social network of the schizophrenic.) Inconsistent findings were associated with the actual network sizes and interconnectedness, the former possibly related to differences in conceptualization of the social networks and the latter to differences in the familial characteristics of the populations sampled.

The findings of the four studies were, however, difficult to interpret and integrate for five reasons: (a) inadequate sample descriptions and differing populations, (b) differences in conceptualization of and operationalization of variables, (c) differing conceptualizations of the social networks under study, (d) inconsistencies in the reported data, and (e) importantly, lack of validation of the self-report data. The present study is designed to respond to the difficulties noted in the previous research allowing for a clarification of the findings in this area of study.

CHAPTER II

METHODS

Subject Selection and Characteristics

General Selection Rationale

Research investigating significant differences between populations is usually designed to promote comparability along certain dimensions that could affect outcome measures. The goal is to reduce initial differences between the samples on these relevant dimensions that are unrelated to the basic distinctions between the populations; accordingly, additional precision is obtained in the statistical analysis of the data. In social science research, the influences of the following variables may be controlled: (a) age; (b) sex; (c) race; (d) marital status; (e) educational level; (f) vocational level; (g) personal economic status (PES), for the purpose of this study, an indicator of the individual's ability to be self-supportive; (h) socioeconomic status (SES), for the purpose of this study, an indicator of the family's economic level; and (i) cultural background.

The following discussion presents the rationale used in determining the relevance of the variables noted above and the procedures used to control for the potential untoward effects, if appropriate.

Due to the impairment in the social functioning of the schizophrenic (see Review of Literature), the variables, educational and vocational levels, and personal economic status (PES), did not appear

appropriate for control. These variables are directly affected by the schizophrenic process, by definition. Attempting to insure comparability, for example, by matching along these three variables is to exclude a priori differences inherent in the two populations. Such "equalizing" procedures would call into question the diagnosis of the schizophrenic sample if the subjects were functional in these areas. The mental health of the normal sample would likewise be questionable if the subjects were dysfunctional in these areas. To some extent, this line of reasoning applies also to the variable, marital status, since the schizophrenic tends not to have the complex skills needed to initiate and maintain the marital union (this variable will also be considered below).

Although studies have shown that the lowest socioeconomic class has a significantly higher incidence of schizophrenia (Dohrenwend & Dohrenwend, 1969), further exploration of the methodology and findings shows no correlation between SES, as defined in this study (the family's income level), and incidence of schizophrenia; however, what is being termed PES in this study appears to be related to incidence of schizophrenia (Dunham, 1965; Goldberg & Morrison, 1963; Hare, 1956a, 1956b). An example would be the schizophrenic who has difficulty maintaining employment (low PES), but who comes from a wealthy family (high SES); herein lies the basic distinction. Dohrenwend and Dohrenwend (1974), notably, still consider this issue unresolved.

Although SES was not considered related to schizophrenia, it is a significant variable in social research of schizophrenia

(Myers & Roberts, 1959), and as such, appears an appropriate variable for control. The remaining variables of age, sex, race, and cultural background appear appropriate for control for the same reason. Two procedures were implemented which have impact on assuring comparability. First, the samples were limited to residents of a specified geographic locale, constraining the range of SES and differences in cultural background. Both samples were drawn solely from the north and northwest suburbs of Chicago. Second, subjects were chosen who would tend to provide a representative cross-section of the population of the designated locale, thereby allowing for the development of samples that would be reflective of the population along the above dimensions. The normal sample was obtained from volunteers found in a variety of settings, i.e., employment, residential, and religious, insuring a cross-section of the identified locale. The schizophrenic sample was also developed from a variety of settings, as no one psychiatric institution (public or private) services all strata of the locale clinically.

An inherent difficulty with this type of research is that subjects are not strictly selected, randomly or otherwise; they volunteer. Therefore, sample characteristics cannot be rigidly controlled. Research sites can be selected that contain the appropriate population or subgroup of same for the study; however, after the qualified, potential participants are identified within the setting, they are invited to participate on a voluntary basis. Their involvement is not fixed; it is a variable. Those who eventually become subjects and follow through with the testing are a subgroup of the identified

original group (this process was essentially identical for both samples). Each sample, therefore, becomes a discrete entity with special characteristics that hopefully are representative of a cross-section of the population and are comparable along the salient dimensions of age, sex, race, SES, and cultural background, given a certain sample size.

Another method to deal with the difficulty of samples that are potentially skewed along salient dimensions is to increase sample size. While it would be advantageous to have very large samples, the following practical issues made the proposed sample size goals difficult to meet. First, the voluntary nature of the procedure proved to be a significant hurdle: Although exact figures were not kept, it was calculated that approximately one-half of the schizophrenics asked to participate declined. Several from the schizophrenic population who refused to participate were characterized clinically as distinctly more hostile or paranoid than participating subjects. Insofar as this subgroup was not studied, its composition was not clearly determined. Other possible influences determining the negative response may have included the potential time commitment of the interview and the instrument's exploration of the personal sphere which may have appeared threatening. In specific relation to the schizophrenic sample, it was found that securing institution approval and support for social science research was a generally difficult, complicated, and lengthy process. Furthermore, obtaining individual physician authorization for the project created lengthy delays. Legal and technical considerations further complicated and delayed the data gathering. Last, the

the corroborating network members were difficult to reach, today's mobile society possibly a factor.

The potential exists, however, that as subjects volunteer for the study, the samples may become skewed along the important variables mentioned above. In the event of such an occurrence, an alternate procedure exists that could theoretically be utilized to promote comparability between the samples, termed "matching." The procedure was not chosen, based on the following rationale: Matching along the five relevant variables would probably lead to a drastic loss of subjects in both samples, reducing sample size below reasonable limits for statistical evaluation. On the other hand, one could attempt to continue searching for appropriate subjects, but considering the number of variables and difficulty obtaining matchable subjects, the process was seen as close to impossible. Basically, though, matching as a procedure was not used because the gains in precision did not appear to justify the procedural difficulties, as the sample differences on the dependent variable were expected to be large. Furthermore, the procedures already taken to promote comparability, in concert with other measures to reduce initial differences, i.e., the selection of subjects aged 18 to 40 years and residing with members of their nuclear family or family of origin, only, reduced the hypothetical variance between the two samples to tolerable limits.

Selection Criteria

While the previous discussion focused on promoting comparability between the two samples on variables unrelated to the definition of the populations, the present discussion focuses on criteria to insure

that the samples drawn are, in fact, distinct and representative of the normal and schizophrenic populations under study. To assure the mental health of the normal sample, the subjects chosen met the following criteria: (a) no known personal or family history of a mental illness as established by the American Psychiatric Association, Diagnostic Statistical Manual of Mental Disorders, III (1980); and (b) continuing employment and/or attending school, as evidence of a functional or adaptive capacity. In the first criterion for the normal sample, family history pertains to history of those family members present in the immediate family, nuclear family, and/or family of origin. Immediate nuclear family could possibly include subject's spouse and children only; immediate family of origin could possibly include subject's parents and/or stepparents, and siblings only. Therefore, the psychiatric history of the subject's nephews or nieces, in-laws, aunts, uncles, or grandparents would not be considered or pertinent. To assure that the other sample was schizophrenic, the subjects chosen met the following criteria: (a) history of hospitalization for a schizophrenic disorder, and (b) diagnosis of schizophrenia made in the past three years.

Other selection criteria alluded to in the previous discussion relative to the issue of comparability included (a) subjects aged 18 to 40 years and (b) residence with members of their nuclear family or family of origin.

Last, due to the difficulties that can be encountered communicating with the schizophrenic, the following criterion was added: Those

participating in the study must not be presently psychotic, meaning out of touch with reality and incapable of communication.

Subjects

Two different groupings of subjects were involved in the two phases of the research. Considering phase two first, all subjects, a total of 35, participated within the two comparison samples: The normal and schizophrenic samples contained 18 and 17 subjects, respectively. Phase one contained five subjects from each sample who permitted the corroboration and at least four members from their social networks, a total of 46 network members. (The following statements apply to all the subjects of the study, excepting the subject/corroborators of phase one.)

According to the selection rationale, the sample characteristics of age, sex, race, and cultural background should be comparable to promote statistical precision; the data found in Table 1 indicate that such was the case in this study. The two sample distributions of age were quite similar (see Table 1). The median and standard deviation for both samples were identical, and the mean varied by only four years. The sex ratios, as presented by Table 1, were roughly comparable. Relative to race, the data on Table 1 demonstrate that the clear majority of both samples were members of the same race (Caucasian): Only one subject per sample was of another race. Last, it was seen that the religious background (associated with cultural heritage) of all subjects reflected the Judeo-Christian tradition; in particular, the Protestant and Catholic religions predominate clearly in the normal sample and were exclusive within the schizophrenic sample.

Table 1: Sample Characteristics

Sample Characteristic	Groups	
	G_1 Normal	G_2 Schizophrenic
	$n_1 = 18$	$n_2 = 17$
Age		
Mean	$\bar{X} = 30$	$\bar{X} = 26$
Median	$M = 30$	$M = 30$
Standard deviation	$SD = 6.0$	$SD = 6.0$
Sex		
Male	8	11
Female	10	6
Race		
Caucasian	17	16
Black	--	1
Oriental	1	--
Marital status		
Single	4	13
Married	13	3
Divorced	1	1
Family residence		
Nuclear family	14	3
Family of origin	4	14
Education		
Highest degree:		
Less HS diploma	--	3
HS diploma	4	12
Baccalaureate	8	1
Advanced degree	6	1
Summary:		
Mean years of schooling	16	13
Employment status		
Full-time	16	5
Part-time	2	--
Unemployed	--	12
Student[a]	1	2
Religious background		
Protestant	7	11
Catholic	8	6
Jewish	3	--

[a]The student category overlaps with the other three.

Also according to the selection rationale, the sample characteristics associated with educational level, employment, personal economic status, and marital status should vary as they are related to the a priori differences in both samples, i.e., their population characteristics; the data in Table 1 indicate that such was the case, although the absence of random selection does not strictly permit the drawing of inferences. Relative to educational level, it appears that subjects within the schizophrenic sample predominantly tended to terminate their education after completion of high school. Subjects of the normal sample, however, tended to pursue and complete the baccalaureate and more advanced degrees. Notably, when the mean years of schooling (see Table 1) were compared, the differences do not seem as large; yet it is crucial to observe that although the mean years were not so dissimilar, the number of those who actually completed the requirements for a degree were. The category of employment status reflects a priori designations in terms of sample criteria; nonetheless, the finding is striking that only 5 of 17 members of the schizophrenic sample were employed at all, while all 18 normal subjects were employed either full- or part-time (see Table 1). Personal economic status which is associated with vocational level and income was difficult to determine due to inability of most schizophrenic subjects to report their personal and family income; however, it was found that the majority of the schizophrenic subjects had held unskilled or semi-skilled jobs in their employment history and were at the time of testing largely dependent upon public aid and/or their family for financial support, whereas subjects within the normal

sample were in large part pursuing a career full-time in a trade, semi-professional, or professional occupation supporting themselves and their family. One could tentatively conclude that the personal economic status did vary considerably between the two groups, the normal sample having a much higher status. Last, the sample differences in terms of marital status and, accordingly, type of family residence (see Table 1) were considerable. Curiously, while married subjects living with nuclear family predominated in the normal sample, single subjects residing with family of origin predominated in the schizophrenic sample. Therefore, as predicted, the subjects differed on variables associated with population characteristics.

These findings support the two positions taken in the selection rationale. First, as the two samples were comparable along the variables of age, sex, race, and cultural background, the relative impact on the social variables in this study is reduced, limiting the possible variance. Second, because the two samples varied on educational level, employment, personal economic status, marital status, and type of family residence, the two samples appeared basically different. In conclusion, the two samples appeared both relatively uniform internally, yet inherently different, representative of the distinct population characteristics; thus, a comparison with intelligible results appears tenable. However, in that approximately half of the schizophrenic persons refused to participate in the study, data were not obtained from a particular section of the schizophrenic population, a subgroup of unclear composition but possibly more hostile and

paranoid. Therefore, the results will not reflect the influence of this undefined subgroup.

Instrumentation

Psychosocial Network Inventory

The Psychosocial Network Inventory was developed as a research instrument to explore the functioning of social networks by E. Mansell Pattison (Pattison et al., 1975). As originally devised, the subject is faced with three primary tasks. First, the subject develops a list of all people personally important to him or her. The criterion of importance has its basis in the clinical origins of the researcher and, as such, places the focus on those persons who are active in the subject's emotional life (see Chapter I). Second, the subject rates the nature and quality of the relationship with each person specified along five variables. The first variable is contact; questions define the frequency of interaction between the subject and the network member, and how close to each other they live. The second variable is emotional intensity; the strength of the feeling between the subject and the network member is assessed. The third variable is type of emotion; questions relate to how positive, negative, or mixed the feelings are. The fourth variable is instrumental base; questions relate to how one can be counted upon for concrete assistance. The fifth and final variable is degree of reciprocity; questions assessing the feelings and the instrumental base are interrelated to develop an idea of the affective and instrumental quid pro quo, i.e., give and take. In other words, the relationship is determined to be symmetrical or not, depending on how the feelings and supportive actions are

expressed between the subject and the network member. Third, the subject indicates which network members have relationships with one another (outside their relationship with the subject), providing a measure of the interconnectedness within the network.

Psychosocial Network Inventory, Modified

The Psychosocial Network Inventory (Pattison et al., 1975) has been modified for use in this study; the revised form, termed the Psychosocial Network Inventory, Modified (PNIM), is distinct in seven major ways. First, the PNIM (see Appendix A) was designed for use in a structured interview. The degree of structure varies depending upon the population: In this study, the degree of structure was high for the schizophrenic sample (see Appendix A: Directions: Structured Interview [2]) and low for the normal sample (see Appendix A: Directions: Structured Interview [1]). Second, the subject's selection of social network members has been structured to enable a more orderly and thorough identification process (see Appendix A: Listing of Persons Important to you). Third, the answer sheet has been designed to ease recording and facilitate computer keypunching (see Appendix A: Answer Sheet). Fourth, a response key utilizing scales has been added to insure accuracy of response within the interview (see Appendix A: Response Key [2]) or without interviewer support for the normal subject (see Appendix A: Response Key [1]). Fifth, a question has been added to assess the content-related aspects of relationships, i.e., types of shared activities within the relationship (see Appendix A: item 3 on the PNIM). Sixth, as the concept of

reciprocity is basic to the interpretation of this instrument, the instrumental and affective quid pro quo between the focal person and the network member has been retained, yet redefined and expanded. In agreement with Pattison, the instrumental and affective aspects of relating are viewed as being supportive, thus functional to the relationship. As designed, affective functioning can be expressed as both behavioral support, i.e., physical affection (see Appendix A: items 5 and 7 on the PNIM), and verbal support (see Appendix A: items 12 and 15 on the PNIM). Furthermore, instrumental functioning can be expressed as both behavioral support, i.e., helping by doing (see Appendix A: items 6 and 13 on the PNIM), and verbal support, i.e., guidance (see Appendix A: items 4 and 11 on the PNIM). (Note: One item assesses the type of support from the focal person to the network member, while the other assesses the support from the other direction.) Seventh and quite importantly, the variables within this study are all defined operationally in terms of the items of the PNIM; therefore, the items of the PNIM are all operationally linked conceptually to variables. The operationalization of the variables used in this study is reviewed in the following section.

Operationalization of Variables

The purpose of this section is to provide an overall perspective and detailed description of the specific variables used in phase two of the study. The major areas are defined, divided, and broken down into their component parts. The variables are described thoroughly and operationalized relative to the PNIM: Important computational

formulas are included. (Please refer to Appendix B, Phase I: Corroboration, for the operationalization of phase one; and Phase II: Main Analysis, for a more intensive treatment in outline form of the operationalization of the PNIM.)

Structure-related variables. The structure-related variables convey the basic morphological characteristics of the social network. The four main structural variables are size, interconnectedness or adjacent density, distance, and frequency of contact. Size refers to the total number within the social network: the actual number of persons identified as important in the social network. Adjacent density, an index of the interconnectedness, refers to the proportion of linkages (relationships) in the social network to the total possible number of linkages in the network. The formula for computing adjacent density is $2a/n(n + 1)$ where a = the actual number of linkages in the network and n = the network size. Distance refers to the distance between the focal person and a network member in terms of location or time of travel, and is assessed through a designated question (see Appendix A: item 2 on the PNIM). Frequency of contact refers to the relative frequency of contact between the focal person and a network member, and is assessed through a designated question (see Appendix A: item 1 on the PNIM).

Content-related variables. The content-related variables convey aspects of the content of the relationship between the social network of normals and schizophrenics. In this study, content is strictly defined as activity. Ten content areas--literally, types of activity--have been selected for inclusion in this study and assessed by a

designated question (see Appendix A: item 3 on the PNIM). These types of activities are intended to be categorical and inclusive. They are listed below with definitive examples:

1. FAMILY activities such as meals, holidays, vacations, or reunions.

2. EMPLOYMENT-related activities such as working with co-workers or supervisors.

3. ROMANTIC activities such as dating, dancing, or going out to dinner.

4. CONVERSATIONAL activities such as intimate, personal sharing or philosophical discussions.

5. SOCIAL activities such as parties, banquets, or visiting.

6. RECREATIONAL activities such as playing cards, participation in sports, or attendance at sports events.

7. FRATERNAL activities such as participation in clubs or other organizations.

8. RELIGIOUS activities such as attendance at church, synagogue, or temple.

9. POLITICAL activities such as rallies, or discussions of politics.

10. VOLUNTEER work such as service to the community, giving blood, or hospital work.

The content of the relationship is assumed to be a partial index of the quality: The more varied the content, i.e., the greater number of activities shared, the higher the quality of the relationship. To reflect this dimension, two types of relationships (with varying

implications about quality) have been chosen for study: the uniplex and the multiplex relationship. In the former, only one activity is shared in the relationship; in the latter, two or more activities are shared.

Another content-related variable, relationship density, is a summary index of the quality of the relationships within the social network, actually the primary star; the formula for relationship density is $\Sigma\ r_x/n$, where r = the number of content areas (in this study r may equal 10) and n = the number of possible linkages in the primary star. Thus, relationship density is an average of the content areas of the relationships between the focal person and the social network.

Function-related variables. The function-related variables reflect the transaction of support between the focal person and the social network: Function is designated as either affective verbal, affective behavioral, instrumental verbal, or instrumental behavioral support (refer to the previous section for a list of the matching items). Two items on the PNIM correspond with each one of the four designations, making a total of eight related items; one item of each pair elicits the degree of support the focal person receives; and the other, the degree of support the focal person provides.

The three function-related variables are functional indegree, functional outdegree, and functional symmetry. Functional indegree indicates the degree of instrumental and affective support that the focal person is receiving (items 5, 11, 13, and 15). Functional outdegree indicates the degree of instrumental and affective support

that the focal person is providing to a network member (items 4, 6, 7, and 12). For one relationship, both are computed by summing the degree of support, whether given or received by the focal person, across the items assessing the four dimensions. The functional indegree and outdegree for a network are computed by summing across the network and dividing by the total network size.

Functional symmetry is a function-related variable that assesses the balance of support in relationships in the social network. Three cases are noted. When the functional indegree (FI) and functional outdegree (FO) are equal, i.e., when the support is given and received in equal measure, the relationship is characterized by functional symmetry, and is termed for this study, "reciprocal." When the FI is larger than FO, i.e., when more support is given by the network member to the focal person, the relationship is functionally asymmetrical, and is termed relative to the focal person, "dependent," When the FO is larger than the FI, i.e., when the focal person is giving more than the network member, the relationship is again asymmetrical, and termed relative to the focal person, "supportive." Assessments of functional symmetry are made within the social networks of normals and schizophrenics in terms of the total social networks.

Emotion-related variables. Assessment of emotions is broken down into two categories: types of feelings and strength of feelings. The variables used to examine the type of emotion are affective indegree, affective outdegree, and affective symmetry. Affective indegree indicates the type of feelings expressed by a member for the focal person as perceived by the focal person. The range extends

from all positive to all negative feelings. The index for one relationship is equivalent to the answer of the designated item (see Appendix A: item 8 on the PNIM). The affective indegree for the social network is a summing across the network for that item divided by the size of the network. Affective outdegree indicates the type of feelings experienced by the focal person for a member of the social network. The range extends from all negative to all positive feelings. The index for one relationship is also equivalent to the answer of one designated item (see Appendix A: item 14 on the PNIM). The total affective indegree is a summing for that item divided by n. Affective symmetry exists when the type of emotion between the focal person and the network member is identical, i.e., when affective indegree (AI) = affective outdegree (AO). Affective asymmetry exists when the type of emotion between the focal person and the network member varies, i.e., when AI $\neq$ AO.

The variables used to examine the strength of emotion are investment indegree, investment outdegree, and investment symmetry. Investment indegree reflects the strength of feelings (emotional investment) experienced by the network member for the focal person as perceived by the focal person. The range extends from weak to very strong feelings. The index for one relationship is equivalent to the answer to one designated item (see Appendix A: item 9 on the PNIM). The investment indegree for the social network is a summing across the network for that item divided by n. Investment outdegree reflects the strength of feelings (emotional investment) experienced by the focal person for a network member. The range extends from weak to

very strong feelings. The index is also equivalent to the answer to one designated item (see Appendix A: item 10 on the PNIM). The total investment outdegree is also a summing across the network divided by n. Investment symmetry exists when the emotional investment experienced by the focal person and the network member is equal. Investment asymmetry exists when their emotional investment is different.

An exception. Certain types of network members will not be included in the data analysis due to the importance and relevance of reciprocity in the analysis of the PNIM and the necessity of corroborated self-report. The analysis and interpretation of the results of the PNIM are predicated on the assumption that the assessed relationships can be reciprocal in all respects: The presence or absence of reciprocity in relationships has certain meanings that are central to the purpose of this study (see chapter I). In order to be able to make proper interpretations of the results, only those network members capable of reciprocal arrangements will be included in the data analysis. Also, network members must be capable of reporting on their relationship with the focal person. Furthermore, they must actually be present physically. For these reasons, the deceased and/or fantasied network members will not be included in the data analysis.

Consent Procedures

Two sets of consent procedures have been developed to accommodate to the intrinsically different characteristics of the two samples, the normal and the schizophrenic, and the environments in which they were identified. The term "schizophrenia" is a psychiatric diagnosis that denotes a certain type of mental illness; as such, it is subject

to regulation and strict definition. Those facilities responsible for the housing and/or treatment of the schizophrenic are ethically and legally charged to protect the identity of the schizophrenic and maintain the confidentiality of the schizophrenic's records. Exceptions are defined legally, must be justificable, and are subject to stringent safeguards. Accordingly, the identification of the schizophrenic sample and the acquisition of informed consent for the study are difficult and complex procedurally and involve ethical and legal considerations, the focus explicitly being the protection of the welfare of the schizophrenic. The term "normal," used to describe the other sample, is neither a psychiatric diagnosis nor is subject to regulation; therefore, the consent procedures are relatively simple and straightforward, although the focus remains protection of the subjects' welfare.

Testing Procedures

Normal and Schizophrenic Samples

A set of parallel, but differing, testing procedures was designed for the normal and schizophrenic samples. Each set constituted a structured interview. Both sets of procedures contained seven interview phases, one of which might not be used depending on whether data corroboration was permitted by the subject. Four of these phases were required for the completion of the Psychosocial Network Inventory, Modified. Each phase corresponded to the completion of a primary task within the interview. The primary tasks of the seven phases were identical between the two samples. However, the manner in which the

primary tasks were to be accomplished differed in varying degrees, based on the characteristics of each sample. Most prominently, group testing and unassisted completion of the inventory (once directions were understood) were permitted for the normal subjects, due to their superior functioning capacity; on the other hand, all schizophrenic subjects were tested individually and in private to respond to their particular personal needs, lower functioning capacity, and issues of confidentiality and privacy: In this way, the interviewer could provide immediate and continuing assistance and direction, and demonstrate overtly a respect for the privacy of the schizophrenic subject. Last, to facilitate the completion of the two types of structured interviews, directions were drafted for the use of the interviewer (see Appendix A: Directions: Structured Interview [1], designed for the normal sample; and Directions: Structured Interview [2], designed for the schizophrenic sample).

Phase 1. The primary task of this phase of the structured interview was to provide an adequate explanation of the study to the subject. Two forms were prepared, one for each sample (see Appendix A: Explanation of the Research Study [1], designed for the normal sample; and Explanation of the Research Study [2], designed for the schizophrenic sample). The appropriate forms were read to subjects of both samples; subjects were encouraged to ask their questions immediately. Members of both samples were asked if they understood the explanation of the study. A lack of understanding or misunderstanding was explored when either appeared. Also, each subject was asked specifically about the corroboration aspect/option of the study to assure comprehension.

If necessary, the letter to be sent to corroborating network members (see Appendix A) was shown to clarify any questions, especially those pertaining to confidentiality and privacy.

Phase 2. The primary task of this phase was to obtain the informed consent of the subject to participate in the study and, when appropriate, to permit the contact of network members, randomly selected, the purpose being corroboration of self-report data. Two consent forms were prepared for use in this phase, one with additional statements relating to the corroboration option for use with subjects giving their approval for corroboration and from whom it was desired by the researcher (see Appendix A: Statement of Informed Consent [1]), and another for use when corroboration was neither approved by the subject nor desired by the researcher (see Appendix A: Statement of Informed Consent [2]). The researcher made the request for the corroboration option of every subject in both samples who appeared interested and open until the desired percentage of respondents was reached. After the appropriate form was placed in front of the subject/s, the top of form (1) or form (2) in entirety was read by the interviewer. When the interviewer was confident that the explanation of the study and of the rights of the subject was understood by the subject/s, the interviewer asked the subject/s to sign and date the form, all interested in further information about the study after its completion to make a mark by their name. For those subjects interested in the corroboration option, the relevant statements found on the lower portion of form (1) were read and explained by the

interviewer. At this point, the request was made for the subject/s to sign and date this portion of the consent form.

Once the consent forms had been signed and dated, the four basic steps in the study were outlined and the data collection began. The four basic steps were as follows: (a) completing the General Information Sheet, (b) listing persons in the network, (c) assessing relationships, and (d) indicating the relationships among the persons named.

Phase 3. The primary task of this phase was the completion of the General Information Sheet (see Appendix A). The interviewer encouraged the normal subjects to complete this form without assistance; however, if this wasn't a successful approach with any normal subjects, then the interviewer would ask the questions and complete the form, using the form as a prompter. For the schizophrenic sample, the interviewer asked the questions, using the form as a prompter, and recorded the responses for the subject.

Phase 4. The primary task of this phase was the development of a list of all persons who were presently important in the life of the subjects. Two forms were designed for use in this phase: the answer sheet (see Appendix A) and a list of persons who might be potentially important to the subject to be used as a prompter, insuring a complete list (see Appendix A: Listing of Persons Important to You). All subjects were encouraged to use their own definition of importance. Additionally, subjects from the normal sample were invited to fill out the names, as well as other identifying information (sex, length of relationship, and type of relationship) on their answer sheet. The

normal subjects were also requested to circle the names of persons named who are deceased. The normal subjects could also exercise an option to complete the list following the interview, as long as a partial list of a minimum of six names was completed in the interviewer's presence to assure a thorough understanding of the task and accuracy. The interviewer filled out the names and identifiers of the complete social network for the schizophrenic subjects.

Phase 5. The primary task of this phase was the assessment of the relationships, identified in the social network, through the use of the Psychosocial Network Inventory, Modified (see Appendix A). Two other forms contained the three scales for answering items 4 through 15 on the Psychosocial Network Inventory, Modified (PNIM), one for each sample (see Appendix A: Response Key [1], designed for the normal sample; and Response Key [2], designed for the schizophrenic sample). After the total list of important people was developed for both samples or, at least, a partial list of six for the normal sample, the assessment of relationships began within the structured interview. The interviewer initiated the assessment by taking the first person identified in chronological order and asking the first three questions on the PNIM. For both samples the interviewer read these questions; however, the normal sample was encouraged to fill in the blanks with the interviewer's assistance and the schizophrenic sample only needed to respond verbally to the questions while the interviewer marked the answer sheet. After these were completed for both samples for the first person, the rest of the questions on page two of the PNIM and the appropriate response key were presented to both samples. The

scales were described as a continuum, all along which answers could be selected. Response Key (1) for the normal sample was numbered one through nine to correspond to the answer code, to permit answers between the modal points, and to facilitate unassisted completion once the directions were understood. Response Key (2), identical to the former response key except for the numbering, was presented to the schizophrenic sample with the explanation that they could identify their answer on any point along the scale, including the five points offered for guidance. Once this had been fully explained, items 4 through 15 were asked of both samples. It was then added that all questions must be completed for all identified persons. The schizophrenic sample with the interviewer's assistance then continued assessing the relationships until all were completed. In some cases, the schizophrenic subjects opted to answer items one through three on all persons before continuing to the second page: Such was permitted (likewise, some normals opted for this alternative). Also, the schizophrenic subjects were offered breaks in the testing to renew their interest and concentration. The normal sample either completed all assessments of the relationships during the interview or finished at least two complete assessments of the relationships if they opted to complete the form later, given their more difficult timetables and scheduling.

Phase 6. The primary task of this phase was the assessment of the degree of connectedness among the network members: The procedure was identical for both samples. The interviewer assisted all subjects to identify ongoing relationships between the network members.

To qualify for an ongoing relationship, it was required that both persons must know each other and have some kind of relationship with each other outside their relationship with the subject. The assigned chronological numbers of those identified as having a relationship with the selected person were written in the right hand column of the answer sheet designated "Connections." After all of the identified persons had been assessed for network connections, the structured interview terminated unless the subject had been asked and permitted the corroboration phase.

Phase 7. The primary task of this phase was to identify through random selection the network members who were to be contacted to corroborate the self-report of the subject. One form was used for this phase to assist the interviewer in random selection of the corroborating members (see Appendix A: Selected Network Members). On this form, the size of the identified network was associated with five numbers of random selection which designate those identified. All subjects were informed which five network members were chosen through the randomizing process. Once fully informed, the subjects were free to rescind their approval of this phase. Only two schizophrenic subjects so decided at this point. The names, addresses, and phone numbers were collected on all five members identified for corroboration; however, when an identified member met one of the criteria for exclusion ([a] deceased and [b] a fantasied relationship), alternate choices were made randomly on the spot. This phase completed the structured interview. With the interview ended, the subjects were thanked for their time, effort, and interest in the research.

Corroborating Network Members

Contact and examination of the corroborating network members, those identified by random selection in phase seven of the testing procedures for the subjects, involved a three-phase effort.

Phase 1. During this phase, the corroborating members were contacted by phone. In the conversation they were informed of the nature and purpose of the contact and the extent of their involvement, asked if they were interested in participating in this research, and if so, to supply or confirm their mailing address. A few declined immediately at this point and others failed to respond after the mailing. A few others were not contacted first by phone as the numbers were not known.

Phase 2. During this phase, the corroborating members who were interested in or open to considering participation or unreachable by phone were mailed the following forms, as well as a self-addressed stamped envelope for response: Corroborating Member Letter (see Appendix A), Statement of Informed Consent (2) (see Appendix A), and Response Key (1) (see Appendix A). In the letter the nature and purpose of the contact and focus of the study were presented, safeguards to confidentiality and privacy mentioned, and the request was made that if they would be willing to participate in the study to sign, date, and forward the enclosed consent form in the self-addressed envelope. If there were any questions, a 24-hour phone number was included. Last, a response key was enclosed to facilitate answering of the questions from the PNIM.

Phase 3. This phase began once the consent form was received in the mail from the cooperating network member; however, when the corroborating members seemed unduly late in returning the form, follow-up calls were made. With the consent forms returned, the corroborating members were again contacted by phone and asked questions about their relationship with the subject and their knowledge of other important relationships. In relation to the former, they were asked all of the questions on the PNIM as it applied to their relationship with the subject. All answers were written on a standard answer sheet which was designated for corroborators of a certain subject: Each corroborator was assigned the number given to him/her by the subject. In relation to the latter, they were asked how many people they knew whom they would consider as personally important to the subject, i.e., the network cluster. The answer to this question, the size of the network cluster, was written under "SUM" on the right portion of the answer sheet, the same place designated for the sum portion of the subject's response. With this final answer recorded, this third and final phase is completed: At least four corroborating members were tested in this fashion, although five were initially identified. All corroborators were informed that, upon their request, they would be forwarded more complete information about the study and an overview of the results. Last, all were thanked for their interest and participation.

Risk/Benefit Analysis

An examination of the nature and design of the study suggested the presence of potential social and psychological risks to the subjects; physical, legal, and economic risks were not posed.

Potential social risks were associated with the request that some subjects relinquish their anonymity to provide access to their social network for further study of the social relationships. The risk appeared to relate to possible misinterpretations by the contacted network members of (a) the subject's motive in identifying them and (b) the reason for the subject's participation in the study.

The social risk of misinterpretation appeared to be largely dependent upon the degree of vagueness inherent in the explanation given to the contacted network member. To minimize this possibility, every effort was made to develop a clear, direct, precise, and unambiguous explanation. However, this safeguard is one-sided in the sense that it can only act to increase the clarity of the statement; it cannot be assumed to control for idiosyncratic interpretations or misuse of the disclosure of the subject's participation by the contacted network member.

Potential psychological risks related to the use and effect of the Psychosocial Network Inventory, Modified (PNIM). The use of all psychological tests is accompanied by potential risks, and the same is true for the PNIM. The primary risk is the generation of psychological conflicts, and resulting discomfort/dysfunction, previously controlled by the subject's defense mechanisms. This reaction could occur in either group, but it is more likely with the schizophrenics;

their coping abilities and defenses are much less controlled and integrated, by definition. However, the type of test used in this study is a highly structured, rather straightforward inventory tapping primarily conscious levels, possibly the least threatening of all psychological test forms; projective tests, on the other hand, tap much deeper levels of the subject's psyche and would, therefore, be much more likely to uncover hidden conflict and provoke an untoward reaction.

The psychological risks were lessened through the choice of a multiple-choice, structured test (see above); however, if such risks materialized, plans were made to encourage the schizophrenic--who, by the way, was tested in a psychiatric setting--to consult with his/her primary therapist and/or sign a release so that the reaction could be reported to appropriate staff. If the reaction was considerable, plans were made to report it immediately so that facility staff could act to intervene. If difficulties arose with a member of the normal group, plans were made to refer him or her to the local mental health center.

Confidentiality was assured through (a) a coding procedure, (b) locked records, and (c) destruction of all identifying information after no longer necessary.

Last, the study was designed to be of benefit to the subject, the profession, and society in general. Through the administration of the PNIM, the subject might develop insights into the processes and dynamics operating in his/her social network and perhaps, discover the extent of available social support. Gains within the professional

realm include the following: (a) determination of the validity and usefulness of self-report scales in social network analysis, clarifying the value of previous contributions to the field who based their work on self-report; (b) greater insight in the psychosocial functioning of the schizophrenic relative to the normal subject; and (c) recommendations regarding the psychosocial management and treatment of the schizophrenic disorder. Society, in general, could be profited by the knowledge as used by the profession.

University Authorization

Following the dissertation committee approval of the research proposal on January 25, 1980, the University Committee on Research Involving Human Subjects (UCRIHS) requested and reviewed the research proposal and supporting materials focusing on the rights and welfare of human subjects (see Appendix C), as mandated by the National Research Act, Public Law 93-348, Section 474(a). Following their review, Henry E. Bredeck, Chairman, UCRIHS, notified this researcher that the committee had approved the project on April 7, 1980.

Research Questions

This section has been included in the chapter as well as the section, Null Hypotheses, to provide the reader with an organizing schema, a mind set, with which to conceptualize the intent or goals of the study, and to grasp the extensive nature of the null hypotheses; the Null Hypotheses section is lengthy and detailed, and yields slowly to understanding without such a guide.

The purpose of the study was to compare the social networks of normals and schizophrenics along four major classes of variables: Structure, the dimension reflecting the morphological characteristics of the network; Content, reflecting the sharing of activities within the network; Function, reflecting the exchange of support within the network; and Emotion, reflecting the experience of emotion within the network. However, before the analysis of the social networks of normals and schizophrenics can be more fully understood, the self-report of the subjects on their social networks must be corroborated with the report of at least four network members to determine the degree of agreement. This constitutes phase one of the analysis. In relationship to this determination, the following research question was posited (stage one of the analysis within phase one): How does the self-report of normals and schizophrenics corroborate with the self-report of identified network members/corroborators on the joint relationship along these variables:

1. Structure, specifically size of the network cluster, distance, and frequency of contact;
2. Content, specifically the number of content areas;
3. Function, specifically functional indegree and outdegree; and
4. Emotion, specifically affective indegree and outdegree, and investment indegree and outdegree?

One further question is posited (stage two of the analysis within phase one): Are the differences between the subjects and corroborators significant between the normal and schizophrenic samples?

In relation to the stated purpose of the study, the following groups of research questions are posited in phase two of the analysis:

1. In terms of structure, how do the social networks of normals and schizophrenics differ relative to size, interconnectedness, distance, and frequency of contact? Given the differences, what do the interrelationships among the variables suggest about the structure of the social networks?

2. In terms of content, how do the social networks of normals and schizophrenics differ in proportion of uniplex and multiplex relationships, and in relationship density? Given the differences, what do the interrelationships among the variables suggest about the content of the social networks?

3. In terms of function, how do the social networks of normals and schizophrenics differ in functional indegree, functional outdegree, and functional symmetry? Given the differences, what do the interrelationships among the variables suggest about the function of the social networks?

4. In terms of emotion, how do the social networks of normals and schizophrenics differ in affective indegree, affective outdegree, affective symmetry, investment indegree, investment outdegree, and investment symmetry? Given the differences, what do the interrelationships among the variables suggest about the emotional dimensions of the social networks?

Last, given the differences in the above four classes of variables, what can be concluded about the overall functioning of the social networks of normals and schizophrenics?

Null Hypotheses

Phase One

Stage one. The following null hypotheses relate to the first stage of the analysis in phase one, the corroboration of the self-report of the normal and schizophrenic samples with selected members of their social network. A statement of the major null hypothesis of stage one and phase one outlines the major intent of this stage of the analysis and precedes the testable null hypotheses associated with the classes of social network variables for the normal and schizophrenic samples: structure, content, function, and emotion. These

following hypotheses are written in multivariate form, excepting the hypotheses associated with the class of variable, content. Both contain a univariate statement. The numbered variables within the null hypotheses correspond to subordinate, univariate null hypotheses: The coded designation of the univariate hypothesis retains the shorthand symbol of the multivariate hypothesis, adding only the variable number separated by a dash from the subscript. The univariate hypotheses are written in full only within the first set of multivariate hypotheses for demonstration purposes. The hypotheses of stage one of phase one are:

Major null hypothesis of stage one of phase one.

Ho_m: No difference exists in the self-report between the normal subjects and network member/corroborators, and between the schizophrenic subjects and network member/corroborators along the major classes of social network variables: structure, content, function, and emotion.

Major null hypotheses: structure.

Ho_{1n}: No difference exists in the self-report of the normal subjects and corroborators in terms of structure-related variables: (a) Variable 1, size of the network cluster; (b) Variable 2, distance; and (c) Variable 3, frequency of contact.

Subordinate, univariate null hypotheses: structure, normal sample.

Ho_{1n-1}: No difference exists in the self-report of the normal subjects and corroborators in terms of the size of the network cluster.

Ho_{1n-2}: No difference exists in the self-report of the normal subjects and corroborators in terms of the distance.

Ho_{1n-3}: No difference exists in the self-report of the normal subjects and corroborators in terms of the frequency of contact.

Ho_{1s}: No difference exists in the self-report of the schizophrenic subjects and corroborators in terms of structure-related variables: (a) Variable 1, size of the network cluster; (b) Variable 2, distance; and (c) Variable 3, frequency of contact.

Subordinate, univariate null hypotheses: structure, schizophrenic sample.

Ho_{1s-1}: No difference exists in the self-report of the schizophrenic subjects and corroborators in terms of the size of the network cluster.

Ho_{1s-2}: No difference exists in the self-report of the schizophrenic subjects and corroborators in terms of the distance.

Ho_{1s-3}: No difference exists in the self-report of the schizophrenic subjects and corroborators in terms of the frequency of contact.

Major null hypotheses: content.

Ho_{2n}: No difference exists in the self-report of the schizophrenic subjects and corroborators in terms of the content-related variable: Variable 4, the number of content areas. To maintain consistency the univariate hypothesis is designated Ho_{2n-4}.

Ho_{2s}: No difference exists in the self-report of the schizophrenic subjects and corroborators in terms of the content-related variable: Variable 4, the number of content areas. To maintain consistency, the univariate hypothesis is designated Ho_{2s-4}.

Major null hypotheses: function.

Ho_{3n}: No difference exists in the self-report of the normal subjects and corroborators in terms of function-related variables: (a) Variable 5, functional indegree; and (b) Variable 6, functional outdegree. Univariate hypotheses corresponding to the variables: Ho_{3n-5}; and Ho_{3n-6}.

Ho_{3s}: No difference exists in the self-report of the schizophrenic subjects and corroborators in terms of function-related variables: (a) Variable 5, functional indegree; and (b) Variable 6, functional outdegree. Univariate hypotheses corresponding to the variables: Ho_{3s-5}; and Ho_{3s-6}.

Major null hypotheses: emotion.

Ho_{4n}: No difference exists in the self-report of the normal subjects and corroborators in terms of emotion-related variables: (a) Variable 7, affective indegree; (b) Variable 8, affective outdegree; (c) Variable 9, investment indegree; and (d) Variable 10, investment outdegree. Univariate hypotheses corresponding to the variables: Ho_{4n-7}; Ho_{4n-8}; Ho_{4n-9}; and Ho_{4n-10}.

Ho_{4s}: No difference exists in the self-report of the schizophrenic subjects and corroborators in terms of emotion-related variables: (a) Variable 7, affective indegree; (b) Variable 8, affective outdegree; (c) Variable 9, investment indegree; and (d) Variable 10, investment outdegree. Univariate hypotheses corresponding to the variables: Ho_{4s-7}; Ho_{4s-8}; Ho_{4s-9}; and Ho_{4s-10}.

Stage two. The following null hypotheses relate to the second stage of the analysis in phase one, the comparison of the normal and schizophrenic samples in terms of the relative differences between the subjects and corroborators. A statement of the major null hypothesis of stage two and phase one outlines the major intent of this stage of the analysis and precedes the testable null hypotheses associated with the classes of social network variables for the normal and schizophrenic samples: structure, content, function, and emotion. These following hypotheses are written in multivariate form, excepting the hypotheses associated with the class of variable, content, which contains a univariate statement. The numbered variables within the null hypotheses correspond to subordinate, univariate null hypotheses: As in stage one, the coded designation of the univariate hypothesis retains the shorthand symbol of the multivariate hypothesis, adding only the variable number separated by a dash from the subscript. The hypotheses of stage two of phase one follow below:

Major null hypothesis of stage two of phase one.

Ho_m: No difference exists in the normal and schizophrenic samples in terms of discrepancy of self-report between subjects and corroborators along the major classes of social network variables: structure, content, function, and emotion.

Major null hypothesis: structure.

Ho_s: No difference exists in the normal and schizophrenic samples in terms of discrepancy of self-report between subjects and corroborators along the structure-related variables: (a) Variable 1, size of network cluster; (b) Variable 2, distance; and (c) Variable 3, frequency of contact. Univariate hypotheses corresponding to the variables: Ho_{s-1}; Ho_{s-2}; Ho_{s-3}.

Major null hypothesis: content.

Ho_c: No difference exists in the normal and schizophrenic samples in terms of discrepancy of self-report between subjects and corroborators along the content-related variable: Variable 4, the number of content areas. To maintain consistency the univariate hypothesis is designated Ho_{c-4}.

Major null hypothesis: function.

Ho_f: No difference exists in the normal and schizophrenic samples in terms of discrepancy of self-report between subjects and corroborators along the function-related variables: (a) Variable 5, functional indegree; and (b) Variable 6, functional outdegree. Univariate hypotheses corresponding to the variables: Ho_{f-5}; and Ho_{f-6}.

Major null hypothesis: emotion.

Ho_e: No difference exists in the normal and schizophrenic samples in terms of discrepancy of self-report between subjects and corroborators along emotion-related variables: (a) Variable 7, affective indegree; (b) Variable 8, affective outdegree; (c) Variable 9, investment indegree; and (d) Variable 10, investment outdegree. Univariate hypotheses corresponding to the variables: Ho_{e-7}; Ho_{e-8}; Ho_{e-9}; and Ho_{e-10}.

Phase Two

Stage one. The following null hypotheses relate to the first stage of the analysis in phase two, the main comparison between the social networks of the normal and schizophrenic samples. A statement of the major null hypothesis of stage one and phase two outlines the major intent of this stage of the analysis and precedes the testable null hypotheses associated with the classes of social network variables: structure, content, function, and emotion. These major hypotheses--following below--are written in multivariate form. The numbered variables within the null hypotheses correspond to subordinate, univariate null hypotheses: The coded designation of the univariate hypotheses retains the shorthand symbol of the multivariate hypothesis, adding only the variable number separated by a dash from the subscript. The hypotheses of stage one of phase two follow below:

Major null hypothesis of stage one of phase two.

Ho_m: No difference exists in the social networks of the normal and schizophrenic samples along the major classes of social network variables: structure, content, function, and emotion.

Major null hypothesis: structure.

Ho_s: No difference exists in the social networks of the normal and schizophrenic samples in terms of the structure-related variables: (a) Variable 1, size of the network; (b) Variable 2, interconnectedness; (c) Variable 3, distance; and (d) Variable 4, frequency of contact. Univariate hypotheses corresponding to the variables: Ho_{s-1}; Ho_{s-2}; Ho_{s-3}; and Ho_{s-4}.

Major null hypothesis: content.

Ho_c: No difference exists in the social network of the normal and schizophrenic samples in terms of the content-related variables: (a) Variable 5, proportion of uniplex relationships; (b) Variable 6, proportion of multiplex relationships; and (c) Variable 7, relationship density. Univariate hypotheses corresponding to the variables: Ho_{c-5}; Ho_{c-6}; and Ho_{c-7}.

Major null hypothesis: function.

Ho_f: No difference exists in the social networks of the normal and schizophrenic samples in terms of the function-related variables: (a) Variable 8, functional indegree; and Variable 9, functional outdegree. Univariate hypotheses corresponding to the variables: Ho_{f-8}; and Ho_{f-9}.

Major null hypothesis: emotion.

Ho_e: No difference exists in the social networks of the normal and schizophrenic samples in terms of the emotion-related variables: (a) Variable 11, affective indegree;

(b) Variable 12, affective outdegree; (c) Variable 14, investment indegree; and (d) Variable 15, investment outdegree. Univariate hypotheses corresponding to the variables: Ho_{e-11}; Ho_{e-12}; Ho_{e-14}; and Ho_{e-15}.

Stage two. The following null hypotheses relate to the second stage of the analysis in phase two, the assessment of symmetry within the two samples. A statement of the major null hypothesis of stage two and phase two outlines the major intent of this stage of the analysis and precedes the testable hypotheses associated with two classes of social network variables: function and emotion. These following hypotheses are written in multivariate form. The numbered variables within the null hypotheses correspond to subordinate, univariate null hypotheses: The coded designation of the univariate hypotheses retains the shorthand symbol of the multivariate hypothesis, adding only the variable number separated by a dash from the subscript. The hypotheses of stage two of phase two follow below:

Major null hypothesis of stage two of phase two.

Ho_m: No difference exists between the measures of outdegree and indegree within the normal and schizophrenic samples along the two major classes of social network variables: function and emotion.

Major null hypothesis: function and emotion, normal sample.

$Ho_{fe/n}$: No difference exists between the measures of outdegree and indegree within the normal sample along the two major classes of social network variables: function and

emotion; i.e., within the normal sample, functional symmetry (Variable 10), affective symmetry (Variable 13), and investment symmetry (Variable 16) exist. Univariate hypotheses corresponding to the variables: $Ho_{fe/n-10}$; $Ho_{fe/n-13}$; and $Ho_{fe/n-16}$.

Major null hypotheses: function and emotion, schizophrenic sample.

$Ho_{fe/s}$: No difference exists between the measures of outdegree and indegree within the schizophrenic sample along the two major classes of social network variables: function and emotion; i.e., within the schizophrenic sample, functional symmetry (Variable 10), affective symmetry (Variable 13), and investment symmetry (Variable 16) exist. Univariate hypotheses corresponding to the variables: $Ho_{fe/s-10}$; $Ho_{fe/s-13}$; and $Ho_{fe/s-16}$.

Research Design and Analysis

Phase One

The focus of the research design and analysis of phase one in the study was the corroboration of self-report. Two stages of the research were planned to investigate this focus. Both are described below.

Stage one. In the first stage, a comparative group design was used for each sample to determine if the self-report data were adequately corroborated by network members within the two samples. To set up this type of design, the self-report of five subjects in each sample was contrasted with the self-report of at least four, if not

five, members of their social networks on the joint relationship, and average difference scores were computed for each subject relative to the network members. These scores were compared to the zero vector. This design was characterized by one fixed independent variable, termed group differences. It has two levels, termed group of average difference scores and group of zero differences. Furthermore, the design has 10 dependent variables, grouped by major class (see Figure 1). Cell size equals five. In a sense, the group of average difference scores associated with the two samples were each compared to the average difference scores of the "ideal" group.

The data analysis was conducted by using three multivariate tests and one univariate test for each sample. The major hypotheses corresponding to the three major classes of variables (structure, function, and emotion) were analyzed through the use of multivariate analysis of variance tests. The goal of these multivariate procedures was to consider each class of variable separately, yet its component variables jointly, while avoiding inflated alpha levels. Each multivariate test was examined at the $p = .10$ level, chosen due to the low degrees of freedom ($df = 4, 1$). Univariate tests were designed to follow if the multivariate test was significant, using an approximate, partitioned alpha level, divided by the number of dependent variables. The partitioned alpha levels of the structure-related, function-related, and emotion-related variables are .03, .05, and .025, respectively. The major hypothesis, corresponding to the class of variable, content, was analyzed through the use of a univariate analysis of variance, examined at the $p = .10$ level.

Dependent Variables by Class		Fixed Independent Variable: Group Differences	
		Group of Average Difference Scores (Normal or Schizophrenic)	Group of Zero Differences
Structure	Size of network cluster	$n = 5$	
	Distance		
	Frequency of contact		
Content	Number of content areas		
Function	Functional indegree		
	Functional outdegree		
Emotion	Affective indegree		
	Affective outdegree		
	Investment indegree		
	Investment outdegree		

Figure 1. Research design for phase one, stage one, for the analysis of corroboration of self-report data for each group, normal and schizophrenic.

Stage two. In the second stage, a comparative group design was used to determine if the two samples were significantly different in relation to the corroboration of self-report. This design was characterized by one fixed independent variable, type of average difference scores, with two levels, normal and schizophrenic. Furthermore, the design has 10 dependent variables, grouped by the four major classes of variables (see Figure 2). Cell size equals five.

The data analysis was conducted by using three multivariate tests and one univariate test. The major hypotheses corresponding to the three major classes of variables (structure, function, and emotion) were analyzed through the use of multivariate analysis of variance tests. As in stage one, the goal of these multivariate procedures was to consider each class of variable separately, yet its variables jointly, while avoiding inflated alpha levels. Each multivariate was examined at the $p = .10$ level, chosen due to the low degrees of freedom ($df = 4, 1$). Univariate tests were designed to follow if the multivariate test was significant, also using approximate, partitioned alpha levels: The alpha levels are identical to those of stage one.

Phase Two

The focus of the research design and analysis of phase two in the study was the main comparison of social network characteristics between the two samples. Two stages of the research were planned to investigate this focus. Both are described below.

Stage one. In the first stage, a comparative group design was used to determine if the two samples were significantly different

Dependent Variables by Class		Fixed Independent Variable: Type of Average Difference Scores	
		Normal Sample	Schizophrenic Sample
Structure	Size of network cluster	$\underline{n}$ = 5	$\underline{n}$ = 5
	Distance		
	Frequency of contact		
Content	Number of content areas		
Function	Functional indegree		
	Functional outdegree		
Emotion	Affective indegree		
	Affective outdegree		
	Investment indegree		
	Investment outdegree		

Figure 2. Research design for phase one, stage two, for the analysis of group differences in self-report data.

along the social network variables that can be compared directly. This excludes those dealing with symmetry. This design was characterized by one fixed independent variable, type of sample, with two levels, normal and schizophrenic. Furthermore, the design has 13 dependent variables (see Figure 3). Although groupings by major class of variable were developed in the previous phase of analysis, this stage was not so designed as the emphasis at this point was placed on the optimum efficiency of the statistical test as opposed to conceptual grouping. Also the possible degrees of freedom permitted this procedure.

The data analysis was conducted by using one multivariate test. All 13 dependent variables, associated with the four major classes of variables, were analyzed through the use of a multivariate analysis of variance. This statistical test was examined at the $p = .05$ level, chosen as an appropriate level of significance due to the high degree of freedom ($df = 1, 33$). Univariate tests were designed to follow if the multivariate test was significant, using an approximate, partitioned alpha level to avoid an inflated alpha. The partitioned alpha level for the univariate tests, if needed, was set at $p = .005$. This value is roughly equivalent to the alpha level of the multivariate test divided by the number of dependent variables.

Stage two. In the second stage, a comparative group design was used to determine if symmetry within the two major classes of variables, function and emotion, exists within the two samples. To develop the design, difference scores were computed between the measures of functional, affective, and investment outdegree and indegree for

Dependent Variables by Class		Fixed Independent Variable: Type of Sample	
		Normal Sample	Schizophrenic Sample
Structure	Size of the network	n = 18	n = 17
	Interconnectedness		
	Distance		
	Frequency of contact		
Content	Proportion of uniplex relationships		
	Proportion of multiplex relationships		
	Relationship density		
Function	Functional indegree		
	Functional outdegree		
Emotion	Affective indegree		
	Affective outdegree		
	Investment indegree		
	Investment outdegree		

Figure 3. Research design for phase two, stage one, for the main comparison of group differences along all social network variables, excepting symmetry.

both samples and compared to the zero vector. This design was characterized by one fixed independent variable, group differences, with two levels, group of difference scores and group of zero differences: Furthermore, the design had three dependent variables (see Figure 4).

The data analysis was conducted by using one multivariate test for each sample. Each statistical test was examined at the $p = .05$ level, due to the high degrees of freedom ([3, 15] and [3, 14] for the normal and schizophrenic samples, respectively). Univariate tests were designed to follow if the multivariate test was significant, using an approximate, partitioned alpha level. The partitioned alpha level for the univariate tests, if needed, was set at $p = .015$. This value is roughly equivalent to the alpha level of the multivariate test divided by the number of dependent variables.

Summary

Subject selection was designed to promote comparability along those dimensions that affect outcome, as well as to insure the identification of appropriate subjects from both normal and schizophrenic populations. In relation to the former goal, the promotion of comparability, it was determined that steps be taken to control for age, sex, race, socioeconomic status, and cultural background, but not for educational and vocational levels, marital status, and personal economic status. In regard to the latter goal, criteria were established, all of which had to be met, for a person to qualify for membership in one of the two samples. A review of the characteristics of both samples indicated that both goals were essentially met. However,

Dependent Variables by Class		Fixed Independent Variable: Group Differences	
		Group of Difference Scores (Normal or Schizophrenic)	Group of Zero Differences
Function	Functional symmetry		
Emotion	Affective symmetry		
	Investment symmetry		

Figure 4. Research design for phase two, stage two, for the analysis of symmetry for each group, normal and schizophrenic.

in that approximately half of the schizophrenic persons contacted refused to participate in the study, the results will not reflect the influence of this undefined, though possibly more hostile and paranoid, subgroup.

The primary assessment instrument, the Psychosocial Network Inventory, Modified (PNIM), as its name suggests, was adapted from an inventory developed by E. Mansell Pattison (Pattison et al., 1975). As originally devised, the instrument presented the examinee with the three tasks of developing a list of personally important persons, rating the nature and quality of the relationships in this social network, and finally, noting the groups of persons who have relationships in common. The new instrument developed for this study, the PNIM, retains much of the content and form of the earlier inventory; however, seven improvements were made. First, it was revised as a structured inventory, responsive to the characteristics of the target populations. Second, the subject's selection of social network members was structured to insure a more orderly and thorough identification process. Third, the answer sheet was designed to ease recording and facilitate computer keypunching. Fourth, a response key was added to insure accuracy of response within the interview. Fifth, a question was added to assess the content-related aspects of relationships. Sixth, the questions associated with the supportive and emotional give-and-take within relationships, i.e., reciprocity, were designed to reflect the verbal and behavioral dimensions, as well. Seventh, the items of the PNIM were all conceptually and operationally linked to the

dependent variables in this study; the operationalization of the variables was reviewed.

Consent procedures were developed to accommodate to the intrinsically different characteristics of the two samples and the settings in which they were identified. Although the procedures relating to the schizophrenic, as opposed to the normal, were more complex due to ethical and legal considerations, the focus remained on the protection of the subjects' welfare.

Separate testing procedures were also developed for both samples and for corroborating network members; however, the normal and schizophrenic subjects were all faced with seven phases of testing as follows: (a) explanation of the study, (b) presentation and signing of the consent forms, (c) completion of the demographic data, (d) development of the list of personally important persons, (e) assessment of relationships with the PNIM, (f) assessment of the interconnectedness, and (g) selection of the corroborating network members. Three phases were involved in the contact and examination of corroborating network members as follows: (a) initial contact including exploration of interest and confirmation of demographic data, (b) mailing of appropriate forms, and (c) second contact for the assessment of the relationship with the focal person.

A risk/benefit analysis was undertaken, determining the presence of potential social and psychological risks to the subjects, but on the other hand, potential benefits to the subject, the professional community, and to society. The potential social risks related to the possible misinterpretation by the corroborating network members of

the subject's motive in identifying them and participation in the study. Clarification in the explanation to the corroborating network member was considered the primary and only safeguard. The psychological risk related to the use of the PNIM in possibly provoking an untoward reaction; however, the risk was deemed low due to the highly structured and straightforward nature of the PNIM. Finally, the benefits were determined to outweigh the possible risks, especially since safeguards were planned in case problems appeared.

Considering the methods so articulated of the research study, the University Committee on Research Involving Human Subjects approved this project on April 7, 1980. The methodology of the research study was directed toward two interrelated goals, the corroboration of self-report data of social network variables within both samples and the main comparison between the two samples along the social network variables. Two research phases were designed to correspond to the two goals: Two stages were required for each phase. Research questions and null hypotheses were developed as well for both stages of both phases. In stage one of phase one, the self-report data of both groups, broken down into 10 variables, were contrasted with the self-report of the corroborating network members on the joint relationship. Average difference scores were computed and compared relative to the zero vector, using a comparative group design. For both samples, three multivariate analysis of variance statistical tests, examined at the $\underline{p} = .10$ level, with optional post hoc univariate tests, using partitioned alpha levels, were used to analyze those dependent variables associated with the major classes of variables, structure,

function, and emotion. One univariate analysis of variance, examined at the p = .10 level, was used to analyze the content-related dependent variable. In stage two of phase one, the average difference scores of both samples were compared to determine if the two groups were significantly different in terms of degree of corroboration of self-report, using a comparative group design. Three multivariate analysis of variance statistical tests, examined at the p = .10 level, with optional post hoc univariate tests, using partitioned alpha levels, were used to analyze those dependent variables associated with the major classes of variables, structure, function, and emotion. One univariate analysis of variance, examined at the p = .10 level, was used to analyze the content-related dependent variable. In stage one of phase two, the main comparison relative to the social network variables between the two samples was implemented by comparing along 13 dependent variables, using a comparative group design. One multivariate analysis of variance statistical test, examined at the p = .05 level, was used to analyze these 13 variables simultaneously: Grouping by major class was not as important conceptually as was efficiency of the statistical test. The partitioned alpha level for the post hoc univariate tests was set at p = .005. In stage two of phase two, the focus was on symmetry within the two major classes of variables, function and emotion. Difference scores between the measures of functional, affective, and investment outdegree and indegree were computed in both samples and were compared to the zero vector, using a comparative group design. For each sample, one multivariate test,

examined at the p = .05 level, was used to analyze the three dependent variables. The partitioned alpha level for the post hoc univariate analysis of variance tests was set at p = .015.

CHAPTER III

RESULTS

The purpose of this chapter is the presentation of the statistical results. For clarity, the material is organized by the various stages and phases of the analysis. Prior to the description of the results, a synopsis of the focus and analysis of each stage is presented. Only significant findings are presented in this chapter; however, in the following chapter, suggestive, though nonsignificant, findings will be explored to determine their relevance for future research.

Results of Phase One: Corroboration of Self-Report

Stage One

The focus of stage one of phase one was the corroboration of the self-report of the normal and schizophrenic samples with selected members of their social networks. Four major hypotheses were developed for each sample, corresponding to the four major classes of social network variables. The 10 dependent variables were grouped by class within these hypotheses. Using a comparative group design, the major hypotheses were analyzed through the use of three multivariate analysis of variance (MANOVA) statistical tests and one univariate analysis of variance (ANOVA) statistical test for each sample. Post hoc univariate statistical tests were planned to follow

when appropriate. The results of the analysis, summarized in Tables 2, 3, and 4, follow below.

Table 2: Major Tests of Significance for the Null Hypotheses in Stage One of Phase One

	Null Hypothesis	Class of Variable	Type of Test	df	F-value
Normal Sample	Ho_{1n}	Structure	MANOVA[a]	(3,2)	10.83*
	Ho_{2n}	Content	ANOVA[b]	(1,4)	23.06*
	Ho_{3n}	Function	MANOVA	(2,3)	42.91*
	Ho_{4n}	Emotion	MANOVA	(4,1)	103.11*
Schizophrenic Sample	Ho_{1s}	Structure	MANOVA	(3,2)	61.00*
	Ho_{2s}	Content	ANOVA	(1,4)	125.00*
	Ho_{3s}	Function	MANOVA	(2,3)	50.96*
	Ho_{4s}	Emotion	MANOVA	(4,1)	34.24

[a]MANOVA = Multivariate analysis of variance.

[b]ANOVA = Analysis of variance.

*$p < .10$.

Corroboration within the normal sample. Significant differences were found to exist between the self-report of the subjects of the normal sample and their corroborators along all four classes of social network variables. In terms of the major null hypothesis associated with structure (Ho_{1n}), the MANOVA indicated that significant differences in self-report exist between normal subjects and corroborators,

i.e., a lack of corroboration, $\underline{F}$ (3, 2) = 10.83, $\underline{p} < .10$ (see Table 2); however, no significant differences were found in the univariate post hoc analyses of the three structure-related variables: (a) size of network cluster, (b) distance, and (c) frequency of contact (see Table 3). In terms of the major null hypothesis associated with content (Ho_{2n}, equivalent to Ho_{2n-4}), the ANOVA indicated that significant differences in self-report exist between normal subjects and corroborators, $\underline{F}$ (1, 4) = 23.06, $\underline{p} < .10$ (see Table 2). The specific content-related variable was the number of content areas. In terms of the major null hypothesis associated with function (Ho_{3n}), the MANOVA indicated that significant differences in self-report exist between normal subjects and corroborators, $\underline{F}$ (2, 3) = 42.91, $\underline{p} < .10$ (see Table 2). The analysis of the univariate null hypotheses yielded significant findings for both function-related variables, functional indegree and functional outdegree, the ANOVA results being $\underline{F}$ (1, 4) = 67.94, $\underline{p} < .05$ for Ho_{3n-5} and $\underline{F}$ (1, 4) = 34.20, $\underline{p} < .05$ for Ho_{3n-6}, respectively (see Table 3). In terms of the major null hypothesis associated with emotion (Ho_{4n}), the MANOVA indicated that significant differences in self-report exist between normal subjects and corroborators, $\underline{F}$ (4, 1) = 103.11, $\underline{p} < .10$ (see Table 2). The analysis of the univariate null hypotheses yielded significant findings for three of the four emotion-related variables, affective indegree, investment indegree, and investment outdegree, the ANOVA results being $\underline{F}$ (1, 4) = 36.00, $\underline{p} < .025$ for Ho_{4n-7}, $\underline{F}$ (1, 4) = 33.68, $\underline{p} < .025$ for Ho_{4n-9}, and $\underline{F}$ (1, 4) = 22.50, $\underline{p} < .025$ for Ho_{4n-10}, respectively (see Table 3). So, in summary, it appears that the self-report of normal

subjects was lacking in corroboration generally along the four major classes of social network variables, i.e., structure, content, function, and emotion, and specifically, along the dependent variables of number of content areas, functional indegree, functional outdegree, affective indegree, investment indegree, and investment outdegree.

Table 3: Univariate Tests of Significance for the Multivariate Null Hypotheses in Stage One of Phase One for the Normal Sample

Major Null Hypothesis	Univariate Hypothesis	Variable	df	F-value
Ho_{1n}	Ho_{1n-1}	Size, network cluster	(1,4)	8.67
	Ho_{1n-2}	Distance	(1,4)	4.38
	Ho_{1n-3}	Frequency of contact	(1,4)	9.85
Ho_{3n}	Ho_{3n-5}	Functional indegree	(1,4)	67.94**
	Ho_{3n-6}	Functional outdegree	(1,4)	34.20**
Ho_{4n}	Ho_{4n-7}	Affective indegree	(1,4)	36.00***
	Ho_{4n-8}	Affective outdegree	(1,4)	10.27
	Ho_{4n-9}	Investment indegree	(1,4)	33.68***
	Ho_{4n-10}	Investment outdegree	(1,4)	22.50***

Note. All significance values correspond to partitioned alpha levels.

*$p < .03$.

**$p < .05$.

***$p < .025$.

Corroboration within the schizophrenic sample. Significant differences were found to exist between the self-report of the subjects of the schizophrenic sample and their corroborators along three of the four classes of social network variables, specifically structure, content, and function; the finding relative to emotion was not significant. In terms of the major null hypothesis associated with structure (Ho_{1s}), the MANOVA indicated that significant differences in self-report exist between schizophrenic subjects and corroborators, i.e., a lack of corroboration, F (3, 2) = 61.00, $p < .10$ (see Table 2); significant differences relative to self-report were also found in all three structure-related variables: (a) size of network cluster, F (1, 4) = 31.34, $p < .03$ for Ho_{1s-1}; (b) distance, F (1, 4) = 12.25, $p < .03$ for Ho_{1s-2}; and (c) frequency of contact, F (1, 4) = 36.00, $p < .03$ for Ho_{1s-3} (see Table 4.) In terms of the major null hypothesis associated with content (Ho_{2s}, equivalent to Ho_{2s-4}), the ANOVA indicated that significant differences in self-report exist between schizophrenic subjects and corroborators, F (1, 4) = 125.00, $p < .10$ (see Table 2). The specific content-related variable was the number of content areas. In terms of the major null hypothesis associated with function (Ho_{3s}), the MANOVA indicated that significant differences exist between schizophrenic subjects and corroborators, F (2, 3) = 50.96, $p < .10$ (see Table 2). The analysis of the univariate null hypotheses yielded significant findings for both function-related variables, functional indegree and functional outdegree, the ANOVA results being F (1, 4) = 21.05, $p < .05$ for Ho_{3s-5} and F (1, 4) = 120.92, $p < .05$ for Ho_{3s-6} (see Table 4). The MANOVA investigating

the major null hypothesis associated with emotion (Ho_{4s}) failed to reach significance (see Table 2). In summary, it appears that the self-report of schizophrenic subjects was lacking in corroboration generally along three of the four major classes of social network variables, i.e., structure, content, and function, and specifically, along the dependent variables of size of network cluster, distance, frequency of contact, number of content areas, functional indegree, and functional outdegree.

Table 4: Univariate Tests of Significance for the Multivariate Null Hypotheses in Stage One of Phase One for the Schizophrenic Sample

Major Null Hypothesis	Univariate Hypothesis	Variable	df	F-value
Ho_{1s}	Ho_{1s-1}	Size, network cluster	(1,4)	31.34*
	Ho_{1s-2}	Distance	(1,4)	12.25*
	Ho_{1s-3}	Frequency of contact	(1,4)	36.00*
Ho_{3s}	Ho_{3s-5}	Functional indegree	(1,4)	21.05**
	Ho_{3s-6}	Functional outdegree	(1,4)	120.92**

Note. All significance values correspond to partitioned alpha levels.

*$p < .03$.

**$p < .05$.

Stage Two

The focus of stage two of phase one was the comparison between the normal and schizophrenic samples in terms of the corroboration of self-report. Four major hypotheses were developed, corresponding to the four major classes of social network variables. The 10 dependent variables were grouped by class within these hypotheses. Using a comparative group design, the major hypotheses were analyzed through the use of three MANOVA statistical tests and one univariate ANOVA statistical test. Post hoc univariate statistical tests were planned to follow when appropriate. The results of the analysis, summarized in Tables 5 and 6, follow below.

Significant differences were found to exist in the degree of corroboration of self-report between the two samples along two major classes of social network variables, including content and emotion; the findings for structure and function were not significant. In terms of the major null hypothesis associated with content (Ho_c), the ANOVA indicated that significant differences in the degree of corroboration exist between the two samples, F (1, 8) = 8.96, $p < .10$ (see Table 5). The specific content-related variable was the number of content areas. A review of the approximate confidence intervals suggests that the differences between subjects and corroborators were higher for the schizophrenic sample. In terms of the major null hypothesis associated with emotion (Ho_e), the MANOVA indicated that significant differences in the degree of corroboration exist between the two samples, F (4, 5) = 3.64, $p < .10$ (see Table 5). The analysis of the univariate null hypotheses yielded significant findings

for only one of the four emotion-related variables, investment indegree, the ANOVA results being $\underline{F}$ (1, 8) = 10.00, $\underline{p} < .025$ for Ho_{e-9} (see Table 6). A review of the approximate confidence intervals suggests that the differences between subjects and corroborators were higher for the schizophrenic sample. In summary, it appears that significant differences exist in the degree of corroboration between the two samples along the two major classes of social network variables, i.e., content and emotion, and specifically, along the dependent variables, number of content areas and investment indegree; in both cases, the degree of difference between subjects and corroborators was higher for the schizophrenic sample.

Table 5: Major Tests of Significance for the Null Hypotheses in Stage Two of Phase One

Null Hypothesis	Class of Variable	Type of Test	df	F-value
Ho_s	Structure	MANOVA[a]	(3,6)	2.05
Ho_c	Content	ANOVA[b]	(1,8)	8.96*
Ho_f	Function	MANOVA	(2,7)	1.06
Ho_e	Emotion	MANOVA	(4,5)	3.64*

[a]MANOVA = Multivariate analysis of variance.

[b]ANOVA = Analysis of variance.

*$\underline{p} < .10$.

Table 6: Univariate Tests of Significance for the Multivariate Null Hypothesis, Ho_e, in Stage Two of Phase One

Univariate Hypothesis	Variable	df	F-value
Ho_{e-7}	Affective indegree	(1,8)	2.65
Ho_{e-8}	Affective outdegree	(1,8)	.85
Ho_{e-9}	Investment indegree	(1,8)	10.00*
Ho_{e-10}	Investment outdegree	(1,8)	.01

Note. The significance value corresponds to a partitioned alpha level.

*$p < .025$.

Results of Phase Two: Comparison Between the Social Networks of Normals and Schizophrenics

Stage One

The focus of stage one of phase two was the main comparison between the social networks of the normal and schizophrenic samples. Using a comparative group design, 13 of the 16 dependent variables associated with the four major classes of variables were analyzed through a MANOVA statistical test. Post hoc univariate statistical tests were planned to follow, if appropriate. The results of the analysis, summarized in Table 7, follow below.

Significant differences were found to exist between the normal and schizophrenic samples when the social network variables were analyzed altogether; however, post hoc procedures revealed that the

Table 7: Univariate Tests of Significance for the Null Hypotheses in Stage One of Phase Two: Main Comparison Between the Social Networks of Normals and Schizophrenics.

Null Hypothesis	Class of Variable	Variable	df	F-value
Ho_{s-1}	Structure	Size of network	(1,33)	45.86*
Ho_{s-2}		Interconnectedness	(1,33)	2.31
Ho_{s-3}		Distance	(1,33)	6.74
Ho_{s-4}		Frequency of contact	(1,33)	3.44
Ho_{c-5}	Content	Proportion of uniplex relationships	(1,33)	.32
Ho_{c-6}		Proportion of multiplex relationships	(1,33)	2.24
Ho_{c-7}		Relationship density	(1,33)	1.11
Ho_{f-8}	Function	Functional indegree	(1,33)	.73
Ho_{f-9}		Functional outdegree	(1,33)	1.17
Ho_{e-11}	Emotion	Affective indegree	(1,33)	4.03
Ho_{e-12}		Affective outdegree	(1,33)	1.58
Ho_{e-14}		Investment indegree	(1,33)	1.99
Ho_{e-15}		Investment outdegree	(1,33)	3.17

*$p < .005$.

differences were significant only for one dependent variable, size of network. The MANOVA analyzing the comparison between the two samples along the 13 dependent variables yielded the following: F (13, 21) = 6.55, $p < .05$. (The actual significance of the F-value was a striking $p = .00008$.) Post hoc findings between the two samples yielded only one significant finding for the structure-related dependent variable, size of network, F (1, 33) = 45.86, $p < .005$ for Ho_{s-1} (see Table 7). In terms of size of network, the normal group had a mean of 36.23 with a standard deviation of 13.31, and the schizophrenic group had a mean of 12.65 and a standard deviation of 5.61.

Stage Two

The focus of stage two was the assessment of function-related and emotion-related symmetry within the two samples. Accordingly, functional, affective, and investment symmetry were grouped into a major null hypothesis for each sample. The difference scores were computed for the measures of outdegree and indegree for the three dependent variables, and the data were analyzed through a MANOVA statistical test. Post hoc univariate statistical tests were planned if appropriate. The results of the analysis, summarized in Tables 8 and 9, follow below.

Symmetry within the normal sample. In terms of the normal sample, no significant differences were found to exist between the measures of functional, affective, and investment outdegree and indegree when the variables were analyzed simultaneously; therefore, support was not found to reject symmetry as significant differences

between the measures of indegree and outdegree would mean that symmetry for the normal sample does not exist (see Table 8.)

Table 8: Major Tests of Significance for the Multivariate Null Hypotheses Pertaining to Symmetry in Stage Two of Phase Two

Sample	Null Hypothesis	df	F-value
Normal	$Ho_{fe/n}$	(3,15)	3.03
Schizophrenic	$Ho_{fe/s}$	(3,14)	10.91*

*$p < .05$.

Symmetry within the schizophrenic sample. In terms of the schizophrenic sample, significant differences were found to exist between the measures of functional, affective, and investment outdegree and indegree when the variables were analyzed simultaneously; therefore, the existence of symmetry was disproven for the multivariate hypothesis. Significant univariate findings were found relative to functional symmetry. In terms of the major null hypothesis associated with the schizophrenic sample ($Ho_{fe/s}$), the MANOVA indicated that significant differences exist in the three dependent measures of outdegree and indegree within the schizophrenic sample, F (3, 14) = 10.91, $p < .05$ (see Table 8). The analysis of the univariate null hypotheses yielded significant findings for only one dependent variable, functional symmetry, the ANOVA results being F (1, 16) = 15.58, $p < .015$ for $Ho_{fe/s-10}$ (see Table 9); therefore, functional symmetry was disproven, and affective and investment symmetry were not

rejected. A review of the approximate confidence intervals for the results related to functional symmetry indicated that functional indegree was significantly larger than functional outdegree for the schizophrenic sample.

Table 9: Univariate Tests of Significance for the Multivariate Null Hypotheses Pertaining to Symmetry in Stage Two of Phase Two: Schizophrenic Sample

Null Hypothesis	Variable	df	F-value
$Ho_{fe/s-10}$	Functional symmetry	(1,16)	15.58*
$Ho_{fe/s-13}$	Affective symmetry	(1,16)	4.35
$Ho_{fe/s-16}$	Investment symmetry	(1,16)	.04

Note. The significance value corresponds to a partitioned alpha level.

*$p < .015$.

Summary

The focus of stage one of phase one was the corroboration of the self-report of the normal and schizophrenic samples with selected members of their social networks. As presented in Table 10, significant differences were found to exist between the self-report of the subjects and their corroborators in the normal sample along all four classes of social network variables and in the schizophrenic sample along three of the four classes of variables: structure, content, and function. In terms of the structure-related dependent variables,

Table 10: Statistical Test Results for Stage One of Phase One: the Analysis of the Corroboration of Self-Report Data for the Normal and Schizophrenic Samples

Dependent Variables by Class	Statistical Test			
	MANOVA		ANOVA	
	Normal	Schizophrenic	Normal	Schizophrenic
Structure	X	X		
Size of network cluster			0	X
Distance			0	X
Frequency of contact			0	X
Content			X	X
Number of content areas			X	X
Function	X	X		
Functional indegree			X	X
Functional outdegree			X	X
Emotion	X	0		
Affective indegree			X	
Affective outdegree			0	
Investment indegree			X	
Investment outdegree			X	

0 = Nonsignificant results.

X = Significant results.

no significant differences were found in the normal sample, while significant differences were found for all three variables in the schizophrenic sample: size of network cluster, distance, and frequency of contact. In terms of the content-related dependent variable, number of content areas, significant differences were found in both samples. In terms of the function-related dependent variables, functional indegree and outdegree, significant differences were again found in both samples. In terms of the emotion-related dependent variables, significant differences were found in the normal sample for affective indegree, and investment indegree and outdegree.

The focus of stage two of phase one was the comparison between the normal and schizophrenic samples in terms of the corroboration of self-report. As presented in Table 11, significant differences were found to exist in the degree of corroboration of self-report between the two samples along two major classes of social network variables, including content and emotion; the findings for structure and function were not significant. The two samples varied significantly along (a) number of content areas and (b) investment indegree, variables related to content and emotion, respectively. Finally, the degree of difference between subjects and corroborators was higher for the schizophrenic sample.

The focus of stage one of phase two was the main comparison between the social networks of the normal and schizophrenic samples. Significant differences were found to exist between the normal and schizophrenic samples when the dependent variables were analyzed simultaneously; however, as presented in Table 12, post hoc procedures

revealed that the differences were significant only for one dependent variable, size of social network. In terms of size of network, the normal group had a mean of 36.23 with a standard deviation of 13.31, and the schizophrenic group had a mean of 12.65 and a standard deviation of 5.61.

Table 11: Statistical Test Results for Stage Two of Phase One: the Analysis of Sample Differences in Self-Report Data

Relevant Dependent Variables	Statistical Test	
	MANOVA	ANOVA
Structure	0	
Content		X
Number of content areas		X
Function	0	
Emotion	X	
Affective indegree		0
Affective outdegree		0
Investment indegree		X
Investment outdegree		0

0 = Nonsignificant results.

X = Significant results.

Table 12: Statistical Test Results for Stage One of Phase Two: the Main Comparison of Sample Differences Along All Social Network Variables, Excepting Symmetry

		Statistical Test ANOVA
Structure	Size of network	X
	Interconnectedness	0
	Distance	0
	Frequency of contact	0
Content	Proportion of uniplex relationships	0
	Proportion of multiplex relationships	0
	Relationship density	0
Function	Functional indegree	0
	Functional outdegree	0
Emotion	Affective indegree	0
	Affective outdegree	0
	Investment indegree	0
	Investment outdegree	0

0 = Nonsignificant results.

X = Significant results.

The focus of stage two of phase two was the assessment of function-related and emotion-related symmetry within the two samples. As presented in Table 13, significant differences were found to exist between the measures of functional, affective, and investment outdegree and indegree (when the variables were analyzed simultaneously) in the schizophrenic sample, but not in the normal sample. Essentially, though, functional, affective, and investment symmetry were not disproven for the normal sample. In terms of the schizophrenic sample, significant differences were associated with functional symmetry, supporting functional asymmetry. In this case, functional indegree was found to be significantly larger than functional outdegree. Furthermore, affective and investment symmetry were not rejected for the schizophrenic sample.

Table 13: Statistical Test Results for Stage Two of Phase Two: The Analysis of Symmetry for Each Sample, Normal and Schizophrenic

	Statistical Tests			
	MANOVA		ANOVA	
	Normal	Schizophrenic	Normal	Schizophrenic
Grouped symmetry	0	X		
Functional symmetry				X
Affective symmetry				0
Investment symmetry				0

0 = Nonsignificant results.

X = Significant results.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Summary

This study was undertaken with two purposes in mind. The major purpose of this study was the comparison of the social networks of normals and schizophrenics, the goal being the identification of psychosocial factors that appear to be associated with the schizophrenic disorder. The comparison was made along four major classes of social network variables: (a) structure, the basic morphological characteristics; (b) content, the nature of shared activities; (c) function, the transaction of support; and (d) emotion, the experiencing of affect. A secondary, yet essential, purpose was the evaluation of the research assumption conceptually basic to much of the previous research that self-report data are a sufficient indicator of the actual status of the social network. The analysis was designed so that all questions and items of the assessment instrument could be corroborated.

In the review of literature, six relevant topics were covered and conclusions were drawn. First, in terms of the importance of the study, it was concluded that the schizophrenic disorder was a worthy area of study due to its extremely disrupting impact upon the affected individual and society. Second, in terms of social network analysis, it was concluded that this new methodology has wide applicability and

value, and as a concept, allows for the integration of multiple levels of analysis. Furthermore, the type of social network conceptualization was adjudged to be quite pertinent to research focus and general perspective. Third, in terms of the theoretical perspective, it was concluded that the concepts of schizophrenic withdrawal and isolation were the theoretical foundation of this study. Fourth, in terms of the key social network variables, predictions which follow below were made regarding the results of the analysis, based on the concepts of withdrawal and isolation:

1. In relation to structure, the social network of the schizophrenic, as opposed to the normal, will be characterized by fewer network members, less interconnectedness, closer proximity of members, and higher frequency of contact.

2. In relation to content, the social network of the schizophrenic, as opposed to the normal, will be characterized by a greater proportion of relationships in which only one activity is shared (proportionately more uniplex relationships), a smaller proportion of relationships in which more than one activity is shared (proportionately fewer multiplex relationships), and a relatively smaller proportion of shared activities per person (less relationship density).

3. In relation to function, the social network of the schizophrenic, as opposed to the normal, will be characterized by a greater degree of support provided by the network members to the focal person (more functional indegree), a smaller degree of support provided by the focal person for network members (less functional outdegree), and a lack of reciprocity (functional asymmetry).

4. In terms of emotion, the social network of the schizophrenic, as opposed to the normal, will be characterized by a lesser degree of positive feelings from network members for the focal person (less affective indegree), a lesser degree of positive feelings from the focal person for the network members (less affective outdegree), a lack of reciprocity in the feelings (affective asymmetry), a greater degree of emotional investment of network members in the focal person (more investment indegree), a lesser degree of emotional investment of the focal person in network members (less investment outdegree), and finally, a lack of reciprocity in the emotional investment (investment asymmetry).

For the fifth of the six topics, the general importance of the social network to the schizophrenic disorder, it was concluded that all components of the social network, i.e., family, extended family, significant nonkin, can have impact on the life of the schizophrenic, either in a protective and supportive way or in a provocative and deteriorating manner. Sixth and finally, in terms of the specific relationships between the social network and psychopathology, in general, and the schizophrenic disorder, in particular, the following was concluded: (a) the type, quantity, and quality of relationships within the social network appear to be linked to psychopathology; and (b) smaller network size, proportionately fewer relationships of more than one activity, relatively more support from network members, nonreciprocal and dependent relationships, and negative perception of the network consistently characterized the social network of the schizophrenic across all studies. The findings associated with actual

network sizes and interconnectedness were inconsistent, possibly varying due to the differences in conceptualizations of the social networks and in the familial characteristics of the samples studied.

The decision was made to attempt a replication in the area of social networks of schizophrenics because of the importance of the research and difficulty with the interpretation and integration of the previous findings due to the following five reasons: (a) inadequate sample descriptions and differing populations, (b) differences in conceptualization of and operationalization of variables, (c) differing conceptualizations of the social networks under study, (d) inconsistencies in the reported data, and (e) most important, lack of validation of the self-report data.

The normal sample was composed of 18 subjects, and the schizophrenic sample, of 17 subjects. Selection of the subjects was designed in such a way as to promote comparability along those dimensions that affect outcome (age, sex, race, socioeconomic status, and cultural background), yet insure the identification of appropriate subjects from both populations. A review of the characteristics of both samples indicated that both goals were essentially met. However, insofar as approximately half of the schizophrenic population contacted refused to participate in the study, the data would not reflect the influence of this group. Although the composition of the subgroup remains unclear and undefined as they were not studied, it is noteworthy that several members of this subgroup were characterized as hostile and paranoid.

All data were gathered through the use of the Psychosocial Network Inventory, Modified (PNIM). In its original form, the instrument presented the examinee with the three tasks of developing a list of personally important persons, rating the nature and quality of the relationships, and noting the groups of persons who have relationships in common. As modified into a structured interview for this study, the PNIM was designed overall to be more thorough in identification of network members, facile and accurate in the recording of subject responses, reflective of the activities shared in relationships and the behavioral and verbal aspects of reciprocity, and last, readily operationalized.

Separate consent and testing procedures were developed for both samples to accommodate to the different characteristics of the two samples, namely the differing legal and ethical considerations, and need for structure and support in the testing situation.

The methodology of the study was directed toward interrelated goals corresponding to two phases in the analysis: (a) phase one, the corroboration of self-report data of social network variables within both samples; and (b) phase two, the main comparison between the two samples along the social network variables. In the phase one analysis, the self-report data of five subjects from both samples and at least four, if not five, members of their social networks were contrasted in order to determine the degree of discrepancy. In stage one of this phase, the analysis focused on the comparison of 10 dependent variables grouped by major class of variable within each sample. In stage two, the analysis focused on the comparison of the

degree of corroboration between the two samples. In the phase two analysis, both samples were, in general, compared along 16 dependent variables, grouped by the four major classes of social network variables within this study. In stage one of this phase, the analysis focused on the comparison of 13 variables directly between the two samples, and in stage two, the comparison of the three variables associated with symmetry within the two samples. The analyses were carried out through the use of multivariate statistical procedures and post hoc univariate analyses of variance.

Conclusions

In the following section, the conclusions of the study are presented. It is important to remind the reader that these findings do not reflect the influence of a subgroup of the schizophrenic population who were unwilling to participate. This subgroup of basically undefined composition was, in large part, characterized as more hostile and paranoid than those who participated. The following conclusions apply by definition to those schizophrenic subjects sharing the common attitude regarding willingness to participate in a scientific study.

Stage One of Phase One

Self-report was not adequately corroborated in either normal or schizophrenic samples. Within the normal sample, it was concluded that self-report was not adequately corroborated, as significant differences were found to exist in self-report along all four major classes of social network variables and 6 of the 10 related dependent

variables. Within the schizophrenic sample, it was concluded that self-report was not adequately corroborated as significant differences were found to exist along three major classes of social network variables and six related dependent variables.

Stage Two of Phase One

The normal and schizophrenic samples do not appear to vary substantially in terms of corroboration of self-report, as differences were found in only two dependent variables and, as expected, less agreement was found to exist between subject and corroborator within the schizophrenic sample regarding these two variables. As significant differences were found in two major classes of social network variables, content and emotion, but only 2 of the 10 related dependent variables, number of content areas and investment indegree, it was concluded that overall in relation to the degree of corroboration the two samples do not vary substantially; however, they do vary significantly in terms of the reported number of content areas and investment indegree. More specifically, the differences were in an expected direction as more disagreement, i.e., less corroboration, in self-report was found to exist between the schizophrenic sample and their network member/corroborators than between the normal sample and their network member/corroborators.

Stage One of Phase Two

In direct comparison, the social networks of the two samples of normals and schizophrenics appear to differ in terms of perception of network size only; specifically, the schizophrenic appears to have

a smaller social network than the normal. As significant differences were found to exist in relation to the 13 dependent variables--not associated with symmetry--assessed simultaneously, but in the post hoc analysis only one dependent variable, network size, it was concluded that the two samples differ in network size: a mean size of 36.23 for the normal sample and a mean size of 12.65 for the schizophrenic sample.

Stage Two of Phase Two

In indirect comparison the following was learned: (a) for the normal sample, relationships appear to be perceived as reciprocal in terms of the transaction of support and mutual in terms of the experiencing of affect; and (b) for the schizophrenic sample, relationships appear to be perceived as mutual relative to the experiencing of affect, but nonreciprocal relative to the transaction of support, placing the schizophrenic in a dependent position. For the normal sample, this conclusion was supported by the lack of significance found overall in relation to symmetry, the result being that functional, affective, and investment symmetry exist for the normal sample. For the schizophrenic sample, this conclusion was supported by the finding of significant differences in terms of symmetry generally and functional symmetry specifically, the results being that functional asymmetry exists. In relation to the differences, functional indegree was significantly larger than functional outdegree, ostensibly placing the schizophrenic in a perceived dependent position relative to his or her social network.

Discussion

Phase One

The conclusions in both stages of phase one are rather startling initially. One might expect the degree of corroboration between subjects and network members to be low for the schizophrenic sample but not for the normal sample. Indeed, the results appeared less significant for the normal sample in stage one of phase one for the structure-related variables, although not overall. However, the conclusions of stage two of phase one tend to confirm that the two samples do not vary substantially in terms of corroboration. Thus the findings that self-report was not adequately corroborated for both samples and that the two samples do not vary substantially in relation to corroboration of self-report, though unexpected, appear conclusive.

Lack of corroboration in both samples casts doubt upon the research assumption that self-report is an accurate and sufficient indicator of the actual status of the social network present in earlier studies (see Pattison, deFrancisco, Wood, Frazier, & Crowder, 1975; Pattison, Llamas, & Hurd, 1979; Tolsdorf, 1976). To understand this statement, one must remember that the data were generated from an instrument that taps conscious-level thought, primarily on phenomena that vary along a continuum of subjectivity and objectivity, all assessed subjectively. The dependent variables associated with the structure, content, and function of the social network tend to be objective, while those associated with emotion tend to be subjective.

The objective variables could be assessed by observation and confirmed, while the subjective (emotion) variables are always products of the subjects' private and conscious mental life, not subject to confirmation. Accordingly, lack of consensus regarding the objective variables tends to suggest that the subjects and corroborators have differing assessments of what both have observed jointly, questioning the accuracy of such data. Essentially, one does not know which might be accurate or if either is. In terms of the subjective variables, it tends to suggest that the subjects and corroborators have differing perceptions of what both experience internally, of course based on external evidence. The implication is that the perception of emotional experience between persons is not sufficiently shared. While some degree of consensus is necessary for functioning in reality (and not rejected here), it appears that there are significant discrepancies existing in the subjective evaluation of both objective and subjective aspects of the social network within both samples; therefore, self-report data from subjects are an insufficient and possibly inaccurate, i.e., unreliable, source of information in terms of the objective variables and is not reflective of the emotional experience of the social network members. Based on this rationale, self-report data in this study can be meaningful, however, in that they represent the subjects' perception of their social network, and as such have important clinical significance.

The lack of reliability in the self-report data appears to have impact upon the power of the statistical tests of phase two of the analysis. By way of explanation, it is known that the reliability of

measures is positively associated with the power of the statistical test in the isolation of existing significant findings. The unreliability of measures has an inflating effect upon the standard error. Therefore, it was expected that the demonstrated lack of reliability might have obscured statistically significant findings in phase two. To determine if this may be the case, sample means from the group of corroborator data were computed corresponding to 14 of the 16 variables--means could not be calculated for the variables, size and interconnectedness, as they strictly relate to the total social network. In a comparison of the corroborator data with the actual (subject) data, major differences were identified for 8 of the means, while 20 were comparable. In a cursory, nonstatistical analysis of the differing means of the corroborators, considerable differences were found between means associated with the normals and schizophrenics along four variables. It is also noteworthy that along all other variables these findings from the corroborator data were supportive of the actual results of the study. In conclusion, then, as an assessment of the corroborator means suggests significant findings along four additional variables, it supports the contention that lack of reliability in the self-report data is associated with decreases in power of the statistical tests of phase two, possibly obfuscating the presence of existing significant findings. Furthermore, the analysis not only strengthens the argument associated with reliability, but implies that the results may vary considerably, depending upon the perspective taken.

Phase Two

As the results represent perceptions of the social networks, as opposed to their actual status, the conclusion of stage one of phase two, the main comparison, would need to be reworded as follows: The social networks of the two samples differ in terms of perceptions of network size. The conclusions of stage two of phase two have already been stated in relation to the subjects' perceptions, since an indirect analysis was implemented.

The finding that the social networks vary in terms of size is shared in the previous studies. Cohen and Sokolovsky (1978) found significant differences between two schizophrenic samples and a non-psychotic control sample, even though the populations studied were not living with family. These results were based on observation as well as self-report. The two mean sizes for the schizophrenic groups in their study, 10.30 for the more disturbed group with residual symptoms and 14.80 for the less disturbed group with minimal residual symptoms, are strikingly comparable to the mean size of 12.65 for the schizophrenic group in this study. Their mean size of 22.50 for the nonpsychotic control group, however, is not similar to the mean size of 36.23 found for normals in this study. Tolsdorf (1976) came close to finding significant differences between his two samples, presumed to be living with family, recording a mean size for the normal (medical) group of 37.80, close to the results of this study, but not for the schizophrenic group (mean size of 29.80). One must remember that he pressed for the largest possible number with the schizophrenic

group to determine the total amount of support available to the schizophrenic. Using the Psychosocial Network Inventory, Pattison et al. (1975) in the early study found considerable difference between the network size in the normal and schizophrenic samples. In relation to this study, his figures for network size varied for the schizophrenic sample (mean range of four to five) and for the normal sample (mean range of 20 to 30). In his most recent study, Pattison et al. (1979) found differences again between normal and schizophrenic groups, but the results for the schizophrenic group were closer to those found in this study (mean range of 10 to 12). Accordingly, the results of all previous studies are consistent regarding differences in perception of network size. Furthermore, even though different conceptualizations of the social network were adopted in each study, consensus is approached in terms of overall size of the social network of the schizophrenic, except for one researcher who attempted to secure an expanded social network to determine the amount of available social support: Such was not the case for the normal sample.

The conclusions regarding symmetry are as expected for the normal sample. The findings that normals perceive relationships characterized by symmetry, i.e., mutually supportive and caring, certainly are in line with the theoretical work of Hollander (1967) and Thibaut and Kelley (1959). In essence the findings support the contention that reciprocity in normal relationships is responsible for their maintenance. Furthermore, it could be said that due to the presence of reciprocity in the relationships of normals, their relationships are rewarding and satisfying.

As expected, symmetry within the schizophrenic sample was rejected. In the follow-up analysis, a perceived lack of symmetry was identified in the supportive aspects of the schizophrenics' relationships; namely, the schizophrenic perceives himself or herself as the dependent party in social relationships. This finding is in agreement with the results of the previous studies (see Cohen & Sokolovsky, 1978; Pattison et al., 1975, 1979; Tolsdorf, 1976). In one study with the focus on objectivity, Cohen and Sokolovsky (1978) inferred that the dependent position of the schizophrenic is an actual, objective phenomenon. Accordingly, one could speculate that in this area the observation of the schizophrenic may, in fact, correspond to reality. However, in contrast to predictions, the emotional aspects of relationships were perceived as mutual both in type and strength of feeling, meaning that the schizophrenic does not perceive himself or herself as having more negative and less strong feelings for network members than are returned. These findings sharply contrast with the impressionistic findings of Tolsdorf (1976) and of the two studies of Pattison et al. (1975, 1979) which suggest that the schizophrenic has a very negative perception of her or his social network. Cohen and Sokolovsky (1978) did not explore the emotional aspects of the social network.

The relative absence of significance in phase two is, in itself, a major finding which tends to raise doubts regarding some earlier findings and the influences of withdrawal and isolation. Significant differences were found in only 1 of 13 dependent variables in direct

comparison in stage one, and one of three dependent variables in indirect comparison in stage two. These results tend to refute earlier findings (actually based on perceptions) with regard to interconnectedness, relationship density, proportion of uniplex and multiplex relationships, and the type and strength of emotion. Furthermore, the significance of only one dependent variable in stages one and two, network size and functional asymmetry (namely, the perceived dependent position of the schizophrenic), lends only weak support to the theoretical foundation of this study, withdrawal and isolation. In explanation, it is posited that the schizophrenic's conscious perception of social relationships, as reflected in the PNIM, does not appear to be substantially different from normals. The differences in the social networks of normals and schizophrenics may, in fact, exist but were not perceived. Also, the PNIM may not have tapped the appropriate level of personality to detect those differences as well. Perhaps they could be assessed through measures of unconscious process. This is described more fully in the following section. Last, as suggested in the previous section, the unreliability of the measures may be responsible as well for the lack of findings.

Implications for Future Research

The implications for future research are associated with the four following areas: (a) significant findings; (b) suggestive, nonsignificant findings; (c) absence of findings; and (d) generalizability of findings. In this section, the meaning and impact of each area are explored in relation to previous research, with recommendations presented for future research.

Significant Findings

The significant findings of phases one and two in this study should have impact on social network analysis. The conclusions of phase one, demonstrating a lack of consensus between subject and corroborator in both samples and a lack of substantial difference in discrepancy of self-report between both samples, strongly suggests that future research on social network analysis, possibly for all types of populations, be based on objective measures, e.g., observation, various types of counting, logs of activity, etc., if the researchers intend to infer to the actual status of the social network, as opposed to subjective perception. As results based on subjective measures cannot be considered sufficient, reliable, or accurate, researchers can no longer use the assumption that self-report on a social network is equivalent to the actual status of the social network. On the other hand, subjective assessments of the social network are seen as valuable when the focus is clearly placed on subjective perception or clinical meaning; however, as stage one of phase two results suggest that both samples of normals and schizophrenics tend to view their social networks similarly, the PNIM does not appear to evoke much useful clinical material; again, this may be a function of its focus on conscious-level thought. In closing, it is noted that social network analysis first evolved as a metaphorical phenomenon, conceptualized to identify a subjective social structure, and by definition remains in part a subjective experience. In a sense, it cannot get away from its theoretical roots. However, attempts can be made to develop objective and reliable measures in the

three more objective areas of social network analysis termed structure, content, and function in this study, and use conceptualizations of the social network that are assessed more easily with objective measures.

Suggestive Findings

Falling into both phases of the research, the suggestive, non-significant findings, closely approaching significance levels, may possibly support and enhance the significant findings of phase one and phase two. Further research in each area is necessary to confirm or disconfirm their actual significance. In stage one of phase one for the normal sample, the analysis of the structure-related variables, size of network cluster and frequency of contact, and the emotion-related variable, affective outdegree, yielded suggestive findings. If these had been significant, then 9 of the 10 total dependent variables would have supported the conclusion of lack of corroboration in the normal sample. In stage one of phase one for the schizophrenic sample, the analysis of emotion generally and the emotion-related variable, affective indegree, yielded suggestive findings. The other three emotion-related variables were significant. Had this class of variable and related dependent variable been significant, then all 10 variables would have supported the conclusion of lack of corroboration in the schizophrenic sample. In stage one of phase two, the analysis of the structure-related variable, distance from focal person, i.e., proximity of network members, yielded suggestive findings. If it had been significant, then it would have appeared that the schizophrenic perceives his or her social network

living closer to him or her than does the normal. This might possibly relate to the schizophrenic's inability to sustain important relationships over distance, as compared to normals. Finally, in stage two of phase two, the analysis of symmetry generally for the normal sample yielded a suggestive finding, investment symmetry being significant in the post hoc analysis. If the finding had been significant, then some basic ideas would have to be revised regarding perception of symmetry in relationships with normals. In summary, pursuing further research into the areas described above might strengthen (or weaken) the support relating to corroboration of self-report and expand our knowledge about the perception of the social network of normals, in terms of symmetry, and of schizophrenics, in terms of proximity.

Given the above rationale that close, though nonsignificant, findings may prove suggestive in future research, it seems important to examine an opposing, though complementary, line of reasoning, namely, that mildly significant results may be specious and misleading. From an investigation of the levels of probability, it appears that all but the following two measures were highly significant: (a) distance, a variable in stage one of phase one; and (b) emotion, a class of variable in stage two of phase one. In relation to the variable distance, had it not been significant, then there would still not be any change in the overall conclusion (lack of corroboration for the schizophrenic sample). In relation to the class of variable emotion, had it not been significant, then the conclusion of no substantial differences in corroboration of self-report between normals and schizophrenics would have been strengthened, not challenged. Therefore, these two

measures of mildly significant probabilities do not appear to suggest substantial reversals in the conclusions, suggestive for further research; in fact, in the latter case, the conclusion would be strengthened.

Absence of Findings

The absence of significant subjective and objective findings in phase two, primarily the main comparisons, may be attributed to the design of the instrument and the diverse nature of the social network, respectively, as well as to the unreliable data--discussed earlier. First, the design of the instrument enables one to assess the examinee's conscious perception of his or her social network. This process excludes unconscious information, e.g., inner object life, intrapsychic dynamics, fantasies, drive states, etc., that possibly could be used to differentiate between normals and schizophrenics as they relate to members of the social network. Unconscious assessment of emotion may have determined differences between the two samples, not accessible to instruments tapping conscious-level thought. Thus, it is recommended that future researchers consider the use of unconscious assessments of subjective variables in social network analysis. Also, the diverse nature of the social network may be responsible for the lack of objective results; namely, the social network contains groups of differing nature, relation, and importance so that the significant trends may disappear in the varying influences. Specifically speaking, differences in structure, content, function, and emotion in the social networks of normals and

schizophrenics may appear if family, relatives, friends, co-workers, etc., were assessed separately. Therefore, it is recommended that future researchers consider investigating subgroups within the social network to assess social network variables more closely. In summary, by using instruments tapping unconscious levels and by focusing on various subgroups of the social network in the analysis (using more objective measures), future researchers may detect more significant findings between social networks of normals and schizophrenics, the two methods assessing subjective and objective realities, respectively. Hopefully, at this point more definitive statements could be made about the relative and interactive effects of isolation and withdrawal.

Generalizability of Findings

The generalizability of the findings is duly limited and obscured by the loss of potential schizophrenic subjects who refused to participate in this study. Although several of these potential subjects were characterized as more hostile and paranoid than the participating subjects, this group, nonetheless, was not studied and, accordingly, remains undefined and vague. Therefore, except for the basic commonality, willingness to participate in a scientific study, the subjects of the study cannot be differentiated from those who refused participation. Notably, though, the willingness to participate, a behavioral characteristic, is associated with the degree of investment in other people or, stated conversely, the degree of withdrawal in the schizophrenic. Perhaps in the methodology of the study, the

researcher created conditions whose demand characteristics separated the two groups along the continuum of capacity for other-directed investment. (Of course, those schizophrenics most withdrawn were not included in the study because they were nonverbal, autistic, etc., but this discussion does not apply to this particular population.) In other words, the schizophrenic who was more withdrawn and less capable of investment in others would avoid participation. Certainly this would be true of those characteristically hostile and paranoid. This situation would have significant impact on the results, if those more withdrawn were excluded a priori. Indeed, the measures were designed to assess this dimension of withdrawal. It is suspected that, in fact, this rationale may account for a sizable number of refusals, yet all this remains speculative. Other variables as well could also account for the refusals, e.g., the personal manner of the researcher, the time commitment, other demands upon the subjects, etc. Only further research could approach this problem, but then one is faced with the ethical and methodological dilemmas of attempting to study those who resist. While the group of subjects seems well-defined in many respects, reflecting the criteria, the loss of potential subjects obscures the sample characteristics and representativeness of the population and, resultingly, limits the generalizability. The two groups are only distinguished behaviorally by participation in a scientific study, possibly associated with capacity for investment in others or degree of withdrawal as well as degree of hostility and paranoia.

Clustering: Implications for Social Network Analysis and Research

At this point in the development of social network analysis, there does not appear to be a means of reflecting the phenomenon of clustering, namely, the naturally occurring grouping of network members who both know each other and share a unifying characteristic. One example of a cluster is the group of co-workers as they share relationships and the common task of work. Other examples include family members, relatives, neighbors, fellow church members, etc. This lack of methodology is unfortunate because an examination of the data identified what appeared to be highly developed clusters in the social networks of normals and nonexistent or poorly developed clusters in the social networks of schizophrenics. Therefore, the two samples may actually differ in terms of clustering within the social networks. The only variable that approaches an estimation of this phenomenon is interconnectedness. However, this variable was based on a simplistic and misleading--though heuristic--model of the social network, the primary star. In this conceptualization, relationships are conceived of as radiating around the focal person, with interrelationships perceived of as connections among the network members without any attention to a unifying characteristic. Accordingly, the variable provides a raw estimate of the density of relationships within the social network but fails to reflect clustering. Since clustering may be a distinguishing factor between the two samples, it is recommended that future researchers develop an appropriate

methodology to identify clustering and explore such differences between the social networks of normals and schizophrenics.

Implications for Diagnosis and Treatment of the Schizophrenic

The findings of this study pertain to the diagnostic assessment and treatment planning of the schizophrenic. In the paragraphs that follow, the implications of these findings are explored and, when appropriate, recommendations are presented.

The lack of corroboration of the self-report of the schizophrenic has implications both for diagnosis and treatment. In terms of diagnosis, if one is interested in the functioning of the schizophrenic's social network, it would appear important to interview the family and key members of the social network, rather than depend solely upon the schizophrenic's perspective of the important social relationships. Furthermore, as one is corroborating the self-report of the schizophrenic and gathering information about the social network, one should fully identify all those available for support. These persons are potentially important in the maintenance of the schizophrenic. In planning treatment, specifically a family or social networking approach, the lack of corroboration suggests two particular techniques: the identification and the correction of misperception within important social relationships. As both techniques are already generally recognized and accepted in the field of family treatment and social networking, this finding tends to substantiate the need for their use.

The absence of significant differences in perception of social networks, except in relation to size, leads to questioning of the utility of diagnostic testing limited to conscious-level evaluation (as discussed earlier). As conscious-level testing may not lead to the detection of clinically significant diagnostic material, the use of projective tests is recommended for diagnostic assessment.

The findings of smaller network size and, possibly, of closer proximity of network members have diagnostic and treatment significance relative to the withdrawal and isolation of the schizophrenic. These social network characteristics may imply that the schizophrenic has difficulty investing personal importance in those around him or her. Diagnostically, this perception of the schizophrenic matches with the professionally held opinion. In terms of treatment, this difficulty should be kept in mind when considering the development of the counseling relationship and treatment goals. In short, the schizophrenic may have problems becoming involved in the counseling relationship. Once the relationship has begun to develop, the counselor in the outpatient setting might facilitate interaction with other treatment staff by introducing the schizophrenic to those staff who will be relating to him or her. In the day treatment setting, the staff would be ready to offer assistance in facilitating contact with others and also be supportive of the need for distance and privacy.

The perceived dependent position of the schizophrenic is a diagnostic statement with treatment implications. It is expected that this self-perception will surface in all types of treatment with

differing manifestations, depending upon the treatment modality. For example, the dependency may become totally focused upon the rehabilitation counselor, psychotherapist, or psychiatrist in a one-to-one relationship. On the other hand, within group, family, or social networking models, the dependency would unfold within the context of these social relationships. Possible interventions would include identification of the perceived dependency and the behavioral ramifications in relationships, as well as attempts to facilitate changes in relationships to ameliorate the dependent position. Change assumes some openness. However, some schizophrenics may prefer the dependent position, even though it is consciously denied, and thus be resistant to change.

Synopsis of Major Contributions

The major findings, conclusions, and recommendations of phase one are, first, that the self-report of both samples was not adequately corroborated. The lack of consensus regarding the objective variables (structure, content, and function) seriously questioned the accuracy of self-report data and regarding the subjective variables, the possibility of sufficiently shared emotional perceptions. Thus it was concluded that self-report data are an insufficient and possibly inaccurate, i.e., unreliable, source of information in social network analysis. Accordingly, the assumption made by previous researchers regarding its sufficiency, accuracy, and reliability appears lacking in support. Second, the degree of corroboration or discrepancy in self-report in both samples did not vary significantly. Thus the

nonpsychotic schizophrenic's perception of his/her social relationships is substantially as reliable as the normal's perception of his or her social relationships. Evidence was also found to support the contention that the lack of reliability limited the power of statistical tests in the main comparison. The above sets of conclusions urge a reexamination of current methodologies in social network analysis, recommending the use of more objective conceptualizations and reliable measures in the assessment of structure, content, and function.

The major findings, conclusions, and recommendations of phase two are, first, that the social networks of normals and schizophrenics vary in terms of only one variable, "perceived" network size. The mean sizes of the social networks of normals and schizophrenics were 36.23 and 12.65, respectively. The absence of significance along the other 12 variables raised the two points: First, when nonpsychotic, the schizophrenic may not consciously perceive his or her relationships much differently from normals. Second, the findings challenged results shared in previous studies, namely, fewer multiplex relations, more support from network members as compared to normals, and negative emotional perception of the network. Thus it was recommended that future researchers consider the use of projectives to determine (subjective) unconscious differences in normals and schizophrenics. Also as the diverse nature of the social network may be responsible for lack of results on a conscious level, the examination of subgroups such as family, relatives, and co-workers to detect significant differences was recommended. Next, it was found that normals perceived their relationships as reciprocal and

emotionally mutual, the latter suggesting that feelings and investment in each other were shared. For the schizophrenic, emotions were also found to be mutual, contradicting previous studies and predictions. However, lack of reciprocity was perceived in relationships as predicted, placing the schizophrenic in a dependent position in his or her self-perception. This finding was in line with the results of previous studies.

In closing, and in line with the results, the nonpsychotic schizophrenic with a history of psychiatric hospitalization and a willingness to be involved in a scientific study, aged 18 to 40 years and living with family, appears as capable as the normal in assessing social relationships. However, the perception of both is insufficient, inaccurate, and unreliable, at least for research purposes. In contrast to the normal, the schizophrenic consciously perceives himself or herself socially surrounded by fewer important persons upon which he or she is dependent. Nonetheless, in the perception of the schizophrenic, the emotions are mutual in these relationships. Overall, though, the schizophrenic does not appear to perceive his or her relationships much differently from normals.

In Retrospect

Following the completion of a research project, it is rather traditional to take a backward glance to determine if the study was actually worth the investment. In retrospect, the input of energy, thought, and time is balanced against the output of results to arrive at the overall value. Certainly this study was much more demanding than imagined in its conception and planning. Three reasons can be

identified. First, the development of the methodology was a difficult task due to the conceptual infancy of social network analysis. Markedly different conceptualizations of social networks presently exist, so much time was spent determining which was most appropriate for use in this study. Furthermore, the variables for social network assessment are still in a formative stage. After a social network conceptualization was chosen, the variables, derived from the Psychosocial Network Inventory, Modified, were operationalized, a difficult and complex task. The second and perhaps most difficult hurdle was the identification and selection of normal and schizophrenic subjects. With the schizophrenic subjects, several medical and ethical barriers had to be handled, taking a great deal of time with meetings, consultation, and waiting to obtain approval (discussed earlier). Once these tasks were completed, one was still faced with identification of potential subjects who met the criteria and then the unpredictable response to the request for participation. Several rejections were received. For the normal sample, the main problem turned out to be the major time commitment requested from this group. Some subjects spent five or more hours compiling a list of persons and assessing their relationships. To provide an overall estimate/indicator of the difficulties encountered, only 17 schizophrenic persons and 18 normal persons, identified as meeting the criteria, agreed to participate in the study through a search lasting a period of one year in the north and northwest suburbs of Chicago. (Future researchers should certainly keep this difficulty in mind.) Third, the data collection for both groups, but especially the schizophrenic, proved to be a tiring,

boring, and repetitive task. For example, in most examinations of the social networks of the schizophrenic sample, each question was read for each identified network member. Also several explanations and clarifications were given. Interviews frequently lasted between one and three hours. As normals did not require the examiner's vigilance, the interview was not as taxing. On the more positive side, however, the results of this study, in the opinion of this researcher, have made significant contributions to the understanding of the schizophrenic (and the normal) and to the evolving development of social network analysis (see previous section). This researcher therefore concludes that the contributions of this study were worth the efforts needed to conceptualize, plan, and implement this research project, making this an extremely valuable and productive research experience.

APPENDICES

APPENDIX A

INTERVIEW MATERIALS

STRUCTURED INTERVIEW FORMAT

1. Explanation of the Research Study (1 or 2)

2. Statement of Informed Consent (1 or 2)

3. General Information Sheet

4. Listing of Persons Important to You

   Family
   - Mother/Stepmother
   - Father/Stepfather
   - Sisters/Stepsisters/Half-sisters
   - Brothers/Stepbrothers/Half-brothers
   - Husband or Wife
   - Ex-spouses
   - Daughters/Stepdaughters
   - Sons/Stepsons

   Relatives
   - Aunts & Uncles
   - Grandparents
   - Cousins
   - Nieces & Nephews
   - In-laws

   Friends

   Neighbors

   Co-workers
   - Colleagues
   - Supervisors

5. Psychosocial Network Inventory, Modified

6. Assessment of Connections

7. Contact of Network Members

   Names
   Addresses
   Phone Numbers

Directions: Structured Interview (1)

Phase 1: Explanation of the research study

Now as we begin, I would like to read with you the explanation of the study. (Explanation of the Research Study [1] is placed in front of the subject/s: Group testing is permitted for normal subjects only.) Please ask your questions as they develop. (The form is read.)

Do you feel that you understand the explanation of the study? (Response of the subject/s is explored if necessary.) Would you like to see the letter that will be sent to identified network members? (If the subject/s would like to see the letter to clarify the nature of the contact, the letter will be shown and explained.)

Phase 2: Statement of informed consent

Before the study can begin, I need to obtain your informed consent to participate in this study. This means that you can only agree to be in the study after you fully know how the study affects you and your rights as a subject. (Statement of Informed Consent [1] or [2] is placed in front of the subject/s, the selection of either being determined by researcher intent and tentative subject consent: Form [1] is for use with subjects who will consider giving their approval for corroboration and from whom it is desired by the researcher, and form [2] is for use when corroboration is neither approved nor desired.) I have placed in front of you the Statement of Informed Consent. I would like to read this with you. Again, please ask your questions immediately. (Top portion of form [1] or form [2] in entirety is read.)

If you feel that you understand the explanation of the study and your rights as a subject, and you wish to participate in this study, please sign and date the form. Make a check mark by your name if you wish to receive further information about the study after it is completed.

Now for the option I mentioned: I would like to request that you permit me to contact members of your network to further explore their relationship with you. Let's read together the rest of the consent form. (Lower portion of form [1] is read.) If you wish to allow me to contact network members as I have indicated, please sign and date the lower portion of the consent form.

Now we are ready to begin with the study. Four basic steps are involved in collecting the data in this study: (a) completing the General Information Sheet, (b) listing persons, (c) assessing relationships, and (d) indicating the relationships among the persons named.

Phase 3: General information sheet

First, we will complete the General Information Sheet. (The interviewer will attempt to encourage the subject/s to complete the form independently; however, if this procedure is not fruitful, the interviewer will ask questions and fill in the responses on the form, using the form as a prompter.)

Phase 4: Listing of persons important to you

I would like to develop a list of all persons who are important in your life at this moment, whether you like them or not. Use your own definition of who is important. I have placed in front of you a list of persons who might be potentially important to you. (Listing of Persons Important to You is placed in front of the subject/s.)

Please tell me the first name and initial of the last name of each person. Also I need to know their sex, how long you have known them, and their relationship with you, that is, mother, son, husband or wife, co-worker, etc. Last, please tell me if anyone named is deceased so that their name may be circled. (This information will be filled out on the answer sheet: The names will be written in the order given and numbered consecutively with the answers to follow placed in the appropriate column. Due to varying time commitments or time tables, some of the subjects may exercise the option to complete the list later with the assistance of the form; however, a partial list of a minimum of six names must be completed in the interviewer's presence to assure a thorough understanding of the task and accuracy.)

Phase 5: Completion of the Psychosocial Network Inventory, Modified

Now that we have developed a list--or, at least, a partial list of six--of those important to you, we can assess the relationships you have with them by using the Psychosocial Network Inventory, Modified. (Page 1 is placed in front of the subject/s.) Let's begin with the first three questions. I will read these with you and show you where to mark your answers.

Now here are the rest of the questions. (Page two of the inventory is placed in front of the subject/s, along with the Response Key [1]: The top of the second page is read--notation about the response key--and it is explained that scales on the response key represent a response continuum. The scales are numbered one through nine to permit answers between the five modal points, to facilitate unassisted completion once the directions are understood, and to correspond to the answer code. Once this has been explained, items 4 through 15 are asked of the subject/s.) As you see, we will take each person, one at a time, and answer these questions. (After the form has been completed for a minimum of two network members, the subject/s will be permitted to fill out the rest of the inventory without the assistance of the inverviewer.)

Phase 6: Assessment of connections

(This phase begins once all network members have been assessed.) Now that the assessment is completed, we can continue to the brief final step. I would like you to tell me which people that you have named are connected by an ongoing relationship, that is, which persons both know each other and have some kind of relationship with each other, outside their relationship with you. First, what about _____? Who else has a relationship with this person? (Network members will be taken in order to determine who knows whom. The numbers of those members that know the selected person will be placed in the extreme right hand column of the answer sheet.)

(If the corroboration has not been approved by or desired for this subject, then this completes the examination. Skip to the concluding remark.)

Phase 7: Contact of the network members

(If contact of corroborating network members has been permitted and after the five corroborating network members have been identified by the interviewer through the use of the form, Selected Network Members, the subject/s will be told which were identified randomly. At this point, the subject/s will be fully informed and, of course, free to rescind approval for this phase of the research. Name, address, and phone number of each identified member will be requested. If an identified member meets the criteria for exclusion, alternate choices will be made randomly on the spot.)

This completes the interview. Thank you very much for your time and effort.

Directions: Structured Interview (2)

Phase 1: Explanation of the research study

Now as we begin, I would like to read with you the explanation of the study. (Explanation of the Research Study [2] is placed in front of the subject. All schizophrenic subjects must be tested on an individual basis and in private.) Please ask your questions as they develop. (The form is read.)

Do you feel that you understand the explanation of the study? (Response of the subject is explored if necessary.) Would you like to see the letter that will be sent to identified network members? (If the subject would like to see the letter to clarify the nature of the contact, the letter will be shown and explained.)

Phase 2: Statement of informed consent

Before the study can begin, I need to obtain your informed consent to participate in this study. This means that you can only agree to be in the study after you fully know how the study affects you and your rights as a subject. (Statement of Informed Consent [1] or [2] is placed in front of the subject, the selection of either being determined by researcher intent and tentative subject consent: Form [1] is for use with subjects who will consider giving their approval for corroboration and from whom it is desired by the researcher, and form [2] is for use when corroboration is neither approved nor desired.) I have placed in front of you the Statement of Informed Consent. I would like to read this with you. Again, please ask your questions immediately. (Top portion of form [1] or form [2] in entirety is read.)

If you feel that you understand the explanation of the study and your rights as a subject, and you wish to participate in this study, please sign and date the form. Make a check mark by your name, if you wish to receive further information about the study after it is completed.

Now for the option I mentioned: I would like to request that you permit me to contact members of your network to further explore their relationship with you. Let's read together the rest of the consent form. (Lower portion of form [1] is read.) If you wish to allow me to contact network members as I have indicated, please sign and date the lower portion of the consent form.

Now we are ready to begin with the study. Four basic steps are involved in collecting the data in this study: (a) completing the General Information Sheet, (b) listing persons, (c) assessing relationships, and (d) indicating the relationships among the persons named. You need only respond to the questions I will be asking as I will record your responses.

Phase 3: General information sheet

First, we will complete the General Information Sheet. (The interviewer will ask the questions, using the form as a prompter.)

Phase 4: Listing of persons important to you

I would like to develop a list of all persons who are important in your life at this moment, whether you like them or not. Use your own definition of who is important. I have placed in front of you a list of persons who might be potentially important to you. (Listing of Persons Important to You is placed in front of the subject.)

Please tell me the first name and initial of the last name of each person. Also I need to know their sex, how long you have known them, and their relationship with you, that is, mother, son, husband or wife, co-worker, etc. Last, please tell me if anyone is deceased so that their name may be circled. (This information will be filled out on the answer sheet: The names will be written in the order given and numbered consecutively with the answers to follow placed in the appropriate column.)

Phase 5: Completion of the Psychosocial Network Inventory, Modified

Now that we have developed a list of those important to you, we can assess the relationships you have with them by using the Psychosocial Network Inventory, Modified. (Page 1 of the form is placed in front of the subject.) Let's begin with the first three questions. I will read these with you. (Answers are obtained for the first three questions.)

Now here are the rest of the questions. (Page two of the inventory is placed in front of the subject, along with the Response Key [2]: The top of the second page is read--notation about the response key--and it is explained that scales on the response key represent a response continuum.) As these scales represent a continuum of possible answers, you may choose an answer anywhere along the scale, as well as the five major points marked on the response key pointed out by the interviewer. (Once this has been explained, items 4 through 15 are asked of the subject.) As you see, we will take each person, one at a time, and answer these questions. (Questions 1 through 15 are asked on each network member in order; however, it is permissible to ask questions 1, 2, and 3 on all network members, and then the other questions in situations where it seems appropriate.)

Phase 6: Assessment of connections

(This phase begins once all network members have been assessed.) Now that the assessment is completed, we can continue to the brief final step. I would like you to tell me which people that you have named are connected by an ongoing relationship; that is, which persons both know each other and have some kind of relationship with each other, outside

their relationship with you. First, what about _____? Who else has a relationship with this person? (Network members will be taken in order to determine who knows whom. The numbers of those members that know the selected person will be placed in the extreme right hand column of the answer sheet.)

(If the corroboration has not been approved by or desired for this subject, then this completes the examination. Skip to the concluding remark.)

Phase 7: Contact of the network members

(If contact of corroborating network members has been permitted and after the five corroborating network members have been identified by the interviewer through the use of the form, Selected Network Members, the subject will be told which were identified randomly. At this point, the subject will be fully informed and, of course, free to rescind approval for this phase of the research. Name, address, and phone number of each identified network member will be requested. If an identified member meets the criteria for exclusion, alternate choices will be made randomly on the spot.)

This completes the interview. Thank you very much for your time and effort.

Code #____

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DEPARTMENT OF COUNSELING AND EDUCATIONAL PSYCHOLOGY

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Release of Information

1. I authorize_____ to release
(Facility)

2. _____
(Specify nature of information to be disclosed)

3. Information about_____ to

4. _____
(Name) (Where information to be sent) (Address)

5. For the specific purpose of _____

_____

6. I understand that I have the right to inspect and copy the information to be disclosed.

7. I understand that I may revoke this authorization at any time except to the extent that action has been taken on this authorization. I further understand that this authorization shall expire without my express revocation on:

_____, 19__.

8. I further understand that the agency which receives this information will not disclose this information without further written consent.

9. _____ 10. _____
(Signature) (Relationship)

11. _____ 12. _____
(Date) (Witness)

Explanation of the Research Study (1)

The purpose of the research study in which you are being asked to participate is to examine one's social network, that is, the social relationships one has with family, relatives, friends, co-workers, and others.

You will be asked to identify persons important to you and to respond to a series of questions about your relationship with these persons. The time commitment varies between an hour and an hour and a half. A possible additional request may apply to you: With your permission, some persons in your network will be contacted in order to further examine their relationship with you. They will only be notified of your participation in this research study: All of your answers, as well as their answers, will remain in strict confidence.

Explanation of the Research Study (2)

The research director/committee of this facility selected you as a potential participant in an approved research study. The reasons for identifying you specifically include your age, diagnosis, and residential status--your residing with your family.

The purpose of the research study in which you are being asked to participate is to examine one's social network, that is, the social relationships one has with family, relatives, friends, co-workers, and others.

You will be asked to identify persons important to you and to respond to a series of questions about your relationship with these persons. The time commitment varies a great deal. A possible additional request may apply to you: With your permission, some persons in your network will be contacted in order to further examine their relationship with you. They will only be notified of your participation in this research study: All of your answers, as well as their answers, will remain in strict confidence.

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EAST LANSING · MICHIGAN · 48824

2120 Hassel Road, #309
Hoffman Estates, Illinois 60195
(Local address)

Dear_____,

You were contacted, because _____ identified you as a/an _____ while participating in a research study and permitted us to contact you. The purpose of this study is to examine one's "social network", that is, the social relationships one has with family, relatives, friends, co-workers, and others.

To clarify our data, I would like to ask you a series of questions briefly about your relationship with _____. Your answers to these questions and your participation in the study will remain confidential.

Please carefully read the enclosed Statement of Informed Consent. If you agree to participate in this research endeavor, please sign and date the form, and return it in the enclosed envelope. If you have any questions, please leave a message at this number, 432-3102 in care of Kenneth Carrico, and I will return your call. If you wish the results of the study and/or an additional explanation after the study is completed, please make a note on the consent form.

The Response Key has been enclosed for your convenience in responding to the questions I will be asking.

Thank you very much for your time and consideration.

Sincerely yours,

Kenneth L. Carrico
Doctoral candidate
Michigan State University

Code #____

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Statement of Informed Consent (1)

I have freely consented to take part in a scientific study being conducted by Kenneth L. Carrico, under the supervision of Norman R. Stewart, Ph.D., Professor, Michigan State University.

The study has been explained to me and I understand the explanation that has been given and what my participation will involve.

I understand that I am free to discontinue my participation in the study at any time without penalty.

I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

I understand that my participation in the study does not guarantee any beneficial results to me.

I understand that, at my request, I can receive an additional explanation of the study after my participation is completed.

Name_____.

Date_____.

I have freely consented to the additional request that persons in my social network be contacted by the researcher, the purpose being further examination of the identified relationships. Only these persons will be informed of my participation in the research study; in all other ways, my anonymity will be preserved.

I understand that all of my answers, as well as their answers, will remain in strict confidence.

Name_____.

Date_____.

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COLLEGE OF EDUCATION EAST LANSING • MICHIGAN • 48824
DEPARTMENT OF COUNSELING AND EDUCATIONAL PSYCHOLOGY

Statement of Informed Consent (2)

I have freely consented to take part in a scientific study being conducted by Kenneth L. Carrico, under the supervision of Norman R. Stewart, Ph.D., Professor, Michigan State University.

The study has been explained to me and I understand the explanation that has been given and what my participation will involve.

I understand that I am free to discontinue my participation in the study at any time without penalty.

I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

I understand that my participation in the study does not guarantee any beneficial results to me.

I understand that, at my request, I can receive an additional explanation of the study after my participation is completed.

Name_____.

Date_____.

Code #____

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EAST LANSING • MICHIGAN • 48824

General Information Sheet (PNIM)

Age____. Sex: Male____. Female____.

Education: Last year of school completed or final degree_____.

Employment: Your occupation_____.

Work status: Employed full-time____. Employed part-time____.
Unemployed____. If unemployed, how long____?
Never employed____. Student____. Number of jobs held, past 5 years____.

Gross yearly income: Personal income_____. Family income_____.

Ethnic group: White____. Black____. Mexican/American____.
Oriental____. American Indian____.
East Indian____. Other____.

Marital status: Single____. Married____. Separated____.
Divorced____. Widowed____. Living together____.

Religious preference: Protestant____. Catholic____. Jewish____.
Islam____. Other____. None____.

Residence: Living alone____. Living with family and/or relatives____. Living with unrelated others____.
In mental health facility or residential setting____.

Number of moves in past 5 years____.
Number of years at present address____.

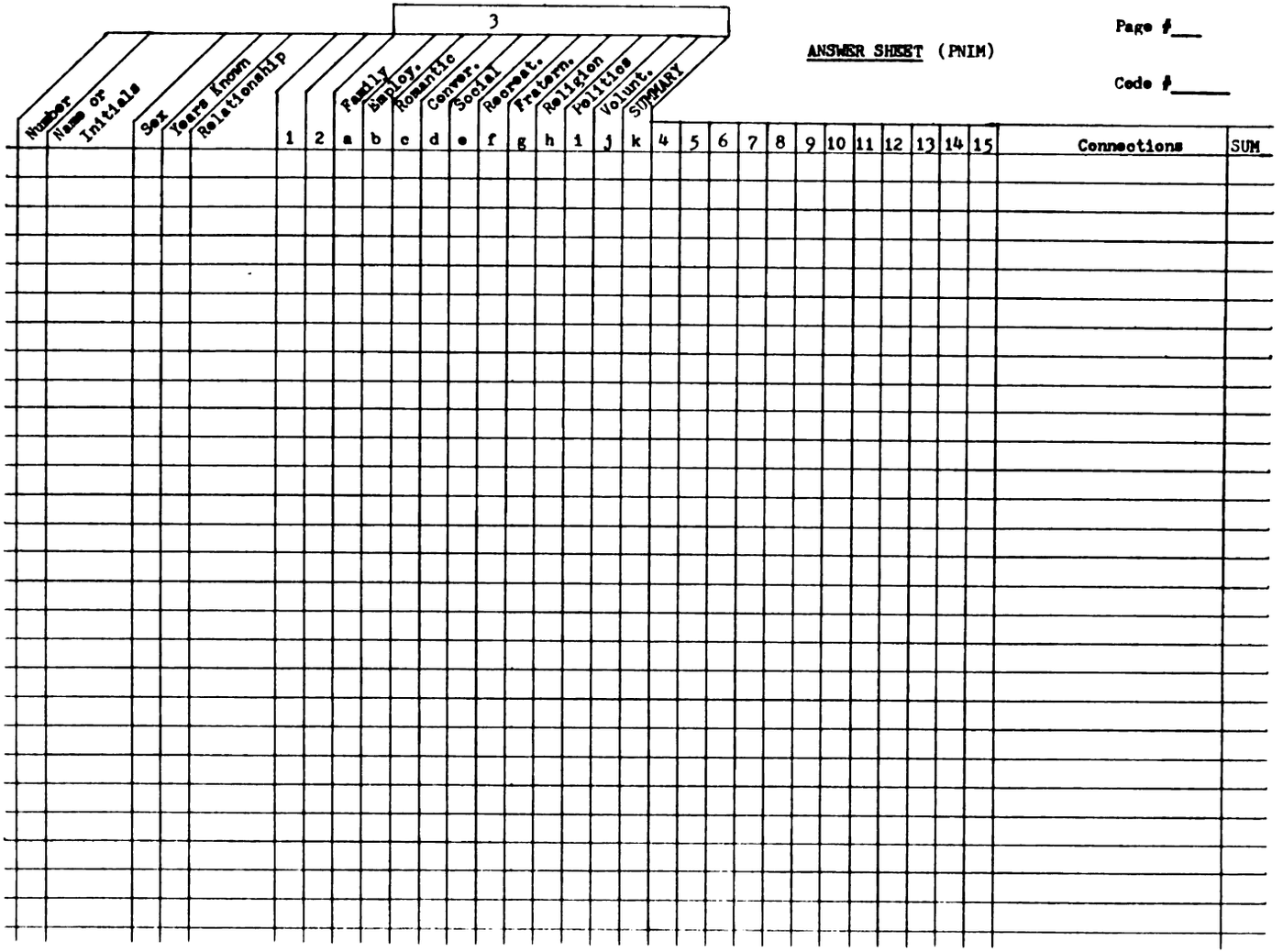
Major life events: Check any of the following if they have occurred during the last year to you and/or your family:

Birth____.
Death____.
Divorce or separation____.
Family or marital conflict____.
Family move____.
Financial problems____.
Marriage or remarriage____.
School or job change____.
Serious accident____.
Serious illness or disability____.
Trouble with Law____.
Other_____
_____.
None____.

Group membership: List names of all formal or informal community associations to which you may belong, such as church, fraternal club, service club, self-help group, social or recreational groups, etc., regardless of your level of participation.

_____

_____


3
Page #___
ANSWER SHEET (PNIM)
Code #_____
Number
Name or Initials
Sex
Years Known
Relationship
Family
Employ.
Romantic
Conver.
Social
Recreat.
Fratern.
Religion
Politics
Volunt.
SUMMARY
1 2 a b c d e f g h i j k 4 5 6 7 8 9 10 11 12 13 14 15
Connections
SUM

Listing of Persons Important to You

Family

Mother/Stepmother
Father/Stepfather
Sisters/Stepsisters/Half-sisters
Brothers/Stepbrothers/Half-brothers
Husband or Wife
Ex-spouses
Daughters/Stepdaughters
Sons/Stepsons

Relatives

Aunts & Uncles
Grandparents
Cousins
Nieces & Nephews
In-laws

Friends

Neighbors

Co-workers

Colleagues
Supervisors

PSYCHOSOCIAL NETWORK INVENTORY, MODIFIED

1. How often do you usually have CONTACT with this person, whether face-to-face, or by phone or letter?

   a. Daily.
   b. At least once a week.
   c. At least once a month.
   d. At least once every six months.
   e. At least once a year.

2. How CLOSE does this person live to you?

   a. Lives in the same household.
   b. Within the same general neighborhood or locale.
   c. Within about a 30-minute drive from you.
   d. Within about a 2-hour drive from you.
   e. Beyond a 2-hour drive from you.

3. Which types of ACTIVITIES do you and this person share as described in the following list?

   a. FAMILY activities such as meal-time, holidays, vacations, or reunions.
   b. EMPLOYMENT activities such as working with co-workers or supervisors.
   c. ROMANTIC activities such as dating, dancing, or going out for dinner.
   d. CONVERSATIONAL activities such as intimate, personal sharing or philosophical discussions.
   e. SOCIAL activities such as parties, banquets, or visiting friends or neighbors.
   f. RECREATIONAL activities such as playing cards or participation in or attendance at sports events.
   g. FRATERNAL activities such as participation in clubs or other organizations.
   h. RELIGIOUS activities such as attendance at church, synagogue, or temple.
   i. POLITICAL activities such as rallies or discussions about politics.
   j. VOLUNTEER activities such as service to the community, giving blood, or hospital work.

(Answers for the following items are found on the scales of the Response Key.)

4. How much do you help this person by providing GUIDANCE when needed, such as giving advice on a task or decision, or giving feedback on an action taken? (Response Key: A)

5. How much does this person help you by expressing AFFECTION when you need it, such as a hug, kiss, or pat on the back? (Response Key: A)

6. How much do you help this person by DOING THINGS for them when needed, such as helping with household tasks, providing personal or family care, assisting on the job, or even lending money? (Response Key: A)

7. How much do you help this person by expressing AFFECTION when needed, such as a hug, kiss, or pat on the back? (Response Key: A)

8. What TYPE of feelings does this person have toward you, regardless of their strength? (Response Key: C)

9. What is the STRENGTH of the feelings and thoughts this person has toward you, regardless of their type? (Response Key: B)

10. What is the STRENGTH of the feelings and thoughts you have toward this person, regardless of their type? (Response Key: B)

11. How much does this person help you by providing GUIDANCE when you need it, such as giving advice on a task or decision, or giving feedback on an action taken? (Response Key: A)

12. How much do you help this person by giving EMOTIONAL SUPPORT when needed, such as giving praise, being a good listener, or providing them with encouragement? (Response Key: A)

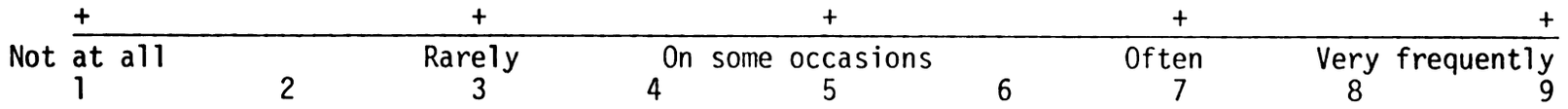
13. How much does this person help you by DOING THINGS for you when you need it, such as helping with household tasks, providing personal or family care, assisting on the job, or even lending money? (Response Key: A)

14. What TYPE of feelings and thoughts do you have toward this person, regardless of their strength? (Response Key: C)

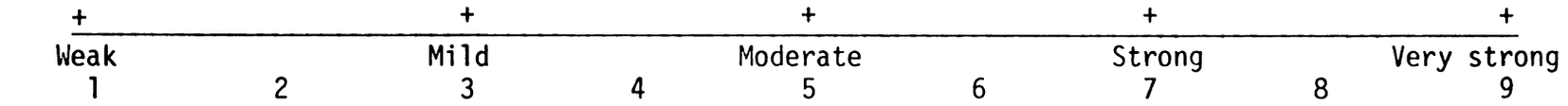
15. How much does this person help you by giving EMOTIONAL SUPPORT when you need it, such as praising you, being a good listener, or providing you with encouragement? (Response Key: A)

RESPONSE KEY (1)

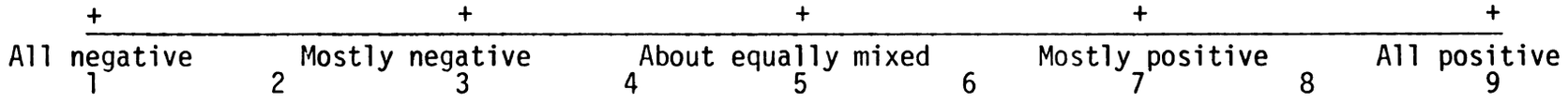
A



B

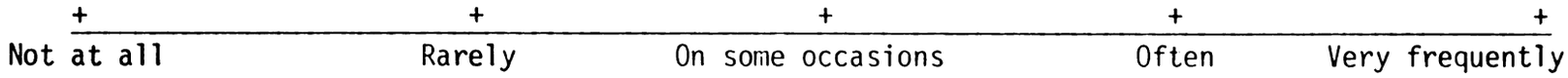


C

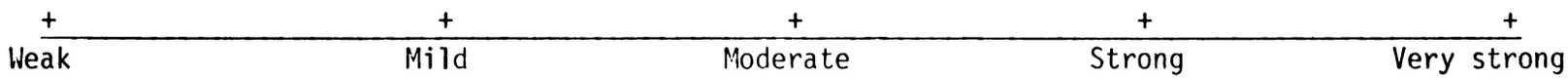


RESPONSE KEY (2)

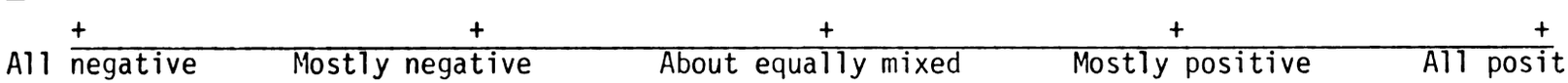
A



B



C



SELECTED NETWORK MEMBERS

Size of Identified Network	Numbers of Network Members for Contact
1	1
2	1, 2
3	1, 2, 3
4	1, 2, 3, 4
5	1, 2, 3, 4, 5
6	2, 3, 4, 5, 6
7	1, 2, 3, 4, 5
8	2, 3, 4, 5, 7
9	2, 3, 7, 8, 9
10	2, 4, 5, 8, 9
11	4, 5, 8, 9, 10
12	1, 2, 6, 7, 10
13	2, 7, 8, 9, 11
14	1, 5, 11, 12, 13
15	3, 4, 9, 12, 15
16	5, 6, 9, 11, 13
17	1, 8, 11, 14, 17
18	1, 8, 13, 14, 16
19	2, 7, 9, 11, 13
20	5, 6, 9, 13, 19
21	2, 3, 4, 7, 17
22	6, 10, 11, 15, 16
23	4, 6, 14, 15, 21
24	6, 10, 11, 15, 16
25	11, 12, 14, 15, 17
26	5, 16, 17, 20, 21
27	1, 2, 8, 19, 20
28	1, 17, 18, 20, 22
29	7, 8, 9, 11, 22
30	5, 6, 19, 23, 26
31	11, 14, 15, 21, 24
32	4, 8, 9, 15, 24
33	1, 7, 16, 31, 32
34	5, 16, 20, 21, 32
35	5, 6, 23, 26, 34
36	12, 14, 15, 24, 33
37	10, 15, 16, 30, 37
38	14, 15, 24, 36, 38
39	2, 8, 22, 36, 37
40	4, 18, 25, 32, 34
41	1, 16, 18, 25, 30
42	9, 12, 15, 20, 23
43	13, 24, 35, 38, 40
44	4, 15, 17, 22, 38

Size of Identified Network	Numbers of Network Members for Contact
45	3, 10, 15, 20, 24
46	2, 3, 9, 15, 32
47	2, 7, 13, 15, 31
48	4, 6, 21, 42, 44
49	3, 9, 15, 19, 22
50	4, 9, 24, 46, 48

APPENDIX B

OPERATIONALIZATION OF VARIABLES

PHASE I: CORROBORATION

STRUCTURE-RELATED VARIABLES

1. VARIABLE: Size of network cluster

DEFINITION: The size of the network cluster is that number of persons that are known jointly by the focal person (the subject) and by the network member/corroborator who are considered important by the focal person.

INDEX: $_{x}C_{sy}$ and $_{x}C_{cy}$

KEY: $_{x}C_{sy}$ = The size of the network cluster as determined by the subject for a certain network member/corroborator. In the notation used in this phase, the prefixes and suffixes are used as coordinates, not as mathematical or statistical symbols. The "x" in the prefix designates the figure is one estimated by the focal person (the subject). The "y" designates the number given to the corroborator as written on the answer sheet. For instance, in an example we could write $_{10S}C_{s3}$, meaning that for the schizophrenic subject, code #10S, we have the size of the network cluster estimated by the subject relative to the network member/corroborator, #3. If the subject was a normal with the same code number, we would have $_{10N}C_{s3}$.

$_{x}C_{cy}$ = The size of the network cluster as determined by the corroborator relative to the focal person (the subject). The "x" in the prefix designates the code number given to the subject (the focal person, not the corroborator). The "c" in the suffix designates that the figure is one estimated by the corroborator. The "y" designates the number given to the corroborator as written on the answer sheet.

In our example, we would write $_{10S}C_{c3}$, meaning that for the schizophrenic subject, code #10S, we have the size of the network cluster estimated by the network member/corroborator whose number is #3.

RELATIONSHIP TO INVENTORY: NA

RELATIONSHIP TO ANSWER SHEET: Five corroborators were identified on the subject's answer sheet; the responses of each corroborator were written on the "corroborator" answer sheet, designated by the number given to them by the focal person. Under the "number" column of the subject's answer sheet (extreme left hand side), match the number of the identified corroborator/s with the number on the corroborator's answer sheet, same column. Follow the row to the extreme right side--the column "SUM." The figure on the subject's answer sheet would be $_xC_{sy}$; the figure on the corroborator's answer sheet would be $_xC_{cy}$.

2. VARIABLE: Distance

DEFINITION: Distance refers to the distance between the focal person and a network member/corroborator in terms of location or time of travel.

INDEX: $_xD_{sy}$ and $_xD_{cy}$

KEY: $_xD_{sy}$ and $_xD_{cy}$ = The estimated distance between the focal person and the corroborator; the former, subject's estimate and the latter, corroborator's estimate. The prefix and suffix designate the subject's code number ("x"), the source of the estimate ("s" or "c"), and the corroborator's number ("y").

RELATIONSHIP TO INVENTORY: The estimated distance is the answer to item #2.

RELATIONSHIP TO ANSWER SHEET: To locate the response on the subject's answer sheet relative to the corroborator, find the corroborator's number on the extreme left hand side on the subject's answer sheet and follow the row across to item #2. On the corroborator's answer sheet, the matching response is also under item #2 on the same row as the corroborator's identifying number.

3. VARIABLE: Frequency of contact

DEFINITION: Frequency of contact refers to the relative frequency of contact between the focal person and the network member/corroborator.

INDEX: $_{x}F_{sy}$ and $_{x}F_{cy}$

KEY: $_{x}F_{sy}$ and $_{x}F_{cy}$ = The estimated frequency of contact between the focal person (the subject) and the corroborator; the former, the subject's estimate and the latter, the corroborator's estimate.

RELATIONSHIP TO INVENTORY: The estimated frequency of contact is the answer to item #1.

RELATIONSHIP TO ANSWER SHEET: The responses to item #1 for both subject and corroborators are found as indicated above.

CONTENT-RELATED VARIABLES

4. VARIABLE: Content

DEFINITION: Content refers to the number of activities shared between the focal person (the subject) and the network member/ corroborator.

INDEX: $_{x}R_{sy}$ and $_{x}R_{cy}$

KEY: $_{x}R_{sy}$ and $_{x}R_{cy}$ = The estimated number of activities shared between the subject and the corroborator; the former, the subject's estimate and the latter, the corroborator's estimate.

RELATIONSHIP TO INVENTORY: The number of activities is the sum of all of the activities checked under item #3, section K.

RELATIONSHIP TO ANSWER SHEET: The answers are found under the "SUMMARY" section of item #3 on both answer sheets: 3-K.

FUNCTION-RELATED VARIABLES

5. VARIABLE: Functional indegree

DEFINITION: Functional indegree indicates the degree of support that the focal person (the subject) is receiving from the network member/corroborator.

INDEX: $_{x}Q_{sy}$ and $_{x}Q_{cy}$

KEY: $_{x}Q_{sy}$ and $_{x}Q_{cy}$ = The estimated degree of support that the subject is receiving from the corroborator; the former, the subject's estimate and the latter, the corroborator's estimate.

RELATIONSHIP TO INVENTORY: Items 5, 11, 13, and 15 assess the degree of support that the focal person is receiving. Items 4, 6, 7, and 12 assess the functional indegree from the corroborator's perspective.

RELATIONSHIP TO ANSWER SHEET: To obtain $_{x}Q_{sy}$, add the responses from items 5, 11, 13, and 15 in the row with the same number of the corroborator. To obtain $_{x}Q_{cy}$, add the responses from items 4, 6, 7, and 12 from the corroborator's answer sheet on the same row as the matching identifying number.

6. VARIABLE: Functional outdegree

DEFINITION: Functional outdegree indicates the degree of support that the focal person (the subject) is providing the network member/corroborator.

INDEX: $_{x}P_{sy}$ and $_{x}P_{cy}$

KEY: $_{x}P_{sy}$ and $_{x}P_{cy}$ = The estimated degree of support that the focal person is providing to the corroborator; the former, the subject's estimate and the latter, the corroborator's estimate.

RELATIONSHIP TO INVENTORY: Items 4, 6, 7, and 12 assess functional outdegree from the subject's perspective. Items 5, 11, 13, and 15 assess functional outdegree from the corroborator's perspective.

RELATIONSHIP TO ANSWER SHEET: To obtain $_{x}P_{sy}$, add the responses from items 4, 6, 7, and 12 on the subject's answer sheet in the row with the same number of the corroborator. To obtain $_{x}P_{cy}$, add the responses from items 5, 11, 13, and 15 from the answer sheet of the corroborator, matching the identifying number.

EMOTION-RELATED VARIABLES

7. VARIABLE: Affective indegree

DEFINITION: Affective indegree indicates the type of feelings held by a network member/corroborator for the focal person.

INDEX: $_{x}V_{sy}$ and $_{x}V_{cy}$

KEY: $_{x}V_{sy}$ and $_{x}V_{cy}$ = The estimated type of feelings held by the corroborator for the subject; the former, the subject's estimate and the latter, the corroborator's estimate.

RELATIONSHIP TO INVENTORY: Item #8 assesses affective indegree from the perspective of the subject. Item #14 assesses affective indegree from the perspective of the corroborator.

RELATIONSHIP TO ANSWER SHEET: To obtain $_{x}V_{sy}$, locate the score on item #8 for the corroborator on the subject's answer sheet. To obtain $_{x}V_{cy}$, locate the score of item #14 on the corroborator's answer sheet.

8. VARIABLE: Affective outdegree

DEFINITION: Affective outdegree indicates the type of feelings experienced by the focal person (the subject) for the network member/ corroborator.

INDEX: $_{x}Y_{sy}$ and $_{x}Y_{cy}$

KEY: $_{x}Y_{sy}$ and $_{x}Y_{cy}$ = The estimated type of feelings held by the subject for the corroborator; the former, the subject's estimate and the latter, the corroborator's estimate.

RELATIONSHIP TO INVENTORY: Item #14 assesses affective outdegree from the perspective of the subject. Item #8 assesses affective outdegree from the perspective of the corroborator.

RELATIONSHIP TO ANSWER SHEET: To obtain $_{x}Y_{sy}$, locate the score on item #14 for the identified corroborator on the subject's answer sheet. To obtain $_{x}Y_{cy}$, locate the score on item #8 on the corroborator's answer sheet.

9. VARIABLE: Investment indegree

DEFINITION: Investment indegree reflects the strength of feelings (emotional investment) experienced by the network member/corroborator for the focal person (the subject).

INDEX: $_{x}G_{sy}$ and $_{x}G_{cy}$

KEY: $_{x}G_{sy}$ and $_{x}G_{cy}$ = The estimated strength of feelings, i.e., emotional investment, held in the subject by the corroborator; the former, the subject's estimate and the latter, the corroborator's estimate.

RELATIONSHIP TO INVENTORY: Item #9 assesses investment indegree from the perspective of the subject. Item #10 assesses investment indegree from the perspective of the corroborator.

RELATIONSHIP TO ANSWER SHEET: To obtain $_{x}G_{sy}$, locate the score on item #9 for the corroborator on the subject's answer sheet. To obtain $_{x}G_{cy}$, locate the score on item #10 on the corroborator's answer sheet.

10. VARIABLE: Investment outdegree

DEFINITION: Investment outdegree reflects the strength of feelings (emotional investment) experienced by the focal person (the subject) for the network member/corroborator.

INDEX: $_{x}H_{sy}$ and $_{x}H_{cy}$

KEY: $_{x}H_{sy}$ and $_{x}H_{cy}$ = The estimated degree of emotional investment in the corroborator by the subject; the former, the subject's estimate and the latter, the corroborator's estimate.

RELATIONSHIP TO INVENTORY: Item #10 assesses investment outdegree from the perspective of the subject. Item #9 assesses investment outdegree from the perspective of the corroborator.

RELATIONSHIP TO ANSWER SHEET: To obtain $_{x}H_{sy}$, locate the score on item #10 for the corroborator on the subject's answer sheet. To obtain $_{x}H_{cy}$, locate the score on item #9 on the corroborator's answer sheet.

PHASE II: MAIN ANALYSIS

STRUCTURE-RELATED VARIABLES

1. VARIABLE: Size

DEFINITION: Size refers to the actual number of persons identified as important in the social network.

INDEX: n

KEY: n = an absolute value; an index is not necessary.

RELATIONSHIP TO INVENTORY: NA

RELATIONSHIP TO ANSWER SHEET: "n" is the total number of persons identified on the left side of the answer sheet--this number will not include the focal person.

2. VARIABLE: Interconnectedness or adjacent density

DEFINITION: Adjacent density, the index of interconnectedness, refers to the proportion of linkages (relationships) in the social network to the total possible number of linkages in the network. The proportion varies between .00 and 1.00.

INDEX: $\frac{a}{N(N-1)/2}$ or $\frac{2a}{n(n+1)}$

KEY: a = the actual number of linkages in the network.

N = the network size (n) plus the focal person--n + 1.

RELATIONSHIP TO INVENTORY: NA

RELATIONSHIP TO ANSWER SHEET: The actual number of linkages in the network, "a," is computed by first summing the sizes of the network clusters (found under the SUM column of the answer sheet) across

all network members, designated $_{x}C_{sy}$, dividing this total figure by two, and last, adding network size. The formula is as follows:

$$a = \tfrac{1}{2} \sum_{i=1}^{n} {}_{x}C_{sy} + n.$$

3. VARIABLE: Distance

DEFINITION: Distance refers to the average distance between the focal person and a network member in terms of location or time of travel.

INDEX: $\sum_{i=1}^{n} d/n$

KEY: d = the degree of distance between the focal person and network member, as assessed on the inventory.

RELATIONSHIP TO INVENTORY: "d" is assessed through item #2.

RELATIONSHIP TO ANSWER SHEET: Locate the #2 column on the answer sheet; a = 1, b = 2, c = 3, d = 4, and e = 5: the lower the value, the closer to the focal person the member lives. The numerator of the index would be the sum of the #2 column.

4. VARIABLE: Frequency of contact

DEFINITION: Frequency of contact refers to the average frequency of contact between the focal person and a network member.

INDEX: $\sum_{i=1}^{n} f/n$

KEY: f = the frequency of contact for an identified person in the network.

RELATIONSHIP TO INVENTORY: "f" is assessed through item #1 in the inventory.

RELATIONSHIP TO THE ANSWER SHEET: To find "f," locate the column under #1 on the answer sheet; a = 1, b = 2, c = 3, d = 4, and e = 5: the lower the value, the more frequent the contact. The numerator of the index would be the sum of the #1 column.

CONTENT-RELATED VARIABLES

5. VARIABLE: Proportion of uniplex relationships

DEFINITION: In the uniplex relationship, only one type of activity is shared in the relationship. The index is a proportion.

INDEX: u/n

KEY: u = the number of uniplex relationships in the social network of one subject.

RELATIONSHIP TO INVENTORY: "u" is assessed by item #3.

RELATIONSHIP TO ANSWER SHEET: On item #3 the type and number of activities shared in a relationship are noted. If only one activity is checked for a relationship, then the identified relationship is uniplex.

6. VARIABLE: Proportion of multiplex relationships

DEFINITION: In the multiplex relationship, more than one activity is shared in the relationship. The index is a proportion.

INDEX: m/n

KEY: m = the number of multiplex relationships in the social network of one subject.

RELATIONSHIP TO INVENTORY: "m" is assessed by item #3.

RELATIONSHIP TO ANSWER SHEET: If more than one type of activity is checked for a relationship under #3 on the answer sheet, then the relationship is multiplex.

7. VARIABLE: Relationship density

DEFINITION: Relationship density is an average of the content areas, i.e., types of activity, between the focal person and the social network.

INDEX: $\sum_{i=1}^{n} r/n$

KEY: r = the number of content areas checked for one person in the network.

RELATIONSHIP TO INVENTORY: (Also a part of item #3)

RELATIONSHIP TO ANSWER SHEET: To find "r," locate the k-column under item #3, "SUMMARY"; each line contains the sum of the checked content areas. The grand total of this column would be numerator of the index.

FUNCTION-RELATED VARIABLES

8. VARIABLE: Functional indegree

DEFINITION: Functional indegree indicates the degree of support that the focal person is receiving.

INDEX: $\sum_{i=1}^{n} q/n$

KEY: q = sum of support that the focal person is receiving from one network member as assessed by four items (5, 11, 13, 15), each on a scale from 1 to 9.

RELATIONSHIP TO INVENTORY: See the table below:

Item #5 = Affective functioning, behavioral mode (physical affection)

Item #11 = Instrumental functioning, verbal mode (guidance)

Item #13 = Instrumental functioning, behavioral mode (helping by doing)

Item #15 = Affective functioning, verbal mode (verbal support)

Note: The higher the number, the greater the degree of functional support.

RELATIONSHIP TO ANSWER SHEET: To obtain "q" for one network member, add the responses from items 5, 11, 13, and 15. According to the index, this would be done for every individual network member, the grand total being divided by "n"; however, an easier method would be to add the columns under 5, 11, 13, and 15 and divide the result grand total by "n."

9. VARIABLE: Functional outdegree

DEFINITION: Functional outdegree indicates the degree of support that the focal person is providing others.

INDEX: $\sum_{i=1}^{n} p/n$

KEY: p = sum of support that the focal person is providing one other network member as assessed by four items (4, 6, 7, 12), each on a scale from 1 to 9.

RELATIONSHIP TO INVENTORY: See the table below:

Item #4 = Instrumental functioning, verbal mode (guidance)

Item #6 = Instrumental functioning, behavioral mode (helping by doing)

Item #7 = Affective functioning, behavioral mode (physical affection)

Item #12 = Affective functioning, verbal mode (verbal support)

Note: The higher the number, the greater the degree of support of the various kinds.

RELATIONSHIP TO ANSWER SHEET: To obtain "p" for one network member, add the responses from items 4, 6, 7, and 12. According to the index, this would be done for every network member, the grand total being divided by "n"; however, an easier method would be to add the columns under 4, 6, 7, and 12, and divide the result--grand total--by "n."

10. VARIABLE: Functional symmetry

DEFINITION: Functional symmetry is a function-related variable that assesses the balance of support in relationships in the social network. The balance can be equal, i.e., reciprocal, or unequal, i.e., either dependent or supportive relative to the focal person.

EMOTION-RELATED VARIABLES

11. VARIABLE: Affective indegree

DEFINITION: Affective indegree indicates the type of feelings held by a network member as perceived by the focal person. The range extends from all negative to all positive feelings.

INDEX: $\sum_{i=1}^{n} v/n$

KEY: v = the type of feelings of one network member for the focal person (as perceived by the focal person) as assessed by item #8

on a scale from 1 to 9. The lower numbers (1-3) suggest a negative feeling; moderate numbers (4-6), mixed feelings; higher numbers (7-9), more positive feelings.

RELATIONSHIP TO INVENTORY: Item #8 assesses this variable.

RELATIONSHIP TO ANSWER SHEET: The singular answer to item #8 is "v" for one network member. To obtain the numerator of the index for one subject, total the column under item #8. The index is computed when the amount is divided by "n."

12. VARIABLE: Affective outdegree

DEFINITION: Affective outdegree indicates the type of feelings experienced by the focal person for a member of the social network. The range extends from all negative feelings to all positive feelings.

INDEX: $\sum_{i=1}^{n} y/n$

KEY: y = the type of feelings the focal person experiences for one network member--assessed by item #14 on a scale from 1 to 9. As with affective indegree, the lower numbers (1-3) suggest a negative feeling; the moderate numbers (4-6), mixed feelings; and the higher numbers (7-9), a more positive feeling.

RELATIONSHIP TO INVENTORY: Item #14 assesses this variable.

RELATIONSHIP TO ANSWER SHEET: The singular answer to item #14 is "y" for one network. To obtain the numerator of the index, total the column under item #14. The index is computed when this amount is divided by "n"--that is for one social network.

13. VARIABLE: Affective symmetry

DEFINITION: Affective symmetry exists when the type of emotion between the focal person and the network member is identical or comparable.

14. VARIABLE: Investment indegree

DEFINITION: Investment indegree reflects the strength of feelings (emotional investment) experienced by the network member for the focal person as perceived by the focal person. The range extends from a weak to very strong investment of feeling (1 to 9).

INDEX: $\sum_{i=1}^{n} g/n$

KEY: g = the degree of investment in the focal person by a network member as perceived by the focal person--assessed by item #9 on a scale from 1 to 9. Lower scores suggest less involvement; higher scores, greater investment.

RELATIONSHIP TO INVENTORY: Item #9 assesses this variable.

RELATIONSHIP TO ANSWER SHEET: The answer to item #9 is "g" for one network member. To obtain the numerator of the index for one subject, total the column under item #9. The index is computed when this amount is divided by "n."

15. VARIABLE: Investment outdegree

DEFINITION: Investment outdegree reflects the strength of feeling experienced by the focal person for a network member. The range is identical to that of investment indegree.

INDEX: $\sum_{i=1}^{n} h/n$

KEY: h = the degree of investment in the network member by the focal person--assessed by item #10 on a scale from 1 to 9. Lower scores suggest less involvement; higher scores, greater investment.

RELATIONSHIP TO INVENTORY: Item #10 assesses this variable.

RELATIONSHIP TO ANSWER SHEET: The answer to item #10 is "h" for one network member. To obtain the numerator of the index for one subject, total the column under #10. The index is computed when this amount is divided by "n."

16. VARIABLE: Investment symmetry

DEFINITION: Investment symmetry exists when the emotional investment experienced by the focal person and the network member is comparable; investment asymmetry, unequal.

APPENDIX C

PROPOSAL TO THE UNIVERSITY COMMITTEE ON RESEARCH INVOLVING HUMAN SUBJECTS

Title of Proposed Research: An Examination of the Social Networks of Normals and Schizophrenics

Type of Research: Doctoral dissertation

Presenting Doctoral Candidate: Kenneth L. Carrico
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Date of Proposal Approval: January 25, 1980

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Abstract

The phenomenon of schizophrenia has long perplexed researchers. Recent attempts to study its psychosocial aspects have utilized a new method of study from the field of sociology, "social network analysis." The investigator in the present study will attempt to replicate the work of these recent studies by comparing the social networks of normals and schizophrenics; however, in the initial stage of the study, the investigator will test an assumption methodologically basic to these studies--that the subjects' self-report is a sufficient and accurate indicator of the functioning of the social network. If this assumption is proven as valid, then the comparison--the focus of the second stage of the study--will be carried out using the self-report data. If not, then the comparison will be carried out as possible.

The social networks of normals and schizophrenics will be compared along four major variables pertaining to social relationships: structure, content, function, and emotion. The structural variables convey the basic morphological characteristics of the social network. The content variables convey aspects of the content of the social relationships, i.e., the types of activities. The function variables reflect the transaction of support. And last, the emotion variables assess the experiencing of affect.

Subject Populations

Sample of Normals

A group of individuals will be identified to represent a normal population who meet the following criteria: (a) residence with

nuclear family or family of origin; (b) age ranging between 21 and 40 years; and (c) no personal or family history of a psychiatric disorder for two generations. From this group, a sample of 20 will be randomly selected for inclusion in this study.

Sample of Schizophrenics

A group of individuals will be identified who have a history of hospitalization for a schizophrenic disorder, and who meet the following additional criteria: (a) residence with nuclear family or family of origin; (b) age ranging between 21 and 40 years; (c) not presently psychotic, meaning not out of touch with reality and capable of communication; and (d) diagnosis of schizophrenia made within the past 3 years.

Selection Rationale

Both groups will be selected for reasons of comparison and contrast, for without this, one is unable to establish a meaningful perspective.

Obtaining informed consent is not foreseen as a problem with the sample of normals, but it may arise with the sample of schizophrenics. As can be seen in the consent procedures, everything is being done to fully inform the schizophrenic subject of his/her rights and alternatives. When this information cannot be understood, then the subject will not be included in the study as they have not met the third criterion mentioned above. This decision will be a judgment made by the researcher.

Risk/Benefit Analysis

An examination of the nature and design of the study suggests the presence of potential social and psychological risks; physical, legal, and economic risks are not posed.

Potential social risks are associated with the request that some subjects relinquish their anonymity to provide access to their social network for further study of the social relationships. The risk appears to relate to possible misinterpretations by the contacted network members of (a) the subject's motive in identifying them and (b) the reason for the subject's participation in the study.

The social risk of misinterpretation appears to be largely dependent upon the degree of vagueness inherent in the explanation given to the contacted network member. To minimize this possibility, every effort has been made to develop a clear, direct, precise, and unambiguous explanation. However, this safeguard is one-sided in the sense that it can only act to increase the clarity of the statement; it cannot be assumed to control for idiosyncratic interpretations or misuse of the disclosure of the subject's participation by the contacted network member.

Potential psychological risks relate to the use and effect of the Psychosocial Network Inventory, Modified (PNIM). The use of all psychological tests is accompanied by potential risks, and the same is true for the PNIM. The primary risk is the generation of psychological conflicts, and resulting discomfort/dysfunction, previously controlled by the subject's defense mechanisms. This reaction could occur in either group, but it is more likely with the schizophrenics;

their coping abilities and defenses are much less controlled and integrated, by definition. However, the type of test used in this study is a highly structured, rather straightforward inventory tapping primarily conscious levels, possibly the least threatening of all psychological test forms; projective tests, on the other hand, tap much deeper levels of the subject's psyche and would, therefore, be much more likely to uncover hidden conflict and provoke an untoward reaction.

The psychological risks have been lessened through the choice of an objective and structured test (see above); however, if such risks materialize, the schizophrenic--who will, by the way, be tested in a psychiatric setting--will be encouraged to consult with his/her primary therapist and/or sign a release so that the reaction can be reported to appropriate staff. If the reaction is considerable, every effort will be made to report it immediately so that facility staff can act to intervene. If difficulties arise with a member of the normal group, he/she will be referred to the local mental health center.

Confidentiality is assured through (a) a coding procedure, (b) locked records, and (c) destruction of all identifying information after such is no longer necessary.

It is hoped that the study will be of benefit to the subject, the profession, and society in general. Through the administration of the PNIM, the subject may develop insights into the processes and dynamics operating in his/her social network and perhaps discover the extent of available social support. Gains within the professional

realm include the following: (a) determination of the validity and usefulness of self-report scales in social network analysis, clarifying the value of previous contributions to the field who based their work on self-report; (b) greater insight in the psycho-social functioning of the schizophrenic relative to the normal subject; and (c) recommendations regarding the psycho-social management and treatment of schizophrenia. Society, in general, may be profited by the knowledge as used by the profession.

Consent Procedures

Two sets of consent procedures have been developed to accommodate to the intrinsically different characteristics of the two samples, the normal and the schizophrenic, and the environments in which they will be identified. The term schizophrenia is a psychiatric diagnosis that denotes a certain type of mental illness; as such, it is subject to regulation and strict definition. Those facilities responsible for the housing and/or treatment of the schizophrenic are ethically and legally charged to protect the identity of the schizophrenic and to maintain the confidentiality of the schizophrenics' records. Exceptions are defined legally, must be justifiable, and are subject to stringent safeguards. Accordingly, the identification of the schizophrenic sample and the acquisition of informed consent for the study are difficult and complex procedurally and involve ethical and legal considerations, the focus explicitly being the protection of the welfare of the schizophrenic. The term normal, used to describe the other sample, is neither a psychiatric diagnosis nor is subject to

regulation; therefore, the consent procedures are relatively simple and straightforward, although the focus remains protection of the subjects' welfare. The consent procedures for the normal sample will be described first.

The sample of normal subjects will be chosen from groups assumed to contain "normal" members; those selected for participation in the study must meet the requirements for inclusion. The purpose and nature of the study will be described to the potential subject (see Explanation of the Research Study [1]), and if the potential subject meets the requirements and agrees to participate in the study, then an informed consent to participate in the study will be obtained in writing (see Statement of Informed Consent [1]). If the subject is involved in stage one of the study where corroboration of the data is required, then a release to notify others in the subject's network will also be obtained (see bottom of Statement of Informed Consent [1]). Those identified by the subject will be contacted by phone, informed of the reason for the phone call and nature of the study, and asked for their consent to participate in the study. A letter describing the study (see Corroborating Member Letter Form) and an informed consent form (see Statement of Informed Consent [2]) will be sent by mail with a self-addressed stamped envelope enclosed. When the consent form is returned, the person--identified by the subject--will be questioned as to the relationship with the subject either in person or over the phone.

The examination of the schizophrenic sample may take place in a day treatment/hospital program or an inpatient unit of a "mental health

facility" or "licensed private hospital" (terms in quotation marks are defined by Illinois statute). To secure permission for the running of the study, a research request will be submitted for approval to the research director and/or committee of the facility. If the request is approved, the procedure to identify the sample and gain the consent forms would proceed as follows: First, a designee of the research director and/or committee will identify those schizophrenics within the facility who meet the requirements for inclusion in the study. Second, a group will be selected randomly from the original identified number. After they have been informed of the nature and purpose of the study (to be determined by the facility), a release of information (see Release of Information) which conforms to Illinois statute will be obtained from those schizophrenics potentially willing to participate in the study, allowing their identity, age, diagnosis, and residential status to be released to the researcher. In a meeting with the researcher, the potential subjects will be informed as to the reasons for their initial selection, and the nature and purpose of the study (see Explanation of the Research Study [2]). If the potential subject agrees to participate in the study, then a consent form to participate in the study will be obtained in writing (see Statement of Informed Consent [1]). If the subject is involved in stage one of the study where corroboration of the data is required, then a release to notify others in the subject's network will also be obtained (see bottom of Statement of Informed Consent [1]). Those identified by the subject will be contacted by phone, informed of the reason for the phone call and nature of the study, and asked for their consent

to participate in the study. A letter describing the study (see Corroborating Member Letter Form) and an informed consent form (see Statement of Informed Consent [2]) will be sent by mail with a self-addressed stamped envelope enclosed. When the consent form is returned, the person--identified by the subject--will be questioned as to his/her relationship with the subject either in person or over the phone.

Explanation of the Research Study (1)

The purpose of the research study in which you are being asked to participate is to examine one's social network, that is to say, the social relationships one has with family, relatives, friends, co-workers, and others.

You will be asked to identify important persons to you and to respond to a series of questions about your relationship with these persons. A possible additional request may apply to you: With your permission, some persons of your network will be contacted in order to further examine their relationship with you. They will only be notified of your participation in this research study; all of your answers, as well as their answers, will remain in strict confidence.

Statement of Informed Consent (1)

I have freely consented to take part in a scientific study being conducted by Kenneth L. Carrico, under the supervision of Norman R. Stewart, Ph.D., Professor, Michigan State University.

The study has been explained to me, and I understand the explanation that has been given and what my participation will involve.

I understand that I am free to discontinue my participation in the study at any time without penalty.

I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

I understand that my participation in the study does not guarantee any beneficial results to me.

I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

Signed_____

Date_____

Code_____

I have freely consented to the additional request that persons in my social network be contacted by the researcher, the purpose being further examination of the identified relationships. Only these persons will be informed of my participation in the research study; in all other ways, my anonymity will be preserved.

I understand that all of my answers, as well as their answers, will remain in strict confidence.

Signed_____

Date_____

Corroborating Member Letter Form

(Name and address of corroborating network member)

Dear (Contact's name),

You were contacted because (subject's name) identified you as a/an (relationship) while participating in a research study and permitted us to contact you. The purpose of this study is to examine one's "social network," that is, the social relationships one has with family, relatives, friends, co-workers, and others.

To clarify our data, I would like to ask you a series of questions briefly about your relationship with (subject's name). Your answers to these questions and your participation in the study will remain confidential.

Please carefully read the enclosed Statement of Informed Consent. If you agree to participate in this research endeavor, please sign and date the form, and return it in the enclosed envelope. If you have any questions, please leave a message at this number, 446-1110, and I will return your call. If you wish the results of the study and/or additional explanation after the study is completed, please make a note on the consent form.

Thank you very much for your time and consideration.

Sincerely yours,

Kenneth L. Carrico

Statement of Informed Consent (2)

I have freely consented to take part in a scientific study being conducted by Kenneth L. Carrico, under the supervision of Norman R. Stewart, Ph.D., Professor, Michigan State University.

The study has been explained to me, and I understand the explanation that has been given and what my participation will involve.

I understand that I am free to discontinue my participation in the study at any time without penalty.

I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

I understand that my participation in the study does not guarantee any beneficial results to me.

I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

Signed_____

Date_____

Code_____

Explanation of the Research Study (2)

The research director/committee of this facility selected you as a potential participant in an approved research study. The reasons for identifying you specifically include your age, diagnosis, and residential status--your residing with your family.

The purpose of the research study in which you are being asked to participate is to examine one's social network, that is to say, the social relationships one has with family, relatives, friends, co-workers, and others.

You will be asked to identify important persons to you and to respond to a series of questions about your relationship with these persons. A possible additional request may apply to you: With your permission, some persons of your network will be contacted in order to further examine their relationship with you. They will only be notified of your participation in this research study; all of your answers as well as their answers will remain in strict confidence.

RELEASE OF INFORMATION

Date prepared_____

1. I authorize _____ to release
(Facility)

2. _____
(Specify nature of information to be disclosed)

3. Information about _____ to
(Patient)

4. _____
(Name) (Where information to be sent) (Address)

5. For the specific purpose of _____

_____

6. I understand that I have the right to inspect and copy the information to be disclosed.

7. I understand that I may revoke this authorization at any time except to the extent that action has been taken on this authorization. I further understand that this authorization shall expire without my express revocation on:

_____, 19___.

8. I further understand that the agency which receives this information will not disclose this information without further written consent.

9. _____ 10. _____
(Signature) (Relationship)

11. _____ 12. _____
(Date) (Witness)

Testing Procedure

The Pattison Psychosocial Network Inventory, Modified (PNIM) for interviewing, will be pilot tested and refined as necessary before being used in this study. For the study, the PNIM will be administered to all subjects within a period of two months. Administration will take place in a setting familiar to the subject.

At the administration, the examiner will make an introductory statement explaining the purpose of the interview and obtain an informed consent in writing. The subject will be presented with the General Information Sheet; the examiner will answer questions and guide as needed to insure accuracy and completeness.

A three-step process now begins. Step one entails the listing of all "important" persons in the subject's social network. The examiner will record the responses. An interview guide for the examiner, designating types of possible relationships, will be used to insure the development of a complete network. Step one ends when all names of those in the subject's network have been obtained. Step two involves the assessing of persons named along the items of the PNIM. The PNIM item guide will, at this point, be placed in front of the subject. The examiner will interview using the PNIM as a visual device to key the subject and otherwise structure the interview. For step three, the subject will be asked to determine which persons in the social network know each other, i.e., have some type of relationship with each other, outside their relationship with the subject.

After the administration of the PNIM is completed, the subject and the examiner will identify a minimum of four key network members

(when corroborating information is required): two in the family; one, a friend; and another, a co-worker. Permission will be obtained to contact these four network members by phone, inform them of the nature of the study, and enlist their participation. The interview may be conducted by phone or in person, after a consent form has been signed and received.

Three steps ensue during the corroborating interview. First, demographic data will be gathered. Second, the corroborator will be asked to list persons by first name and initial, known to be important to the subject, and briefly explain why. Last, the relationship between the corroborator and the subject will be assessed along the items of the PNIM. Corroborating data will be gathered until an adequate sample is obtained to test for concordance of results.

PSYCHOSOCIAL NETWORK INVENTORY, MODIFIED

GENERAL INFORMATION

1. Age____. 2. Sex: Male____. Female____.

3. Education: Last year of school completed or final degree_____.

4. Employment: Your occupation_____.
   Work Status: Employed____. Unemployed____. Retired____. Student____.

5. Ethnic group: White____. Black____. Mexican/American____. Oriental____.
   American Indian____. East Indian____. Other____.

6. Marital status: Never Married____. Married____. Separated____.
   Divorced____. Widowed____.

7. Religious preference: Protestant____. Catholic____. Jewish____.
   Islam____. Other____. None____.

8. Residence:
   Living arrangement: Alone____. In home with family and/or relatives____.
   In home with unrelated others____.
   In a facility or residential setting____.
   Number of moves in past 5 years____.
   Number of years in present address____.

9. Major life events: Check any of the following if they have occurred during the last year in your life and/or your family:

   Birth____:
   Death____.
   Divorce or separation____.
   Family or marital conflict____.
   Family move____.
   Financial problems____.
   Marriage or remarriage____.
   School or job change____.
   Serious accident____.
   Serious illness or physical disability____.
   Trouble with law or legal problems____.
   Other (specify)_____
   _____.
   None____.

10. Group membership: List the names of all formal or informal community associations that you may belong to, such as church, fraternal club, service club, self-help group, social or recreational groups, etc., regardless of your level of participation.

_____

_____

_____

_____

1. How often do you usually have CONTACT with this person, whether face-to-face, or by phone or letter?

   a. Daily.
   b. At least once a week.
   c. At least once a month.
   d. At least once every six months.
   e. At least once a year.

2. How CLOSE does this person live to you?

   a. Lives in the same household.
   b. Within the same general neighborhood or locale.
   c. Within about 30 minutes drive from you.
   d. Within about 2 hour drive from you.
   e. Beyond a 2 hour drive from you.

3. Which types of ACTIVITIES do you and this person engage in according to the following list.

   a. FAMILY activities such as meals, holidays, vacations or reunions.
   b. EMPLOYMENT-related activities such as working with co-workers or supervisors.
   c. ROMANTIC activities such as dating, dancing, or going out for dinner.
   d. CONVERSATIONAL activities such as intimate, personal sharing, or philosophical discussions.
   e. SOCIAL activities such as parties, banquets, or visiting neighbors or friends.
   f. RECREATIONAL activities such as playing cards, participation in or attendance at sports events.
   g. FRATERNAL activities such as participation in clubs or other organizations.
   h. RELIGIOUS activities such as attendance to church, synagogue, or temple.
   i. POLITICAL activities such as rallies or discussions of politics.
   j. VOLUNTEER work such as service to the community, giving blood, or hospital work.

4. How much do you help this person by providing GUIDANCE when they need it, such as giving advice on a task or decision, or giving feedback on an action taken?

Not at all — Rarely — On some occasions — Often — Very frequently

5. How much does this person help you by expressing AFFECTION when you need it, such as a hug, kiss, or pat on the back?

Very frequently — Often — On some occasions — Rarely — Not at all

6. How much do you help this person by DOING THINGS for them when they need it, such as helping with household tasks, providing personal or family care, assisting on the job, or even lending money?

Very frequently — Often — On some occasions — Rarely — Not at all

7. How much do you help this person by expressing AFFECTION when they need it, such as a hug, kiss, or pat on the back?

Not at all — Rarely — On some occasions — Often — Very frequently

8. What TYPE of feelings does this person have toward you, regardless of their strength?

All positive — Mostly positive — About equally mixed — Mostly negative — All negative

9. What is the STRENGTH of the feelings and thoughts this person has toward you, regardless of their type?

Weak — Mild — Moderate — Strong — Very strong

10. What is the STRENGTH of the feelings and thoughts you have toward this person, regardless of their type?

Weak — Mild — Moderate — Strong — Very strong

11. How much does this person help you by providing GUIDANCE when you need it, such as giving advice on a task or decision, or giving feedback on an action taken?

Very frequently — Often — On some occasions — Rarely — Not at all

12. How much do you help this person by giving EMOTIONAL SUPPORT when they need it, such as praising them, being a good listener, or providing them with encouragement?

Very frequently — Often — On some occasions — Rarely — Not at all

13. How much does this person help you by DOING THINGS for you when you need it, such as helping with household tasks, providing personal or family care, assisting on the job, or even lending money?

Not at all — Rarely — On some occasions — Often — Very frequently

14. What TYPE of feelings and thoughts do you have toward this person, regardless of their strength?

All negative — Mostly negative — About equally mixed — Mostly positive — All positive

15. How much does this person help you by giving EMOTIONAL SUPPORT when you need it, such as praising you, being a good listener, or providing them with encouragement?

Very frequently — Often — On some occasions — Rarely — Not at all

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